

**ENGINEERING REPORT PHASE - DRAFT  
CONTRACT FOR PROFESSIONAL SERVICES  
FOR  
TREATMENT WORKS**

CITY/TOWN OF ALLENSTOWN, NEW HAMPSHIRE

This AGREEMENT made and entered into at Merrimack County, New Hampshire, this \_\_\_ day of \_\_\_\_\_ 2016, by and between City/Town of Allenstown hereinafter called the OWNER, and Hoyle, Tanner & Associates, Inc. hereinafter called the ENGINEER.

WITNESSETH:

WHEREAS, the OWNER intends to examine the need, alternatives and cost of constructing Treatment Works including \_\_\_\_\_

Further development of the Asset Management Program for the wastewater collection and treatment facilities

hereinafter called the PROJECT, and

WHEREAS, professional sanitary engineering services are required to prepare an engineering report, and

WHEREAS, such services are of a distinct professional nature and hence not subject to the bidding process,

NOW THEREFORE, in consideration of these premises and of the mutual covenants herein set forth, the OWNER hereby retains the ENGINEER to furnish the following engineering services in connection with the proposed PROJECT; and it is agreed by and between the OWNER and the ENGINEER as follows:

**I. Services to be performed by the ENGINEER**

A. The ENGINEER agrees to produce a complete and definitive Engineering Report to meet current division requirements and to perform any and all engineering incidental thereto. The detailed scope of the work is as outlined in the attached Plan of Study.

B. Furnish to the OWNER two (2) copies of information needed for the acquisition of easements, site options for treatment plant and pump stations and route options for interceptor sewers within 15 calendar days after the Engineering Report has been approved by the New Hampshire Department of Environmental Services, Water Division, hereinafter called the DIVISION.

C. Furnish 4 copies of the Engineering Report to the OWNER and two (2) copies to the DIVISION. Additional copies to be available at cost.

D. Prepare applications with supporting and associated documents for Federal, State and other grant or loan programs.

1. Assists the OWNER in securing grants or loans by State, Federal and other grant or loan agencies.

E. Provide the DIVISION with one copy of design calculations, work sheets, field notes, estimates and other data generated in preparing the Engineering Report in a form satisfactory to the DIVISION.

**II. The OWNER'S Responsibilities**

A. Assist the ENGINEER by placing at his disposal all available information pertinent to the PROJECT, including previous reports and other data relative to the reports.

B. Make provisions for the ENGINEER to enter upon public and private lands, municipal facilities and industrial establishments as required to perform work under this AGREEMENT.

**III. Time of Completion**

A. The ENGINEER agrees that he will submit to the DIVISION and the OWNER for approval after modification or revision as recommended by the DIVISION and agreed to by the ENGINEER the completed report within 365 consecutive calendar days following the

acceptance of the contract by the OWNER, and deliver same to the OWNER within 15 calendar days following the date of final approval by the DIVISION.

B. It is agreed by the parties to this contract that failure by the ENGINEER to complete the work within the time stipulated under III, A, above may be considered sufficient basis for the debarment of the ENGINEER from the DIVISION'S Roster of Prequalified Engineers as provided for under New Hampshire Code of Administrative Rules Env-Wq 603.08, or the Assessment of liquidated damages as provided for under RSA 485-A: 4, XII.

**IV. Compensation to be Paid the ENGINEER**

A. Method of Payment - Amount of Fee

1. Payment to the ENGINEER, for services rendered, shall be according to the following schedule:

Monthly billing based on hours and rates by labor category with mark-up and incidental expenses in accordance with the attached fee schedule.

2. The OWNER agrees to pay and the ENGINEER agrees to accept for all services under this AGREEMENT, a fee not to exceed

Thirty Thousand and No/100

Dollars (\$ 30,000.00 ),

and the ENGINEER agrees that the work proposed is sufficient to satisfactorily complete the study and that the monies to be paid are adequate. The attached fee schedule with labor category, hours, hourly rate, markup, incidental expenses, and fees for special services, shall be the basis for billing for engineering services.

a. The ENGINEER agrees that prior to submitting the report to the DIVISION for formal approval he shall make revisions in the report as recommended by the DIVISION and agreed to by the ENGINEER without additional compensation. After formal approval if it becomes necessary to update the report for reasons beyond the control of the ENGINEER, payment for such revision or revisions shall be made to

the ENGINEER on a basis to be negotiated with the DIVISION.

be left in the possession of the ENGINEER at the OWNER'S discretion.

**V. Additional Covenants**

A. The ENGINEER agrees to assign in active charge of this PROJECT for the life of the contract a Project Engineer who is a permanent employee of the ENGINEER and who is a "qualified sanitary engineer" as defined under the DIVISION'S "Rules and Regulations for the Prequalification of Consulting Engineers." The Project Engineer shall be\*

Michael A. Trainque, P.E.  
Vice President

\* See appended resume describing the candidate's qualifications for the assignment.

Any proposed change in identity of the Project Engineer on the PROJECT shall first be approved by the DIVISION before transfer of responsibility is made. Failure of the ENGINEER to abide by the above covenant is agreed to be sufficient basis for debarment of the ENGINEER from the DIVISION'S Roster of Prequalified Consulting Engineers as provided for under New Hampshire Code of Administrative Rules Env-Wq 603.08.

B. The ENGINEER agrees to be solely responsible for all bills or claims for payment for services rendered by others and for all services and materials employed in his work, and to indemnify and save harmless the OWNER, and all of the OWNER'S officers, agents and employees against all suits, claims or liability of every name and nature arising out of or in consequence of the negligent acts or failures to act of the ENGINEER or others employed by him in the performance of the work covered by this AGREEMENT.

C. The ENGINEER further agrees to procure and maintain at his expense such workmen's compensation insurance as is required by the statutes and public liability insurance in amounts adequate to provide reasonable protection from claims for bodily injury, death or property damage which may result from his performance and the performance of his employees under this AGREEMENT.

D. All documents, including original drawings, design calculations, work sheets, field notes, estimates, and other data shall remain the property of the OWNER and shall be transmitted to the OWNER in clean and orderly condition on demand; however, these may

E. The ENGINEER shall not sublet, assign or transfer any part of the ENGINEER'S services or obligations under this AGREEMENT without the prior approval and written consent of the OWNER and the DIVISION, and the contract shall be binding upon and inure to the benefit of the parties, their successors and assigns.

IN WITNESS WHEREOF, the parties hereto have affixed their hand and seals at Merrimack County, New Hampshire, the day, month, and year first above written.

**ENGINEER:**

HOYLE, TANNER & ASSOCIATES, INC.

By: \_\_\_\_\_  
(Authorized Representative\*)

Date: \_\_\_\_\_

**OWNER:**

TOWN OF ALLENSTOWN, NEW HAMPSHIRE

By: \_\_\_\_\_  
(Authorized Representative\*)

Date: \_\_\_\_\_

**APPROVED: \*\***

DEPARTMENT OF ENVIRONMENTAL SERVICES  
Water Division

By: \_\_\_\_\_  
(Authorized Representative)

Date: \_\_\_\_\_

\* Signatures should be supported by appropriate document.  
\*\* It is agreed that as an act in furtherance of its statutory authority to approve engineering agreements for treatment works, the DIVISION'S approval does not impose any contractual obligation or liability on the State of New Hampshire, the Department of Environmental Services or the Division.

Approved as to form:

Town Counsel

At a meeting of the Partners/Directors of \_\_\_\_\_ ,  
held on \_\_\_\_\_ , at which all the Partners/Directors were present, except \_\_\_\_\_  
\_\_\_\_\_, it was

VOTES: That all contracts may be signed by any one of the following:

*(see attached Secretary's Certificate)*

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

A true copy

Attest: \_\_\_\_\_

Place of Business: \_\_\_\_\_

Date of this Contract: \_\_\_\_\_

I hereby certify that I am the Clerk of \_\_\_\_\_ ,  
that \_\_\_\_\_ is the duly elected \_\_\_\_\_ ,  
and that the above vote has not been amended or rescinded and remains in full force and effect as of this date.

\_\_\_\_\_  
Clerk

**CORPORATE RESOLUTION**

I, Christopher R. Mulleavey, hereby certify that I am duly elected Assistant Secretary of **HOYLE, TANNER & ASSOCIATES, INC.**, a New Hampshire corporation, and that the Directors of said corporation, at a meeting duly authorized and held March 27, 2016, adopted a resolution authorizing certain persons to execute proposals and contracts on behalf of the Corporation, acting individually, which authorization is still in full force and effect this date:

Todd M. Clark  
William R. Davidson  
Mary Beth Dopfer  
Karen J. Frink  
Robert M. Furey  
Sean T. James  
Matthew J. Low  
Wilbur J. Mathurin  
Christopher R. Mulleavey

Douglas N. Norman  
Jon A. Olin  
Linda K. McNair-Perry  
Carl L. Quiram  
Julie R. Roberts  
Michael V. Schramm  
Andrew Sturgeon  
Michael A. Trainque  
Frank E. Wells

IN WITNESS WHEREOF, I have executed this instrument this the 11th day of May 2016.


  
\_\_\_\_\_  
Christopher R. Mulleavey, Assistant Secretary

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STATE OF NEW HAMPSHIRE  
HILLSBOROUGH, SS

The foregoing instrument was acknowledged before me this 11th day of May 2016.



  
\_\_\_\_\_  
JUDITH DONOVAN HANN, Notary Public  
My Commission Expires May 23, 2017

**PART I - GENERAL**

1. GRANTEE / LOANEE: <b>Town of Allenstown, New Hampshire</b>		2. GRANT/LOAN NO.
3. NAME OF CONTRACTOR OR SUBCONTRACTOR: <b>Hoyle, Tanner &amp; Associates, Inc.</b>		4. DATE OF PROPOSAL <b>5/10/2016</b>
5. ADDRESS OF CONTRACTOR OR SUBCONTRACTOR (Include ZIP) 150 Dow Street, Manchester, NH 03101		6. TYPE OF SERVICE TO BE FURNISHED <b>Eng. Services - Asset Management</b>

**PART II - COST SUMMARY**

7. DIRECT LABOR (Specify labor categories)	HOURS	HOURLY RATE	ESTIMATED COST	TOTALS
Principal/P.M.	8	\$ 58.92	\$ 471.36	
Senior Engineer	206	\$ 36.96	\$ 7,613.76	
Project Engineer	0	\$ 32.44	\$ -	
Junior Engineer	0	\$ 27.45	\$ -	
Sr. CADD/Designer	0	\$ 28.63	\$ -	
CADD Technician	0	\$ 21.05	\$ -	
Intern	40	\$ 15.50	\$ 620.00	
Clerical	0	\$ 25.00	\$ -	
<b>DIRECT LABOR TOTAL:</b>				<b>\$ 8,705.12</b>
8. INDIRECT COSTS (Specify indirect cost pools)	RATE	X BASE =	ESTIMATED COST	
	1.8	\$ 8,705.12	\$ 15,669.22	
				\$ -
<b>INDIRECT COSTS TOTAL:</b>				<b>\$ 15,669.22</b>
<b>9. OTHER DIRECT COSTS</b>				
a. TRAVEL			ESTIMATED COST	
(1) TRANSPORTATION			\$ 325.00	
(2) PER DIEM			\$ 140.00	
<b>TRAVEL COSTS TOTAL:</b>			<b>\$ 465.00</b>	
b. EQUIPMENT, MATERIALS, SUPPLIES (Specify categories)		QTY	COST	ESTIMATED COST
Printing		1	\$ 134.00	\$ 134.00
Telephone/Fax		1		\$ -
Shipping		1		\$ -
Materials/Supplies		1	200	\$ 200.00
<b>EQUIPMENT SUBTOTAL:</b>				<b>\$ 334.00</b>
c. SUBCONTRACTS			ESTIMATED COST	
Geotechnical/Trenchless			\$ -	
Survey/Mapping			\$ -	
Wetlands			\$ -	
<b>SUBCONTRACTS SUBTOTAL:</b>			<b>\$ -</b>	
d. OTHER (Specify categories)			ESTIMATED COST	
Flow Meter Rental			\$ 2,100.00	
			\$ -	
<b>OTHER SUBTOTAL:</b>			<b>\$ 2,100.00</b>	
e. OTHER DIRECT COSTS TOTAL:				<b>\$ 2,899.00</b>
<b>10. TOTAL ESTIMATED COST (rounded to nearest integer)</b>				<b>\$ 27,273</b>
<b>11. PROFIT (rounded to nearest integer)</b>				<b>\$ 2,727</b>
<b>12. TOTAL PRICE (rounded to nearest integer)</b>				<b>\$ 30,000</b>

**PART III - PRICE SUMMARY**

13 COMPETITOR'S CATALOG LISTINGS, IN-HOUSE ESTIMATES, PRIOR QUOTES (Indicate basis for price comparison)	MARKET PRICE (\$)	PROPOSED PRICE

**PART IV - DIRECT LABOR BY CATEGORY**

14. INSERT THE APPROPRIATE WORK CATEGORY IN THE TABLE BELOW. WORK CATEGORIES WOULD INCLUDE BUT NOT BE LIMITED TO THOSE CATEGORIES SHOWN IN THE CONTRACT DOCUMENTS SUCH AS DESIGN, SURVEY, SUBSURFACE, CADASTRAL, O&M MANUAL, ADMINISTRATION, INSPECTION, RECORD DWGS, START-UP, SPECIAL SERVICES, ETC.

Work category →	TASK 1  <b>Kick Off Meeting</b>	TASK 2  <b>Vertical Inventory</b>	TASK 3  <b>Update Horizontal Data</b>	TASK 4  <b>Develop Condition Assessment</b>	TASK 5  <b>Identify Focus Areas Based I/I</b>	TASK 6  <b>Training on VUEWorks</b>	Total  Hours	Rate	Cost
Principal/P.M.	4	0	0	0	2	2	8	\$ 58.92	\$ 471.36
Senior Engineer	4	32	26	44	50	50	206	\$ 36.96	\$ 7,613.76
Project Engineer	0	0	0	0	0	0	0	\$ 32.44	\$ -
Junior Engineer	0	0	0	0	0	0	0	\$ 27.45	\$ -
Sr. CADD/Designer	0	0	0	0	0	0	0	\$ 28.63	\$ -
CADD Technician	0	0	0	0	0	0	0	\$ 21.05	\$ -
Intern	0	20	20	0	0	0	40	\$ 15.50	\$ 620.00
Clerical	0	0	0	0	0	0	0	\$ 25.00	\$ -
<b>TOTALS</b>	<b>8</b>	<b>52</b>	<b>46</b>	<b>44</b>	<b>52</b>	<b>52</b>	<b>254</b>		\$ -
<b>Total - Direct Labor Cost</b>									\$ 8,705.12

**ATTACHMENT A  
PROPOSED SCOPE OF WORK  
WASTEWATER ASSET MANAGEMENT  
ALLENSTOWN SEWER DEPARTMENT, ALLENSTOWN, NEW HAMPSHIRE  
MAY 10, 2016**

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## **INTRODUCTION**

The NHDES has offered financing through the Clean Water State Revolving Fund (CWSRF) loan program, with incentives in the form of principal loan forgiveness, to promote asset management and assist community wastewater systems in developing an asset management plan or implementing aspects of a wastewater asset management plan that has already been developed.

Asset management programs help communities to identify and understand infrastructure needs and establish systematic procedures for addressing the following:

- Developing or updating system inventory and mapping
- Establishing preventive maintenance procedures
- Responding to and tracking of emergency responses
- Comprehensive financial forecasting
- Customer service tracking

Addressing these challenges will allow municipalities to better understand risk through condition and consequential failure of their asset, current and future deficiencies, regulatory needs, and the financial resources necessary to achieve the community's level of service.

The benefits of an asset management plan include:

- Increased system knowledge
- Identification of system elements using risk
- Increased asset life through proper maintenance
- Data based decision making used in allocation of capital funds
- Compliance with new regulations
- Improved system reliability/security
- Increased Level of Service (or better understanding of Level of Service)
- Sound basis for financial decisions (Capital Improvements)

The Allenstown Sewer Department currently has good GIS mapping of its sewer system, but is missing multiple attributes needed to be able to fully utilize its asset management software. Some of the attributes have been collected, but at this point this information needs to be completed for specifically the major equipment. The development of tasks and work orders should be incorporated into the asset management plan so that data can be collected to help in the development of condition and life cycle costs.

The town has begun using condition assessment, but because it is based on old data, the assessment does not provide a consistent evaluation of the wastewater system. There have not been any



Consequence of Failure tools developed to allow the Town to develop a risk based decision making process. Allenstown has just started the development of a formal asset management program, but the work performed under this SRF loan will tie together all of the core components of asset management and result in a beneficial tool for the municipality.

## SCOPE OF WORK

The Allenstown Sewer Department will complete the following tasks related to further developing its wastewater system asset management plan:

- **Task 1:** Attend one (1) kick-off meeting with town staff to discuss the goals of the project and collect additional information to supplement what the Town has already provided to the consultant. (See list of requested information below.)
- **Task 2:** Update and expand the current inventory of major equipment at the wastewater treatment facility by development of proper names for the different asset types of equipment and required attributes such as year installed, cost of equipment, current condition, expected life, manufacturer's information, and function. Preventative and operational maintenance requirements for each major asset will be reviewed during the inventory assessment. Tasks and work orders, based on run times using the SCADA system or an alternative timeline, will be developed for preventative maintenance, safety, and resource requirements. This will be done within the Asset Management program so future condition assessments can be performed along with risk assessment.
- **Task 3:** Expand collection system attribute database. The collection system mapping includes GPS coordinates of the system components, but important attributes such as year installed and physical attributes, need to be added. Expanding the database will help in determining the future requirements for maintenance as well as allocating capital improvements of the collection system.
- **Task 4:** Develop standards for the Probability of Failure (condition assessment) for the collection system based on the data that is currently available and from the data collected as part of this project. Most collection systems use the Pipe Assessment Certification Program (PACP) as a standard for condition evaluation. Many communities use an abbreviation of the PACP program to provide only the information they need. A section of the collection system will be used to establish baseline data and perform an on-site evaluation. The data and evaluation process will provide a model for the Town to use when completing the assessment for the remaining assets. Concurrent with performing the on-site evaluation, standards for the condition assessment will be developed as a template for future use. An example of this would be to evaluate 10 manholes and the pipes in between those manholes to establish and evaluate the work flow and make corrections to reflect the condition of the system. The resulting work flow and standardized form(s) would be used in the future for the rest of the system with periodic re-evaluation and updates. Under this Task, the included segments of sewer pipe will also be television inspected.
- **Task 5:** Identify infiltration/inflow problem areas. As part of this evaluation, locations within the collection system with concerns for inflow and infiltration will be identified. Temporary flow

meters will be installed in up to 3 locations for flow monitoring and left in place until a 1-inch hour rain event has occurred or one month has elapsed since the installation, whichever comes first. This flow information will be used to determine areas to establish a condition rating based on infiltration/inflow. The recommended corrective action for sections with both low condition rating and signs of infiltration will vary based on other condition assessments (e.g. hydraulic capacity). This will help in developing the proper capital improvement plan as well as, the recommended operation and maintenance procedures based on different failure modes.

- **Task 6:** Estimate remaining service life for one asset type based on manufacturer’s published literature (where available), industry standards and reference material, engineering judgment, operator input and experience with the system, and service history. This information will be compiled into VUEWorks software to predict future capital improvement costs. This will help in developing a standard to complete other asset types.
- **Task 7:** Develop a fats, oil, and grease (FOG) Program, including permits and inspection forms, and develop schedules using the asset management software. The FOG program is directly related to the operational condition of the collection system. Building the FOG program inside the Asset Management program will demonstrate the relationship between the source of FOG and the assets that are impacted. This will be used to help in the development of other programs and the relationships to the respective assets.

**Costs**

<u>TASK</u>	<u>COST</u>
Task 1	\$1,000
Task 2	\$5,000
Task 3	\$3,000
Task 4	\$5,000
Task 5	\$8,000
Task 6	\$3,000
Task 7	\$5,000
Total cost	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> \$30,000

## MICHAEL A. TRAINQUE, P.E.

*Vice President - Senior Project Manager*

Mr. Trainque's responsibilities include business development, client maintenance, project management, QA/QC and the planning, design and construction administration of a variety of wastewater and water projects including: pumping stations; wastewater treatment facilities; sewers, sewer system repairs, rehabilitation and replacement; water supply systems, and solid waste disposal facilities. Specific expertise includes project management, funding assistance, engineering design, construction administration and development of contract documents and reports. Experience also includes providing expert witness services.

### Relevant Experience

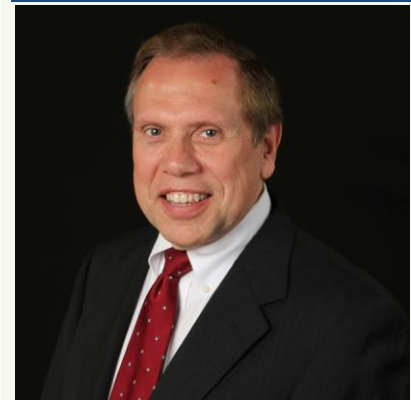
**Wastewater Treatment Facility Upgrade, Allenstown, NH:** Project Manager and Lead Design Engineer for planning, permitting, design, construction, funding assistance and Client coordination. Scope: Constructed a biological process modification to enhance solids settling and increase hydraulic capacity by 30% without adding tankage using an innovative new process. Ballast is added to the wastewater stream which enhances solids settling to allow for operation of the biological process at a significantly higher mixed liquor concentration. This is the first full-scale municipal application of this process in the US. The project was funded under the American Recovery and Reinvestment Act (ARRA) of 2009 as Innovative/Alternative Technology.

**New Septage Receiving Facilities, Allenstown, NH:** Project Manager for all technical aspects of the project, scheduling, budget and cost control, management of subconsultants, public presentations, permitting, and client coordination. Scope: Planning, design and construction administration for new septage receiving facilities at the WWTF to process 70,000-100,000 gallons/day (20 MG/year) of septage. Gross revenue from septage processing exceeds \$ 1.0 million/year.

**WWTF Aeration System Upgrade, Allenstown, NH:** Project Manager and lead design engineer responsible for technical aspects of the project, QA/QC, budget and cost control, final equipment selection recommendations, public presentations and client coordination. Scope: Develop conceptual design and cost estimate to replace the existing aeration blower system at the Allenstown wastewater treatment facility with a new high-efficiency aeration blower system in a new building. The new aeration system must provide for adequate biological treatment of wastewater as well as mixing of septage since the Town accepts and processes 20 million gallons/year of septage.

**Wastewater Treatment Facility Upgrade, Rollinsford, NH:** Project Manager and Lead Design Engineer for planning, design, permitting, approvals, construction and funding assistance. Scope: Upgraded the existing wastewater treatment facility, in which a biological phosphorus removal (BPR) process utilizing the anaerobic/oxic (A/O) configuration was selected and implemented. Also assisted the District in securing funding for the project including a mix of loans and matching grants from several different State and Federal funding programs. Grants covered 86% of the total project cost.

**Wastewater Treatment Facility Upgrade – Evaluation of Alternatives, Windsor, VT:** Project Manager for all technical aspects of the project, scheduling, budget and cost control, management of subconsultants, public presentations and client coordination. Scope: Conducted a condition assessment and evaluation of alternatives for upgrade of the existing



### **Professional Registrations:**

Professional Engineer: ME, NH, MA, VT, FL  
NCEES-Nationally

### **Education:**

University of Lowell, BS, Structural & Sanitary Engineering, 1979

### **Professional Associations:**

- American Public Works Association (APWA)
- American Water Works Association (AWWA)
- Massachusetts Water Works Association (MWWA)
- New England Water Environment Association (NEWEA)
- New England Water Works Association (NEWWA)
- New Hampshire Legislative Stormwater Commission - Commissioner (Past)
- New Hampshire Water Pollution Control Association (NHWPCA)
- North American Society of Trenchless Technology (NASTT)
- Southeast Watershed Alliance - Chairman, Board of Directors
- University of Massachusetts, Lowell - Chair, Civil & Environmental Engineering Department Advisory Board
- Water Environment Federation (WEF)

**Years in Industry: 37**

wastewater treatment facility which utilizes rotating biological contactors (RBC's) for biological treatment. The plant was originally constructed in 1964 and upgraded to secondary treatment 1989 with a design capacity of 1.13 MGD. Much of the equipment is old and upgrade of the plant is necessary to replace aging equipment, meet anticipated NPDES permit requirements for treatment and rectify conditions that do not meet current code requirements. An evaluation and engineering report was prepared that included recommendations and opinions of cost.

**Restoration of Wastewater Treatment Facility Lagoon No. 3, Brentwood, NH:** Project Manager/Design Engineer for evaluation, design, permitting, construction administration and client coordination. Scope: Completed forensic evaluation, design and construction for complete restoration of the wastewater treatment lagoon serving Rockingham County prison and administrative complex after the liner ruptured causing failure. Construction included removal and replacement of subgrade, installation of new liner and a new aeration system.

**Restoration of Wastewater Treatment Facility Lagoons 1 & 2, Brentwood, NH:** Project Manager/Design Engineer for evaluation, design, permitting, construction administration and client coordination. Scope: Completed forensic evaluation, design and construction administration for complete restoration of Lagoons No. 1 and No. 2 serving Rockingham County prison and administrative complex, to restore the wastewater treatment facility following failure of the liner in Lagoon 1. Construction included removal/replacement of subgrade, installation of new liner and a new aeration system.

**NPDES Permit Renewal, Groveton, NH:** Project Manager for all technical aspects of the project, scheduling, budget and cost control, management of subconsultants, public presentations, permitting, and client coordination. Scope: Preparation of the application for renewal of the National Pollutant Discharge Elimination System (NPDES) discharge permit for a wastewater treatment facility serving a former paper-making mill complex.

**Main Wastewater Treatment Facility Upgrade, Burlington, VT:** Senior Engineer for planning and design of a major upgrade to the wastewater treatment facility. Designed all of the pumps and piping and the hydraulic profile for the plant. Scope: Designed an upgrade to the Main Wastewater Treatment Facility, one of three WWTF's that serve the City, for a design ADF of 5.8 MGD and a peak flow of 13.0 MGD. This project included first flush facilities to handle CSO flows up to 75 MGD, and increase plant capacity by more than 30%. The design provided for flexible biosolids management and included the design of storage, thickening and dewatering equipment.

**New Secondary Clarifier & Related Improvements at the WWTF, Farmington, NH:** Project Manager/design engineer for all technical aspects of the project, scheduling, budget and cost control, management of subconsultants, public presentations, permitting, and client coordination. Scope: Designed and constructed a new secondary clarifier and replaced the clarifier mechanism in the existing clarifier to increase secondary settling capacity and improve overall plant performance.

**Treated Effluent Reuse Water Main, Inverness, FL:** Design Engineer responsible for preliminary design, layout, final design, permitting and approvals. Scope: Planning, design, permitting, bidding assistance, construction observation and funding assistance for 17,000 feet of 16 inch diameter ductile iron transmission pipe and replacement of a spray irrigation system for the reuse water line that conveys highly treated effluent from the wastewater treatment facility to a nearby golf course where it is used for irrigation.