

Town of Milton
Remote Board of Selectmen Meeting
August 4, 2020
Meeting Minutes
Electronic Meeting
Checklist During State Of Emergency

Although this meeting is open to the public, everyone who attends must fill out a contact form and wear a face mask. Anyone refusing to do so will not be allowed entry. Furthermore, with social distancing, the capacity of the meeting room is approximately 14 people. If more than 14 people arrive, then the meeting will have to immediately be adjourned.

As Chair of the Milton Board of Selectmen, I find that due to the State of Emergency declared by the Governor as a result of the COVID-19 pandemic and in accordance with the Governor's Emergency Order #12, this public body is authorized to meet electronically.

There is no physical location to observe and listen contemporaneously to this meeting, which was authorized pursuant to the Governor's Emergency Order.

We are utilizing the following for this electronic meeting:

1. *Conference call, for people who don't have the means to join via computer.*
 - a. The public has access to contemporaneously listen and, if necessary¹, participate in this meeting by dialing the **toll free phone number (844) 855-4444** and upon the prompt, enter Access Code **145672** and push # (pound sign), or by clicking on the following website address: <https://join.freeconferencecall.com/miltonta> (the online meeting ID is **miltonta**)
 - b. As the Select Board has opened the meetings to the public, this service remains as a convenience offered to those who may wish to access the live meeting remotely by phone or computer to enable additional means by which the public may have access to Select Board meetings.

➤ **6:00 PM – CONVENE MEETING**

➤ **CALL TO ORDER AND PLEDGE OF ALLEGIANCE**

➤ **WORKSHOP SESSION**

- **INTERVIEW THREE WASTEWATER TREATMENT FACILITY CONSULTANTS**
 - DUBOIS & KING – SEE ATTACHED QUALIFICATIONS
 - UNDERWOOD ENGINEERING – SEE ATTACHED QUALIFICATIONS
 - WRIGHT-PIERCE – SEE ATTACHED QUALIFICATIONS

Presentations were made by all three consultants. The Board of Selectmen deliberated, with Andy Rawson stating that he thought Underwood Engineering would be a good fit. Staff stated that any of the three would likely do a good job, but also pointed out that Wright-Pierce has the most Great Bay Watershed-related experience. Matt Morrill made a motion to rank the consultants in the following order of preference:

1. Wright-Pierce
2. Underwood Engineers
3. Dubois & King

¹ Public Participation is required only in the case of a public hearing or a quasi-judicial proceeding of a Planning Board or Zoning Board of Adjustment)

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The motion was seconded by Claudine Burnham. The vote was unanimous.

Wastewater Superintendent Dale Sprague explained that the next step would be for the Select Board to look at the pricing proposals, now that a decision had been made based solely on qualifications. From that point, if the Board feels that the preferred choice is too expensive, there can be negotiation to try to reach an acceptable price point. If not, then the Board could then move down the list. He explained that as long as the process was followed correctly, costs would be eligible for the State Revolving Fund, which could be very beneficial to the Town from a cost perspective.

A motion was made by Andrew Rawson to Adjourn, which was seconded by Claudine Burnham. The vote was unanimous.

Respectfully submitted by Ernest M. Cartier Creveling

BOARD MEMBER	PARTICIPATION			APPROVED <i>9/20/2020</i>			Signatures
	Physically Present	Attending Remotely	Not Attending	YES	NO	ABSTAIN	
Andrew Rawson				<i>✓</i>			<i>Am</i>
Matthew Morrill				<i>✓</i>			<i>[Signature]</i>
Claudine Burnham				<i>✓</i>			<i>Claudine Burnham</i>

TOWN OF MILTON



Engineering Facility Study Qualifications | 7.10.20

SUBMITTED BY:

DuBois & King, Inc.
831 Union Avenue
Laconia, New Hampshire 03246





226473X
July 10, 2020

Ernest Cartier-Creveling
Town Administrator, Town of Milton
424 White Mountain Highway
Milton, New Hampshire 03851

**Subject: Request for Qualifications and Proposals, Engineering Facility
Study, Town of Milton Wastewater Treatment Plant**

Dear Mr. Cartier-Creveling,

DuBois & King (D&K) is pleased to present our Statement of Qualifications for engineering and consulting services supporting the evaluation and upgrade of the Town of Milton (Town) Wastewater Treatment Plant (WWTP). D&K has a strong interest in working with the Town and brings a multidisciplined team with well-established internal lines of communication and current, positive working relationships with regulatory officials. We have visited the site and have tailored our submission according to the Town's Request for Qualifications and Proposals.

I will serve as Project Manager. Based out of our Laconia office, I am a New Hampshire-licensed professional engineer with 16 years of experience providing administration and observation, management, design, permitting, and funding program assistance for WWTPs. I will serve as the lead point of contact, provide civil and process design, and manage the day-to-day development of our study. I will be supported by Chuck Goodling, PE, D&K's Senior Vice President, who will provide QA/QC reviews and verify the project is delivered in an efficient manner. He has provided senior-level engineering and project management on numerous wastewater treatment plant upgrades throughout his 33-year career, including many of the 18 lagoons and 38 wastewater treatment facilities designed by D&K.

Jon Ashley, PE, D&K's Public Works Division Director will provide quality assurance review of deliverables. Jon has 27 years of experience in the areas of wastewater treatment and collection, on-site disposal, stormwater, and hazardous materials. I am also supported by Wilbur Horton Jr., PE, who brings 31 years of electrical engineering and SCADA experience and design for a range of municipal wastewater projects, including the upgrade of the Randolph WWTP and numerous other WWTPs and pump stations. Steve Dumas, PE, CxA, BCxP, LEED AP, will lead the mechanical evaluation for this project. With 37 years of experience, Steve served on the D&K team as senior mechanical engineer on the upgrade of the Randolph Wastewater Treatment Plant.

The DuBois & King team appreciates the opportunity to submit our qualifications for this project. Should you have any questions regarding our submission, please feel free to contact me at 603.524.1166 or at nsceggell@dubois-king.com.

Sincerely,
DuBois & King, Inc.

A handwritten signature in blue ink, reading 'Nicholas Sceggell', is written over a light blue circular background.

Nicholas Sceggell, PE
Project Manager

Project Understanding

The Town of Milton's Wastewater Treatment Plant (WWTP) is permitted for 100,000 gallons per day (GPD) of capacity and currently has average daily flows of 55,000 GPD.

The Town manages and operates the WWTP in a responsible manner and is seeking a highly qualified engineering firm to complete a Facility Study of the WWTP. D&K understands that the Town's priority to be evaluated and discussed in this Facility Study include:

- Potential impacted groundwater from lagoons
- Lagoon liner repairs/replacement
- Solids removal and processing
- Great Bay Total Nitrogen permit impacts to Town
- Funding sources

The D&K team will focus on an asset management evaluation of the existing WWTP treatment processes and building and identifying upgrade alternatives. The team will prioritize alternatives that are long-lasting and reliable, and have the potential for reducing operational costs and energy consumption. Alternatives must also take into consideration current Groundwater Bureau enforcement actions, as well as future limits associated with Great Bay's Total Nitrogen General Permit.

Potentially Impacted Groundwater

The Town of Milton's WWTP staff samples groundwater around the facility via monitoring wells that are located upstream and downstream of the lagoons. Recently, elevated levels of nitrates and chlorides were detected at the downstream monitoring well. The Waste Management Division of NHDES is requiring the Town to develop an action plan to address the violations. During a site visit with NHDES staff and experts on lagoon liners from RTD Enterprises, it was noted that the existing liner in the largest lagoon is showing signs of breaking down, and is the likely source of groundwater contamination. Repairs or replacement of the lagoon liner will be evaluated as a potential remedial measure. D&K will evaluate recommended improvements, such as complete replacement of the liner, with consideration of the life cycle cost, as well as other improvements to the current lagoon treatment process as may be required to provide nitrogen removal capability. These measures are in response to nitrogen limitations to be imposed by NHDES/EPA. D&K has experience working with the EPA Region 1 General Permit for the Connecticut River Watershed for Phosphorus.



Lagoon Liner Repairs/Replacement

The Town of Milton has reviewed the existing lagoon liners with representatives from RTD Enterprises. During a site visit with staff from RTD and NHDES, attendees noted several liner failure locations. These locations are potential sources for groundwater contamination from the lagoon. RTD noted that the liner is beyond any warranty period, and it is approaching the end of its useful life. During the inspection, the failures were observed at the top of the liner near the normal operating water level where there is more exposure to environmental elements such as sunlight, which can degrade the liner. RTD identified the following alternatives to address the failed liner:

Full Liner Replacement: The first alternative is a complete replacement of the liner system. This would require removal of all the accumulated sludge prior to replacement, and would be a significant expense to the Town, both to address solids/sludge that has accumulated over the life of the treatment plant and to complete the work involved with a full liner replacement.

Partial Liner Replacement: The second alternative is to remove and replace the top half of the liner, which has been exposed to the elements and where the leaks were identified during the inspection. The partial replacement requires less sludge removal and is a less expensive option to address the current groundwater contamination violation identified by NHDES.

As part of the facility study, D&K will review these alternatives and provide feedback to the Town about short-term and long-term benefits of each option. We understand that fixing the lagoon liners is a priority for NHDES Groundwater staff in addressing the current violations for elevated nitrates and chlorides. We also recognize that the Town will be expected to address future effluent permit limits for total nitrogen based on the proposed Great Bay Total Nitrogen permit, and any proposed improvements must also take into consideration those requirements.

Solids Removal and Processing

The facility has a lined lagoon system that has been accumulating sludge for 33 years. Similarly to the Orwell (VT) WWTP, where D&K recently assisted with lagoon system upgrades, the No. 1 (and largest) lagoon contains a substantial sludge volume, but the facility has not had trouble meeting effluent quality requirements. To reestablish the available treatment volume and enable the facility to continue to meet effluent quality requirements, a sludge/solids removal plan is needed. Based on our experience, following are the primary options for management of the lagoon sludge:



The lagoon liner shows significant signs of deterioration (below), which will be addressed as a part of this study.



Dewater the lagoon and pump sludge into trucks for delivery to a WWTP or a permitted sludge facility. The receiving facility would need to be able to handle the anticipated volume of sludge over a period of time. Some limitations with this approach are that many facilities do not have sufficient capacity to take the needed volume of sludge and/or charge a premium for it. Alternative facilities are typically needed to take the sludge in the event that dewatering is ongoing and a problem occurs at the receiving facility. In addition, this method includes trucking significant volumes with sludge typically containing approximately 5% solids. Given that most of the weight is water, it will be advantageous to dispose of the effluent and solids at a location in close proximity to Milton.

Mobile dewatering centrifuge system. For the recent Orwell WWTP project, a mobile dewatering centrifuge system with trucking and disposal of solids at a landfill was the only feasible alternative for Lagoon No. 1 sludge removal. After draining the lagoon, the sludge was pumped at a concentration of approximately 5% solids to a trash separator, separated in a trailer-mounted centrifuge system, and delivered via conveyor belt to a side dump trailer. The system achieved 28% solids collection concentration, allowing the solids to be shipped to the most cost-effective nearby landfill.



D&K employed a mobile dewatering centrifuge system at the Orwell WWTP. Shown above



Great Bay Total Nitrogen Permit Impacts

The Draft Great Bay Total Nitrogen General Permit covers discharges of nitrogen from 13 WWTPs in the State of New Hampshire that discharge wastewater into a surface water located within the Great Bay watershed. The Milton WWTP is one of the facilities listed in the draft permit, and the Milton WWTP is the smallest facility on the list. The draft permit identifies a total nitrogen (TN) waste load allocation for the Milton facility of 11 pounds per day (lbs/day). It emphasizes that this is considered an annual limit, and recognizes that TN levels will be lower in warmer months and higher in colder months. It also states that monitoring for total nitrogen will commence on the effective date of the permit, and requires the municipality to develop a Nitrogen Optimization Plan (NOP) for the following purpose:

“...evaluate alternative methods of operating the existing Wastewater Treatment Plant to optimize the removal of nitrogen throughout the year, including, but not limited to, operational changes designed to enhance nitrification and denitrification, incorporation of anoxic zones, septage receiving policies and procedures, and sidestream management.”

D&K reached out to NHDES to get an update on the current status of these permit requirements and understands that the original public comment period on the draft permit was extended to May 8, 2020, and that EPA is currently working on responses to comments received. It will be important to obtain as clear an update as possible from EPA regarding the TN wasteload allocation for Milton during the course of this

study, so this pending permit requirement can be accounted for during the identification and evaluation of facility upgrade alternatives.

Equipment Vendors. While preparing this proposal, D&K reached out to several equipment manufacturer representatives who address nutrient removal at lagoons to have an initial discussion of potential applications for cold weather nitrogen removal at a facility like Milton's WWTP, which could include:

- **Provide floating insulated modular covers:** To achieve nutrient reduction in a lagoon in cold weather, insulated covers may be an important component of any upgrade as temperature conservation is a key to maintaining the nitrification process through the winter months.
- **Installing new aeration/lagoon upgrade for nutrient removal:** Modifying the internal operations within the lagoon can provide the correct environment for nitrification/denitrification to occur.
- **Implementation of Moving Bed Biofilm Reactor (MBBR) of Integrated Fixed-film Activated Sludge (IFAS) technologies:** These are “add-on” technologies that can be implemented at a lagoon to achieve nutrient removal.
- **Conversion to a new treatment technology:** An alternative approach is to replace the lagoon treatment facility with a new technology, which can be designed to achieve nitrogen reduction. The Sequencing Batch Reactor (SBR) is one technology that is particularly suited for nutrient reduction and has been used in previous lagoon upgrade applications in northern New England. D&K is well-acquainted with SBR technology, having designed four SBR facilities.

Modifying a lagoon facility that is operating in a cold climate to achieve nitrogen removal presents significant challenges. D&K will complete a careful investigation of upgrade technologies. D&K will compare an upgrade approach to an alternative that moves away from lagoon treatment to a technology that provides better process control.

State and Federal Funding Program Experience

D&K understands that the Town submitted a pre-application to the Clean Water State Revolving Fund (CWSRF) Loan Program in June and is waiting to hear if the project will receive any funding from the Program. If the project ranks on the priority list, then the Town will be required to submit a full application for the proposed work. D&K has relevant experience and is fully capable of supporting and/or leading the requisite funding agency coordination and preparation of Grant/Loan Funding Applications and associated documentation for this project. Our experience includes planning, design, and construction phases. The assigned D&K team has experience conforming our professional services agreements to the requirements of a variety of funding agencies.

The senior members of our project team have decades of experience assisting New Hampshire municipalities with funding for wastewater and stormwater projects funded by CWSRF. D&K can provide additional assistance to review other funding sources such as the USDA Rural Development (RD) Grant and Loan program. D&K is fully versed in and has solid working knowledge in the utilization of State and Rural Development procurement (bid) and construction contract documents. Our team routinely works with the CS-1 documents on CWSRF-funded projects and EJCDC documents that are modified by RUS Bulletin 1780-26 on RD-funded projects. D&K works with staff from both agencies during the planning, design, and construction phases projects to maximize eligibility and to monitor contractor compliance with the procurement and construction contract documents.

Nick Sceggell and Chuck Goodling participate periodically in the Engineering Liaison Committee meetings held periodically by RD for coordination with NHDES and the consulting community regarding state and federal funding and technical programs, policies, and protocols. D&K attended recent workshops provided by NHDES on CWSRF Loan Program requirements and eligibility. D&K has direct working relationships with senior staff within the applicable funding agencies including:

USDA Rural Development

- Jon-Michael Muise, Acting State Director
- Eric Law, Community Program Specialist
- Jonathan Harries, State Engineer

NHDES

- Tracy Wood, Administrator Wastewater Engineering Bureau
- Kathie Bouret, Grants Administrator, SRF
- Dennis Greene, Supervisor Design Review, WWTP and Sewers

Project Manager Nick Sceggell, PE, previously worked for the Granite State Rural Water Association and was an active member of the Salmon Falls Watershed Collaborative during that time. In his role as source water protection specialist, Nick's received funding from EPA to assist rural water districts with drinking water protection initiatives. The Salmon Falls River, which serves the City of Somersworth, NH, and the Town of Berwick, ME, as the primary drinking water source was a focus for both states and the EPA regional office. Nick developed strong working relationships with regulators from NHDES and EPA to advocate for rural communities for funding and assistance with compliance issues.

Scope of Services

DuBois & King (D&K) anticipates the development of the Town's Wastewater Treatment Plant engineering facility study will include the following tasks:

Task 1. Project Kick-off Site Visit: Our Senior Environmental Engineer and Staff Engineer will make a site visit to the facility with the Operator to gather relevant existing information for the facility study, such as:

- Existing Flows
- Existing Facility Layout and Treatment Process Review
- Existing Monitoring Data
- Historical Information and Reports

Task 2. NHDES Meeting: Our Senior Environmental Engineer will coordinate a meeting with contacts from NHDES Waste Management Division (Matthew Taylor) and the Wastewater Engineering Bureau (Ken Kessler) to review the existing conditions and discuss the alternatives to address the potential groundwater contamination that was identified previously. This meeting will inform the Town and NHDES about current progress and identify a path to compliance.

Task 3. Preliminary Corrective Action Plan: In response to NHDES's March 10, 2020, letter to the Town, D&K will develop a corrective action plan to address the compliance issues identified. The preliminary corrective action plan will identify the steps that the Town intends to take to bring the WWTP into compliance. The first step in that process will be developing the feasibility study for the plant on a holistic basis. This includes addressing the immediate compliance issue and considering long-term impacts and needs for the Town, including compliance with future permit requirements. D&K's preliminary plan will include several alternatives that will be studied in more detail prior to selecting the preferred alternative.

The approach will be outlined in the preliminary corrective action plan and shared with NHDES stakeholders for feedback. Upon completion of the study, and concurrence from the Town on the recommended alternative, D&K will update the Corrective Action Plan to identify appropriate corrective actions.

Task 4. Alternatives Analysis: Several alternatives have been identified by the Town with varying degrees of complexity and expense. D&K will review the alternatives and update the estimated costs for each alternative. In addition to capital costs, the analysis includes life cycle cost evaluations that consider operation and maintenance costs and also determine if improvements are expected to achieve compliance with the Great Bay Total Nitrogen General Permit. D&K anticipates that alternatives will range from partial liner replacement to complete replacement of the treatment process.

Task 5. Selectboard Presentation of Alternatives: D&K will present the findings of the alternatives analysis to the Selectboard. This will provide the Town with the opportunity to review the alternatives, ask questions, and identify a preferred alternative based on recommendation from D&K and the WWTP Operator.

Task 6. Preliminary Rate Study Investigation and Funding Opportunities: D&K will use cost information from the preferred alternative, in addition to historical O&M costs for the WWTP, for comparison against revenue generated from user fees. Affordability indexes that compare sewer rates to median household incomes will be presented and compared with information available from surrounding communities. This information will be used to identify potential rate increases that would be needed to pay for recommended upgrades and continued operation of the facility.

Task 7. Final Report and Presentation: D&K will summarize the findings from the facility study and alternatives analysis into a written report to be submitted to the Town for review and comment before being shared with NHDES for feedback. D&K will address the Town's feedback and present a final report to the Selectboard. D&K will share a final corrective action plan, inclusive of the Selectboard's edits, with NHDES.

Note: *The scope of services does not include any design phase services to implement recommended alternatives, which will be provided during subsequent phases.*

Project Team

Since its inception in 1962 as an environmental engineering firm, DuBois & King has led the evaluation, design, bid, and construction phase services for wastewater treatment and other infrastructure to towns with needs similar to those of Milton. With offices in Laconia, Bedford, and Keene, New Hampshire, D&K employs a staff of 130 engineers, surveyors, permitting specialists and support staff. The local team assigned to this project brings current knowledge of the Milton community and similar wastewater treatment facilities.

The team has a firm understanding of the Town's expectations and requirements for this project. D&K currently serves as the municipal Planning Board Engineer for the Town of Milton, and the continued sustainable provision of wastewater infrastructure is a key element influencing and supporting the community. The D&K team will provide comprehensive engineering services with in-house staff who have collaborated on numerous similar project assignments. The following are descriptions of individual team members. Resumes for key D&K staff are included at the end of the document.

Key Staff

Nicholas Sceggell, PE, Project Manager, has 16 years of experience working with municipal clients to evaluate and design water, wastewater, and road infrastructure throughout New Hampshire. Nick brings hands-on experience guiding municipalities and cooperatives through CWSRF- and CDBG-funded wastewater asset management and improvement projects and maintains positive working relationships with officials at the state and federal level. Nick is currently leading the study and design of wastewater improvements at the Glencliff Home Dementia Wing. In addition to managing and providing design and permitting for wastewater projects, Nick brings significant experience leading design of the site/civil, stormwater, and environmental aspects of these projects. Having successfully managed numerous recent wastewater projects, he will be able to continue to efficiently use established lines of communication within the firm and with pertinent regulators to provide a high-quality, cost-effective study to the Town of Milton in a manner that promotes open communication and minimizes delays.



Charles Goodling, PE, Principal and Process Engineer, has 31 years of civil and process engineering experience providing administration and observation, management, design, permitting and funding assistance for Wastewater Treatment Plant projects throughout central Vermont and New England. Chuck served as Project Manager for Burlington's three WWTPs and 26 pump stations, managed Randolph's WWTP upgrade and process conversion, and provided senior-level engineering for the Town of Northfield's WWTP upgrade and process conversion, and most of D&K's recent wastewater collection projects in New Hampshire. Chuck will be in responsible charge of the study, will serve as the lead process engineer, and as a Senior Vice President of the firm, will assure that the project receives the in-house resources necessary for successful completion.



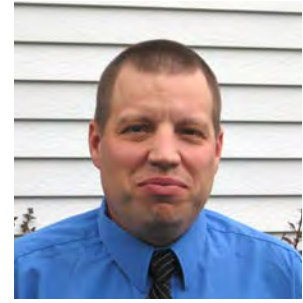
Jonathan Ashley, PE, Quality Assurance Reviewer, has 27 years of experience managing and leading design of wastewater treatment and collection, civil, stormwater, and hazardous materials projects. Jon managed the Orwell WWTP evaluation and design project, provided construction administration for the Randolph WWTP project, and recently led successful projects designing small municipal wastewater treatment and disposal systems. He will be responsible to review deliverables and assure that the firm's services proceed through D&K's quality assurance and control processes.



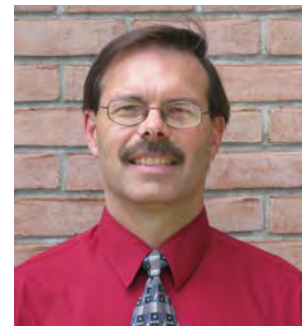
Galen Hagen, PE, Project Engineer, has seven years of experience designing, permitting, and supporting the construction of wastewater collection and other municipal utilities replacement projects in a variety of urban and rural residential contexts. He brings current, working knowledge of state and federal regulations concerning the design of sewer mains, pump stations, and wastewater treatment facilities. He is currently leading design and serving as a point of contact for wastewater facility improvements at the Sugarbush WWTP and City of Barre WWTP. He was also the lead designer for the aeration system upgrade at the municipal lagoon treatment facility in the Town of Orwell. Galen will lead day-to-day report development.



Wilbur Horton, Jr., PE, Senior Electrical Engineer, has 31 years of professional experience, including design for a range of wastewater treatment plant electrical services, as well as design for gas flares for landfill gas systems and Wastewater Treatment Plant digester systems. Wilbur worked closely with Chuck Goodling on the Town of Randolph's WWTP upgrade and process conversion, as well as numerous process upgrade, gas flare, and controls upgrades to wastewater treatment facilities throughout northern New England. Wilbur's gas experience includes projects at the Northampton, MA, Wastewater Treatment Plant, and support services for the primary cover replacement in Barre. Wilbur will lead any necessary electrical evaluation of equipment and building envelope needs for this project.



Steven Dumas, PE, CxA, BCxP, LEED AP, Senior Mechanical Engineer, has 37 years of engineering experience on projects ranging from conceptual design studies and facilities evaluations to complex, multidisciplinary design packages for multi-million dollar projects. He has direct experience in all areas of MEP project delivery, including client contact and proposals, establishing the basis of design development and delivery, construction services, and commissioning/retro-commissioning services. He has specific experience with energy conservation evaluations and building system controls design to provide energy saving operation for both existing and new systems. Steve will lead the mechanical evaluation of equipment and building envelope needs for this project.



Support Staff

Timothy Dall, PE, SE, SECB, LEED AP, Senior Structural Engineer, has 23 years of experience as a structural engineer. Tim leads the DuBois & King Structures Division. His experience includes design and investigation of various building materials, including steel, concrete, precast concrete plank, masonry, and timber. Tim was the structural engineer for the Randolph WWTP Upgrade, and the Cochecho Street Wastewater Pump Station in Dover, NH. Tim will provide structural engineering support as needed for this project.



Michael Spasyk, PE, LEED AP, Mechanical Engineer, has 23 years of mechanical engineering experience. As an HVAC Engineer, he has provided mechanical engineering to support Wastewater Treatment Plant improvement projects. He designed the HVAC system for the Northfield Wastewater Treatment Plant Upgrade Project; served as a Senior Mechanical Engineer for the Randolph Wastewater Treatment Plant Upgrade and Process Conversion; and served as Mechanical Engineer for HVAC and mechanical upgrades at the Barre Wastewater Treatment Plant. Mike will provide quality control review of the mechanical design and cost estimating for mechanical systems.



Availability of Assigned DuBois & King Team Members

D&K's project team has a thorough understanding of the effort involved, and the D&K team assigned has the required technical disciplines, experience on similar projects, and the capacity to perform the work in an efficient and focused manner. Beyond the assigned team, D&K has the in-house capacity to provide additional support to the project if necessary.

DuBois & King does not have any current or upcoming obligations that would affect our performance under the requested scope. D&K offers the Town individual and dedicated service throughout the duration of this contract. The firm maintains six-month workload projections, and based on current workload projections, the team is confident that we have the capacity to meet the needs and expectations of the Town for this project assignment.



Representative Experience

Asset Management and 20-Year Engineering Evaluation, 3 WWTPs and 26 Pump Stations, Burlington, VT. D&K evaluated Burlington's three wastewater treatment plants and 26 wastewater pumping stations that serve the City's 42,000 residents. The existing facilities include screening, grit removal, clarification, aeration, and sludge dewatering and digestion. D&K staff visited each pumping station and treatment plant to determine the existing conditions of each device within each facility, forecast replacement costs, and impacts to ratepayers.



For Burlington, D&K completed an evaluation report, which was prepared in a ranking matrix, with each item defined on a risk/probability scale, and each item hyperlinked to a photograph. The report is divided into individual components and is cross linked to Burlington's GIS system. This provides integrated asset management capabilities and a user-friendly method for staff to access current equipment condition information.



Wastewater Lagoon Aeration, Orwell, VT. D&K provided design, construction management, and startup assistance services for an upgrade of the lagoon aeration system to meet current standards. The plant consists of an aerated lagoon facility that provides secondary treatment and chlorine disinfection of municipal wastewater. The aging aeration system was a submerged lateral system, which the project replaced with a floating lateral system with two new regenerative blowers with VFDs. D&K coordinated dewatering and sludge removal from Lagoon 1 and Lagoon 2, which was processed on-site to render it suitable for landfill disposal. D&K also coordinated the installation of the new aeration system in both lagoons and replacement of the existing compressors while maintaining the treatment facility in operation during the time of construction. D&K provided mechanical design including improvements to the operations building HVAC system, which now allows the operator to close the doors and windows. D&K provided electrical design for the facility improvements as well, including installation of a new electric service to replace the 150-amp service. The new aeration system has improved dissolved oxygen levels in the lagoons from 0.5 milligrams per liter (mg/l) to 7 mg/l.



20-Year WWTP Evaluation, Fairfax, VT. D&K provided engineering services for the existing Wastewater Treatment Plant consisting of a 78,000-GPD three-cell, aerated lagoon system constructed in 1980. Average daily flows are approximately 52,500 GPD, along with a 10 percent 7,800-GPD municipal reserve and half the allocation commitments. D&K performed an evaluation of alternatives to increase the wastewater treatment capacity of the Town's existing facility and to make a determination of how much the facility could be expanded.



20-year WWTP Evaluation, Brattleboro, VT. D&K completed a 20-year performance evaluation of the nearly 45-year-old facility, as required by Condition D of the current National Pollutant Discharge Elimination System (NPDES) permit based on the age of the WWTP. The evaluation concluded that the WWTP has operated with few problems or documented NPDES permit violations during the three-year study period. However, much of the equipment and control systems are at the end of their useful operating life and should be upgraded with state-of the art equipment and control systems.



Additionally, certain sub-systems require complete redesign and replacement to function more effectively during the next 20-year planning period. These include grit removal; septage receiving and handling; systems dealing with fats, oils, and greases (FOG); anaerobic digestion components; and solids stabilization and dewatering equipment. The firm also provided preliminary engineering to define the scope and costs for a \$20 million facility-wide upgrade including a comparison of two process alternatives: replacement/upgrade of existing RBC process, or; process replacement with SBR technology. Preliminary engineering encompassed a detailed comparison/evaluation of alternative sludge dewatering technologies (including belt filter press, Fournier Press, and centrifuge), included advantages and disadvantages of each technology, performance and space considerations, and capital and operational costs in a life-cycle/present worth analysis.

WWTP Evaluation, Ben & Jerry's Homemade, Waterbury, VT.

D&K evaluated the manufacturing wastewater pretreatment plant (lagoon) at an ice cream production plant. The D&K team conducted a preliminary investigation of pretreatment processes and recommended complete limited site survey to identify key elevations. The firm completed an existing hydraulic profile of the facility, identified bottlenecks and recommended changes in piping sizes/slopes and/or changes in equipment elevations to support planned future gravity and pumped flow requirements. D&K coordinated with WWTP staff to define design parameters, including design ratio, production hours, peak hourly flow, maximum average daily flow, and additional information. The firm prepared the basis of the design report for all proposed equipment systems, including definition of WWTP hydraulics, individual equipment sizing, required piping upgrades, and budget cost estimates for improvements. D&K recommended additional sampling of waste strength to better characterize loading into the Aerated Lagoon System, and analyzed the performance of Pretreatment Aerated Lagoon System for current and proposed increases in ice cream production.



Study and Design for Phosphorus Removal, Poultney, VT. D&K conducted a preliminary engineering study to evaluate the existing Wastewater Treatment Plant to include phosphorus removal capabilities. The firm also prepared an environmental assessment. Upon receiving approval, D&K completed the final design for upgrade of the Village of Poultney Wastewater Treatment Plant to include phosphorus removal capabilities. The project includes new circular clarifiers; a new aerated sludge storage tank; new chemical/sludge pumping building to house new sludge pumps; alum, caustic, and polymer feed systems; a new phosphorus laboratory; and modifications to existing blower building. Other work included site grading, yard piping, and all associated architectural, structural, mechanical, and electrical work.

Evaluation and Design, Sugarbush WWTP, Warren, VT.

D&K provided an evaluation of wastewater treatment options supporting comprehensive expansion at the Lincoln Peak area. Phase I included analysis of seasonal influent flow characteristics and development of Waste Loading Basis of Design to define biological, chemical, and hydraulic loading parameters. The team completed a detailed performance evaluation and preliminary cost estimate for upgrades to the existing Wastewater Treatment Plant (0.164 MGD) to correct process/hydraulic limitations as required to enable the facility to meet tertiary effluent requirements under new flow/loading conditions. The owner determined that construction of a new facility would avoid unnecessary permitting-related issues associated with expansion of existing facility. Phase II included the detailed final design of a new wastewater collection/pumping, treatment, and subsurface disposal facilities in upland watershed. A SBR and tertiary Wastewater Treatment Plant were included in the design to meet extremely stringent discharge limitations. The SBR and tertiary facility included the capability for biological and chemical phosphorous removal, biological nitrification/denitrification, polymer addition and pH adjustment systems, automatic backwashing filtration (ABF), and a high rate subsurface disposal facility. Due to the owner's requirements for phased ski area expansion program, D&K designed the treatment facility innovative features such as vertical basin concepts enabling treatment capacity to be expanded by over 60 percent (from 0.066 MGD initially to 0.107 MGD at full build out) by simply raising a float setting to deepen SBR reactor volume, and adding one additional blower. This approach resulted in significant process flexibility and substantial savings in future construction costs and permitting requirements. Other innovations included sludge wasting by gravity (i.e. without pumping) to interior, lower level, aerated sludge storage tanks.



Additional Design Experience

Wastewater Treatment Plant Upgrade and Process Conversion, Randolph, VT.

D&K was responsible for the design, permitting, and construction phase services for an \$8.9 million comprehensive upgrade of the 40-year-old Wastewater Treatment Plant that serves the Town of Randolph. D&K assembled a team of professionals, including a local architect, geotechnical engineer, and energy management specialist. A new SBR was designed to provide operational flexibility in the face of pending nutrient removal requirements in the Connecticut River drainage basin. The project included new headworks, fine screen grit removal, chlorine disinfection/dechlorination, aerated sludge storage, and centrifuge dewatering and a backup generator. Using a holistic and integrated design approach, opportunities were maximized to incorporate energy conservation and renewable energy features into the upgraded facility while minimizing operational and maintenance costs. D&K provided full-time resident engineering and construction administration. *The project received an Award for Engineering Excellence by the American Council of Engineering Companies, Vermont Chapter's annual competition.*



Digester Cover and Boiler Replacement, Barre, VT.

D&K is currently providing design for the replacement of an anaerobic digester cover, waste gas flare, and boiler serving the Barre Wastewater Treatment Plant. The firm is supported by LCS Controls for this project.

Primary Digester Cover Replacement, Barre, VT.

D&K provided design and construction phase services for the replacement of a primary digester cover at the Barre Wastewater Treatment Plant. The firm evaluated several different types of material to replace the cover and concluded that aluminum was a cost-effective material to prevent deterioration.

Advanced Wastewater Treatment Plant Upgrade, Barre, VT.

D&K provided design and construction services for upgrade of Barre Wastewater Treatment Plant to advanced wastewater treatment, including nitrification and phosphorus removal capabilities. The firm provided full design, permitting, and resident engineering and construction administration.



Pump Station Rehabilitation, Laconia, NH. D&K completed process piping and electrical redesign of an oversized pump station. The facility is located in a built-out residential neighborhood. A significant portion of the station's design flow was redirected to another pump station. Improvements include new influent grinder unit to be installed in a structurally modified channel, electrical controls, generator, pumps, and force main. The project was expanded to include pump replacement to better match current wastewater flow conditions, and downsizing an existing sewer forcemain using an innovative slip-line technique.

Pump Station Reconstruction, Dover, NH. D&K led the reconstruction of a 40,000-60,000 GPD pump station including the pump, controls, appurtenant site improvements, standby generator, and evaluation/mitigation of hazardous materials including petroleum present at the site. The project is in the construction phase.

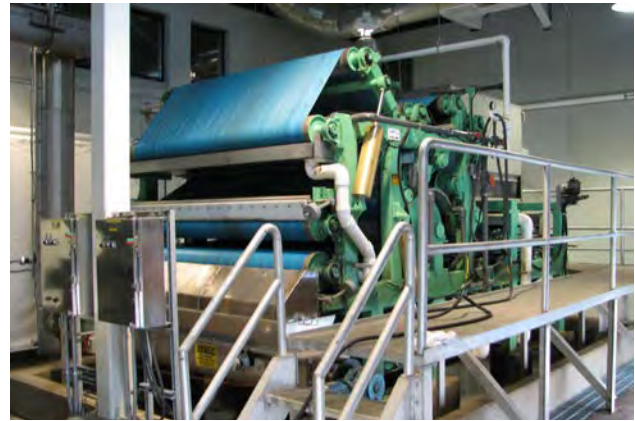
Wastewater Treatment Plant Upgrade and Process Conversion, Northfield, VT.

D&K provided a comprehensive upgrade of 40-year-old Wastewater Treatment Plant and process conversion from Trickling Filter to SBR to comply with stringent phosphorus limitations. The project replaced outdated headworks with fine screen and aerated grit chamber to improve removal of inorganics and FOG. The project included an innovative reuse of existing TF tank for post-SBR flow equalization, resulting in \$200,000 savings. The site was constrained due to a railroad and the Dog



River, requiring geotechnical measures to protect rails. D&K completed upgrade/replacement of biosolids processing, including replacement of anaerobic digesters with aerated sludge storage, evaluation of alternative sludge dewatering technologies, new centrifuge and dewatered sludge screw conveyor, and efficient on-site storage/off-site hauling. The project eliminated a public health and safety threat by converting from 1-ton gas chlorine to liquid chlorination/dechlorination system. Energy efficient design techniques included premium efficient motors, heat recovery system from blower room, innovative day-lighting in Control Building, and new SCADA system for improved on-site/off-site monitoring. D&K provided full-time resident engineering and construction administration. The project received an Award for Engineering Excellence by the American Council of Engineering Companies, Vermont Chapter's annual competition.

WWTP Upgrade, Bennington, VT. The project focused on reducing extraneous flows to the treatment facility through comprehensive sewer separation and pipe/manhole/pump station rehabilitation efforts that were implemented in four separate construction contracts. The existing primary treatment facility was upgraded to 5.1-MGD RBC, including new 11-MGD raw sewage pumps, secondary treatment, anaerobic digestion, and effluent polishing filter for Ultimate Oxygen Demand removal and disinfection system. The firm provided construction services for the biosolids dewatering building to house 2.0-meter belt filter press and innovative 4-ton per-day in-vessel sludge composting system with biofilter for odor control. Project construction was phased over a 20-month period.



Capacity Expansion, Essex Junction, VT. D&K performed a detailed evaluation of alternative sludge dewatering technologies, including centrifuge, gravity belt thickener (GBT), and rotary (Fournier) press. The D&K team completed a mixer upgrade in the anaerobic digester and new 1.5-meter GBT to avoid the historic practice of co-thickening excess waste activated sludge in the primary clarifiers, which limited the total hydraulic capacity of the facility. Significant improvement in sludge handling resulted in a much needed increase in National Pollution Discharge Elimination System (NPDES) permitted discharge capacity from 3.1 MGD to 3.3 MGD. The project included an innovative reuse of existing facilities (tankage, piping) and efficient use of available space in existing buildings allowing project approval as a “minor” Act 250 Permit Amendment, resulting in substantial savings in costs and time.





Nicholas Sceggell, PE

Project Manager

EDUCATION

Bachelor of Civil Engineering (BCE), Environmental Concentration, The Catholic University of America, 2004

REGISTRATIONS

Professional Engineer: NH 13870

NH Local Public Agency Certification Training – Federal Aid: 1518

Mr. Sceggell has 16 years of experience working with municipal, nonprofit, and commercial clients on a diverse portfolio of design, construction management, and environmental planning projects. He has significant experience on civil/site and utility projects including drinking water, wastewater/sewer, and stormwater infrastructure. Nick has expertise with ArcGIS mapping software and GPS data collection; AutoCAD Civil3D to create alignments, profiles, vertical and horizontal curve design, and related site design techniques; WaterCAD to model water systems in order to evaluate capacity and development impacts; and HydroCAD for stormwater management calculations.

Cochecho Street Wastewater Pump Station, Dover, NH. Project Manager for reconstruction of a 40,000–60,000 GPD pump station including the pump, controls, appurtenant site improvements, standby generator, and evaluation/mitigation of hazardous materials including petroleum present at the site. Responsible for scheduling and budgeting of in-house survey, civil and electrical design, construction phase, and support staff as well as leading day-to-day design development.

Clearwater Pump Station Rehabilitation, Laconia, NH. Project Manager for process and electrical redesign of an oversized pump station. The facility is located in a built-out residential neighborhood. A significant portion of the station's design flow was redirected to another pump station. Improvements include new influent grinder unit to be installed in a structurally modified channel, electrical controls, generator, pumps, and force main.

Rehabilitation, Benjamin's Wastewater Treatment Facility, Port Deposit, MD. Designed rehabilitations to an existing 40,000 GPD wastewater plant including influent pumping station, fine bubble aeration system, and UV disinfection system.

Preliminary Design Report, Fort Detrick Water Treatment Facility, Fort Detrick, MD. Environmental Engineer for a preliminary design report, evaluation of various treatment processes, and upgrades and modifications in order to optimize plant efficiency and water quality.

Surfside Wastewater Treatment Facility, Nantucket, MA. Environmental Engineer for preparation of construction drawings in tandem with process engineers and project managers for regulatory approval. Oversaw subcontractor borings for sewer rehabilitation in areas of high inflow/infiltration.

On-Call Sewer Review, Plymouth Village Water and Sewer District, Plymouth, NH. Project Manager for third party review services to evaluate new wastewater connections to a municipal wastewater collection system. Services include review of design plans and calculations to support location and sizing of new water and sewer infrastructure, and review of design details and specifications for compliance with PVWSD standards

WWTP Design, Glenduff Home Dementia Wing Addition, State of New Hampshire. Civil Engineer completing an assisting with the evaluation and design of an upgrade to an existing on-site wastewater treatment and disposal system to accommodate the design of a new building addition. The wing will house 15–20 single patient rooms with ensuite toilet rooms and associated support spaces to form a new dementia care unit. The proposed addition will increase the system loading by approximately 2,400–GPD. The wastewater from the facility is conveyed by a gravity sewer system to an on-site wastewater treatment and disposal system located behind the Maintenance Shop. The system comprises an Imhoff tank, (2) primary settling tanks, a pumping chamber, (4) sand filters and (3) subsurface disposal fields. The pumping system is float actuated, dosing two sand beds at a time. Beds are rotated monthly (two on and two off) via two manually operated valves. Perforated pipe collects the filtered effluent below the sand beds and conveys the flow via gravity to the three subsurface disposal fields. Responsible for a study to review and design a new package facility.

Source Water Protection Initiatives, Granite State Rural Water, Various Communities, NH. Water Resources Specialist to prepare watershed assessments of drinking water sources for New Hampshire communities. Work included organizing and running stakeholder meetings, gathering input from state agencies, community organizations and private individuals to develop action plans and protect the watersheds. Tasks included drainage area mapping, subwatershed delineations, identifying potential sources of contamination, and stormwater runoff calculations.



Charles Goodling, PE

Principal/Process Engineer

EDUCATION

B.S., Civil and Environmental Engineering,
Utah State University, 1984

A.A.S., Ecology & Environmental Technology,
Paul Smith's College, 1981

REGISTRATIONS

Civil Engineering: VT 5797

Mr. Goodling is a Senior Engineer with 31 years of experience with wastewater and water infrastructure improvement projects. His work has included planning and evaluation of alternatives; detailed engineering design; project management and scheduling; cost estimating; quality control and value engineering; client relations; and interaction with municipal, state, and federal agencies regarding permitting, funding, and project approvals.

Fairfax WWTP Expansion Study & I/I Study, Fairfax, VT. Project Manager for feasibility level assessment of the expansion to the existing aerated lagoon treatment facility built in 1980. Reviewed existing data, records, and reports for the facility. Conducted site inspection to review existing facility, land area, and characteristics surrounding the facility. Prepared the preliminary basis of design for expansion of the facility to incorporate process equipment for phosphorus removal. Coordinated with ANR for input regarding NPDES permit and operations and discharge coordination issues relative to expansion of the WWTP. Prepared preliminary construction and project cost estimates. Evaluated hydraulic and biological expansion and wastewater treatment alternatives. Prepared preliminary configurations of additional lagoon and expansion using orthophoto. Prepared a report with recommendations for the feasibility of expansion.

20-year Asset Management Plan, 10-year Capital Improvements Plan for 3 Wastewater Treatment Facilities and 25 Pump Stations, Burlington, VT. Project Manager for an evaluation of civil, process, mechanical, and electrical components for the City of Burlington's wastewater treatment and pumping. Oversaw day-to-day development of the project, led process engineering evaluation and narrative report completion, provided client coordination, and quality assurance review of deliverables for a multidisciplinary team.

20-year Evaluation, Brattleboro Wastewater Treatment Facility, Brattleboro, VT. Senior Environmental Engineer and Quality Assurance/Quality Control for 20-year performance evaluation to meet NPDES permit requirements for the facility that was first constructed in 1965 and upgraded/expanded in 1984. Performed facility inspection; evaluated current and projected population, flow, and loading; evaluated existing wastewater equipment; performed process analysis; developed recommendations and design for meeting future needs; recommended WWTP be updated to meet future population, commercial, and industrial demand; and evaluated alternative treatment process and improvements necessary to meet anticipated discharge requirements. Developed conceptual designs and planning-level cost estimate for recommended facility improvements. Prepared Preliminary Engineering Evaluation Report (PER).

Wastewater Treatment Facilities, Poultney, Northfield, and Randolph, VT. Comprehensive performance evaluation for existing wastewater treatment facilities in Poultney (0.35-MGD), Northfield (1.6-MGD), and Randolph (0.4-MGD). The evaluation included inspection and performance evaluation of critical treatment process components, assessment of facility capacity and effectiveness in accomplishing treatment objectives, inspection of collection system and pumping stations, recommendations for improvements, cost estimates, and development of implementation schedules. The facility evaluation in Poultney and Northfield incorporated an assessment of the feasibility and cost associated with converting to a sequencing batch reactor (SBR) process.

SBR Wastewater Treatment Facility Evaluation and Sequencing Batch Reactor (SBR) Final Design, Sugarbush Ski Resort, Warren, VT. Project Manager/Construction Administrator for evaluation of wastewater treatment options supporting comprehensive expansion at Lincoln Peak base area.

Engineering Assessment of Wastewater Treatment Technologies, Craig Brook National Fish Hatchery, East Orland, ME. Project Manager for an engineering assessment of wastewater treatment technologies at a US Fish and Wildlife Service fish hatchery. The facility has a discharge permit issued by the Maine Department of Environmental Protection (DEP) for discharge of a monthly average of 3.5 MGD of fish rearing and hatchery wastewater. The permit limits the total phosphorus discharge to 0.02 mg/l and the facility has had numerous violations of this limit. Provided a desktop review of the facility, previous studies, and current permits; reviewed existing conditions and discussed day-to-day operations with operational staff; and summarized and prepared a report on available technologies to bring the facility into compliance with discharge limits.

Secondary Digester Cover Replacement, Boiler Replacement, Barre, VT. Project Manager and Process Engineer for the design of an ongoing biosolids improvement project at a 3.8-MGD wastewater treatment facility. Led preparation of a study of repair options and design of improvements, managed scheduling and budgeting, and provided coordination between the client, vendors, subconsultants and other interested parties.

Primary Digester Cover Replacement, Barre, VT. Design and Manager of Construction Phase Services for an ARRA-funded project involving the replacement of the primary digester cover at the City of Barre Wastewater Treatment Facility. Evaluated fixed digester cover alternatives. The final design included the preparation of technical specifications and costs estimate. Provided bid phase and contractor procurement services, and administrative oversight throughout the construction phase. Coordinated with Owner, ANR, and Contractor Representatives.

Advanced Wastewater Treatment Facility Upgrade, Barre, VT. Process design team leader for a \$5.8-million advanced WWTP upgrade. Responsibilities included sizing, evaluation, selection, facilities layout and design, and specification writing for process equipment. Provided support throughout the construction phase, including shop drawing review, systems start-up, operator training, and assistance with development of operations and maintenance manual. Provided 12-month Operation and Performance Monitoring. Prepared four quarterly reports to present evaluations of unit process system performance, summarize operational data, and identify and resolve outstanding items having potential to impact overall facility performance.

Randolph Wastewater Treatment Facility Upgrade and Process Conversion, Randolph, VT. Project Manager/Construction Administrator for final design, permitting, and construction phase services for an \$8.9 million comprehensive upgrade of the 40-year-old wastewater treatment facility that serves the Town of Randolph. A new sequencing batch reactor (SBR) was designed to provide operational flexibility in the face of pending nutrient removal requirements in the Connecticut River drainage basin. Responsibilities included process design, management of scheduling and budgeting, coordination between the client, subconsultants, and regulatory agencies; and construction administration and observation. *The project received an Award for Engineering Excellence from the American Council of Engineering Companies, Vermont Chapter.*

General Electric ECM Manufacturing Facility and “Brewery” Process Expansion, Rutland, VT. Project Manager/Construction Administrator for final design and construction of a 27,000-square-foot ECM manufacturing facility expansion at GE’s Rutland Plant #2. The project includes the design of a \$2.5-million, 3,900-square-foot “Brewery” process to treat, condition, and recycle electrolyte used in the electrochemical milling of jet engine turbine fan blades. Responsible for design development of the client’s schematic/conceptual brewery design, construction drawings/specifications and project construction administration. *The project received an Award for Engineering Excellence from the American Council of Engineering Companies, Vermont Chapter.*

SBR Wastewater Treatment Facility Upgrade, Northfield, VT. Project Manager/Construction Administrator for a multiyear, \$6-million upgrade of a 1.0-MGD wastewater treatment facility that resulted in a comprehensive biological treatment process change-out from a 40-year-old trickling filter to a state-of-the-art sequencing batch reactor (SBR) facility. Early stages of the project included a facilities planning phase to identify and evaluate alternatives for phosphorous removal as required by the Agency of Natural Resources for municipal facilities that discharge to the Lake Champlain drainage basin. Provided support during the construction phase and assisted with process start-up, troubleshooting, operator training, and one year performance monitoring period. *The project received an Award for Engineering Excellence from the American Council of Engineering Companies, Vermont Chapter.*



EDUCATION

B.S. Environmental Engineering, Rensselaer Polytechnic Institute, 1992

M.S. Course, Advanced Hydrology, Kansas State University, 2001

M.S. Course, Physical and Chemical Hydrogeology, University of Massachusetts, Lowell, 1996

M.S. Courses, Wastewater Treatment and Engineering; Open Channel Hydraulics, University of New Haven, Connecticut, 1994-95

REGISTRATIONS

Professional Engineer: NH 9709; VT 7350; NY 79818

Certified Vermont Class 2 Public Water System Operator

40-hour OSHA HAZWOPER Course

8-hour OSHA HAZWOPER Course

Firefighter I Certification

Mr. Ashley has 27 years of environmental and civil engineering experience. His experience includes planning, management and design of water and sewer projects, hazardous waste and brownfield remediation, road and slope projects, stormwater collection and treatment, and site/civil development projects for municipal, state, local and private clients. Jon has supported environmental documentation and permitting for infrastructure and site projects and maintains strong working relationships with regulatory officials.

Wastewater Lagoon Aeration, Orwell, VT. Project Manager for the design of the aeration system for the existing lagoon, upgrading the system to meet current standards. The plant consists of an aerated lagoon facility that provides secondary treatment and chlorine disinfection of municipal wastewater. The existing aeration system is a submerged lateral system and is being upgraded to a floating lateral system with two new regenerative blowers. D&K is coordinating dewatering and sludge removal from Lagoon 1 and Lagoon 2, installation of the new aeration system in both lagoons, and replacement of the existing compressors. The treatment facility is being kept in operation during the time of construction.

Addison Wastewater System, Town of Addison, VT. Conducted a comprehensive needs assessment and feasibility study for community wastewater options to serve existing properties in the Village District. Identified alternatives and provided cost estimates for clustered wastewater systems that could serve the public buildings in the village, in an area with generally difficult soil conditions. Assisted the Town with procuring architectural services to facilitate restoration of the historic Town Hall. Assisted the Town with CWSRF funding and conducted a preliminary engineering study of a performance-based mound and curtain drain for the most promising disposal site. Prepared an Environmental Report with a Finding of No Significant Impact (FONSI). The project is currently in final design for an innovative collection system and a disposal capacity of 4,300-gallons-per-day.

Randolph Wastewater Treatment Facility Upgrade and Process Conversion, Randolph, VT. Senior Engineer responsible for construction phase project management includes site and project meeting attendance, submittal review, response to RFIs, and architect coordination. The project is an \$8.9 million comprehensive upgrade of the 40-year-old wastewater treatment facility that serves the Town of Randolph. A new sequencing batch reactor (SBR) was installed to provide operational flexibility in the face of pending nutrient removal requirements in the Connecticut River drainage basin. The project received an Award for Engineering Excellence from the American Council of Engineering Companies, Vermont Chapter.

Water and Wastewater Feasibility Study, Confidential Client, VT. Project Manager/Project Engineer for evaluating community water and wastewater options to accommodate growth in a Vermont town. Mapped existing infrastructure and evaluated disposal capacity of a large potential indirect discharge disposal site with tertiary wastewater treatment for approximately 238,000-gallons-per-day of sewer flow. Also evaluated water supply and distribution options for a 790-gallons-per-minute municipal water system.

Closed Landfill, Orford, NH. Project Manager for landfill monitoring and reporting at Orford Closed Landfill. Coordination with laboratory and field staff on annual sampling requirements. Coordinated testing for per and polyfluorinated alkyl substances (PFAS) and evaluated the results. Evaluate ground and surface water quality data. Prepare annual Groundwater Management Permit Summary Report. Developed permit application for renewal of the facility's Groundwater Management Permit.

Whiting Water Corporation Asset Management Plan, Whiting, VT. Project Manager for a comprehensive asset management plan for a community water system. Planning activities included asset inventory, assessment, and mapping, analysis of multiple asset management schedule alternatives and development of funding strategies. The project team used underground locating services, aerial orthophotography, and GPS to locate and map infrastructure, analyze life cycle costs focusing on the system's water source options, and conducted a risk assessment of priority assets. The highest priority asset was determined to be a long-term water source and accompanying transmission main. Pipe replacement, pipe bursting, pipe lining, and new source locations were evaluated as potential alternatives to address an aging and deteriorating mile-long transmission main.



Galen Hagen, PE

Project Engineer

EDUCATION

B.S. Civil Engineering, University of Vermont, 2012

REGISTRATIONS

Professional Engineer: VT 4427

AFFILIATIONS

American Society of Civil Engineers (ASCE)

Mr. Hagen has 7 years of experience in civil engineering, site development, land use planning. He has worked on the civil design components of both residential and commercial projects, including grading, drainage, utility, erosion control, and site design services. Galen is experienced with all design and management components of both large and small land development projects from pre-design services through construction. He understands all phases of civil site design, including but not limited to: drainage, grading, water main design, sanitary sewer main design, storm sewer design, detention and water quality pond design, construction observations and inspections, and project management.

Wastewater Lagoon Aeration, Orwell, VT. Project Engineer for the design of the aeration system for the existing lagoon, upgrading the system to meet current standards. The plant consists of an aerated lagoon facility that provides secondary treatment and chlorine disinfection of municipal wastewater. The existing aeration system is a submerged lateral system and is being upgraded to a floating lateral system with two new regenerative blowers. D&K is coordinating dewatering and sludge removal from Lagoon 1 and Lagoon 2, installation of the new aeration system in both lagoons, and replacement of the existing compressors. The treatment facility is being kept in operation during the time of construction.

Addison Wastewater System, Town of Addison, VT. Project Engineer for final design plans for a community wastewater disposal system to serve existing properties in the Village District. Supported design of an innovative collection system using a "Flout" floating outlet, providing a disposal capacity of 4,300 gallons-per-day.

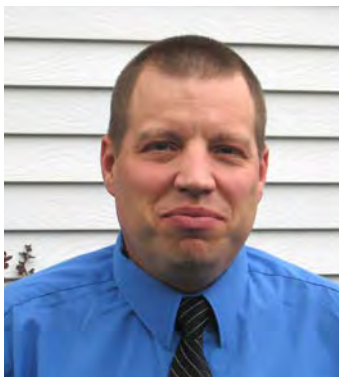
College Street Pump Station Rehabilitation, Burlington, VT. Project Engineer to design a new wet well, emergency storage valve vault and forcemain realignment for a wastewater pump station.

Town of Rochester Wastewater System Improvements, Rochester, VT. Project Engineer for final stages of the reconstruction and improvements to the Town of Rochester's municipal wastewater disposal system. D&K provided preliminary engineering services, including development of design alternatives, opinion of probable construction costs and life-cycle and user cost analyses. Assisted with review of the Operation & Maintenance Manual.

Hopkinton Village Precinct, Water System Improvement, Hopkinton, NH. Project Engineer for a project to address water supply and pressure concerns for the Hopkinton Village Precinct (HVP). The HVP operates a small community water system that is supplied by two bedrock wells. The water from each well is pumped to a pneumatic pressure tank, which pressurizes the entire distribution system. The HVP believes the pneumatic pressure tank is beyond its useful design life, and is concerned about its long-term reliability. A significant goal of the HVP is to avoid overspending on short-term bandages and keep capital costs in a range that are manageable given the HVP's small resident base. D&K is assessing the feasibility of converting the existing pneumatic pressure tank to an atmospheric storage tank that would continue to be supplied by the existing wells. Responsible to design potable water storage and a new booster new pump station.

Water System Improvements, Proctor, VT. Project Engineer for close out of a \$4.2 million Drinking Water State Revolving Fund (DWSRF)-funded improvement project for a complex municipal water system. The project included replacement of the east side water storage tank, water tower road improvements, replacement of an isolation valve, and improvements to the west tank. The system includes multiple water storage reservoirs, pressure zones, booster stations and a variety of modern and legacy infrastructure components. Assisted with preparing the Operation & Maintenance Manual for the municipal drinking water source treatment, transmission, distribution, and booster station facilities.

Bastrop Station Retail Center, Bastrop TX. Project Engineer for renovations to a two-building retail center that included Goodwill and 7 tenants. The project included, parking lot design, site design, stormwater detention, water and wastewater services. Worked with the project architect to provide adequate parking and site layout to maximize parking and building square footage.



Wilbur Horton, Jr., PE

Senior Electrical Engineer

EDUCATION

A.S., Electrical and Electronics Engineering
Vermont Technical College, 1987

REGISTRATIONS

Professional Engineering: NH 13801; VT 7790; ME 11081; MA 43250; NY 94995

Mr. Horton is an electrical engineer with 31 years of experience in electrical engineering design and computer assisted design drafting with AutoCAD. His responsibilities include the review and design of electrical engineering documents for commercial, institutional, water treatment, and wastewater treatment facilities. His experience includes building evaluations, building and industrial electrical distribution, instrumentation, and supervisory control and data acquisition (SCADA) system design. He has been responsible for project conceptual design to final design, specifications, cost estimates, and field inspections. He has designed new electrical and upgrades for water and wastewater treatment systems and also has experience with the design of commercial buildings and schools. Wilbur's designs have included power, lighting, fire alarm, data communication, controls (SCADA), power system analysis, and standby power systems.

Evaluation and Asset Management Plan for 2 Wastewater Treatment Facilities, Whitingham and Jacksonville, VT.

Senior Electrical Engineer for the evaluation of equipment at both plants for function, condition, risk and probability of failure assessment, replacement cost, and anticipated service life. Responsible for the evaluation and assessment of electrical components for both facilities.

20-year Asset Management Plan, 10-year Capital Improvements Plan for 3 Wastewater Treatment Facilities and 25 Pump Stations, Burlington, VT.

Senior Electrical Engineer for inspection and evaluation of 3 wastewater treatment plants and 25 sewage pumping stations on the City of Burlington's collection system. Existing pump stations were evaluated for age and condition, categorized based on risk, and replacement items and timeframes were proposed. Information was presented to the client in excel spreadsheet format, cross linked to the City's GIS system, with clickable .jpeg hyperlinks of each item.

Randolph Wastewater Treatment Facility Upgrade and Process Conversion, Randolph, VT.

Senior Electrical Engineer for final design, permitting, and construction phase services for an \$8.9 million comprehensive upgrade of the 40-year-old wastewater treatment facility that serves the Town of Randolph. A new sequencing batch reactor (SBR) provides operational flexibility in the face of pending nutrient removal requirements in the Connecticut River drainage basin. The project included new headworks, fine screen, grit removal, SBR, chlorine disinfection/dechlorination, aerated sludge storage, and centrifuge dewatering. A holistic and integrated design approach, maximized to incorporate energy conservation and renewable energy features into the upgraded facility, while minimizing ongoing operational and maintenance costs. Provided SCADA system design connecting all process equipment and controls.

20-year Evaluation, Wastewater Treatment Facility, Bellows Falls, VT. Electrical Engineer for a 20-year evaluation of a wastewater treatment facility electrical and controls systems. The report required a site inspection to verify existing conditions of the power distribution, lighting and control systems. As part of the inspection an informal interview of the plant operator occurred to document maintenance issues or problems with major equipment. An assessment of the major equipment was made with an estimate of remaining useful life. A general code NFPA 820 code assessment was completed to note costs for areas that the code would reclassify as explosion proof and increase upgrade costs.

20-year Evaluation, Wastewater Treatment Facility, Saxtons River VT. Electrical Engineer for a 20-year evaluation of a wastewater treatment facility electrical and controls systems. The report required a site inspection to verify existing conditions of the power distribution, lighting and control systems. As part of the inspection an informal interview of the plant operator occurred to document maintenance issues or problems with major equipment. An assessment of the major equipment was made with an estimate of remaining useful life. A general code NFPA 820 code assessment was completed to note costs for areas that the code would reclassify as explosion-proof and increase upgrade costs. A cost estimate was completed for the recommended upgrades.

Montpelier WWTP UV Design, Montpelier, VT. Provided electrical systems design for the Montpelier WWTP UV design project. The design includes upgrades to the electrical service with new equipment and new generator sized to supply the plant load and Ultraviolet disinfection system.

WWTP Effluent Force Main Upgrade, Derry, NH. Electrical Construction Support Engineer for an effluent pump station upgrade and booster pump station, which increases the capacity of an eight mile effluent discharge pipeline. The project also includes radio-based SCADA for control of the pumping system.



Steven Dumas, PE, CxA, BCxP, LEED AP Senior Mechanical Engineer

EDUCATION

M.S., Mechanical Engineering, Rensselaer Polytechnic Institute, 1995

B.S., Mechanical Engineering, University of Vermont, 1982

REGISTRATIONS

Professional Engineer: NH 16216; VT 7355; CT 16137

LEED Accredited Professional

CxA (Certified Commissioning Authority)

Building Commissioning Professional (BCxP)

Mr. Dumas is a mechanical engineer with 37 years of experience in project management, design, and construction administration services for projects ranging from conceptual design studies and facilities evaluations, to complex multidisciplinary design packages for multimillion dollar projects. He has been directly involved in all areas of project administration: initial client need definition, proposal, basis of design definition, design development, CA services, start-up/commissioning support, and operational verification. In addition to design experience, Steve provides commissioning services to a wide variety of clients and facilities primarily focusing on HVAC and specialty ventilation systems and beginning with Owner Project Requirements (OPR) development and through post occupancy operational verification.

Randolph Wastewater Treatment Facility Upgrade and Process Conversion, Randolph, VT.

Senior Mechanical Engineer for the design, permitting, and construction phase services for an \$8.9 million comprehensive upgrade of the 40-year-old wastewater treatment facility that serves the Town of Randolph. D&K assembled a team of professionals, including a local architect, geotechnical engineer, and energy management specialist. A new sequencing batch reactor (SBR) was designed to provide operational flexibility in the face of pending nutrient removal requirements in the Connecticut River drainage basin. The project included new headworks, fine screen, grit removal, chlorine disinfection/dechlorination, aerated sludge storage, and centrifuge dewatering and a backup generator. A holistic and integrated design approach maximized opportunities to incorporate energy conservation and renewable energy features into the upgraded facility while minimizing operational and maintenance costs.

Copple Crown Village District Pump Stations, New Durham, NH.

Senior Mechanical Engineer for design for three booster pumping stations for a private village district to address drinking water service outages that were experienced with the existing booster stations. The project included site design to accommodate a wood framed building with vinyl siding for the pump stations, completed site layout and grading, process design for the pump and piping layout in the station, and provided electrical and mechanical engineering in support of pump station facilities and equipment controls. Services also included bid and construction phase support.

Data Center Facility Manual, Keurig Green Mountain, South Burlington, VT.

Mechanical Engineer for a manual that addressed the following components of a newly constructed facility: Architectural, Mechanical, Vendor Equipment, Electrical, Controls, Life Safety (Fire Alarm/Fire Suppression), Safety Systems (EPO/Purge), Security, Access Control/Intrusion, IT Vendor Equipment.

Data Center Mechanical Design, Keurig Green Mountain, South Burlington, VT.

As Project Manager/Project Engineer, responsible for the complete design from concept through construction oversight and start-up of a 400 ton cooling capacity Chilled Water System for a central Data Center. The Data Center is critical infrastructure for corporate operations. Design included redundancy on every level, including mechanical, electrical, and controls. Project included design of seven purpose built areas, including the Data Center, UPS Power Room, Demark room, Manifold Room, Mechanical room and Electrical room. Design includes pod enclosure housing all IT equipment racks with segregated hot & cold aisles utilizing in-row coolers. Required comprehensive coordination with the Owner's computer IT personnel to determine rack equipment heat loads and rack density. Systems design included equipment sizing and fit-out for initial loads plus provisions for future IT load expansion. Project included complete Construction Administration services, and full system start-up support with controls functionality verification.



TOWN OF
MILTON
NEW HAMPSHIRE

**REQUEST FOR QUALIFICATIONS
and PROPOSALS**

ENGINEERING SERVICES
**WASTEWATER FACILITY
STUDY**

July 10, 2020

Submitted by:



25 Vaughan Mall
Portsmouth, New Hampshire
&
99 North State Street
Concord, New Hampshire

N2889

July 10, 2020

Mr. Ernest Cartier-Creveling, Town Administrator
Town of Milton
PO Box 310
Milton, NH 03851

**Re: Request For Qualifications and Proposals
Wastewater Facility Study
Milton, New Hampshire**

Dear Mr. Cartier-Creveling:

Underwood Engineers is extremely pleased to have the opportunity to submit a Qualifications Package for engineering services relative to a Wastewater Facility Study for the Town of Milton. We are confident that upon review of our attached Qualifications Statement and subsequent interview discussions, you will find that Underwood Engineers is the right engineer for your project and the right fit for Milton.

Underwood Engineers is a local New Hampshire firm serving primarily New Hampshire municipal clients. We have been serving the New Hampshire wastewater community for 38 years from our two offices in Portsmouth and Concord, NH. Our staff is made up primarily of licensed professional engineering personnel who are committed to client service and quality solutions above all else. When you hire Underwood, the people you meet in the interview are the people who will perform your project and be your key contacts throughout the life of the project.

Wastewater facility plans are a staple item of Underwood's workload. Collectively, Steve Clifton and Dave Mercier have participated in the generation of dozens of wastewater facility plans in New Hampshire, Maine, and Vermont communities. Dave is currently working on projects at aerated lagoon facilities in Derry, Grantham, Lancaster, and Epping, NH.

We were also retained by both Newmarket and Epping to prepare comments on the Draft Great Bay Total Nitrogen General Permit and have a good understanding of what Milton is facing.

We look forward to receiving an interview request to share with you further our approach and vision for your project. We are confident that we can deliver a product that exceeds your expectations within a reasonable budget.

Very truly yours,

UNDERWOOD ENGINEERS, INC.



David J. Mercier, P.E.
Senior Project Manager



W. Steven Clifton, P.E.
Vice President

ph 603.230.9898
fx 603.230.9899
99 North State Street
Concord, NH 03301
underwoodengineers.com

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MILTON, NEW HAMPSHIRE

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Our continuing commitment to sustainability

Underwood Engineers has undertaken an effort to improve the sustainability of our corporate endeavors, in our community and beyond. This binder is made from recycled materials carrying the Forest Stewardship Council approval and is printed using soy-based inks. It is, itself fully recyclable. The metal parts may be unscrewed and recycled separately from the paper parts.



section one

firm profile

INTRODUCTION TO UNDERWOOD ENGINEERS

Underwood Engineers (UE) is a full service civil and environmental engineering firm that has been providing professional engineering services for over thirty-five years. Founder Frank G. Underwood, started the company in 1982. In 2006, the company ownership expanded to include Keith Pratt, P.E., W. Steven Clifton, P.E., and Colleen A. Morrow and in 2011, Keith Pratt and Steve Clifton assumed the President and Vice President roles, respectively. Areas of the firm's expertise include infrastructure systems, wastewater engineering, funding, water engineering, user rate studies, roads and drainage, municipal planning, site planning and engineering, construction services, and solid waste.



SERVING NEW ENGLAND COMMUNITIES

As a dedicated and highly professional organization, we have maintained long-term relationships with numerous New England municipalities. From our offices in Portsmouth and Concord, New Hampshire, we serve clients throughout New Hampshire, Maine, Massachusetts, and Vermont. Approximately ninety-five percent (95%) of our workload is for municipalities and municipal districts/commissions. Most of our staff are registered Professional Engineers and many of our staff engineers are members of municipal boards in their home communities. Our experience and community service provides us with excellent hands-on understanding of the concerns of area citizens.

PROJECT DELIVERY PHILOSOPHY

Our President and Vice President are responsible for and set continuous goals of quality assurance and client satisfaction. Mr. Pratt and Mr. Clifton oversee all projects and maintain constant communication with Project Managers. As our client, you always have direct access to these two individuals.

We are firmly committed to a project management system ensuring our goals for quality assurance and client satisfaction are met. A Project Manager with a Professional Engineer license is assigned to each project and has the overall responsibility for project delivery (i.e. schedule, budget, technical coordination, and communication). The Project Manager remains as your primary contact from project initiation through construction and to satisfactory completion.

The Project Engineer is designated as the secondary client contact to assure that assistance will always be available when requested.



section one

firm profile

PROFESSIONAL STANDARDS

Underwood Engineers’ staff maintains memberships to several industry specific professional organizations which advocate high standards and ethics for Professional Engineers. As Members, we recognize our obligation to protect the environment and community’s population through the conscientious application of the best design techniques available. Many of our employees are also active in the state and regional associations such as MEWEA, NHWPCA, MWWPF, NEWEA and NEWWA. Underwood Engineers remains on the NHDES list of pre-qualified engineering firms.

RECOGNITION FOR YANKEE INGENUITY

Our engineers are recognized as innovative problem solvers. With inherent Yankee ingenuity, we have constantly achieved long term, affordable solutions for the complex problems municipalities face. By proven expertise in obtaining funding, State & Federal grant procedures, negotiation, permitting procedures, design solutions, project delivery, value engineering, budgets and cost sharing, we have demonstrated our reputation for excellence and service.

THE UNDERWOOD TEAM

Currently, Underwood Engineers has 58 employees:

Licensed Professional Engineers	25*
Professional Support Staff	23
Technical Support	4
Administrative	<u>6</u>
Total Staff	58

* Licenses cover NH, VT, ME, MA

We have nine employees that hold Masters Degrees and provide specialized technical service.



section one

firm profile

VALUES, VISION AND MISSION

Underwood Engineers completed a companywide strategic plan to articulate our core vision, mission and values. The following represents our beliefs.

Values

- Exceptional Client Service
- Quality Solutions
- Professional Integrity

Vision

Underwood Engineers' vision is to be the civil and environmental firm of choice in New England recognized for technical expertise, exceptional client service, and collegial teamwork. We take pride in cultivating client relationships based on exceeding expectations and mutual trust.

Mission

Underwood Engineers' mission is to solve our clients' civil and environmental engineering challenges with a commitment to outstanding value, exceptional service, and quality results.



section one

firm profile

PROFESSIONAL SERVICE PROFILE

Wastewater Collection and Treatment

- Facility Plans, Master Plans, CIPs
- Sewer System Evaluation Studies and I/I Evaluation
- Regulation compliance assistance
- Funding option analysis and assistance
- Industrial pretreatment programs & facilities
- Treatment plant analysis, permitting, design and operations assistance
- Collection system analysis and computer modeling
- Rate structure analysis
- Toxicity reduction evaluation studies
- Septage treatability studies
- National Pollution Discharge Elimination System (NPDES) permits
- Outfall/Diffuser design

Funding and Financing

- Grant Applications
- Environmental Assessment
- Public information meetings
- Warrant Article preparation
- Accounting coordination

Construction Services

- Bidding services
- Contract administration
- Resident project representative (Resident Inspector)
- Record drawing information
- Project start up
- Project close out

Environmental Permitting

- Wetlands
- ACOE Dredge & Fill
- NPDES
- Site Specific
- Solid Waste
- Local development permits

Water Distribution and Treatment

- Facility Plans, Master Plans, CIPs
- Water supply and management analysis
- Distribution system analysis, computer modeling, permitting and design
- Water treatment facilities design and permitting
- Regulation compliance assistance
- Rate structure analysis
- Well and storage facility design
- Fire suppression system design

Stormwater Management

- Drainage analysis
- Computer modeling and master planning
- Permitting and regulatory compliance
- Stormwater Treatment

Site Engineering

- Surveying
- Planning
- Site layout and design
- Permitting and regulatory compliance

Solid Waste

- Solid waste management planning
- Waste characterization study
- Hydrogeological studies
- Landfill design and permitting
- Solid waste facilities permitting and design

Municipal Roadways

- Road surface management systems
- Repair and rehabilitation strategies
- Roadway design
- Drainage facilities



section one

firm profile

CORPORATE INFORMATION

NAME: Underwood Engineers, Inc.

FOUNDED: 1982

LOCATIONS: Portsmouth, NH (headquarters) and Concord, NH

PRESIDENT: Keith A. Pratt, P.E. - kpratt@underwoodengineers.com

VICE PRESIDENT: W. Steven Clifton, P.E. - sclifton@underwoodengineers.com

TREASURER: Colleen Morrow - cmorrow@underwoodengineers.com

LICENSES: NH, ME, MA and VT

SERVICES: Wastewater, Water and Civil Engineering

SERVICE AREA: Northern New England

WEBSITE: www.underwoodengineers.com

CONTACT: Portsmouth Office:
25 Vaughan Mall
Portsmouth, NH 03801
(603) 436-6192
(603) 431-4733 (fax)

Concord Office:
99 North State Street
Concord, NH 03301
(603) 230-9898
(603) 230-9899 (fax)



section two

project understanding

PROJECT UNDERSTANDING

The Town of Milton, New Hampshire owns and operates a 0.1MGD wastewater treatment facility constructed in 1987. The 33-year old facility is generally all original construction, with the exception of replacement aeration tubing and a new roof and vinyl siding on the Operations Building.



The facilities consist of an influent syphon that drains to a Parshall flume influent flow measurement structure, followed by coarse and fine bar rack screening, followed by aerated grit removal and three (3) lagoons which flow in series. The first, or primary, aerated lagoon is twice the size of the second and third lagoons. Aeration is provided via a Lazaire Tubing Aeration System and all three (3) lagoons are lined with a 45 mil Hypalon liner. (The original Hinde tubing has been replaced with Lazaire tubing and additional holes were drilled on the top of the tubing for additional air flow.) No baffles exist in the lagoons. Flow from the third lagoon passes by pipe into a below-ground structure and reduces down to 2" with a flow control valve and magnetic flow meter. Flow then continues on by gravity to an on-site submersible effluent pumping station with a separate valve vault where chlorine is added. The station pumps the treated effluent across Route 125 to a high point, after which the outfall transitions to gravity flow to a transition manhole and out to the Salmon Falls River. The forcemain serves as the chlorine contact tank to the transition manhole which is where

the facility samples for effluent quality. Other features of the facility include an Operations Building which houses a garage, an administration area, and the headworks including bar racks and a grit classifier. The collection system is said to be in good condition with little infiltration and inflow. The sewer pipe is said to all be ductile iron and all wastewater collection is by gravity, with the exception of a single submersible pumping station. That submersible pumping station also has a separate valve vault.



The main issues that the Milton wastewater facility is facing and the reasons for this Request for Qualifications and Proposals are as follows:

Issue 1 – Impacted Groundwater

The facility has been logging increased amounts of chlorides, nitrates and specific conductance in the down gradient lagoon groundwater monitoring wells. This has caused concern at the New Hampshire Department of Environmental Services.



section two

project understanding

Issue 2 – Lagoon Liner Degradation

The Hypalon liner in Lagoon #1 is deteriorating at the water surface/ice interface and has required multiple point repairs since 2015. The liner is also becoming frayed at the water line. There is a concern that this could be contributing to groundwater impacts and may become a larger problem in the very near future.



Issue 3 – Sludge Accumulation

The facility has now been in operation for 33 years and sludge has never been removed from the lagoons. In particular, the Town has noted that significant amounts of sludge have accumulated in Lagoon #1. This is likely more than normal since the Town has been adding alum ahead of the primary lagoon to help the plant meet its total phosphorus effluent limit for the last 15 years.

Issue 4 – Effluent Permit

The facility's NPDES Discharge Permit has been expired since 2007. Milton is one of the twelve (12) communities that has been listed in the Draft Great Bay Total Nitrogen General Permit recently issued by the EPA. It is unlikely that the facility can consistently meet the proposed limits in the draft permit without significant upgrades. An evaluation needs to be performed to determine what would be required to meet the draft permit.

The Town has some capital reserves and it is from these funds that this engineering study will be paid for; however, the Town has also submitted a pre-application to the NHDES Clean Water SRF (CWSRF) Loan Program with principal forgiveness. If the Town is successful at passing a warrant article in 2021, the Town will reimburse themselves for this study out of the CWSRF Loan. The Town only has approximately 300 sewer connections and user rates are quite low, on the order of \$260 per year. Capital reserves are at about \$500,000. Based on the plant operator's estimates, upgrades on the order of \$800,000 are needed and that is the value of the CWSRF pre-application that was submitted.



section three

project approach and schedule

PROJECT APPROACH

Underwood understands that the Town of Milton, NH is a small community with a limited number of users connected to the sewer system and hence resources are limited. It will be very important to identify and take advantage of all available funding sources to address the Town's wastewater needs. Underwood is very familiar with the funding resources available to small communities in New Hampshire and we are a known and trusted entity at the New Hampshire Department of Environmental Services.

Our proposed approach to your project will be to remain focused on the **four (4) most pressing issues** the Town is facing as identified in your Request for Qualifications and Proposals and also during the mandatory pre-proposal walkthrough we attended at the wastewater treatment facility. In this way costs can be kept manageable until we have provided the Town with recommendations and funding has been obtained to tackle design and construction of the necessary upgrades. Our approach to each of the four most pressing issues are as follows.

1. Potential Impacted Groundwater From Lagoons

At this point it is unclear what the source is for the increased chlorides, nitrates, and specific conductance that have been found in the downgradient lagoon groundwater monitoring wells. It is possible that the source of the chlorides/specific conductance could be the salt shed located on the property immediately adjacent to and upgradient of the wastewater treatment facility site. However, chlorides/specific conductance in the upgradient groundwater monitoring well have been low. This fact, combined with the fact that downgradient wells have also seen hits for nitrates, suggests that the lagoons are more likely the cause. Underwood would propose to work with the Town to analyze multiple years of groundwater monitoring data to see if other conclusions can be made and if it would make sense to install additional upgradient groundwater monitoring wells to help confirm the source. However, we believe that the most prudent approach to this issue would be to address the condition of the existing lagoon liners and then continue to monitor the well data over time to see if the chloride, nitrate and specific conductance concentrations fall off prior to spending any significant money towards this issue directly. We will assist the Town in presenting this approach in the Corrective Action Plan (CAP) that is being required by the NHDES Waste Management Division.

2. Lagoon Liner Repairs/Replacement

Based on Underwood's past experience with lagoon liners and based on our field observation of the condition of the Milton lagoon liners, we believe that the majority of the lined lagoon area in Milton still has significant life left and the focus of the immediate work should be on patching those areas of the liners that are just below the normal low water level to the top of the lagoon berms where the liner is locked into the ground. These are the areas that are the most exposed to environmental conditions such as UV rays from sunlight and ice action at the water surface. They are also the most



section three

project approach and schedule

likely areas to develop holes and are the areas where repairs have already been made and additional deterioration is currently visible. Future repair could be via installation of new liner material over the top of the existing liner or, in some cases, we have found that installing a coating over the existing liner can be appropriate. Underwood's approach would be to arrange for specialty contractors to visit the site and develop quotes to repair the liners for consideration and implementation by the Town once sufficient funding has been obtained. We would review the proposals and provide pros and cons for each option to assist the Town in making a decision on how to proceed.

3. Solids Removal and Processing

Lagoon sludge removal is a difficult and expensive operation. The work is best done by specialty contractors who have the equipment necessary to slurry the thick settled sludge so that it can be pumped to a trailer-mounted dewatering unit, with the dewatered material then being hauled off site for final disposal. While technical references will typically say that aerated lagoons need to be cleaned out every 20 years, Underwood's experience has been that that timeframe can often be extended significantly. The addition of alum to the influent has increased the amount of sludge accumulating in Lagoon #1 over what would be considered normal amounts. The key factor in determining when sludge removal must occur is whether the loss of available liquid treatment volume is causing a deterioration of effluent quality. In Milton, although it has been said that Lagoon #1 has significant volumes of sludge in it, the effluent quality from the lagoons has been and remains acceptable. This is likely due to the fact that the facility is only receiving approximately 55% of its design flow and Lagoons #2 and #3 still have limited sludge in them. Underwood's approach would be to solicit quotes from specialty contractors to remove a large portion of the sludge from Lagoon #1 only at this time once sufficient funding has been obtained. We would then recommend that the Town establish a regular schedule to have sludge removed from all three lagoons on a 5-to-10 year schedule. Utilizing this approach, not all of the sludge needs to be removed which will allow the lagoons to stay in operation and will mitigate potential damage to the liners if trying to completely remove the sludge. Further, the cost for sludge removal will be more manageable in smaller increments. Our proposed scope would include floating the lagoons in a boat to document the existing sludge elevations throughout while taking samples of the sludge for total solids analysis and additional parameters to determine sludge quality. This will dictate the potential disposal sites available to the Town and will provide us with the ability to estimate the total wet and dry tons of solids needing to be removed and the cost to do so.

4. Great Bay Total Nitrogen Permit Impacts to Town

Underwood is very familiar with the Draft Great Bay Total Nitrogen General Permit recently issued by the EPA. In fact, we generated draft permit review comments for two of the New Hampshire communities affected by it (Newmarket and Epping) and also for a Maine community (Berwick) that will ultimately be impacted by its issuance. Milton falls into the category whereby EPA has made assumptions on what the historic effluent total nitrogen was for the plant without requesting actual



section three

project approach and schedule

data. Had the EPA requested actual data before draft permit issuance, it is highly likely they would have found that the amount of total nitrogen being discharged historically was greater than they estimated. Since their approach is to require communities such as Milton to “hold the load” and not discharge more nitrogen in the future than they have historically, underestimating the historic loading is penalizing them and requiring them to obtain additional treatment in order to meet the proposed limits. Further, it prevents growth in any of these communities from occurring unless additional treatment is added. The draft permit allots the Milton WWTF a total nitrogen (TN) load of 11 lbs/d.

At the current annual average flow of 55,000 gpd, that equates to an effluent limit of 24 mg/L. **Since February 2020, Milton has sampled for TN thirteen times and only two of those samples were under 11 lbs/d.**

The draft permit also carries with it the expectation that the twelve (12) Great Bay communities with WWTFs will achieve significant non-point source total nitrogen reductions as well. In most cases the goals are infeasible from a practical standpoint as well as unaffordable.

Underwood's approach to this task would be to analyze total nitrogen influent and effluent data from the plant over the longer term and compare that to the assumed effluent quality EPA utilized in the draft permit. We would then propose to analyze a minimum of two alternatives to upgrade the existing lagoon facility to achieve the draft permit limits. Given that the schedule for issuance of the draft permit in final form is unknown, Underwood recommends limiting efforts in this area to that noted above. There is a high potential for significant time to pass before a final permit is issued and the final form of the permit may be significantly different from the draft. Further, once a permit of this type is issued, it typically carries with it a reasonable implementation schedule on the order of four or more years which would provide the Town with ample reaction time to determine a course of action and solicit and obtain funding.

The RFQ/RFP also noted the following **two (2) additional issues** are of concern during the prosecution of work.

5. Funding Sources

The most common funding sources for small New Hampshire communities include NHDES Clean Water State Revolving Fund (CWSRF) loans, NHDES State Aid Grants (SAG), NHOSP Community Development Block Grants (CDBG), and USDA Rural Development (RD) loans and grants. Underwood is very familiar with and has utilized all of these programs for multiple communities throughout New Hampshire. We understand the conditions that are necessary to obtain a high ranking on funding applications and have assisted with income surveys and user rate analyses to put our clients in the best position to obtain funding. For Milton, we would propose to complete the report and then take future action as appropriate to apply for multiple funding sources once the necessary upgrades have been defined.

As an example of UE's funding experience, we have a pending \$13M RD application for cleaning the Epping lagoons and installing a solar field.



section three

project approach and schedule

6. Working Relationship with NHDES and EPA

Underwood has been practicing wastewater engineering in New Hampshire for 38 years. Over that time we have established relationships with all of the various departments at the NHDES and we have also dealt with the EPA and their NPDES permit division on multiple occasions regarding permit applications, permit modifications, and administrative orders incorporating implementation schedules. Please refer to the References section of this proposal for contacts at NHDES and EPA. We encourage you to call them and ask about us.

PROJECT SCHEDULE

UE proposes the following Schedule for the project. Note: We will hold meetings with the Town and the NHDES at the kickoff point as well as the half way and end points of the project to maintain eligibility for the NHDES CWSRF Planning Evaluations principal forgiveness you are pursuing.

Award Engineering Contract	July 2020
Conduct Field Investigations <i>(lagoon liner inspections & lagoon sludge measurements/testing)</i>	August – September 2020
Confirm Position on SRF Funding List	August 2020
Perform Evaluations and Write Report	October – November 2020
Draft Report	November 2020
Assist Town in Writing Warrant Article	December 2020
Final Report	January 2021



section four

project team

PROJECT TEAM

The following key personnel from Underwood Engineers (UE) have been assigned to the project.



W. Steven Clifton, P.E., is a Vice-President of Underwood Engineers and will serve as Principal in Charge on the Milton project.

Mr. Clifton will be responsible for developing the unit process evaluations and mass balance calculations for the Wastewater Facility Study. In addition, he will be responsible for developing the BioWin™ modeling of the wastewater treatment facility upgrades to predict performance based on operational, process and infrastructure modifications.

Steve has over 35 years' experience in all aspects of wastewater treatment, collection, outfall design, residuals disposal, and user rate studies. Steve is responsible for biological process design, BioWin™ modeling and managing wastewater treatment and collection system projects at Underwood Engineers.



David J. Mercier, P.E., will serve as Senior Project Manager for the Wastewater Facility Study.

Mr. Mercier will be the key client contact and will be responsible for successful execution and completion of all aspects of the work in a timely and cost-effective manner.

Mr. Mercier has 25 years of professional engineering experience in wastewater and water facilities design. He has prepared facility plans, performed treatment plant upgrade evaluations, assessed alternative screening, grit removal, secondary treatment, disinfection and solids handling systems, and has designed these unit process components for upgrade implementation. His experience extends into construction administration, start-up assistance, SCADA implementation, O&M manual preparation, and rate studies. Mr. Mercier also has experience applying for civil and wastewater permits and has successfully applied for State and Federal funding on multiple projects.

Dave is currently working at four (4) other facilities with aerated lagoons on projects involving liner repair, sludge removal, and aeration replacement.



section four project team



Meagan L. McCowan, P.E., will serve as **Project Engineer** for this project and will assist Mr. Mercier in performing the specific Facility Study tasks.

Ms. McCowan has a background in civil and environmental engineering and has provided professional engineering evaluations, designs, and administrative support on a variety of civil and environmental engineering projects with a focus on water and wastewater engineering, infiltration/inflow analysis, rate studies, and data analysis.



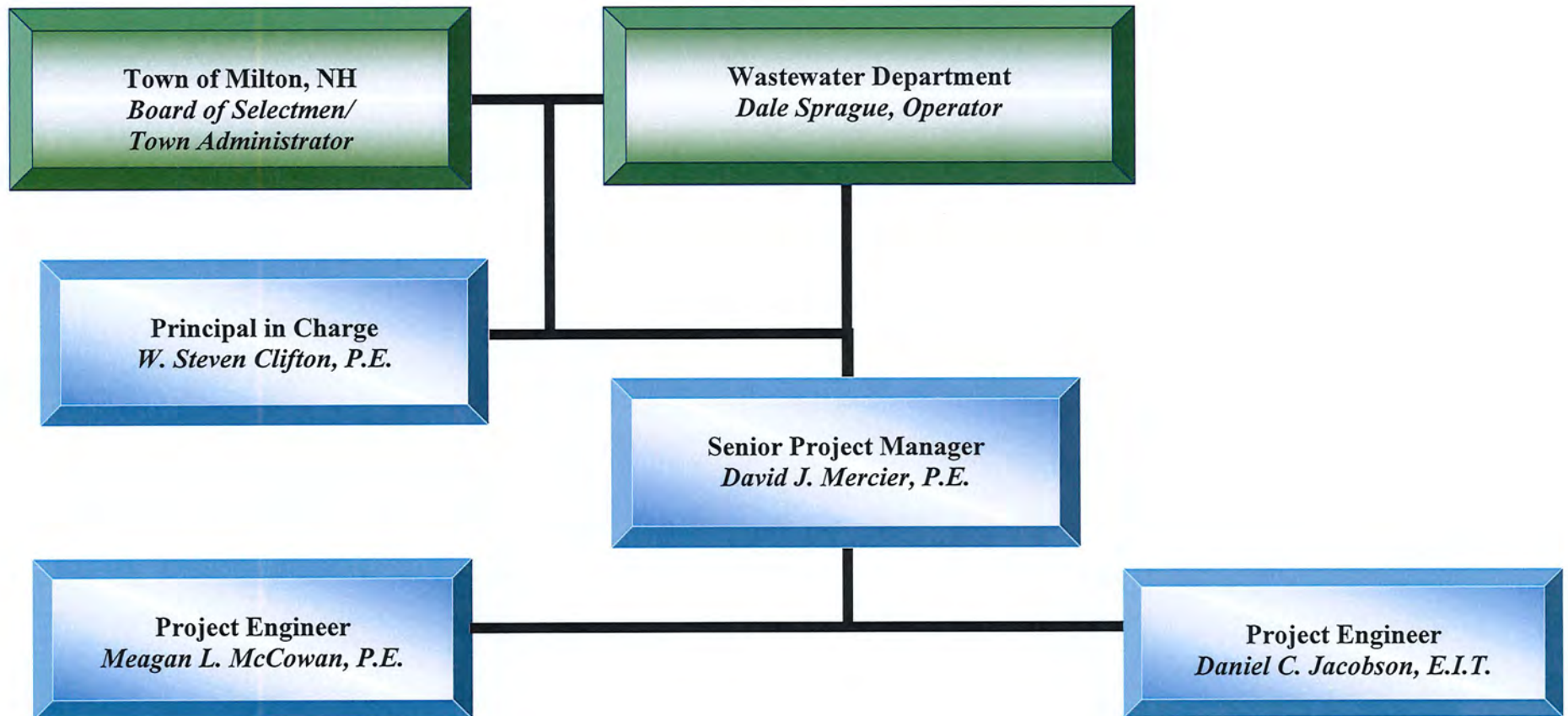
Daniel C. Jacobson, E.I.T., will serve as **Project Engineer** for this project and will assist Mr. Mercier in performing the specific Facility Study tasks.

Mr. Jacobson joined Underwood Engineers in 2017. He holds a Bachelor of Science degree in Environmental Engineering from the University of New Hampshire and is a certified Engineer in Training. He has provided professional engineering assistance with experience in wastewater treatment facility evaluation and design, construction administration, shop drawing review, construction observation, and record drawing review.

Detailed resumes of the key staff identified above are available upon request.



section four project team



Detailed resumes are available upon request.



section five

related project experience and references

Underwood Engineers (UE) has completed many Wastewater Facility Studies/Plans for our clients over the past 38 years. The attached table features details on nine select clients.

The proposed Underwood Team is currently working on aerated lagoon facilities in Derry, Epping, Grantham (Village District of Eastman), and Lancaster, NH which involve liner repairs, sludge removal, dewatering, and disposal. Further, we are performing annual groundwater monitoring analyses in Exeter, Swanzey, and Hillsborough, NH.



section five

related project experience and references

PROJECT AND CONTACT INFORMATION	ENGINEERING SERVICES/TEAM MEMBERS	PROJECT DESCRIPTION
Town of Epping, NH WWTF Improvements Jim Pouliot Water & Sewer Supt. (603) 389-7058	 <p>Engineering Services: Facilities Planning, Design, Construction, User Rate Analysis, Funding Assistance (NHDES SAG & SRF, USDA Rural Development)</p> <p>Team Members: Mercier, Smith, Jacobson, Baker</p>	<p>Major Upgrade Components</p> <ul style="list-style-type: none"> ■ Lagoon sludge estimates and removal and disposal costs ■ Headworks ■ Septage receiving ■ Dewatering ■ MBR membrane replacement ■ SCADA ■ NPDES permit assistance ■ Groundwater monitoring assistance
Town of Derry, NH Wastewater Assistance Tom Carrier Assistant DPW Director (603) 845-5456	 <p>Engineering Services: Planning, Design, Construction, Funding Assistance (NHDES SAG & SRF)</p> <p>Team Members: Mercier, Jacobson</p>	<p>Major Upgrade Components</p> <ul style="list-style-type: none"> ■ Lagoon liner repairs and sludge odor abatement ■ Sewer extensions ■ Pump station evaluations
Village District of Eastman Grantham, NH WWTF Improvements Duncan Wood Commissioner (603) 863-6512	 <p>Engineering Services: Facilities Planning, Design, Construction, Funding Assistance (NHDES SAG and SRF)</p> <p>Team Members: Mercier, Page, Jacobson</p>	<p>Major Upgrade Components</p> <ul style="list-style-type: none"> ■ Aeration and blowers ■ Effluent disposal ■ Lagoon sludge measurements and costing ■ Lagoon baffles ■ Headworks improvements ■ Effluent pumping ■ Standby generator ■ Groundwater discharge permit assistance






section five

related project experience and references

PROJECT AND CONTACT INFORMATION	ENGINEERING SERVICES/TEAM MEMBERS	PROJECT DESCRIPTION
<p>Town of Lancaster, NH Wastewater Improvements</p> <p>Tim Bilodeau Water & Sewer Supt. (603) 915-1282</p>	 <p>Engineering Services: Facilities Planning, Funding Assistance (NHDES SRF)</p> <p>Team Members: Mercier, Baker</p>	<p>Major Components</p> <ul style="list-style-type: none"> ■ Wastewater Facilities Plan ■ Wastewater Asset Management Plan
<p>Town of Milford, NH Wastewater Treatment Facility Upgrade</p> <p>Kevin Stetson, Director Milford Water Utilities (603) 249-0661</p>	 <p>Engineering Services: Facilities Planning, Design, Construction, User Rate Analysis, Funding Assistance (NHDES SAG & SRF)</p> <p>Team Members: Clifton, Mercier, Smith, Jacobson</p>	<p>Major Upgrade Components</p> <ul style="list-style-type: none"> ■ UV disinfection ■ Centrifuge dewatering ■ Standby generator ■ Asset management ■ Administration Building HVAC ■ Secondary clarifier scum pit modifications ■ NPDES permit assistance
<p>City of Lebanon, NH Phase II Wastewater Treatment Facility Improvements</p> <p>Jim Donison DPW Director (603) 498-3112</p>	 <p>Engineering Services: Facilities Planning, Design, User Rate Analysis, Funding Assistance (NHDES SAG, SRF, & Septage)</p> <p>Team Members: Clifton, Giguere</p>	<p>Major Upgrade Components</p> <ul style="list-style-type: none"> ■ Waste Activated Sludge Thickening Facilities (Evaluation and Equipment Matrix) ■ Primary gravity thickener ■ Headworks ■ Primary and secondary clarifier mechanism replacement ■ Biological Nutrient removal ■ Sludge Dewatering Facilities (evaluation, equipment matrix, pilot testing) ■ Disinfection facilities & odor control ■ New Lab/Admin Building

section five

related project experience and references

PROJECT AND CONTACT INFORMATION	ENGINEERING SERVICES/TEAM MEMBERS	PROJECT DESCRIPTION
<p>City of Somersworth, NH Wastewater Treatment Facility Upgrade</p> <p>Bob Belmore City Manager (603) 692-4266</p>	 <p>Engineering Services: Facilities Planning, Design, Construction, User Rate Analysis, Funding Assistance (STAG, NHDES SAG, SRF, & Septage)</p> <p>Team Members: Clifton, Mercier</p>	<p>Major Upgrade Components</p> <ul style="list-style-type: none"> ■ Septage receiving station ■ Influent screening, washer, compactor ■ Biological nutrient removal (n & p) ■ Sludge dewatering facilities (evaluation, equipment matrix, pilot testing) ■ Secondary clarifier internal equipment ■ Dechlorination facilities ■ Filtration facilities ■ Post aeration ■ Sludge dryer
<p>Berwick Sewer District, ME WWTF Optimization</p> <p>Jay Wheeler Administrator (207) 698-4459</p>	 <p>Engineering Services: Facilities Planning, Design, User Rate Analysis, Funding Assistance</p> <p>Team Members: Clifton, Giguere</p>	<p>Major Upgrade Components</p> <ul style="list-style-type: none"> ■ Biological nutrient removal ■ Modifications to existing aeration tanks ■ Energy efficiency evaluation ■ Sludge dewatering evaluation ■ New sludge dewatering equipment ■ New sludge pumps & controls ■ Replace existing chlorination/dechlorination pumps and controls
<p>Kennebunk Sewer District Wastewater Treatment Facility Plan</p> <p>Mike Bolduc District Manager (207) 985-4741</p>	 <p>Engineering Services: Facilities Planning</p> <p>Team Members: Clifton, Giguere</p>	<p>Major Upgrade Components</p> <ul style="list-style-type: none"> ■ Buildout study ■ Evaluation of existing WWTF ■ Wastewater characterization ■ Ocean outfall feasibility ■ WWTF Improvements alternatives evaluation based on future permits ■ Design Review workshop ■ Administration Building ■ Headworks and influent pumping

section five

related project experience and references

Underwood Engineers (UE) has completed multiple projects similar to Milton's in other New Hampshire communities. Attached are reference contacts for those communities and New Hampshire regulators.

CLIENT REFERENCES		
<i>Town of Epping</i>	Dennis Koch Public Works Coordinator waterandsewer@townofepping.com Jim Pouliot, Superintendent eppingwwtf@townofepping.com 157 Main Street Epping, NH 03042	603-679-5441 603-389-7058
<i>Town of Derry</i>	Tom Carrier, Deputy DPW Director tomcarrier@derrynh.org 14 Manning Street Derry, NH 03038	603-432-6147
<i>Village District of Eastman, Grantham</i>	Duncan Wood, Commissioner dwood@eastmanh2o.org PO Box 990 Grantham, NH 03753	603-863-6512
<i>Town of Lancaster</i>	Tim Bilodeau, Water & Sewer Supt. water@lancasternh.org 25 Main Street Lancaster, NH 03584	603-915-1282
<i>Town of Milford</i>	Kevin Stetson, Director kstetson@milford.nh.gov Milford Water Utilities 564 Nashua Street Milford, NH 03055	603-249-0661
<i>City of Lebanon</i>	Jim Donison, P.E., DPW Director james.donison@lebanonnh.gov 193 Dartmouth College Hwy. Lebanon, NH 03766 Jay Cairelli, Asst. DPW Director cairelli@lebanonnh.gov	603-498-3112 603-448-3112



section five

related project experience and references

<i>City of Somersworth</i>	Robert M. Belmore, City Manager bbelmore@somersworth.com Scott Smith, Finance Director sasmith@somersworth.com 1 Government Way Somersworth, NH 03878	603-692-9502 603-692-4266
<i>Berwick Sewer District</i>	Jay Wheeler, Administrator bsd_jwheeler@myfairpoint.net 39 Powerhouse Road Berwick, ME 03901	207-698-4459
<i>Kennebunk Sewer District</i>	Mike Bolduc, District Manager mbolduc@ksdistrict.org 44 Water Street, Kennebunk, Maine	207-985-4741



section five
related project experience and references

<i>REGULATORY REFERENCES</i>		
<i>NHDES Asset Management Program Concord, NH</i>	Sharon Nall Wastewater AMP	(603) 271-2508
	Luis Adorno Water AMP	(603) 271-2472
	Deborah Loiselle Stormwater AMP	(603) 271-1352
<i>NHDES Wastewater Engineering Bureau Concord, NH</i>	Beth Malcolm Grants Management State Revolving Fund & State Aid Grant	(603) 271-2978
<i>NHDES Wastewater Engineering Bureau Concord, NH</i>	Kathie Bourret Grants Management State Revolving Fund	(603) 271-2902
<i>NHDES Wastewater Engineering Bureau Concord, NH</i>	Dennis Greene, P.E. Design Review Supervisor WWTFs & Sewer Systems	(603) 271-2980
<i>NHDES Wastewater Engineering Bureau Concord, NH</i>	Shannon Larocque, Supervisor Construction Management State Aid Grant & State Revolving Fund	(603) 271-2903
<i>US EPA, Region 1 Boston, MA</i>	Douglas MacLean Dan Arsenault NPDES Permit Writers	(617) 918-1608 (617) 918-1562

Additional References Available Upon Request





25 VAUGHAN MALL
PORTSMOUTH, NH 03801
PH: (603) 436-6192
FAX: (603) 431-4333
uei@underwoodengineers.com

99 NORTH STATE STREET
CONCORD, NH 03301
PH: (603) 230-9898
FAX: (603) 230-9899
concord@underwoodengineers.com



MILTON, NEW HAMPSHIRE

Statement of Qualifications

JULY 2020

Wastewater Treatment Plant Facility Study



July 10, 2020

Ernest Cartier-Creveling
Town Administrator
PO Box 310
Milton, NH 03851

**SUBJECT: Statement of Qualifications
 Wastewater Treatment Plant Facility Study**

Dear Ernie,

First, Wright-Pierce would like to thank the Town for providing us the opportunity to submit qualifications for this important assignment. We have reviewed the RFQ and understand you are faced with a challenge common to New Hampshire: aging sewer infrastructure and increasingly stringent environmental regulations. We are excited to help you in resolving this problem.

In preparing this statement of qualifications (SOQ), we developed our understanding of the project through our review of the RFQ's background and scope of services; a site visit performed in May 2020 with our Technical Advisor, Neil Cheseldine; a site visit performed in June 2020 that included our Project Manager, Mike Theriault; and a review of background and reference documentation. These efforts, coupled with our depth of technical expertise related to wastewater treatment and nutrient removal upgrades, led to our identification of a reliable, cost-effective, approach for addressing the Town's immediate needs of potentially repairing or replacing of the lagoon liners and developing a more comprehensive facility plan. Wright-Pierce proposes to conduct this work in two phases, each of which will have a unique approach to funding.

1. Lagoon Liner Evaluation

Perform a comprehensive liner inspection, groundwater review, and develop an Action Plan to allow the Town to respond to NHDES. Given the immediate needs of this phase, it should be accomplished using local Town funds as state or federal monies could take an extended amount of time to obligate.

2. Facility Planning

Perform a comprehensive facility plan to identify sustainability of the existing WWTF to serve the Town in the future, identify the need for upgrades to address current and future permitting needs, identification of a sludge management plan for the existing lagoon sludge, and development of a final report. Fund this evaluation through NHDES Clean Water SRF program with potential principal forgiveness monies, maintain eligibility with NHDES State Aid Grant Program, and pursue Predevelopment Planning Grants (PPG) funding through USDA Rural Development

7/10/2020

Ernest Cartier-Creveling

Page 2 of 2

Wright-Pierce has recently completed several wastewater facilities studies for communities throughout the Great Bay watershed of New Hampshire. These studies were primarily initiated in response to NPDES Permits and/or Administrative Orders for upgrades to achieve nutrient removal, specifically for Total Nitrogen Discharges. Many of these facilities studies were funded by the NHDES

Like many of its Seacoast neighbors, the Milton WWTF contributes flows to the Great Bay watershed. A Draft General Permit has been developed by the US EPA to decrease the amount of total nitrogen being discharged to the estuarine environment by limiting known point-sources like WWTFs. As the Milton WWTF does not currently have a total nitrogen permit limit, the implementation of the EPA general permit will require the facility to modify its treatment process to include nitrogen removal.

Thank you for the opportunity to submit our qualifications for this important assignment. If you have any questions or need any additional information, please feel free to call or email us at the contact information listed below.

Sincerely,

WRIGHT-PIERCE



Tim Vadney, PE
Vice President/Principal-in-Charge
tim.vadney@wright-pierce.com
207.712.7145 (cell)



Michael Theriault, PE
Project Manager
mike.theriault@wright-pierce.com
603.606.4435

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ENR Top 500 Design Firms
ENR Top 200 Environmental Firms
ACEC Award-Winning Projects
PSMJ Circle of Excellence



Our mission – to enhance your success by delivering reliable solutions, responsive service and superior value.

Wright-Pierce is an award-winning, multidiscipline engineering firm that has been providing wastewater, water, and civil infrastructure services since 1947. Employee-owned and operated, our 250+ engineers and support professionals are located in offices throughout New England, New York, and Florida.

We complete many water, wastewater and civil infrastructure projects each year, ranging in size from \$100,000 to more than \$100 million. We provide complete engineering services from initial planning to design, bidding, construction administration and operations.

An Award-Winning Firm

Wright-Pierce has been recognized by several industry organizations for business performance and engineering excellence. We rank in Engineering News-Record (ENR) “Top” lists including the Top 500 Design Firms and Top 200 Environmental Design Firms in the country. Many of our projects receive regional ACEC Engineering Excellence Awards.

In addition, we have repeatedly received the PSMJ ‘Circle of Excellence’ Platinum Award – one of only six firms in North America to do so. PSMJ is a firm dedicated to business practices of architectural and engineering (A/E) firms worldwide and bestows its Circle of Excellence award after assessing benchmarks for operations, management and sustainability.

Responsive Service Focused on Your Success

The cornerstone of our business is to help our clients improve their communities and protect public health and the environment. For every project, we focus on the following.

- Understanding the project issues and goals
- Stressing practical, operator-friendly solutions
- Identifying fiscal constraints and emphasizing value-based solutions
- Involving and collaborating with our clients throughout the project

Wastewater Engineering Services

Effective management of wastewater is critical to maintain public health and protect our natural resources. This includes collection and treatment of wastewater and its residuals, from small decentralized systems to large, complex municipal and industrial systems.

Ranked among the top 25 U.S. wastewater treatment firms in Engineering News Record's 2019 Sourcebook, we offer all aspects of comprehensive planning, design, construction administration, operational assistance, and asset management services.

Wastewater Planning

- Sewer System Master Planning
- Facility Plans/Evaluations
- Value Engineering
- Asset Management/Capital Improvement Plans (CIP)
- Biosolids Management
- Energy Efficiency
- FOG Management
- Decentralized Wastewater Management
- Industrial Pretreatment/Local Limits
- Funding/User Rate Studies
- Regionalization Studies
- Regulatory Assistance/Permitting
- Public Outreach/Education

Wastewater Collection

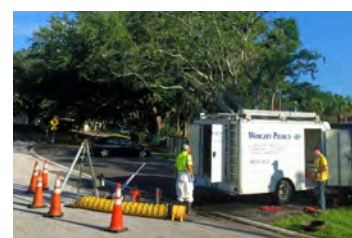
- I/I, SSES and Condition Assessments
- CMOM/SSO Control Compliance
- Combined Sewer Overflows
- Inline/Offline CSO Storage
- Rehabilitation/Combined Sewer Separation
- Hydraulic Modeling/Design
- Odor Control
- Sewer Replacement/Extensions

Wastewater Pumping

- Wet/Dry Well Stations
- Submersible Stations
- Above-Grade Suction-Lift Stations
- Force Mains
- Pressure Pipe Assessment
- Low Pressure Sewers
- Odor Control
- Bypass Provisions
- Influent Screening
- Grinding and Grit Removal
- Emergency Power
- Wet Well Mixing for FOG Control

Wastewater Treatment and Discharge/Reuse

- Influent Pumping Systems
- Influent Screenings/Grit
- Septage Receiving/Treatment
- Fats, Oils and Grease (FOG)
- Primary Treatment
- Secondary Treatment
- Nutrient Removal/Treatment
- Disinfection
- Biosolids
- Digestion
- Odor Control
- Water Reclamation/Reuse
- Surface Water Outfalls/Subsurface Disposal
- Decentralized Package Plants
- Lagoon Treatment



Wastewater Treatment Facility Expertise

Throughout Wright-Pierce's history, wastewater engineering has been a mainstay of our company. We are proud of our record in wastewater innovation and have won numerous ACEC Engineering Excellence awards for our wastewater treatment projects.

While much of our work is for mid-sized communities, we have also provided comprehensive engineering services for some of the largest and most complex wastewater treatment facilities in our geographic regions. Our wastewater treatment plant projects range in capacity from less to 0.1 MGD up to peak design flows of 165 MGD.

On the complex end of the wastewater treatment spectrum, we have performed the engineering services for numerous major upgrade projects to achieve some of the most stringent effluent nutrient limits in the nation for nitrogen, phosphorus and ammonia, and for other pollutants such as copper and zinc. We have designed more than 200 new or upgraded wastewater treatment facility upgrade projects that have included:

- Biological nutrient (nitrogen and phosphorus) removal
- Headworks, influent pumping, screening, and/or grit removal
- Primary settling tanks
- Secondary clarifiers
- Fine-bubble diffuser and sparge/parabolic aeration systems
- Tertiary chemical phosphorus removal
- Effluent filtration
- Chemical and biological odor control
- Conversion from gaseous chlorination and dechlorination systems to liquid chemical systems
- Ultraviolet (UV) disinfection
- Sludge pumping, handling, dewatering, and digestion
- Sludge drying and composting systems
- Sludge incineration and emissions control systems
- Fats, Oils and Grease (FOG) receiving and processing
- Effluent pumping
- Water reuse systems
- Effluent rapid infiltration, injection, and spray irrigation systems
- New outfalls and effluent diffuser systems
- I&C and SCADA systems including system integration
- Electrical system upgrades
- Building system upgrades
- Energy efficiency upgrades
- Asset management systems

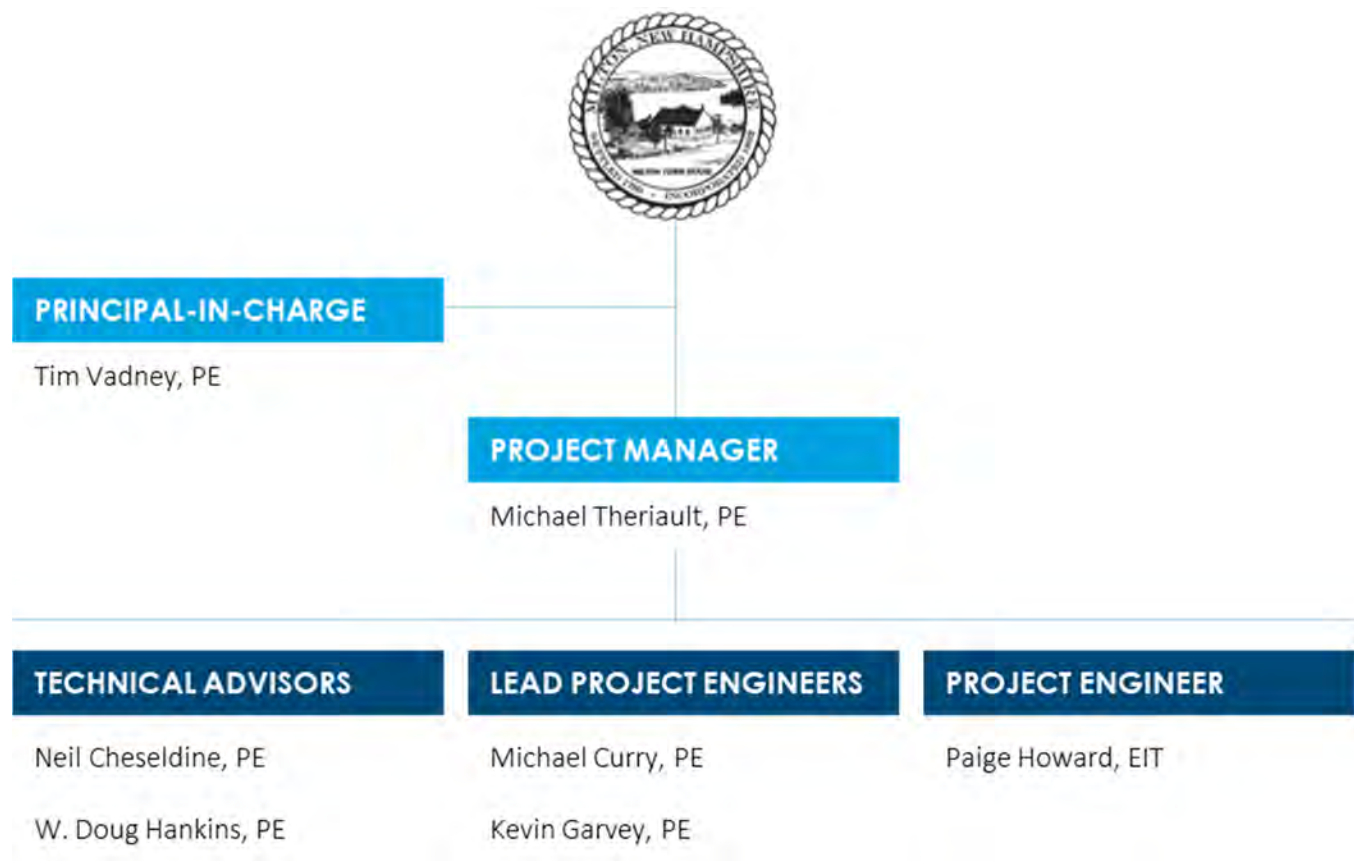


2

Our Team Dedicated to Your Project

From our full-service, diverse staff of experienced engineering professionals, operators, technicians and support personnel, we have assembled a project team with many years of demonstrated practical experience completing similar projects. We understand that no one will know the requirements of this project better than you. To find the best solution, working together as a team will be essential, and our team is committed to working with you.

Mike Theriault will be your dedicated Project Manager for the Wastewater Treatment Facility Study project. He has 16 years of experience working on wastewater treatment projects. Mike will be supported by the technical team shown below, many of which have worked together before on projects similar to this one and have familiarity with this project.



Introducing Our Key Team Members

The following introductions describe each of our key team members and explains:

- Their role and responsibilities for this project
- Their general qualifications as they relate to this project
- A synopsis of specific experience that helps them add value to this project

Additional information about each team member and their experience can be found in their resume in an appendix to this submittal.



Wright-Pierce team members typically participate through all phases of a project to ensure continuity, effective implementation of original concepts, and overall success.



Experience: 18 years
Joined Firm: 2002
Professional Licenses: NH, MA, ME

Principal in Charge: Tim Vadney, PE

Tim's role, as Principal-in-Charge, is to bring corporate oversight to your project, ensuring that it is completed on time and on budget, and that our services exceed your expectations. Tim is a leader in Wright-Pierce's Wastewater Practice Group and a seasoned expert in all facets of wastewater treatment. He brings knowledge of all components of project development and financing to the team.



Experience: 16 years
Joined Firm: 2013
Professional Licenses: NH, MA, VT

Project Manager: Michael Theriault, PE

As project manager, Mike will serve as the Town's primary contact, commit resources to meet project objectives, and provide technical oversight and guidance. Mike has 16 years of experience in project engineering evaluations and design support for wastewater treatment facilities, pump stations, and utilities. He has worked on facility improvements, infrastructure improvements, new and replacement utilities, construction administration, and asset management programs, and has significant experience in state SRF USDA-Rural Development project funding.



Experience: 30 years
Joined Firm: 1990
Professional Licenses: NH, CT, MA, ME

Technical Advisor: Neil Cheseldine, PE

Neil will serve as a technical advisor for this project, providing technical oversight and QA/QC. He is a project manager and lead project engineer for Wright Pierce, with a wide range of experience in planning, design, and construction of wastewater facilities for municipal and industrial clients throughout New England. In addition to engineering tasks, Neil has extensive experience negotiating with regulatory agencies, administering public funding for projects, and providing operational and permit compliance assistance to wastewater treatment facilities.



Experience: 23 years
Joined Firm: 2002
Professional Licenses: CT, FL, ME

Technical Advisor: W. Doug Hankins, PE

Doug is a technical leader and process specialist in Wright-Pierce's Wastewater Treatment Practice Group. He will provide technical oversight and QA/QC as a technical advisor for this project. Doug has extensive experience in a wide variety of wastewater processes including secondary treatment systems, biological nutrient removal, tertiary systems, and advanced treatment systems. Moreover, he is an expert in biological nutrient removal (nitrogen and phosphorus), filamentous bacterial control processes, aeration systems, and process enhancements for reduced sludge production.



Experience: 9 years
Joined Firm: 2014
Professional Licenses: NH

Lead Project Engineer: Michael Curry, PE

Mike will serve as a lead project for this project. His responsibilities include evaluation of existing infrastructure; analysis and design of wastewater collection and treatment facilities; evaluation of design alternatives; cost estimating; preparation of design plans and specifications; coordination with regulatory agencies and subcontractors; and construction administration services.



Experience: 11 years
Joined Firm: 2019
Professional Licenses: NH, MA

Lead Project Engineer: Kevin Garvey, PE

Kevin will serve as a lead project engineer for the Town's Facility Study. He has years of experience in the areas of wastewater and stormwater design, planning, and master planning activities. Kevin has managed or designed numerous wastewater facility improvements and wastewater system designs.



Experience: 6 years

Joined Firm: 2017

Professional Licenses: NH – EIT

Project Engineer: Paige Howard, EIT

Paige is an engineer in the Wastewater Treatment Practice Group. Her responsibilities include analysis and design of wastewater collection and treatment facilities; preparation of reports, design plans, specifications; bidding and construction administration assistance. Additionally, she is knowledgeable in project funding applications, permitting, field services, and municipal wastewater operations and maintenance. Paige will assist the project manager and lead project engineers with all facets of the project.

3

Wastewater Facilities & Master Plans

The purpose of a facilities plan is to assess the condition of municipal infrastructure, establish a need for improvements, evaluate options and costs to address system needs, and develop a recommended plan. Projects planned in this way may be eligible to receive financial assistance from state Clean Water Fund programs.

Wright-Pierce has completed dozens of wastewater planning studies, wastewater management plans, and sewer master plans for communities ranging from sparse populations with less than 1,000 people to cities with more than 500,000 people. These planning studies have included addressing environmental and public health concerns, as well as planning for system growth to promote economic development. This experience results in our understanding of the technical, non-technical, and regulatory requirements that must be addressed as part of the planning process.

Regulatory Compliance & Nutrient Management Planning

Wright-Pierce has recently completed several wastewater facilities studies for communities throughout the Great Bay watershed of New Hampshire. These studies were primarily initiated in response to NPDES Permits and/or Administrative Orders for upgrades to achieve nutrient removal, specifically for Total Nitrogen Discharges. These facilities studies were funded by the NHDES

The Milton WWTF may soon be faced with a total nitrogen effluent limit as part of its NPDES discharge permit. Like many of its Seacoast neighbors, the Milton WWTF contributes flows to the Great Bay watershed. The US EPA has developed a Draft General Permit to decrease the amount of total nitrogen being discharged to the estuarine environment by limiting known point-sources like WWTFs. As the Milton WWTF does not currently have a total nitrogen permit limit, the implementation of the EPA general permit will require the facility to modify its treatment process to include nitrogen removal.

Wastewater Facility Plan

Pittsfield, New Hampshire



Lagoons with mechanical aerators

The Pittsfield WWTF is an aerated lagoon facility originally constructed in 1978. Effluent is disinfected and then discharged to the Suncook River. In 2015 the EPA issued more stringent water quality based limits for total phosphorus and ammonia nitrogen due to receiving water impairments. Unlike more typical activated sludge treatment facilities, the aerated lagoon process lacks flexibility to modify operations to enhance phosphorus and nitrogen treatment. The Town of Pittsfield entered an Administrative Order by Consent (AOC) with the EPA in 2016 due to non-compliance with the new discharge limits and agreed to address the issues per the compliance schedule in the AOC.

Wright-Pierce completed a comprehensive Facility Plan that included evaluation of innovative treatment upgrade alternatives and effluent disposal alternatives to eliminate the surface water discharge to the Suncook River. The recommended plan includes removal of accumulated sludge from the lagoons, new aeration system, improvements and additions to the chemical handling facilities, and upgrade of two pump stations in the collection system.

The Facility Plan was submitted to the EPA and NHDES and met the requirements of the AOC. Wright-Pierce is presently assisting the Town to obtain external funding for the project.

Client Contact

Town of Pittsfield

PO Box 98
85 Main Street
Pittsfield, NH 03263

Cara Marston

Town Administrator
603.435.6773
cmarston@pittsfieldnh.gov

Rob Lauricella

Area Manager
Utility Partners (Operator)
603.543.0680
rlauricella@utilitypartnersllc.com

Highlights

- Stringent discharge permit limits for total phosphorus and ammonia-nitrogen
- Administrative Order by Consent (AOC) issued due to discharge permit non-compliance
- AOC compliance schedule
- Aerated lagoons treatment process
- Evaluated innovative lagoon upgrade technologies to enhance ammonia nitrogen treatment
- Evaluation of innovative discharge strategies including land-based disposal, and effluent storage.
- Large volume of accumulated sludge in lagoons
- Equipment and facilities at or beyond service life

Dates

Facility Plan: 2018 – 2020

Final Design: TBD

Construction: TBD

Key Personnel

Neil Cheseldine, Mike Curry,
Tim Vadney

Costs

Initial Engineering Fee: \$64,400

Initial Construction Cost: TBD

Comprehensive Facility Plan

Exeter, New Hampshire



In December 2012, the Town of Exeter, then operating an aerated lagoon facility with disinfection, was issued a new NPDES permit by the EPA which included stringent nitrogen removal requirements, the existing WWTF was not able to accomplish. The EPA then issued an Administrative Order on Consent (AOC) in June 2013 which provided a framework and schedule for the Town to achieve compliance with the NPDES permit requirements.

Wright-Pierce was retained to prepare a comprehensive Wastewater Facilities Plan that included a flows, loads and effluent standards analysis; an evaluation of existing facilities; a town wide nitrogen management plan; an evaluation of alternatives; a recommended plan of action; and a summary of project costs and financing methods.

The alternatives analysis considered:

- Abandoning the existing facility and constructing a regional treatment facility at the Pease Tradeport with Portsmouth, Stratham, Newfields and Greenland
- Constructing a regional treatment facility in Exeter with connections for Stratham, Hampton, and potentially Newfields
- Constructing various combinations of treatment on-site for cost-effective nitrogen removal

Client Contact

Town of Exeter

13 Newfields Road
Exeter, NH 03833

Matt Berube

Water and Sewer Manager
603.773.6157
mberube@exeternh.gov

Jennifer Perry

Director of Public Works
603.773.6157
jperry@exeternh.gov

Highlights

- Project drivers included an AOC and future NPDES nutrient limits
- Facility plan resulted in upgrades to the Main Pump Station, major force main replacement and a new state-of-the-art WWTF designed for nitrogen removal

Dates

Final Report: March 2015
Preliminary Design: 2015
Final Design: 2015 – 2016
Construction: 2017 – 2020

Key Personnel

Tim Vadney, Doug Hankins,
Mike Theriault, Mike Curry

Costs

Engineering Fee: \$340,000
Construction Cost: \$53 M

Exeter Comprehensive Facility Plan (cont.)

The major components of the recommended plan were to:

- Comprehensively upgrade and increase the capacity of the Main Pump Station, which pumps all sewage from Exeter to the WWTF, to reduce or eliminate CSOs;
- Replace the existing failing force main to the WWTF (5,500 lf);
- Construct a new water main to the WWTF (5,500 lf);
- Construct a new activated sludge process at the Exeter WWTF site designed to achieve 5-mg/l effluent TN; and
- Remove sludge from the existing lagoons

The new WWTF would include a new headworks, BNR tanks, secondary clarifiers, dewatering building, sludge storage tanks, SCADA and control building, and other civil/site work upgrades.

Both the Facility Plan and subsequent design were heavily influenced and aided by the Town's Public Works staff, Town volunteers (from the Water and Sewer Advisory Committee), elected officials (the Board of Selectman), and NHDES staff. Wright-Pierce is currently providing support as the construction phase wraps up on the improvements that involved major upgrades to the wastewater treatment facility, main pump station and force main.

Wastewater Treatment Facility Upgrades

Whitefield, New Hampshire



Drone flyover of process tankage construction in April 2020.

The Town of Whitefield is a growing community in New Hampshire and, with its growth, required an upgrade in capacity and process to its aging lagoon wastewater treatment facility (WWTF). Wright-Pierce, working alongside the Town, selected a Sequencing Batch Reactor (SBR) design for the upgraded facility. The project included:

- Evaluation of treatment alternatives for secondary and tertiary treatment for total phosphorus removal
- Sole source procurement and bid evaluations of SBR equipment
- Calculation of treatment facility hydraulics
- Design of a new headworks building, influent pump station, and process building including aeration blowers, effluent pumping, solids dewatering system, tertiary disc filtration, and ultra-violet disinfection
- Procurement and coordination of state and federal funding agencies

Construction of the upgrade is estimated to be complete by the Fall of 2020.

Client Contact

Town of Whitefield

56 Littleton Road
Whitefield, NH 03598

Rob Larson

Director of Public Works
603.631.4006

Highlights

- New SBR WWTP
- Headworks
- Influent pump station
- Process upgrades
- State and federally funded

Dates

Preliminary Design: 2018

Final Design: 2019

Construction: 2020

Key Personnel

Mike Curry, Paige Howard, Tim Vadney, Doug Hankins, Mike Theriault

Costs

Engineering Fee: \$870,000

Construction Cost: \$7 M

Comprehensive Wastewater System Upgrades

Farmington, New Hampshire



The Town discharges to the Cocheco River, and ultimately to New Hampshire's Great Bay estuary. This resulted in the EPA and DES imposing very stringent phosphorus, metals, ammonia and total nitrogen limits. Wright-Pierce was retained to evaluate treatment and disposal alternatives to position the town for long-term compliance and to provide for modest growth within the existing collection system. The facilities planning process recommended the following plan:

- New 0.5-MDG sequencing batch reactors to meet treatment objectives
- Implement a combined land-based (rapid infiltration basins) and river-based discharge
- Rehabilitate portions of the collection system to reduce peak I/I flow
- Optimize potable water corrosion control to minimize influent copper

The EPA and DES permitting also included an innovative “peak flow to river” concept whereby, 98% of the year-round volume of effluent will be discharged to the land, while the other 2% of the year-round flow will be discharged to the river (during peak I/I season).

The I/I removal and sewer replacement project included open cut sewer and storm drain installation, cure-in-place sewer methods to minimize street disturbance, and cure-in-place service lateral rehabilitation to minimize private property disturbance. This public/private rehabilitation has dramatically reduced I/I.

Client Contact

Town of Farmington

Farmington Municipal Offices
356 Main Street
Farmington, NH 03835

Client Name

Steve Deinstadt
603.755.4883

Highlights

- Original facility built in 1975 was incapable of achieving new effluent limits
- Facility extended aeration activated sludge facility with disinfection and effluent aeration
- Negotiated with EPA and DES on river- and land-based discharge permit conditions
- Conducted hydrogeologic investigations and permitting for land-based discharge

Key Personnel

Tim Vadney, Neil Cheseldine,
Mike Curry

Wastewater Facilities Upgrade

Jaffrey, New Hampshire



Soon after constructing an aerated lagoon treatment facility in the 1990's, the Town of Jaffrey received stringent unachievable discharge limits for ammonia, copper and BOD due to limited dilution in its discharge site, the Contoocook River. Wright-Pierce subsequently conducted a comprehensive evaluation of treatment and discharge options, including land disposal of effluent. The recommended upgrade planning required a multi-prong strategy to achieve both regulatory compliance and the schedule requirements of administrative orders issued by the DES and EPA. River modeling was conducted to challenge the proposed nutrient criteria.

A hydrogeologic investigation of multiple potential land-based discharge sites was done while negotiating innovative NPDES discharge permit conditions. This phase required coordination with DES on a total maximum daily load (TMDL) study of the Contoocook River and the state's first attempt at nutrient modeling in a river. The facility was designed to achieve ultralow nutrient and metals levels as follows:

- Total phosphorus <0.10 mg/L
- Ammonia-nitrogen <0.61 mg/L
- Total aluminum <0.087 mg/L
- Total copper <0.005 mg/L
- Total lead <0.001 mg/L
- Total zinc <0.066 mg/L

Client Contact

Town of Jaffrey

10 Goodnow Street
Jaffrey, NH 03452

Jason Beckwith

Suez Plant Manager
603.532.6914

Jason.beckwith@suez.com

Highlights

- Assisted town in obtaining \$19.7M in state and federal funding for \$20.7M project
- Received \$12.8M in grants from NHDES, USDA Rural Development, US Economic Development Authority, and EPA STAG
- Remaining project costs funded with low-interest SRF loans

Dates

Preliminary Design: 2005 and 2009

Final Design: 2006 – 2007 and 2009

Construction: 2007 – 2009 and 2010 – 2012

Key Personnel

Neil Cheseldine, Doug Hankins,
Mike Curry

Costs

Initial Engineering Fee: \$4.0 M

Eng. Change Orders: N/A

Initial Construction Cost: \$10.4 M +
\$2.7 M = \$13.1 M

Cons. Change Orders: \$500,000

The state-of-the-art upgrade includes a 1.25 MGD (3.8 MGD peak) enhanced biological nutrient removal oxidation ditch, and tertiary ballasted flocculation (Actiflo®) treatment facility with centrifuge sludge dewatering and UV disinfection.

Wastewater Treatment Facilities Upgrade

Swanzeny, New Hampshire



Wright-Pierce performed a comprehensive evaluation of the existing wastewater treatment facility to address anticipated future sewered flows and loads, and subsequently designed facility upgrades which dramatically improved efficiency and brought the facility into compliance with discharge permit requirements.

The facility upgrade included the following:

- Headworks upgrade including channel grinder for screenings treatment
- Lagoons upgrade including demolition of original aeration system, removal and disposal of 1,000,000 gallons of sludge, and installation of floating baffles and fine bubble diffused aeration system
- Blower system upgrade including three blowers, site piping and building addition
- Disinfection upgrade including sodium hypochlorite and sodium bisulfite storage and feed facilities, mixing facilities, and effluent flow meter

As a result of the attractive financing package and cost-effective design, the town was able complete this project without increasing user rates.

Client Contact

Swanzeny Sewer Commission

98 Pine Street
Swanzeny, NH 03446

Glenn Page

Chairman
603.352.7411

Highlights

- Project, including sludge removal costs, funded through NHDES State Aid Grant (SAG) and State Revolving Fund (SRF) loan
- Principal and interest rates funded through user rates
- Construction of the upgrade improvements and removal of the accumulated sludge was completed in 2001

Key Personnel

Neil Cheseldine

4

Project Understanding

The existing lagoon liner at the Milton Wastewater Treatment Facility's (WWTF) is 33 years old and is showing sign of deterioration and wearing at several select locations. Local groundwater monitoring wells have reported elevated levels of chlorides, nitrates, and bacteria at times, prompting NHDES to express concerns for potential groundwater contamination, the need for additional investigation, and development of a corrective action plan. The existing lagoons contain 33 years of sludge, with a substantial amount of sludge in Lagoon No. 1, the largest lagoon. The Town desires to develop an action plan to identify a pathway to address the immediate needs of the potential groundwater contamination. Additional evaluation and facility planning is necessary to assess the sustainability of the existing WWTF to serve the Town moving forward amongst future potential permitting conditions. The Town desires the study focus on six primary issues:

1. Potential impacted groundwater from lagoons
2. Lagoon liner repairs/replacement
3. Solid removal and processing
4. Great Bay Total Nitrogen permit impacts to Town
5. Funding sources
6. Working relationship with NHDES and EPA.



Photo of a Milton WWTF Lagoon

In preparing this statement of qualifications (SOQ), we developed our understanding of the project through our review of the RFQ's background and scope of services; a site visit in May 2020 with our Technical Advisor; a site visit in June 2020 that included our Project Manager; and a review of background and reference documentation. These efforts, coupled with our depth of technical expertise related to wastewater treatment and nutrient removal upgrades, led to our identification of three keys to success for this project:

1. Lagoon Liner Evaluation, Action Plan

Assess the need for immediate repairs and development of an action plan to respond to NHDES.

2. Facility Planning

Develop a plan for sustainability of operations and process. Laying the groundwork and a stepwise approach for upgrades ahead of potential permitting changes over the coming years.

3. Financing, Funding, & Regulatory Assistance

Identifying opportunities to assist with project affordability. Maintain a functional partnership with NH regulators.

Project Approach

To develop a reliable and the most cost-effective approach for addressing the Town's immediate needs of potentially repairing or replacement of the lagoon liners and developing a more comprehensive facility plan, Wright-Pierce proposes to conduct this work in two phases, each of which will have a unique approach to funding.

Phase I – Lagoon Liner Evaluation: Perform a comprehensive liner inspection, groundwater review, develop an Action Plan to allow the Town to respond to NHDES. Given the immediate needs of this phase, accomplish using local Town funds as state or federal monies could take an extended amount of time to obligate.

Phase II – Facility Plan – Perform a comprehensive facility plan to identify sustainability of the existing WWTF to serve the Town in the future, identify the need for upgrades to address current and future permitting needs, identification of a sludge management plan for the existing lagoon sludge, and development of a final report. Fund this evaluation through NHDES Clean Water SRF program with potential principal forgiveness monies, maintain eligibility with NHDES State Aid Grant Program, and pursue Predevelopment Planning Grants (PPG) funding through USDA Rural Development

1 Lagoon Liner Evaluation, Action Plan Comprehensive Liner Inspection

The Town has attempted to lower lagoon levels to allow for some inspection of the upper portions of the existing liners. Pinholes and exposed fabric threading of select locations of the Lagoon No. 1 liner have been observed, but are not widespread and have generally been inconsistent throughout Lagoon No. 1 and have not been observed in Lagoon No. 2 and 3. Wright-Pierce will work with the Town to lower levels in the lagoons and allow a comprehensive liner inspection to occur with representatives of a reliable liner installer. Given the variable nature of the liner defects observed, issues may be a result of deficiencies in the original manufacturing of the liner fabric. The comprehensive liner inspection should assess each individual liner panel for defects.

Groundwater Data Review

Review available groundwater data, monitoring well data, and WWTF MOR sampling data. Review surrounding properties and evaluate the potential for groundwater contamination from the WWTF and/or surrounding properties.

Liner Repair Feasibility

Summarize the extent of liner repairs required from the comprehensive inspection. Assess the feasibility of performing liner repairs without the need for sludge removal and fully draining the lagoons.

Site Plan Development

Develop an approximate site plan of the WWTF area and adjoining pertinent properties based on available aerial photos as a base and identification of pertinent features. Develop a similar plan sketch of each lagoon to allow for liner deficiencies to be illustrated to support the liner inspection.

Technical Memorandum

Summarize the liner inspection, groundwater data review, liner repair feasibility assessment, site plan and lagoon liner deficiency plan into a technical memorandum. Provide an engineering estimate of probably construction cost for repairing the lagoon liners as a spot replacement and a preliminary conceptual cost for sludge removal, dewatering, and full liner replacement. Provide a list of advantages and disadvantages for the repair vs. replacement options.

NHDES Action Plan

Assist the Town in preparing an action plan to be proposed to NHDES in response to their March 10, 2020 letter requiring additional investigation of the lagoon liner and development of an action plan.

2 Facility Planning

Based on our meetings with the Town of Milton WWTF staff and to best demonstrate our experience, understanding, and approach to each of aspect of the Town's desired project, we have structured our approach to include the following:

- **Description of the Wastewater Treatment Facility:** One of the key elements of effective facility planning is a deep understanding of the treatment facility. A facility plan must include a detailed evaluation of the entire treatment facility, including not only process equipment, but also building systems and life safety systems.

Wright-Pierce has electrical, mechanical, structural, and architectural engineers on staff (no need to subcontract), and our wastewater treatment engineers have served other municipalities of the Great Bay watershed with similar studies.

- **Planning Data:** A Facility Plan is much more than an assessment of the current state of a Treatment Facility – a Facility Plan must look to the future and clearly identify what will be needed to serve the Town’s needs in perpetuity. All of our facility plans include extensive review of current and projected future loads, drawing on the community’s historic data, planning projections, and also the Town’s approach to managing industrial dischargers and growth.
- **Lagoon Sludge Management Plan:** The existing lagoons contain 33 years of settled sludge. Review available sludge measurement data and estimate sludge quantities. Identify handling and disposal alternatives for current sludge quantities and potential future quantities over the course of the next 20 years. Results will be summarized in a technical memorandum.
- **NPDES Permit:** Potentially even more impactful to the future of the plant is what will be required by future NPDES permits. Wright-Pierce has helped several communities during their negotiations with NHDES and EPA to obtain permits that are acceptable to the community. Wright-Pierce is currently working with several other communities in the Great Bay watershed and has a deep knowledge of what current and future permitting trends within New Hampshire and New England will mean for the Town. Wright-Pierce will work with the Town on the existing and future potential discharge limits relative to the existing lagoon treatment process and impacts on future sewer growth. Results will be summarized in a technical memorandum.
- **Budget, Revenue, and User Rates:** Wright-Pierce will perform a cursory review of historical budget and revenue trends. Sewer user rates in communities of a similar size to the Town will be surveyed and summarized as compared to the Town rates.
- **Treatment Facility Alternatives:** Wright-Pierce will evaluate future treatment facility alternatives including the following:
 1. Maintain existing lagoon WWTF
 2. Upgrade lagoon to a higher rate and/or addition of a denitrification reactor for total nitrogen removal
 3. Replacement of lagoon WWTF with a new activated sludge process
- **Final Report:** The final report format will be developed based on the Town’s individual needs and recommendations for upgrades. A draft report will be developed for review and comment will be presented to Town staff and stakeholders and will be an extremely useful planning tool to assist the Town with wastewater treatment for the next 20 years. The final report will be prepared based on feedback from the Town and submitted to the Town and NHDES. The final report will include the supporting appendices as a backbone of the report. The appendices will provide the backup documentation and calculations to support the recommendations and results of the study. Some common supporting appendices include cost estimates, the NPDES permit, technical memos from the building services engineers, etc.

Planning for the Future

This project will serve as the basis for future decisions and upgrades at the Milton facility. We will take those future needs into consideration at the onset of this project to best prepare the Town for future upgrades in an effective and strategic manner.

This type of up-front planning allows for more efficient, cost-effective designs in the future to ultimately benefit the Town.

3

Financing, Funding, & Regulatory Assistance

Public infrastructure projects often require significant capital expenditures and a well-developed financing plan. Many municipalities request assistance to establish funding for their projects and each financing approach can be unique.

Wright-Pierce has considerable experience in developing cost-effective engineering solutions and investigating funding options to maximize the use of state/federal grants and low-interest loan programs.

We routinely present clients with viable funding and financing options, with advantages and disadvantages of each alternative, so that our clients can make informed decisions.

We are intimately familiar with eligibility, application, and administration requirements of funding programs and understand how to present a project to maximize grant funding. We have assisted our clients in obtaining well in excess of \$100 million in grant and loan financing from USDA Rural Development (RD), Community Development Block Grant funding programs (CDBG), Economic Development Administration (EDA), State and Tribal Assistance Grants (STAG), and State Revolving Loan Funds (SRF) for a variety of projects.



Wright-Pierce understands how to present a project to maximize grant funding.

NHDES State Funding

The SRF program is a favorable option for project financing and may include principal forgiveness. We will ensure the project maintains both CWSRF and SAG eligibility through frequent coordination with the NHDES Wastewater Engineering Bureau, especially the Design Review and Grants Management divisions.



Spotlight: Michael Theriault, Project Manager, has been involved with the five largest USDA-RD's loan and grant funding packages offered to municipalities for infrastructure projects in the State of New Hampshire.

USDA Rural Development Funding

The USDA-RD offers several levels of funding for municipal water and sewer infrastructure projects. At the planning level, municipalities can apply for Predevelopment Planning Grants (PPG) for 75% grant funding, up to \$30,000, without the need to have a warrant article vote or loan resolution passed. USDA-RD also offers larger low interest loan and grant funding for design and construction phases for eligible projects.

Potential Upcoming Federal Stimulus Funding

Discussions are being held at the Federal level regarding a stimulus package that may include funding for infrastructure projects. The last substantial federal stimulus package that focused on infrastructure needs was the American Recovery and Reinvestment Act (ARRA) of 2009. One of the key requirements of the ARRA funding involved presenting a shovel-ready project (i.e., project designs must be complete and required permits in hand). Wright-Pierce was successful in fast tracking several design projects for our clients to maximize ARRA qualification and minimize user impacts. If the stimulus package passes and the Town wishes to pursue this option further, we stand ready to assist.

Funding Assistance Experience

Location/Community	State Revolving Fund (SRF)	USDA Rural Development (RD) Grant and/or Loan	USDA Predevelopment Planning Grant (PPG)	Community Development Block Grant (CDBG)	Economic Development Administration (EDA)	EPA/STAG Grant	Army Corp of Engineers	ARRA 2009/ AIS	State Aid Grant (SAG)	Unique State Funds ¹	Energy Rebate Programs	Local Bond/ Bond Bank
New Hampshire												
Berlin	•	•						•	•		•	
Bow	•								•			
Claremont	•								•		•	
Concord	•								•		•	•
Dover	•							•	•		•	
Durham	•							•	•		•	•
Exeter	•								•		•	
Farmington	•	•		•				•	•		•	
Hampton	•								•		•	
Jackson		•					•					
Jaffrey	•	•			•	•		•	•	•	•	
Keene	•								•			
Lebanon				•			•		•			
Londonderry	•								•			•
Manchester	•								•		•	
Merrimack	•								•	•	•	
Nashua	•											
Newington	•										•	
Newmarket	•	•							•		•	
Portsmouth	•								•			
Plymouth	•	•	•					•	•			•
Ossipee	•								•	•		
Raymond									•			•
Rochester	•			•							•	•
Rye												•
Somersworth						•						
Sunapee	•	•						•	•			
Warner	•			•					•			
Whitefield	•	•										
Wolfeboro	•	•			•			•	•		•	

Permitting & Regulatory Assistance

Wright-Pierce routinely assists clients with obtaining a wide range of regulatory approvals from federal, state, and local agencies. Because of the amount of similar work that we perform, our staff can keep abreast of recent and pending changes to the complex system of regulations that governs design, bidding and construction within the State of New Hampshire. Our recent experience includes the following:

Federal Agencies

Corps of Engineers Permitting

Under Chapter 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act

Environmental Protection Agency

(US EPA) New England Region

- NPDES wastewater permits
- NPDES stormwater permits
- SPCC plans
- Self-audits

Environmental Reviews

Under NEPA associated with use of federally originating funds

- USDA/Rural Development
- CDBG/HUD
- FEMA
- NH DES SRF / USEPA

Local Approvals

- Site Plan (Planning Board)
- Subdivision (Planning Board)
- Conditional Use (Planning Board)
- Variances (Zoning Board of Appeals)
- Street Opening / Utility Location Permits

State Agencies

NH Department of Environmental Services:

- Wetlands Bureau
- Wastewater Discharge Licensing
- Water Supply and Treatment Licensing
- Underground Storage Tanks
- Solid Waste Management
- Hazardous Waste Remediation Approvals
- Household Hazardous Waste
- Dam Safety and Maintenance
- Groundwater Withdrawal Permits
- Groundwater Discharge Permits

NH Department of Transportation:

- Highway Opening Permits
- Utility Location Permits
- Access / Entry Permits

Scope of Services

The scope of services is as follows:

Phase I

1. Review of Existing information including wastewater treatment facility (WWTF) monthly operations reports for the past 10-years, Groundwater Monitoring for the past 15-years, WWTF financials for the last 5-years, water use information for one billing cycle, WWTF design drawings, and other relevant available WWTF monitoring data. Reports are anticipated PDF format and will need to be reformatted into excel.
2. A Kickoff Meeting onsite to confirm project scope and to review the existing facilities including headworks, lagoons, blowers, disinfection, effluent pump station and force main, other structures and a general site inspection.
3. After reviewing groundwater data, identify a period where the groundwater is typically low to allow for dewatering of the lagoon for a more comprehensive inspection. Coordinate and attend a site inspection with the Town to discuss potential remediation options. Following this meeting, Wright-Pierce will tabulate monitoring well data and analyze results in a technical memorandum. This meeting may be combined with the onsite kickoff meeting.
4. Review available sludge measurements data and estimate current quantity and generation rate. Identify potential handling alternatives and estimate cost to remove current quantity and project future quantity during a 20-year planning period. These analyses will be summarized in a technical memorandum.
5. Summarize existing WWTF conditions and summarize anticipated facility upgrades for a 20-year planning period including the option of higher rate lagoon and or denitrification reactor upgrade for TN treatment and moving to activated sludge to replace lagoons. This analysis will be summarized in a technical memorandum.
6. Review the existing WWTF budget and revenues for the previous 5-years. Survey sewer rates in up to ten similar communities and summarize in comparison to Milton rates.
7. Develop a recommended upgrade plan with implementation schedule that identifies potential funding sources. This information will be summarized in a draft report and a final report the incorporates the Town's comments.

Phase II

1. Perform a flows and loads analysis based on monthly WWTF operations data, perform a statistical evaluation of the data, summarize current flows and loads, perform projections based on potential future growth, Truth check influent measured wastewater loadings to industry standard per capita load contributions, and summarize data into a technical memorandum. Operations data is anticipated to include influent and effluent flows, BOD, TSS, Total Phosphorus based on average mg/l and lbs/day, Total Nitrogen, Effluent Coliforms (Average and max mg/l), Chlorine Residual (Average and max mg/l), Alum use, and Sodium Hypochlorite use.
2. Develop an approximate site plan of WWTF area and adjoining pertinent properties including the neighboring NHDOT salt storage facility using Google Earth or an Esri GIS based platform.
3. Review the Town's existing and anticipated Discharge Permit and the Great Bay General Permit to compare to the existing lagoon treatment process and discuss potential impact of future sewer system growth. This information will be summarized in a technical memorandum.
4. Review available sludge measurements data and estimate current quantity and generation rate. Identify potential handling alternatives and estimate cost to remove current quantity and project future quantity during a 20-year planning period. These analyses will be summarized in a technical memorandum.
5. Summarize existing WWTF conditions and summarize anticipated facility upgrades for a 20-year planning period including the option of higher rate lagoon and or denitrification reactor upgrade for TN treatment and moving to activated sludge to replace lagoons. This analysis will be summarized in a technical memorandum.
6. Review the existing WWTF budget and revenues for the previous 5-years. Survey sewer rates in up to ten similar communities and summarize in comparison to Milton rates.
7. Develop a recommended upgrade plan with implementation schedule that identifies potential funding sources. This information will be summarized in a draft report and a final report the incorporates the Town's comments.

Client-Focused Project Management

The cornerstone of our project management plan is client focus. At Wright-Pierce, our goal is to produce quality, cost-effective projects. Our managers accomplish this through a well-developed work plan, utilizing proven standards and procedures, having individual responsibility and accountability, and leveraging our company-wide commitment to client satisfaction.

We involve our clients throughout the project to ensure we understand their needs, develop solutions that address those needs, and continually solicit client feedback on ways we can improve our services and minimize conflicts.

Team Organization & Responsibilities

Team members typically participate throughout all phases of a project to ensure continuity, effective implementation of the original concepts, and overall success. See breakout below.



Principal-in-Charge

- Owner and/or director of firm
- Commits resources to meet objectives
- Assists with public presentations & regulatory meetings



Technical Advisors

- Leading expert within applicable discipline
- Provides technical oversight & guidance
- Performs QA/QC reviews



Project/Client Manager

- Regularly contacts & collaborates with client
- Develops & maintains work plan, schedule & budget; oversees project team
- Coordinates & performs QA/QC reviews



Lead Project Engineer(s)

- Oversees execution of work plan
- Coordinates technical aspects of project
- Reviews work of engineers & technical staff



Engineers, Technical Staff

- Performs tasks within their specialty/discipline



Subconsultants (as needed)

- Add technical and/or local expertise
- Participate as member of team

Quality Assurance & Quality Control

Wright-Pierce has developed a proven, standardized approach for the production of quality facility master plans. From the development of preliminary directives through final plan and closeout deliverables, our internal QA/QC process is designed and executed to minimize the need for additional reviews by clients.

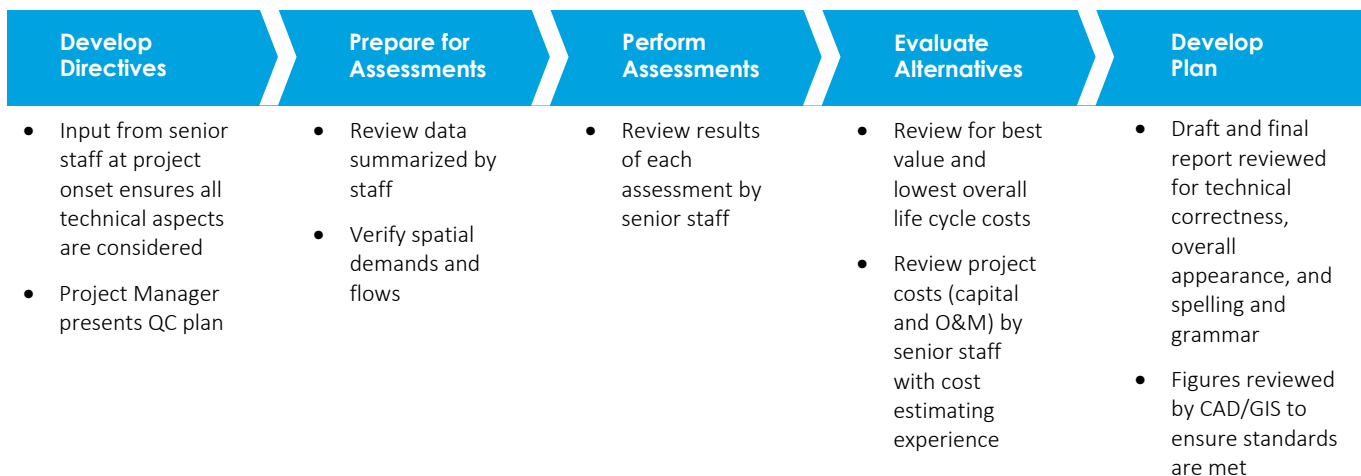
The project team will employ well-established QA/QC procedures that require internal reviews conducted by senior members with experience on similar projects. Principal-in-Charge Tim Vadney and Technical Advisors Neil Cheseldine and Doug Hankins will be involved throughout the life of the project to leverage their experience, scrutinizing every milestone deliverable before reaching your desk. To facilitate these reviews, Project Manager Mike Theriault will establish internal deadlines that drive performance and carry the same weight as client deadlines.

Technical leaders from each discipline are charged with maintaining comprehensive guidelines, calculations templates, and standard documents based on best industry practices and our many years of experience. Additionally, once we complete a project, the entire project team is involved in a formal “suggested modifications” process to improve our standards based on lessons learned by staff while actively working on projects. New hires are required to undergo a formal on-boarding process that includes training for these standards.

Companywide Program

The firm’s QA/QC process is fine-tuned and cultivated independent of specific projects. To encourage consistent quality performance, we have established a formal in-house training program with frequent (i.e., several per week) training sessions related to technical execution, management, and technology.

The graphic below represents our proposed project approach and identifies QA/QC mechanisms for the successful implementation of each phase.



RESUMES



Timothy R. Vadney, PE

VICE PRESIDENT

Project Assignment: Principal-in-Charge

Education

B.S., Civil Engineering,
University of New Hampshire

Professional Registration

New Hampshire
Maine
Massachusetts

Experience

18 Years

Joined Firm

2002

Professional Affiliations

Water Environment
Federation
Maine and New Hampshire
Water Pollution Control
Associations
Board of Directors, NHWPCA

Presentations

Vadney, T. R., "Pump Station
and Force Main
Improvements - Ogunquit
Sewer District", NEWEA
Annual Conference Boston,
Massachusetts, January 2010

Vadney, T. R., "Optimization
of the Activated Sludge
Process", NEWEA Spring
Conference, Hyannis,
Massachusetts, June 2008

Vadney, T. R., "Energy Audit
Process for Wastewater
Treatment Facilities",
CTAWWA Specialty
Conference, Hartford,
Connecticut, January 2008

Experience Summary

Mr. Vadney is a Vice President and leader in Wright-Pierce's Wastewater Practice Group, with his first focus on client success. A seasoned expert in all facets of wastewater treatment, he provides clients with a trusted representative to ensure the highest level of client service on all projects. He has over 18 years of extensive experience in a wide variety of wastewater fields including wastewater treatment, odor control, residuals management, septage treatment, collection systems, and pump stations.

Relevant Project Experience

Wastewater Treatment

Comprehensive Wastewater Facilities Plan, Exeter, NH

Principal for the preparation of the Town's Comprehensive Wastewater Facilities Plan. The plan included a flows, loads, and effluent standards analysis; an evaluation of existing facilities; a town wide nitrogen management plan; an evaluation of alternatives; a recommended plan of action; and a summary of project costs and financing methods.

Comprehensive Wastewater Facility Plan, Pittsfield, NH

Principal for the comprehensive facility plan update for 0.4-MGD Pittsfield WWTF to achieve compliance with new NPDES permit phosphorus and ammonia discharge limits, including evaluation of innovative aerated lagoon upgrade alternatives, seasonal land application and complete replacement of the existing lagoon facility with an activated sludge system.

Wastewater Treatment Facility Upgrades, Whitefield, NH

Principal for a Sequencing Batch Reactor (SBR) design for Whitefield's WWTF upgrades. The project included the evaluation of treatment alternatives for secondary and tertiary treatment for total phosphorus removal; sole source procurement and bid evaluations of SBR equipment; calculation of treatment facility hydraulics; design of a new headworks building, influent pump station, and process building including aeration blowers, effluent pumping, solids dewatering system, tertiary disc filtration, and ultra-violet disinfection; and procurement and coordination of state and federal funding agencies.

Wastewater Treatment Facility Upgrade, Farmington, NH

Design of Phase I improvements at the 0.35-MGD wastewater treatment facility. Project includes new fine-screening, upgrade to existing 1,000-GPM influent pump station, new aerobic selector upgrade to existing oxidation ditch rotors and sludge holding tank modifications.

Wastewater Treatment Facility Evaluation, Seacoast, NH

Participated in evaluation of 17 New Hampshire Seacoast Region wastewater treatment facilities as a component of the New Hampshire state legislature-funded, Seacoast Region Wastewater Management Study. Evaluation involved development of current unit process loading rates, future loading rates, and overall capacity for BOD, TSS, TKN, TP and hydraulic capacity for each facility, including the Portsmouth Peirce Island facility.

Wastewater Treatment Facility Upgrade, Hudson, MA

Design of 3.05-MGD wastewater treatment facility upgrade. The \$14M project includes advanced chemical phosphorus removal, new tertiary treatment process (dissolved air floatation), and unit process modifications at the headworks, sludge processing, and main influent pump station.

Wastewater Treatment Facility Feasibility Study, Rockport, MA

Conducted feasibility study and alternatives analysis for chlorine gas conversion and secondary clarifier evaluation at the Rockport Wastewater Treatment Facility.

Wastewater Treatment Facility Upgrade, Sanford, ME

Assisted with the preparation of design plans and specifications for the 3.60-MGD wastewater treatment plant upgrade, including influent mechanical screening equipment, septage receiving equipment, and multiple aeration systems. Project Engineer for the design and construction of the Phase II upgrade to meet a total phosphorus limit of 0.1 mg/L. Upgrade included complete overhaul of the gravity sand filters, lamella clarifiers, and numerous building / electrical system upgrades.

Construction Administration, Old Town, ME

Assisted with the construction administration of a 1.7-MGD wastewater treatment facility, including shop drawing review, and intermittent project inspection.

Pilot Testing, Sanford, ME

Conducted tertiary filter pilot testing for compliance with 0.1 mg/L TP limit. Project included selection of pilot testing equipment, development of pilot testing protocol, development of piloting summary report, and development of recommended Phase II upgrade scope.

Water Pollution Control Facilities Upgrade, Manchester, CT

Facilities planning and design of the 8.5-MGD water pollution control facilities upgrade. The \$50M project includes 4-stage Bardenpho biological nutrient removal activated sludge system, ballasted-flocculation advanced phosphorus removal system, as well as headworks, solids handling and SCADA system upgrades.

Water Pollution Control Facilities Upgrade, Glastonbury, CT

Design of the 3.25-MGD water pollution control facilities upgrade. Project includes fine screening vortex grit removal, primary clarification, 4-stage Bardenpho biological nutrient removal activated sludge system, ultraviolet disinfection, final effluent pumping, gravity thickener, rotary drum sludge thickening, and SCADA system.



Michael R. Theriault, PE

PROJECT MANAGER

Project Assignment: Project Manager

Education

B.S., Environmental
Engineering, Rensselaer
Polytechnic Institute

Professional Registration

New Hampshire
Massachusetts
Vermont

Experience

16 Years

Joined Firm

2013

Professional Affiliations

Water Environment
Federation (WEF)

New England Water
Environment Association
(NEWEA)

NH Water Pollution Control
Association, Board of
Directors, and Activities
Committee Chairman
(NHWPCA)

Project Awards

2018 Engineering Excellence
Awards, Newmarket, NH
WWTF Upgrades, ACEC,
2018

Excellence in Asset
Management, Claremont, NH
Asset Management Program,
NHDES, 2019

Presentations

"Taking a Global Look –
Citywide Pump Station
Assessment for Portsmouth,
NH", NEWEA Annual
Conference, 2020

Experience Summary

Mr. Theriault has over 16 years of experience in project engineering evaluations and design support for wastewater treatment facilities, pump stations, and utilities. He has worked with facility improvements, infrastructure improvements, new and replacement utilities, discharge permit compliance, construction administration, and asset management programs. He has significant experience in state SRF USDA-Rural Development project funding. The following is a representative listing and his project experience.

Relevant Project Experience

Wastewater Treatment

Comprehensive Wastewater Facilities Plan, Exeter, NH

Project manager for the preparation of the Town's Comprehensive Wastewater Facilities Plan. The plan included a flows, loads, and effluent standards analysis; an evaluation of existing facilities; a town wide nitrogen management plan; an evaluation of alternatives; a recommended plan of action; and a summary of project costs and financing methods.

Wastewater Treatment Facility Improvements, Newmarket, NH

Construction project manager for the construction of an approximately \$11.2M improvement project at the 0.85-MGD AADF wastewater treatment facility. Project involves the conversion of the existing trickling filter facility to a four-stage Bardenpho facility and includes new aeration tanks and process equipment, a new control building, secondary clarifiers, influent screening, dewatering, pump and process equipment replacement, sludge storage tanks, chemical feed, and modifications to existing structures and equipment.

Sludge Stabilization Evaluation, Concord, NH

Project manager for the evaluation of future sludge processing and disposal options included a comparison of dewatering technologies, sludge drying, and disposal via beneficial reuse, landfill, or incineration.

Sludge Dewatering, Stabilization, and Disposal Evaluation, Claremont, NH

Project manager for the evaluation of future sludge processing and disposal options included a comparison of dewatering technologies, sludge drying, and disposal via beneficial reuse, landfill, or incineration.

Primary and Secondary Clarifier Upgrades, Concord, NH

Project manager for the design and construction of upgrades to three (3) 95-foot secondary clarifiers and two (2) 95-foot primary clarifiers. Upgrades include mechanism replacement, weirs, baffles, scum collection, as-needed structural repairs, and electrical improvements staggered in a multi-year construction sequence.

“Setting on Example for Energy Efficiency and Proactive Facility Maintenance, Hall Street Wastewater Treatment Facility Upgrades-Concord, NH, NHWPCA Fall Meeting, 2018

“The Future of Wastewater Treatment in the Great Bay Estuary, Newmarket WWTF Upgrades”, NEWEA Annual Conference, 2018, and NHWPCA Winter Meeting, 2017

“Navigating the World of Funding”, GSRWA, 2017

“Septage Receiving Upgrades: One System’s Tale”, GSRWA Operator Field Day, 2017

“Fitchburg’s Largest Sewer Separation Project Provides Relief to the Nashua River: Conquers Urban City Challenges”, NEWEA Annual Conference, 2017

“Septage Receiving Upgrades: Regionally Serving Northern, NH”, NEWEA Annual Conference, 2017

Septage Receiving Upgrades, Plymouth Village, NH

Project manager for the evaluation, design, and construction of upgrades to the 4.0-MG/year septage receiving facilities, including making improvements to handle future septage flows and loadings. Upgrades included truck discharge, manual screening, means for grit removal, equalization holding tanks, transfer pumps, truck scale, odor control, and process optimization to convey septage to the facility gravity thickener.

Dewatering and Septage Receiving Improvements, North Conway, NH

Lead project engineer for the evaluation of upgrades to the sludge dewatering at the wastewater treatment plant and the septage receiving facilities. Improvements included replacing plate and frame dewatering presses with inclined screw presses, polymer feed systems, conversion of excess sludge storage tankage to septage holding tanks, septage receiving equipment replacement, transfer pumps, and odor control.

Blower Replacement, Claremont, NH

Project manager for the design and construction of two replacement 75 HP rotary screw positive displacement blowers including associated aeration piping modifications and electrical improvements.

Blower Evaluation and Upgrade, Hanover, NH

Project manager for the evaluation of and replacement of three high-speed turbo blowers with new rotary screw positive displacement blowers.

Anaerobic Digester Heating System Evaluation, Winnepesaukee River Basin Program, Franklin, NH

Lead project engineer for the evaluation of two 0.750-MMBTU sludge heat exchangers and primary digester operations at the Franklin Wastewater Treatment Facility, including an assessment of sludge heating capacity, a review of historical operation and service records, and identification of revisions to equipment and operations to meet current heating needs.

Disinfection Upgrades, Burlington, VT

Project manager for the design of disinfection upgrades at Burlington’s three wastewater treatment facilities, Main WWTF 5.3 MGD and 100+ MGD wet weather facility, East WWTF 1.2 MGD, and North WWTF 2.0 MGD. Upgrades included sodium hypochlorite and sodium bromide disinfection systems with replacement bulk storage tanks, chemical feed pumps, and associated process piping, mechanical, architectural, electrical, and instrumental improvements.

Wastewater Infrastructure Improvements, Burlington, VT

Project manager for the evaluation of capital improvements at Burlington’s three wastewater treatment facilities, Main WWTF 5.3 MGD and 100+ MGD wet weather facility, East WWTF 1.2 MGD, and North WWTF 2.0 MGD. Evaluations include headworks, primary and secondary clarifiers, aeration and blower systems, dewatering systems, updated process models, solids handling master plan, and feasibility of continuing East WWTF operation and associated process.



Neil Cheseldine, PE

PROJECT MANAGER

Project Assignment: Technical Advisor

Education

B.S., Civil Engineering,
University of Vermont

Professional Registration

New Hampshire
Connecticut
Maine
Massachusetts

Experience

30 Years

Joined Firm

1990

Professional Affiliations

New England Water
Environment Association
(NEWEA)

NH Water Pollution Control
Association (NHWPCA)

NHWPCA NPDES Permits
Committee (2012-2015)

Presentations

Cheseldine, N., Dean, C.
“Industrial Local Limits
Overview”, Maine Water
Environment Association
(MEWEA) Fall Conference,
September 2018

Cheseldine, N.
“Nutrient Removal: Current
Regulatory Status, Strategies
and Lessons Learned in New
England”, Maine Rural Water
Association annual
conference, December 2017

Cheseldine, N. “50 Years of
Dewatering”, Maine Water
Environment Association fall
conference, September 2016

Cheseldine, N. “NPDES
Permits Current Trends”,

Experience Summary

Mr. Cheseldine is a project manager and lead project engineer for Wright Pierce, with a wide range of experience in planning, design and construction of wastewater facilities for municipal and industrial clients throughout New England. In addition to engineering tasks, Mr. Cheseldine has extensive experience negotiating with regulatory agencies, administering public funding for projects and providing operational and permit compliance assistance to wastewater treatment facilities.

Relevant Project Experience

Wastewater Treatment

WWTF Facility Plan Update, Pittsfield, NH

Project manager for comprehensive facility plan update for 0.4-MGD Pittsfield WWTF to achieve compliance with new NPDES permit phosphorus and ammonia discharge limits, including evaluation of innovative aerated lagoon upgrade alternatives, seasonal land application and complete replacement of the existing lagoon facility with an activated sludge system.

WWTF Septage Receiving Facility, Jaffrey, NH

Project manager for planning and design of septage receiving facilities including automatic flow metering, screening, storage and transfer pumping to accommodate annual volume of two million gallons.

WWTF Tertiary Phosphorus Removal Upgrade, Jaffrey, NH

Project manager and lead project engineer of design and construction of tertiary phosphorus removal ballasted flocculation and settling system and wood pellet boiler heating system for 1.25-MGD wastewater treatment facility.

Wastewater Treatment Facility Upgrade, Jaffrey, NH

Project manager and lead project engineer for construction administration of 1.25-MGD lagoon wastewater treatment facility upgrade including diffused aeration system and sludge removal.

Wastewater Treatment Facility Evaluation, Jaffrey, NH

Lead project engineer for evaluation of 1.25-MGD wastewater treatment facility including evaluation of advanced wastewater treatment options and land-based discharge options via rapid infiltration to meet water quality limitations and low

Lagoon Treatment Facility Upgrade, Swanze, NH

Project manager and lead project engineer for design and construction administration for 0.16-MGD lagoon treatment facility upgrade, including diffused aeration, disinfection and sludge removal.

NHDES sponsored training,
April 2016

Cheseldine, N., "Biological
Nutrient Removal at
Wastewater Treatment
Facilities", Portland Water
District Staff Training,
January 2012

Cheseldine, N., "Biological
Nutrient Removal at
WWTFs", Granite State Rural
Water Association, Training,
May 2012

Cheseldine, N., "One
Community's Experience
Meeting the Challenges of
Stringent Water Quality
Based Discharge Limits",
NHWPCA Symposium –
NPDES Permitting, June 2012

Cheseldine, N., "Sludge
Dewatering", MRWA, Annual
Conference, December 2012

Cheseldine, N. "Jaffrey, New
Hampshire - One
Community's Experience
Meeting the Challenges of
Stringent Water Quality
Based Discharge Limits",
NEWEA Conference, January
2011

Cheseldine, N., "Biological
Nutrient Removal", MEWEA,
Fall Conference, September
2011

Cheseldine, N., "Biological
Nutrient Removal at
WWTFs", GSRWA sponsored
training, November 2011

Cheseldine, N., "Jaffrey, NH –
Advanced WWTF to Meet
Stringent Nutrients and
Metals Limits", New
Hampshire Water Pollution
Control Association, Fall
Meeting, September 2010

Sludge Handling Alternative Study, Farmington, NH

Lead project engineer for sludge handling alternatives study for 0.3 MGD wastewater treatment facility.

WWTF and Sewer System Improvements, Rockland, ME

Project manager for Preliminary Engineering Report (PER) and design for \$10.4 million comprehensive WWTF improvements and sewer system separation and rehabilitation project. WWTF improvements include upgrades to sludge dewatering, primary and secondary clarifiers, headworks screenings and grit systems, aeration blower and diffusers, and activated sludge conversion to a Modified Ludzig Ettinger (MLE) nitrogen removal process

WWTF Nitrogen and Phosphorus Treatment Study, Claremont, NH

Project manager for evaluation of nitrogen and phosphorus treatment alternatives for the 3.89-MGD Claremont WWTF to achieve compliance with new NPDES permit discharge limits.

Effluent Discharge, Regulatory Compliance and Discharge Permits Wastewater Treatment Facility Operational Assistance, Various Communities in New England

Project manager and lead project engineer providing operational assistance to numerous communities including Rockland, Falmouth and Brunswick, Maine; and Sunapee and Jaffrey, New Hampshire.

NPDES Discharge Permit Review and Negotiations, Various Communities in New England

Project manager and lead project engineer for numerous projects involving review and negotiation of NPDES permit requirements. Projects completed for Bath, Brunswick, Rockland, Presque Isle, and Sanford, Maine; Nahua, Farmington, Merrimack, Berlin, Jaffrey, Claremont, Pittsfield, Exeter, Dover, and Newmarket, NH, Spencer, Massachusetts.

Decentralized Wastewater Collection and Disposal Study, Jaffrey, NH

Project manager and lead project engineer for feasibility study of decentralized wastewater collection and disposal facilities to replace an existing 1.25-MGD centralized collection, treatment and surface water discharge system.

Nitrogen Control Plan, Newmarket, NH

Project manager for development of a Nitrogen Control Plan to address non-point source and point source nitrogen loadings to Great Bay and the Lamprey River. This study was a requirement of an EPA issued Administrative Order on Consent.

Septage Disposal Lagoon Permitting and Design, Ossipee, NH

Project manager for permitting and design of seepage receiving lagoons installed at existing subsurface disposal facility.



William D. Hankins, PE

WASTEWATER TECHNICAL LEADER

Project Assignment: Technical Advisor

Education

M.S., Environmental Engineering, The John Hopkins University

B.S., Environmental Engineering, Syracuse University

Professional Registration

Connecticut
Florida
Maine

Experience

23 Years

Joined Firm

2002

Publications

Brown, W.E., Hankins, W.D., Leonard, E.J., "Nutrient Control-Focus on Nitrogen," Water & Waste Digest, September, 2009

Brown, W.E., Hankins, W.D., "Nutrient Control-Focus on Phosphorus," Water & Waste Digest, May 2009

Presentations

Hankins, W. D., "Maximizing Wet Weather Flow Capacity: The Greater Lawrence Sanitary District Case Study", Joint NEWEA/NYWEA Conference, Mystic, CT, June 2006

Hankins, W. D., Richardson, C., Tobiason, D.F., Eames, M., Pinnette, J.R., "Mitigating Wet Weather and Filamentous Bacterial Issues at the Lewiston-Auburn WWTF," WEFTEC Conference, New Orleans, LA, 2004

Experience Summary

Mr. Hankins serves as Wright-Pierce's wastewater technical leader. He has extensive experience in a wide variety of wastewater processes including secondary treatment systems, biological nutrient removal, tertiary systems, and advanced treatment systems. Moreover, he is an expert in biological nutrient removal (nitrogen and phosphorus), filamentous bacterial control processes, aeration systems, and process enhancements for reduced sludge production.

Mr. Hankins has designed or been responsible for the design and of multiple nutrient removal wastewater facilities ranging \$1M to \$100M in construction costs. He has extensive process modeling experience as well as operational knowledge having provided multiple on-call operational support roles for municipalities.

Relevant Project Experience

Wastewater Treatment

Wastewater Treatment Facility Upgrade, Exeter, NH

Project engineer for a comprehensive upgrade to the existing 3.0-MGD WWTF. Responsible for the design of a new 4-stage Bardenpho biological nitrogen removal activated sludge system.

Wastewater Treatment Facility Upgrade, Killingly, CT

Technical advisor for the design of a comprehensive upgrade for the 3.6-MGD water pollution control facility which will includes a new MLE biological nutrient removal activate sludge system, a new ballasted flocculation phosphorus removal system, replacement of sludge thickening and dewatering systems and replacement of influent mechanical screening.

Wastewater Treatment Facility Upgrade, The Mattabasset District, Cromwell, CT

Provided construction administration services and operational start-up assistance for the \$100M comprehensive upgrade project over a three-and-a- half year period. Unique project components include construction of a side stream reactor, secondary effluent pump station and installation of a fluidized bed incinerator with a state-of-the-art emissions system to meet new EPA regulations (the first in New England).

WWTP Demonstration and Upgrade, Salisbury, MD*

Lead project engineer for the Salisbury WWTP, full-scale BNR demonstration (preliminary engineering services). Performed data analysis and modeling based on the results of a 1-year, full-scale demonstration of a first-of-its-kind, fixed-film biological nutrient removal process. Determined and established the basis of design for upgrading the existing 6.8-MGD trickling filter plant to accomplish BNR (8.0 mgTN/1) through the use of the anoxic/oxic trickling filter (A/O-TF) process (patented process).

Hankins, W. D., Messick, N. W., Nasr, S. M., Winslow, D., "Full Scale Demonstration of an Innovative Trickling Filter BNR Process," WEFTEC Conference, Anaheim, CA, 2000

WWTP Upgrade, Spotsylvania, VA*

Lead project engineer for the Massaponax WWTP, Phase I - BNR upgrade and expansion (design services). Designed biological nutrient removal activated sludge system incorporating an anaerobic selector, return and waste activated sludge pump station, secondary clarifiers, aeration system (two-story blower building) and chemical feed systems (sodium hypochlorite and sodium bisulfite) for a multi-phased upgrade of an existing wastewater treatment plant. The \$30-million, Phase 1 upgrade included a capacity expansion to 8.0 MGD while obtaining an effluent total nitrogen concentration less than 8.0 mg/1.

Facility Upgrade and Expansion, Queen Anne's County, MD*

Lead project engineer for the KN/S/G WWTP, BNR upgrade and expansion (design services). Established basis of design for an advanced biological nutrient removal activated sludge system (3.0 mgTN/1). Designed advanced BNR activated sludge system incorporating an anaerobic selector, aeration system, blower building, influent pump station, secondary clarifiers, RAS/WAS pump station, effluent filters, ultraviolet disinfection system, onsite laboratory, effluent pump station, post-aeration system, plant waste pump station and yard piping system for a new 3.0-MGD (\$28-million) wastewater treatment plant.

Evaluations

Phosphorus Removal Study, Plymouth, CT

Technical advisor for phosphorus removal study including evaluation of alternative biological, chemical, and tertiary phosphorus removal processes, and impact of recycle streams on process selection, and hydraulic evaluation of existing facilities. Project being funded with a 55% planning grant through state's Clean Water Fund Program.

Value Engineering and Hydraulic Evaluation Study, The Mattabasset District, Cromwell, CT

Reviewed various improvements to the facility including increasing the facilities design flow capacity from 20 MGD to 35 MGD while achieving enhanced nutrient removal effluent limits (TN \approx 3.0 mg/l). Other improvements analyzed included solids dewatering systems, wet weather treatment and disinfection.

Nutrient Removal Evaluation, Manchester, CT

Lead project engineer for the nutrient removal evaluation of the town's WPCF. The nutrient removal evaluation recommended upgrading the town's secondary treatment process to a four stage anoxic-oxic nutrient removal process.

WWTP Evaluation, Salisbury, MD*

Lead project engineer for the Salisbury WWTP, BNR process alternative evaluation (preliminary engineering services). Evaluated various biological treatment process alternatives in order to achieve advanced biological nutrient removal (3.0 mgTN/1) in conjunction with the A/O-TF process.

*Experience from previous employer



Michael A. Curry, PE

LEAD PROJECT ENGINEER

Project Assignment: Lead Project Engineer

Education

M.S., Environmental/Civil Engineering, University of New Hampshire

B. S., Civil Engineering, University of New Hampshire

Professional Registration

New Hampshire

Experience

9 Years

Joined Firm

2014

Professional Affiliations

New Hampshire Water Pollution Control Association (NHWPCA)

Professional Trainings

10-hr. OSHA Construction Certification

40-hr. OSHA HAZWOPER Certification

Experience Summary

Mr. Curry is a Lead project engineer in the Portsmouth, New Hampshire, office with experience primarily in wastewater infrastructure projects. His responsibilities include evaluation of existing infrastructure; analysis and design of wastewater collection and treatment facilities; evaluation of design alternatives; cost estimating; preparation of design plans and specifications; coordination with regulatory agencies and subcontractors; and construction administration services. Prior to entering the wastewater industry, he studied the removal of 1,4-dioxane in private drinking water wells in New Hampshire.

Relevant Project Experience

Wastewater Treatment

Wastewater Treatment Facility Upgrades, Whitefield, NH

Lead Project Engineer for the design of an approximately \$8M improvement project at an existing lagoon wastewater treatment facility. Assumed the lead role in both the preliminary and final design efforts for the Sequencing Batch Reactor design, interdisciplinary coordination for all new infrastructure, in addition to being the primary contact between the State and Federal funding agencies. Critical lead design efforts including evaluation of treatment alternatives for secondary treatment and tertiary treatment (total phosphorus removal), managing a sole source procurement and bid evaluations of Sequencing Batch Reactor equipment, calculation of treatment facility hydraulics, design of a new Headworks Building, Influent Pump Station, and Process Building including aeration blowers, effluent pumping, solids dewatering system, tertiary disc filtration, and ultra-violet disinfection system.

Wastewater Facilities Plan, Pittsfield, NH

Lead Project Engineer for development of a wastewater facilities plan including process and equipment assessment, flows and load analysis, evaluation of nutrient treatment capabilities and proposed upgrade alternatives. Efforts included coordination with town's wastewater treatment operations staff, conducting visits to review existing WWTF infrastructure, reviewing and analyzing sampling data, developing planning level cost estimates for future upgrades to the system and providing alternatives and recommendations to meet more stringent NPDES permit limitations.

Wastewater Treatment Facility Upgrade, Farmington, NH

Project engineer assisting with construction administration services, Operations and Maintenance manual updates, and warranty period process support for upgrades which included a new grit classifier, modifications to the secondary equalization basins, and construction of a new storage garage.

Wastewater Treatment Facility Upgrades, Exeter, NH

Project engineer for the design and construction of an approximately \$50M improvement project at the existing lagoon wastewater treatment facility. Project responsibilities include preliminary design for a new headworks building including a mechanical fine screening and a grit removal system, and the final design, layout, and coordination of a residuals dewatering system including sludge conveyance, polymer feed, sludge storage tanks, and large bubble mixing system.

Wastewater Treatment Facility Nutrient Removal Upgrades, Newmarket, NH

Lead project engineer for the design and construction oversight of a \$14M comprehensive wastewater treatment facility upgrade to achieve stringent nutrient removal standards. Responsibilities included preliminary and final design efforts, SRF and Rural Development funding coordination, and a lead role in construction management. Major unit processes for the upgrade include a mechanical fine screen (rotary type), new secondary treatment tankage and mechanisms, slow-speed sludge dewatering system, sludge storage system, plant water system, chemical feed systems (sodium hypochlorite and sodium bisulfite), and various process pumps.

Wastewater Facilities Plan Update & Phase I Design, Hampton, NH

Lead Project Engineer in development of a comprehensive Wastewater facilities plan update including equipment assessment, sewer build-out study projections, industrial loading analysis, and proposed upgrade alternatives. Coordinated closely with the Town's wastewater treatment operations and engineering staff, attended public meetings and initiated a public education campaign, completed on-site evaluations of existing WWTF infrastructure, and created planning level recommendations and cost estimates for future upgrade projects to the treatment facility.

Lead Project Engineer for the preliminary and final design of an approximately \$12M wastewater improvement project (Phase 1) including headworks, grit, influent pump station, solids handling, and comprehensive secondary treatment upgrades. Assumed the lead role in both the preliminary and final design efforts for the secondary treatment system design, including coordination with significant "high concentration" industrial users within the Town. Critical lead design efforts including evaluation of treatment alternatives for secondary treatment tank layout, aeration system design including a new fine bubble diffused air system and aeration blowers, and design of a new aeration control system.

Dewatering and Septage Receiving Upgrade, North Conway, NH

Lead project engineer for the design of a new residuals dewatering system including two new screw presses, conveyors, and an integrated control strategy to allow the precinct to continue to utilize the existing dewatering system. The project also included addition of an odor control system and installation of a new automated septage receiving unit.



Kevin M. Garvey, PE

PROJECT MANAGER

Project Assignment: Lead Project Engineer

Education

M.S., Civil Engineering,
Northeastern University

B.S., Civil Engineering,
University of New Hampshire

Professional Registration

New Hampshire
Massachusetts

Experience

11 Years

Joined Firm

2019

Trainings/Certifications

Institute for Sustainable
Infrastructure (ISI) Envision™
Sustainability Professional
(ENV SP)

Grade 4 Operator, Certified
Wastewater Collection
System Operator

OSHA 10-Hour Construction

Experience Summary

Mr. Garvey is a civil engineer with over ten years of experience in the areas of wastewater design and master planning activities. He has managed or designed wastewater treatment plant improvements; wastewater collection system master planning projects; collection system rehabilitation measures; Municipal Separate Storm Sewer System (MS4) Permitting/Compliance and Capacity, Maintenance and Operations, Management (CMOM) Programs including Preventative Maintenance Programs.

Relevant Project Experience

Wastewater

Wastewater Treatment Facility Upgrades, Talifah, Jordan*

As part of an ongoing USAID project, that involved creating significant upgrades to the existing WWTF and significantly expanding the capacity. Mr. Garvey was responsible for the design of the plant water system and the yard piping throughout the plant. Mr. Garvey was also tasked with redirecting the influent flows to a new headworks facility, new design a new outfall, and developing a sequence of construction in a manner that allows flows to transfer from the existing plant to the proposed plant without a shutdown.

Comprehensive Wastewater/Stormwater Master Plan, Revere, MA*

Mr. Garvey was the Project Engineer responsible for developing a long-term wastewater and stormwater management plan to address the City's Environmental Protection Agency (EPA) Consent Decree obligation of reduction Sanitary Sewer Overflows (SSOs) and poor water quality at municipally owned stormwater outfalls. Project included developing of a variety of alternatives, developing metrics to weigh and prioritize alternatives. Review future development projections with the City Planner and developing future flow projections based on this information. The program included quantifying extraneous wastewater flows using an InfoWorks model and inspection of wastewater and stormwater collection system including tide gates, pump stations, pipelines, and access structures. In Response to the EPA 2014 document allowing affordability assessments to extend the duration of Consent Decree driven work for separated collection systems, the City's initial CWMP/CSMP was updated to recommend a financial burden not to exceed 2% of median household income. As a result of the more in-depth financial analysis, the City's CIP was extended an additional 20 years. The supplement CWMP/CSMP included additional information on the City's proposed operations and maintenance (O&M) program, a 5-year Illicit Discharge Detection and Elimination (IDDE) program, and a summary of field validation data for the City's wastewater model.

Wastewater Extension Master Plan Update, Amherst, MA*

Project Engineer responsible for providing engineering support for the Town of Amherst Wastewater Extension Master Plan Update. Tasks included updating population and wastewater flow rates projections, sewer projection prioritization, costs estimates, priority lists for recommended alternatives, and a general review and update of the report.

*Experience from previous employer



Paige A. Howard, EIT

PROJECT ENGINEER

Project Assignment: Project Engineer

Education

B.S., Environmental
Engineering, University of
New Hampshire

Professional Registration

NH, EIT

Experience

6 Years

Joined Firm

2017

Certifications

Massachusetts Municipal
Wastewater Treatment Plant
Operator – Grade 4

Confined Space
OSHA 10-hour

Experience Summary

Ms. Howard is an engineer in the Wastewater Treatment Practice Group. Her responsibilities include analysis and design of wastewater collection and treatment facilities; preparation of reports, design plans, specifications; bidding and construction administration assistance. Additionally, she is knowledgeable in project funding applications, permitting, field services, and municipal wastewater operations and maintenance.

Relevant Project Experience

Wastewater Treatment

Wastewater Treatment Facility Upgrade, Whitefield, NH

Project Engineer responsible for leading both Bidding and Construction Admin. Phases of project. Design of the Dewatering System (Centrifuge, Screw Conveyor, Polymer Blending Unit, Sludge Feed Pump, and sludge disposal options), Headworks Influent Screening (Mechanical Fine Screen), Influent Pump Station (Wet Well Sizing and Submersible Duplex Pumps), recycle Flow Measurement (Palmer-Bowlus Flume), sewer sizing site wide (Process Drain, Outfall, and Lagoon Overflow piping), pumps (WAS & Effluent Pumps), and assistance with the Hydraulic Profile.

Wet Weather Flow Treatment Facility Influent Screening Upgrade, Nashua, NH

Responsible for both the conceptual and preliminary design of a new Mechanical Screen (multi-rake) for CSOs and assisting with reports.

Dewatering & Septage Receiving Upgrades, North Conway, NH

Responsible for the design of two additional Screw Conveyors, third Polymer Blending Unit, the three Sludge Feed Pumps, integration of a third Screw Press, and associated piping revisions.

Grit System Upgrade, Durham, NH:

Responsible for leading both Construction Admin. and Inspection activities for sizing and selecting a new Grit Classifier, Grit Feed Pump, and Horizontal Transfer Screw.

Influent Screenings, Aeration and Dewatering Systems Upgrade, Somersworth, NH

Responsible for assisting the design of the influent screening system, sludge dewatering system, RAS/WAS pumps, and the development of specifications and reports.

Catch Basin and Wet Well Cleanings Treatment Facility, Dover, NH:

Responsible for assisting during preliminary design, reports, equipment selection and sizing.

WWTF Odor Control Evaluation and Recommendations, Durham, NH

Responsible for conducting two odor control tests, providing equipment selections, and developing an odor control study including a life cycle analysis.

Phase I – Disinfection Upgrades, Burlington, VT

Responsible for assisting design, specification/drawing development, and pump selections for new Disinfection Systems for three of Burlington's wastewater plants: Main, North, and East.

Phase II – Wastewater Infrastructure Improvements, Burlington VT

Responsible for developing a comprehensive evaluation of converting Burlington's East WWTF to a Pump Station. The East WWTF PS eval. included a collection system assessment, preliminary hydraulic analysis, capital cost estimating, pump selections, a life cycle assessment, and report.

Construction Administration

Wastewater Treatment Facility Upgrade, Whitefield, NH

Responsible for leading and managing general construction administration, development of project construction documentation (progress meetings, CP/CO, RFI, EC, etc.), submittal reviews, equipment start-ups, O&MM, record drawings, inspection, and coordination between team members, general contractor, sub-contractors, materials testing agencies, and client.

Dewatering and Septage Receiving Upgrades, North Conway, NH

Responsible for leading and managing general construction administration, development of project construction documentation (progress meetings, CP/CO, RFI, EC, etc.), submittal reviews, equipment start-ups, O&MM, record drawings, inspection, and coordination between team members, general contractor, sub-contractors, materials testing agencies, and client.

Grit System Upgrade, Durham, NH

Responsible for leading and managing general construction administration, development of project construction documentation (progress meetings, CP/CO, RFI, EC, etc.), submittal reviews, equipment start-ups, O&MM, record drawings, inspection, and coordination between team members, general contractor, sub-contractors, materials testing agencies, and client.

Septage Receiving Upgrade, Plymouth, NH

Responsible for leading and managing general construction administration, development of project construction documentation (progress meetings, CP/CO, RFI, EC, etc.), submittal reviews, equipment start-ups, O&MM, record drawings, inspection, and coordination between team members, general contractor, sub-contractors, materials testing agencies, and client.



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