Stephen R. Gates, P.E., DEE

Tufts University
B.S. in Civil Engineering, Cum Laude

Project Role:
Principal-in-Charge

Mr. Gates, who recently joined R. W. Beck as a Client Services Director for the Boston Office Water/Waste Practice, has 29 years of environmental engineering experience providing program management, management consulting, facilities planning, detailed design and construction management for a wide variety of environmental engineering projects throughout Northeastern United States and Canada. He has successfully planned, designed, and managed construction of environmental facilities for public and commercial clients valued well over US$2 billion. He is highly experienced in alternative project delivery methods, including design/build contracting and program management.

EXPERIENCE

Public Sector Projects

Project Manager

Mr. Gates directed a wide variety of projects for federal, municipal and county governments. He managed projects, including master planning, facilities and feasibility studies, permitting, design and construction management for water supply and distribution; wastewater collection, conveyance and treatment; solid waste management-land filling and incineration; and hazardous waste management. Mr. Gates managed facilities permitting, including the then largest (3,000 TPD) mass burn solid waste incinerator ever built. He wrote program policy and guidance documents for EPA, COE and HUD.

MWH Global, Inc.

Program Management Global Practice Unit
Project Development

In select geography, Mr. Gates led MWH's Program Management Practice, providing vision, strategic direction, leadership and resources to create, acquire and support Program Management engagements. He worked to maintain MWH's highly regarded reputation and track record for successful program management engagements through team building, resource allocation, and the development and deployment of best practices among all MWH programs.

MWH Americas

Client Service Manager
New York City/President

Previously, as Corporate Officer-in-Charge, Mr. Gates directed all work performed by MWH for the NYC Department of Environmental Protection, including the East of Hudson Dams Rehabilitation; Hillview Reservoir Chamber Improvements; Facilities Planning for the Interim Upgrade of the Rockaway Water Pollution Control Plant; Citywide

Collection System SCADA System; and the Advanced Wastewater Treatment Program Management Assistance contracts. In this capacity, Mr. Gates directed all project activity and assured the focus of MWH's senior management on high quality service to NYC DEP through appropriate staffing, attention to established quality assurance protocols, and active oversight of project management and contract administration, to meet customer needs and to assure that project goals were met to the satisfaction of NYCDEP. With 9 million customers, NYC DEP is among the largest water utilities in the world. During this assignment, Mr. Gates directed a Needs Analysis and Functional Requirements Report for a comprehensive Project Management Information System (PMIS) to assist the Department with management of its US$16.5 billion 10-year capital improvement plan, and the implementation of a proof of concept PMIS.

MWH Americas, Inc.

Northeast Region Manager

Until his assignment to serve the needs of NYC DEP on a full-time basis, Mr. Gates was responsible for MWH's operations throughout the Northeastern United States and Canada. He oversaw all project activity, including significant environmental engineering projects for the Massachusetts Water Resources Authority, the New York City Department of Environmental Protection, the Hartford Metropolitan District Commission, the Providence Water Supply Board and the cities of Trenton and Newark, New Jersey, Cambridge, Massachusetts and Ottawa, Ontario.

Collection System SCADA Master Plan

Massachusetts Water Resources Authority
Project Director

Mr. Gates managed completion of a comprehensive Master Plan for the implementation of a centralized system for automatic monitoring and control of all facilities owned and operated by the Sewerage Transport Division of the Massachusetts Water Resources Authority (MWRA). The Transport Division is responsible for the operation of all the Authority's Pumping Stations and CSO facilities. The Master Plan evaluated alternative means and defined the most appropriate level of centralized monitoring and control for MWRA's 1.2 billion gallon-per-day (GPD) wastewater collection and transport system, which serves approximately 2 million customers in and around Boston, Massachusetts. The Master Plan also provided detailed implementation recommendations for the proposed SCADA and computerized control system, considering organizational development and training needs, purchasing constraints, and technical requirements.

Central Artery/Tunnel Project

Massachusetts Highway Department - Environmental Services Contract
Deputy Project Director

Mr. Gates directed work plan development and managed permitting, engineering, design and construction tasks on a $50,000,000 services contract for the Massachusetts Highway Department, Central Artery/Tunnel Project. He managed environmental audits, assessments, and remediation designs at 250 sites throughout Boston in support of highway construction involving excavation of 13 million cubic yards of urban fill. Mr. Gates also managed negotiations of Memos of Understanding (MOUs) on the requirements of federal, state and local environmental regulations with stakeholder agencies. Construction progress on the $14.5 billion project remains largely unimpeded by environmental issues.

Paul B. Doran, P.E.

Mr. Doran joined R. W. Beck in 2004 and serves as a Senior Water Consultant in the National Owner Advisory Services Practice. Having over 30 years of consulting experience in sanitary, environmental and general civil engineering, Mr. Doran has served in the roles of a Project Manager, an Associate Engineer, a Director and a Principal Engineer. In these various roles, Mr. Doran designed, managed construction and managed major projects in municipal wastewater treatment, industrial wastewater pretreatment, municipal and industrial wastewater collection systems, pumping stations, water distribution systems, water treatment, sewer system evaluation surveys, stormwater abatement, combined sewer overflow abatement, sewer separation, and evaluated the applicability of public/private partnerships through procurement of private industry responses to RFP's. In addition, Mr. Doran has been responsible for the implementation of alternative, decentralized wastewater collection and treatment systems and water and wastewater facilities plan preparation for rural communities.

Prior to joining R. W. Beck, Inc., Mr. Doran was the Director of Engineering for a management consulting firm that specialized in independent engineering reviews and procurement of municipal alternative delivery projects. Mr. Doran also served as Principal Engineer, Department Manager, Senior Project Manager, and Project Engineer for various civil engineering design firms.

DESIGN / BUILD, DESIGN / BUILD / OPERATE, CONTRACT OPERATIONS & OVERSIGHT SERVICES

Mr. Doran utilizes a blend of technical, business and project implementation skills to manage all facets of nationwide Design/Build (D/B), Design/Build/Operate (D/B/O) and Contract Operations (CO) alternate project delivery/contracting approaches for municipal and industrial water and wastewater collection, distribution and treatment projects to include: feasibility studies, goal setting workshops, preparation of comprehensive Request for Proposal (RFP) documents, evaluation of private vendor proposals and detailed technical reviews of proposals, conduct private vendor interviews, development of private vendor technical selection criteria, recommendation of the most advantageous private vendor, negotiation of private vendor contracts, preparation of private vendor service contract technical exhibits, and monitoring private vendor service contract performance.

Mr. Doran's specific activities in public-private partnerships have included: Preparation of Request for Proposals to solicit private vendor solutions to municipal infrastructure problems, evaluation of vendor proposals, selection of the private proposal most advantageous to the municipality, participation in public forums and conferences on public private partnerships, authored private contract exhibits, participation in negotiations of the private vendor contract and monitoring of private contracts on behalf of the municipality.

Northeastern University
B.S. in Civil Engineering
M.S. in Civil Engineering

KEY EXPERTISE

Innovative Procurement of Design/Build and Design/Build/Operate Alternative Project Delivery Options

Negotiation/Monitoring of Private Vendor Service Contracts

Strategic and Business Planning For Utilities

Asset Management Programs for Municipalities and Utilities

Technical and Business Assessments/Reviews of Water/Wastewater Facilities

Independent Engineering Reviews of Water /Wastewater Utilities

Optimization of Water/Wastewater Facilities

Design and Construction Management

Adjunct Faculty in Civil/Environmental Engineering

R·W·BECK

In addition, Mr. Doran evaluates existing treatment plant equipment useful life and prepares detailed capital and operating cost estimates, which are used as benchmarks to compare private proposals to the traditional municipal design-bid-build project delivery method.

Oversight Services & Preparation of Request for Proposals, Evaluation of Responses, and Contract Negotiations for Long-Term Contract Operations, Sale or Lease of Wastewater Treatment Plant and Pump Stations, and Design/Build for CSO and Other Capital Improvements

Taunton, Massachusetts

Program Manager, Construction Manager, Project Manager. As one of the first D/B/O projects in Massachusetts and the United States, Mr. Doran prepared a comprehensive Request for Proposals for either the 20-year contract operations, or sale or lease of the City's 9 MGD wastewater treatment plant and collection system pump stations. In addition, Mr. Doran also solicited proposals from private contractors to continue the existing City practices of short-term private contract operation. The RFP presented a unique "menu" approach to provide the City with a choice of multiple proposals. Private contractors were to be responsible for financing, design and construction of capital improvements, a portion of which were CSO projects.

Seven strong and competitive proposals were received from national firms in December 1996. Proposal evaluation was completed in November 1997. Mr. Doran then assisted the City with contract negotiations.

Once into construction, Mr. Doran provided the City with design review, construction monitoring, construction management and service contract monitoring and oversight services. Mr. Doran monitored and recommended approval of the start-up services and acceptance testing of the completed facility.

Mr. Doran provided the City oversight services for the first seven years of the private operator's operation and maintenance practices and prepared yearly detailed reports summarizing the performance of the private vendor. Annually, Mr. Doran prepared the year-end financial summary and met with the private contractor to approve the annual settlement statement for operation and maintenance costs.

Oversight Services and Assistance with Preparation of Request for Proposal, Evaluation of Proposals and Contract Negotiations for Design, Construction and the Long-Term Operation and Maintenance of a New Wastewater Treatment Plant

Plymouth, Massachusetts

Project Manager. Mr. Doran assisted the Town in several aspects of their procurement to design, build, operate and maintain a new wastewater treatment plant, and operate and maintain a new pump station and force main for a 20-year term. Mr. Doran provided strategic guidance for this public/private partnership on technical, business, and contract issues to aid in structuring the RFP. Mr. Doran also assisted with RFP preparation, review of proposals, design review, construction monitoring, and operations oversight and monitoring of the D/B/O and D/B private contractors.

Mr. Doran developed detailed estimates of the capital and operating costs associated with the conventional D/B/B procurement of the proposed wastewater plant that were used as a "benchmark" to compare this traditional project delivery method to the private D/B/O option. Mr. Doran then used the benchmark to compare private proposals for D/B/O with the analysis for a traditional procurement approach, thereby allowing the Town to make an informed decision regarding the cost savings of the private approach.

In addition, Mr. Doran recommended to the Town to procure the design and construction of a new main pump station and force main via the D/B route. Mr. Doran also recommended to the Town to convert the existing wastewater operations building into the pump station and have this as an alternative in the RFP. Mr. Doran evaluated proposals and assisted in the Town in service contract negotiations. Retrofitting the existing wastewater treatment operations building into a pump station was ultimately selected and saved the Town considerable capital costs when compared to a new pump station.

Mr. Doran conducted a presentation to Plymouth residents via a Special Town Meeting comparing the public and private options available and the advantages and disadvantages of each. Mr. Doran assisted the Town in completing the contract negotiations of two service contracts, one for the design and construction and one for the operation and maintenance of the new wastewater plant. Mr. Doran also served as Program Manager, overseeing the work of all parties during the design and construction of the new plant.

Oversight Services & Preparation of Request for Proposal, Evaluation of Proposals and Contract Negotiations for Long-Term Operation, Sale or Lease of the Water System and Wastewater Treatment Facilities, and Design/Build for Capital Improvements

Chester Borough, New Jersey

Project Manager. As the Project Manager, Mr. Doran prepared the request for proposals, assisted in evaluation of proposals, and assisted the community with contract negotiations. In addition, Mr. Doran provided oversight and contract monitoring services. Chester Borough owned and operated its water and wastewater systems. It was faced with the dual needs of significant capital facilities improvements and expansion of its water and sewer lines. The Borough was seeking private proposals for long-term contract operations, sale or lease of its water and wastewater systems.

The RFP was released in December 1996. The procurement was conducted in accordance with the New Jersey 1995 Water and Wastewater Privatization Acts.

The Borough decided to sell its water system and to enter into a 20-year operations and maintenance contract for its wastewater system. The private contract operator for the wastewater system is also responsible for financing, designing, and constructing capital improvements. Contract negotiations were completed in 1997.

Oversight Services and Design/Build Procurement, Contract Negotiation, Project Management for Wastewater Treatment Plant and Air Pollution Control Upgrade of the Sludge Incinerators

Upper Blackstone Water Pollution Abatement District
Millbury, Massachusetts

Project Manager, Oversight and Construction Manager. Mr. Doran was the Project Manager and Construction Manager for the District's upgrade project at its 56 MGD wastewater treatment plant, the first public/private D/B wastewater project in the Commonwealth of Massachusetts. The project, under a strict DEP Consent Order, included major air pollution retrofits and upgrade to the solids handling/incineration complex.

Mr. Doran conducted the following activities: permitting, developing a procurement strategy, preparing requests for proposals, assisting in proposal evaluation, contract negotiations, design review, construction monitoring, and monitoring of acceptance testing. As part of his project management role, Mr. Doran was responsible for managing the efforts of a consulting engineering firm that provided the detailed resident engineering and construction management services.

Mr. Doran also provided technical review of the design of a pretreatment system for cyanide and heavy metal removal from the air pollution control system's wastewater side-stream. The project was partially funded via a low-interest loan from the MA DEP State Revolving Loan Fund.

Procurement of the private design/build contractor was successfully completed. Construction commenced in July 1995, and was completed in mid-1997. Facility start-up was successfully completed and acceptance testing has been completed. All requirements of the Consent Order were met.

Workshops in Public/Private Partnerships

Greater Lawrence Sanitary District
North Andover, Massachusetts

Task Manager. Conducted workshops for staff, Board members, and elected officials of the Greater Lawrence Sanitary District relative to public/private partnership alternatives, and the technical, economic, environmental and financial impacts to existing operations.

Innovative Procurement of Design/Construction Administration/Operation of Wastewater Treatment Facilities and Collection System Pump Stations for 20 Years, Preparation of the RFP, Evaluated Proposals and Assisted in Contract Negotiations; Provided Management, Technical and Financial Expertise

Sioux, City, Iowa

Project Manager. Mr. Doran managed an innovative design-operate (D/O) procurement for the City that integrated a number of professional services: preparation of an equipment evaluation report that identified the treatment plant and pumping station upgrades necessary for the next 20-year design period, preparation of an operations evaluation report and preparation of a feasibility study for a new treatment plant to replace the existing plant. Mr. Doran developed an engineering and economic assessment of needs to upgrade the existing 30 MGD wastewater treatment plant and comparing that to an alternative for the relocation, design, and construction of a new facility within the regional service area. The study concluded it would be more economical to upgrade the existing plant and to use its remaining useful life.

Once the planning studies were concluded, Mr. Doran developed an innovative D/O procurement procedure to comply with Iowa laws that consisted of: preparation of RFP for the D/O procurement for a retrofitted wastewater treatment plant, evaluation of private vendor proposals, selection of a preferred vendor, developed detailed estimates of the capital and operating costs associated with the proposed wastewater plant and negotiation of two contracts with the selected vendor – one for operation and maintenance and the other for design and construction administration.

During the project, Mr. Doran coordinated the efforts of and worked with the Mayor, the City Manager, the Director of Environmental Services, the City Attorney, the Citizen's Advisory committee and a local engineering firm.

Procurement for Short-Term Operations and Maintenance of Water and Wastewater Treatment Facilities and Water Distribution and Sewer Collection Systems; Preparation of the RFP, Evaluated Proposals and Assisted in Contract Negotiations; Provided Management, Technical and Financial Expertise

Lee, Massachusetts

Project Manager. Mr. Doran was the Project Manager and Procurement Advisor to the Town for all aspects of the project.

The Town of Lee entered into Administrative Consent Orders with the Massachusetts Department of Environmental Protection which require the upgrade of its Water Treatment and Distribution Facilities and Wastewater Treatment Plant and Collection System. The Town commenced procurement for short-term (2 year) private operations and maintenance of its 2-MGD water and 1-MGD wastewater treatment plants and water distribution and sewer collection systems. The intent was to procure an operator for two years while the Town considered the upgrades necessary to meet ACO requirements. The Town would then consider a long-term D/B/O procurement for these facilities.

Mr. Doran was responsible for the procurement for the short-term Contract Operations of the wastewater treatment plant, water treatment plant, wastewater collection system and water distribution system. Mr. Doran developed the detailed Request for Proposals, contract principles, evaluated private vendor proposals, conducted the vendor interviews, recommended a preferred private vendor to the Town and negotiated the service contract. The procurement was conducted pursuant to the requirements of Chapter 30(B), the Commonwealth's procurement law for services.

Procurement for Operations and Maintenance of 25-MGD Water Treatment Plant; Preparation of an RFP, Evaluation of Proposals and Contract Negotiations for Private Operations

Waterbury, Connecticut

Project Manager. A private contractor had operated the City of Waterbury's water treatment plant since it was constructed. Prior to the expiration of the existing contract, Mr. Doran served the City, through its Bureau of Water, by providing technical and financial assistance in preparing an RFP for continued private operation and maintenance of the plant for a period of an additional five years. Mr. Doran also assisted in evaluation of private proposals received, negotiated and prepared the draft service contract for continued private operations and maintenance of the plant.

Assessment of Feasibility of Public/Private Partnership Options

Taunton, Massachusetts

Mr. Doran identified options for public/private partnerships to reduce costs and to enhance revenues at the City's 9 MGD wastewater treatment plant and ancillary facilities. In developing the options, Mr. Doran also addressed the City's interest in limiting exposure for potential noncompliance with the plant's NPDES permit.

Mr. Doran presented the privatization options to the Mayor and DPW staff, discussing the pro's and con's of each option, and ultimately recommended the City determine the most economically advantageous option by soliciting private-sector proposals for expanded contract operations, a lease arrangement, or facility sale.

Preparation of Request for Proposal for Upgrade and Long-Term Operation of Wastewater Treatment Plant and Sludge Incinerator

Borough of Naugatuck, Connecticut

Lead Engineer. Mr. Doran was responsible for the procurement of design review and construction monitoring for $20 million D/B/O upgrade of wastewater treatment plant. Mr. Doran served as member of a team of procurement, technical, financial, and legal specialists for the procurement to upgrade and provide long-term contract operation (20 years) of the Borough's 10-mgd wastewater treatment plant and multiple-hearth incinerators. Mr. Doran was responsible for preparing the RFP, reviewing proposals, and assisting in contract negotiations. Mr. Doran also assisted in preparing the "benchmark analyses" for comparison to the proposals. The project is unique in that the Borough is continuing its history of "no-

cost" for wastewater treatment plant operations (i.e., revenues derived from incineration of outside sludge cover the cost of operating and maintaining the wastewater treatment plant.)

Independent Engineering Review of Water Treatment Plant Upgrade Options

Billerica, Massachusetts

Project Manager. Mr. Doran provided an independent engineers report and review, required under Massachusetts procurement law, of options for the Town to either upgrade its existing water treatment plant or construct a new 14 MGD water treatment plant. Mr. Doran conducted a comprehensive review of the work of the Town's consulting engineer, from facilities planning, selection of a new plant site, an independent evaluation of the plant site, preliminary calculations, environmental impact study and impacts of new and pending water regulations.

WATER TREATMENT

Mr. Doran has experience and design in the following: municipal well iron and manganese treatment system renovations, water booster pump station designs, variable speed pumping systems, water transmission system improvement, computer modeling of hydraulics of transmission systems, new water supply feasibility reports, and renovating existing recreational water distribution systems.

Third Party Independent Engineering Review of the Water Treatment Options

Billerica, Massachusetts

Project Manager. Mr. Doran provided a third-party independent engineering review, report preparation and economic analysis for the municipal water treatment plant. The study provided the municipality with an independent review of all previous work and a second opinion regarding the construction of a new water plant versus the renovation of the existing water plant. The final project was to be completed by design-build.

Mainline Water Booster Station Design and Bid Documents

Milford and Shirley, Massachusetts

Project Manager/Chief Designer. Mr. Doran designed mainline booster pump stations for each community. Mr. Doran performed the hydraulic design, prepared detailed construction plans and specifications, prepared bidding documents. Special project features included: variable speed pumps used for constant pressure output, designed to float off tank or system pressure.

Water Transmission System Improvements

Londonderry, New Hampshire

Project Manager/Chief Designer. Mr. Doran conducted computer hydraulic modeling of the municipal distribution system to determine various bottlenecks in the system. Mr. Doran performed the modeling analysis and authored a report that presented recommendations for the placement of a new booster station in the existing distribution system. In addition, Mr. Doran recommended various transmission network improvements to restore system pressure and improve hydraulic capacity of the distribution system as a whole.

Water Distribution Study

Boy Scouts of America
Paxton, Massachusetts

Project Manager/Chief Designer. Mr. Doran prepared a water distribution study that reviewed the options to improve the existing water supply and distribution system at a summer boy scout camp. The study selected two options for the boy scouts to consider and recommended new water supply facilities for staged construction.

Water Distribution System Computer Modeling Study

Providence, Rhode Island

Task Manager. Mr. Doran conducted water distribution system hydraulic analysis using a computer model to balance two water booster stations, three storage reservoirs and transmission main improvements. Mr. Doran recommended the improvements to the transmission network and modifications to the booster pump stations to increase pumping capacity and pressure, selection of new pumps and control systems.

Design/Build Documents for Iron and Manganese Water Treatment System

Dover, New Hampshire

Project Manager. Mr. Doran prepared the design/build bid plans and specification documents to solicit general contractors to construct a 1.5-MGD municipal well treatment system for iron and manganese removal. The design/build RFP described background information, selection and evaluation procedures, technical requirements for permits, minimum specifications for design and performance criteria.

INDUSTRIAL WATER TREATMENT

Mr. Doran has a strong background in industrial water treatment. Specific responsibilities include: water discharge permitting, pilot plant design and evaluation, waste treatment studies, preparation of design plans and specifications, design of water reuse facilities, design of instrumentation and control systems, design of industrial monitoring stations, operator training, and O&M manual preparation. Mr. Doran has the knowledge and application of the following industrial treatment processes: dissolved air flotation; membrane filtration to include microfiltration, ultrafiltration and reverse osmosis; pressure filtration; mixed-media filtration; coagulation; flocculation; carbon adsorption; pH neutralization; carbon dioxide neutralization; metals removal; cyanide destruction; oxidation/reduction techniques; and ion exchange. In addition, Mr. Doran has prepared Stormwater Pollution Prevention Plans for various industrial activities.

Design and Permitting of Industrial Pretreatment System

Unifirst Corporation, Corporate Environmental Department
Various National Locations

Principal Engineer. Mr. Doran designed and permitted numerous industrial laundry pretreatment systems throughout the country for the Corporate Division of Unifirst Corporation, treating heavy metals such as zinc, and oil and grease, and heavy automotive and industrial soiled uniforms. All systems included: permit application preparation, regulatory interfacing, design plans and specifications, operation and maintenance manual preparation, and start-up services. Specific locations of these systems include: Portland, Maine; Lebanon, New Hampshire; Nashua, New Hampshire, Springfield, Massachusetts; Stratford, Connecticut; Syracuse, New York; New Kensington, Pennsylvania; Franklin, Ohio; Phoenix, Arizona; and Richland, Washington.

Design and Permitting of the Country's First Nuclear Laundry Pretreatment System

Interstate Nuclear Services, Corporate Engineering Department
Springfield, Massachusetts and Richland, Washington

Principal Engineer. Mr. Doran designed and permitted two nuclear laundry pretreatment systems to control the amount of soluble, low-level radionuclides discharged to the municipal publicly owned treatment works. Mr. Doran's responsibilities included: permit application preparation, regulatory interfacing including the Nuclear Regulatory Commission, and detailed project construction plans. The Springfield, Massachusetts, facility was designed and built as a full-scale demonstration system, and was the first nuclear pretreatment system of its kind to be permitted in the Country.

Design and Permitting of Industrial Wastewater Pretreatment Systems

Various Locations in Massachusetts

Principal Engineer/Project Manager. Mr. Doran designed and permitted various industrial wastewater pretreatment systems for metals removal. Treatment process design included hexavalent chromium removal, cyanide oxidation, mercury removal, silver removal, zinc, hydroxide precipitation, pH adjustment, spent bath treatment and removal of other problem metals. Mr. Doran provided plans and specifications, worked with each industry to construct and start-up every system, and gained approval of the Massachusetts Department of Environmental Protection for each system.

Full-Scale Pilot CO_2Pretreatment System
Innovative Carbon Dioxide Treatment System for pH Control

Lebanon, New Hampshire

Principal Engineer. Mr. Doran Full-scale pilot pretreatment system utilizing liquid carbon dioxide for pH control. Obtained all permits and directed the conduct of the study and construction.

MUNICIPAL WASTEWATER TREATMENT

Mr. Doran's specific activities in the municipal wastewater field have included: feasibility studies; wastewater facilities plans; technical and financial analyses for process selection; detailed engineering design; engineering plans and specification preparation; project bidding, wastewater facility permitting; vendor selection; contract negotiations; construction administration; public presentations, training of personnel and regulatory interfacing.

Mr. Doran provides experience in the total wastewater system to include: planning, conceptual design and process selection to meet treatment goals, liquid and solids process design calculations, preparation of detailed design drawings and specifications for construction, site layout, site drainage, site grading, site process piping, site building layouts, and instrumentation and control engineering; construction management, field construction observation during construction, start-up services, supervision of process acceptance testing, troubleshooting projects and providing operation and training services.

In addition, Mr. Doran advises municipalities on how to establish asset management systems to extend the useful life of equipment and ensure efficient operation and maintenance services. Mr. Doran has also conducted treatment plant operator training classes to prepare personnel to sit for certification examinations and/or be more efficient on the job.

Retrofit of a Small Municipal Treatment System, Prepare Design Plans/ Specification, Obtaining a Rebate through the Local Electric Utility Company

Shelburne Falls, Massachusetts

Project Manager/Chief Designer. Mr. Doran provided detailed design, preparation of plans and specifications for a retrofit to a secondary activated sludge treatment plant. Responsibilities included: sizing a new fine bubble aeration system, preparing an application to Massachusetts Electric for a rebate, obtaining a power company rebate, sizing of new variable speed blowers, construction management, and project permitting.

Design Review, Construction Monitoring and Acceptance Testing for a Septage Only Treatment Facility

Carver, Massachusetts

Project Manager. Mr. Doran provided design review, permitting review, construction monitoring, and facilities acceptance testing for a 100,000-gallon-per-day private, septage-only, treatment facility. The facility utilizes rotating biological contractors, filtration and subsurface rapid infiltration of treated septage. The unique features of this design is its ability to handle septage with a higher than normal grease content and overland flow groundwater infiltration disposal of treated effluent.

Major Combined Sewer Overflow Abatement Project/ Recommended Solution Deep Rock Tunnels and Expansion of Wastewater Treatment Plant

Fall River, Massachusetts

Managing Engineer/Author -Wastewater Facilities Report. Mr. Doran was responsible for managing and directing the efforts of a team of engineers, technicians, : the evaluation of all alternatives and CSO abatement strategies; effects of various abatement strategies on water quality; economic analysis of all alternatives; selection of recommended plan; quality assurance; technical direction for the entire team, client contact, subconsultant coordination. Mr. Doran's analysis included various computer simulations of sewer system response to rainfall events, technical and cost analysis to completely separate sanitary and storm sewers in the City, and recommendations for increasing the capacity of the interceptor network.

Mr. Doran authored four volumes of the six-volume facilities plan study. The results of the study recommended combination of deep rock tunnel and surface storage of combined sewer overflows; alterations of existing best management practices within the municipal collection system maintenance division; and expanding the capacity of the existing treatment plant.

Advanced Wastewater Treatment Plants for Nitrogen and Phosphorus Removal/ Effluent Disposal Through Use of Groundwater Leaching System Disposal

Essex and Cohasset, Massachusetts

Principal Engineer. Mr. Doran provided the selection of the site, conceptual design, process selection, design bid plans preparation and permitting for two advanced wastewater treatment plants for private developments, one in Essex, Massachusetts, and one in Cohasset, Massachusetts. Mr. Doran developed permitting plans for collection and treatment system involving approximately 30,000 LF of gravity sewers, 6,000 LF of forcemain, four pump stations, one 60,000 gpd wastewater treatment facility and one 28,000 gpd wastewater treatment facility. Each treatment facility consisted of rotating biological contactors, nitrification and denitrification facilities, mixed-media sand filters, ultraviolet light disinfection and final disposal of highly treated effluent via subsurface groundwater leaching system. These treatment plants were required due to the high density of individual systems in the area.

Design, Bid and Construction Management of Two Advanced Wastewater Treatment Plants Both Plants Provided Nitrogen and Phosphorus Nutrient Removal

Town and Village of Webster, New York

Project Manager/Construction Manager. Mr. Doran provided preliminary and final design services for a 15.75-MGD and a 3.75 MGD municipal advanced wastewater treatment plant for nitrogen and phosphorus removal. Mr. Doran performed detailed final designs of liquid wastewater and biosolids treatment systems, prepared bid set of plans and specifications, provided construction management and start-up services. Special project design features included: two-stage recirculating trickling filters on two different sites, combination complete mix and conventional activated sludge with fine bubble aeration, modulating control structure for hydraulic control of submerged effluent weirs.

Operation and Maintenance Manual Preparation

Six Municipal Wastewater Treatment Plants

Project Engineer. Mr. Doran prepared the Operation and Maintenance Manuals for six (6) municipal wastewater treatment plants. Treatment processes covered in these manuals included: preliminary treatment to include screening and degritting, flow equalization; primary clarification; conventional, complete mix, plug flow, contact stabilization, extended aeration activated sludge processes; rotating biological contactors; final clarifiers; coagulation, flocculation, pressure and mixed-media filtration; chlorination; dechlorination; nitrification, denitrification and phosphorus removal; chemical storage & feed systems; belt filter press, gravity and centrifuge sludge thickening; anaerobic digestion and aerobic digestion; belt filter press and plate/frame sludge dewatering; hydraulics and pumping systems.

Design, Bid and Construction Management of a Retrofit to a Secondary Wastewater Treatment Plants

Massena, New York

Project Manager/Construction Manager. Mr. Doran performed detailed final designs of liquid wastewater and biosolids treatment systems, liquid and solids process calculations, prepared bid set of plans and specifications, provided construction management and start-up services for a 2.75 MGD municipal wastewater treatment plant: Special project design features included: compressed anaerobic digester gas mixing system, traveling bridge secondary clarifiers with rapid sludge return, and disk nozzle centrifuges for waste activated sludge thickening.

Municipal Wastewater Facilities Plans

Mountour Falls, Odessa, Village and Town of Victor, and Farmington, New York

Project Manager. Mr. Doran prepared the wastewater facilities reports for several upstate New York Villages and Towns namely: Mountour Falls, New York; Odessa, New York; Village and Town of Victor, New York; Farmington, New York. Studied regional advanced treatment modifications for each of these towns, provided alternative analysis and costing, determined collection system modifications, evaluated the effectiveness of existing treatment systems in meeting new discharge permit requirements, and overall preparation of conceptual designs and economic analyses of chosen alternatives. These facilities studies were the first step planning document required by the Federal Construction Grants program.

Innovative Small Diameter Gravity Sewer Collection System and Aerated Lagoon Treatment System

Village of Interlaken, New York

Project Manager. Mr. Doran prepared a detailed wastewater facilities plan and conceptual design documents for an innovative collection and treatment system using small diameter gravity sewers, septic tank effluent pumping and aerated lagoons for wastewater treatment. The facilities plan contained the complete planning, conceptual design, economic analysis and environmental impact analysis for the project. The aerated lagoons utilized a state-of-the-art aeration system and an innovative ozone injection system for post aeration and algae control. Mr. Doran obtained an innovative/alternative Federal grant for the Village to fund the project at the highest level. The project utilized ozone for both disinfection and algae control.

Mr. Doran obtained a Federal and State grant for t he project that funded 92.5% of the total project cost.

Demonstration Grant for Construction of New Municipal Cogeneration Facility

New York State Energy Research and Development Authority

Project Manager. Mr. Doran obtained a Demonstration Grant for the Village of Avon, New York, to be used to the implement the cogeneration of electricity via the utilization of anaerobic digester gas. The proposal was selected out of 85 applicants Statewide. Mr. Doran provided the complete planning, conceptual design, capital and O&M analysis, life-cycle cost analysis for the cogeneration facility and obtained the money for Avon to use in its construction.

Innovative Small Diameter Gravity Sewer Collection System and Recirculating Sand Filter Treatment System

Village of Rushville, New York

Project Manager. Mr. Doran authored the wastewater facilities report for the new innovative wastewater collection and treatment facility for a small Village community in New York State. The facilities report contained the complete planning, conceptual design, capital and O&M analysis, life-cycle cost analysis for an innovative treatment and collection system for the dense area of the core parts of the Village. The collection system consisted of using small diameter gravity sewers, 3-inch and 4-inch in diameter, after the individual septic tanks and larger, community septic tanks for intermediate treatment. The treatment system consisted of a nitrifying recirculating sand filter with surface discharge into an intermittent stream. In addition, Mr. Doran prepared the required environmental impact analysis and conceptual design documents for the project. This was one of the first innovative processes of its type in New York State.

Mr. Doran obtained a Federal and State grant for t he project that funded 92.5% of the total project cost.

Offshore Wastewater Treatment Facilities – USS Missouri

Department of the Navy
Fort Kamehameha, Pearl Harbor, Hawaii

Managing Engineer. Mr. Doran was in responsible charge of the design and preparation of contract bid documents for the modifications of the wastewater treatment facility at Pearl Harbor, Hawaii. These modifications were made to accommodate the final resting place of the USS Missouri. The improvements included major modifications and additions to the secondary biological treatment system, secondary clarification and return sludge processing facilities.

Innovative Pressure Sewer, Small Diameter Gravity Sewer Collection System

Town of Milo, New York

Project Manager. Mr. Doran conducted detailed facilities planning, environmental impact analysis, and implementation of an innovative collection system which gathered wastewater from approximately 250 lakefront homes along one of New York State's Finger Lakes premier resort towns. Mr. Doran designed and applied low-pressure force mains, grinder pumps and septic tank effluent pumps to mitigate negative impacts of failing septic systems on the water quality of the lake.

Mr. Doran produced conceptual designs and layout, complex hydraulic designs that required positive displacement pumps to interface with mainline centrifugal pump stations. Once the calculations were made, Mr. Doran prepared preliminary design plans and specifications, final designs and bid set of contract documents. Mr. Doran was responsible for all management aspects of the projects, including meeting with individual residents to obtain project easement. Project consisted of over six miles of mainline force main, four major mainline booster pump stations, 250 individual home grinder pump stations and 2,500 LF of conventional gravity sewers.

Mr. Doran obtained a Federal and State grant for t he project that funded 92.5% of the total project cost.

Design, Bid and Construction Management of New Municipal Nutrient Removal Treatment System, Revision of Municipal Sewer Use Ordinance, New Industrial User Agreement

Village of Avon, New York

Project Manager. Mr. Doran diagnosed existing treatment system operational problems, prepared design calculations, prepared bid plans and specifications and performed construction management services for the modification to an existing 2.5-MGD wastewater treatment facility to correct seasonal SPDES permit violations. The project consisted of implementing chemical treatment with Odophos™ and polyelectrolytes for phosphorus removal; improved solids capture in secondary settling and gravity thickening. After the renovations were made, the plant was able to consistently meet NPDES discharge permit requirements.

In addition, Mr. Doran conducted negotiations with a significant industrial user for an increase in sewer use fees for the Village; rewrote portions of the municipal sewer use ordinance; and prepared a new industrial use agreement with the industry to reflect current conditions. The new sewer use ordinance and industrial agreement resulted in an increase of sewer use revenue to the Village.

New Interceptor Sewer Project and Renovation to Six Combined Sewer Overflow Structures

Monroe County Water Division
Rochester, New York

Project Manager. Mr. Doran provided the technical analysis and prepared the technical design report and preliminary plans for a major extension to the existing City interceptor sewer network. Project consisted of replacement of 5,000 LF of 84 inches to 96 inches prestressed concrete interceptor sewer and renovations to six combined sewer overflow structures.

Major Combined Sewer Overflow Abatement Project/ Computer Modeling for Quantity, Quality Impacts to Receiving Waters

City of Rochester, New York

Project Engineer. Mr. Doran was a Project Engineer assigned to the City of Rochester Combined Sewer Overflow Study. In this capacity, Mr. Doran developed the complete technical quantity and quality database and input data that was used in the sophisticated German QQS hydraulic and pollution control

computer model simulation. Simulation of CSO discharges via computer modeling was used in the study for the assessment of combined sewer overflow pollutant quantity and quality impacts on receiving water of the City. Mr. Doran also developed various abatement strategies used to mitigate the effects of CSO discharges.

Treatability Studies

Town of Webster, New York

Project Engineer. Mr. Doran performed laboratory pilot testing, jar testing and chemical addition analysis for phosphorus removal for the purposes of determining the initial dosages of all chemicals to be used in design of full-scale treatment plant modifications.

GENERAL MUNICIPAL CIVIL ENGINEERING PROJECTS

Mr. Doran has designed, constructed and managed major municipal projects in site design, roadway design, utilities design, municipal and industrial collection systems, pumping stations, stormwater abatement, combined sewer overflow abatement, sewer separation. In addition, Mr. Doran has designed, constructed and managed general civil engineering projects to include: major residential development, industrial development, utilities layout and design, site layout and grading, drainage design, roadway layout, horizontal and vertical geometric highway design and water/wastewater pump station designs.

During preparation of design plans and specifications for 10 residential, 8 commercial, and various industrial development projects, Mr. Doran's experience included the design and application of the following: water main design, sewer design, drainage and electrical utilities design; drainage detention ponds, drainage collection systems, stormwater detention facilities and management systems, erosion and sedimentation control plans, flood studies, computer model applications of TR 55 and TR 20 for drainage and detention pond design, stormwater management plans and runoff control plans.

In addition to the preparation of various bid contract documents, Mr. Doran has experience in obtaining all permits, interfacing with State and local Planning Boards, Conservation Commissions, and Zoning Boards of Adjustment for all types of development projects.

The following are representative of the development projects Mr. Doran has provided professional civil engineering services.

Utility and Site Work Hillside Estates and Art Lot Acres Subdivision

Grafton, Massachusetts

Performed site grading, drainage design, detention pond design, sewer and water main design for 2-200 home adjoining subdivisions. Managed wetland protection issues. Permitted and gained approval through the Conservation Committee, Planning Board, and Zoning Board of Adjustment.

Design Plans Specifications for Industrial Access Road

Naugatuck, Connecticut

Performed the horizontal, vertical, and drainage design for a new industrial access road to a chemical manufacturer's site. Mitigated sensitive site issues and local resident noise concerns.

PROFESSIONAL REGISTRATION

Registered Professional Engineer: New York, Massachusetts, New Hampshire.

Licensed Designer of Subsurface Disposal Systems: New Hampshire.

PROFESSIONAL AFFILIATIONS

University of Massachusetts – Lowell, Member of Adjunct Faculty Mr. Doran teaches courses in Wastewater Operations and Maintenance, Industrial Waste Treatment, Wastewater Treatment Plant design, Hydraulics, Pumps and Compressors. Courses were developed to prepare wastewater plant operators for State certification and prepare civil engineering students for their Bachelors Degree.

Northeastern University, Member of Adjunct Faculty Mr. Doran teaches modules in the Professional Engineers Preparation Course reviewing concepts and problem solving in wastewater treatment.

Mr. Doran is a member of the following organizations:

- American Society of Civil Engineers
- American Water Works Association
- New England Water Works Association, Member, Filtration Committee
- Water Environment Federation
- New England Water Environment Federation.

AWARDS, PUBLICATIONS, PRESENTATIONS

Mr. Doran was nominated for the Haskell Memorial Award given annually to the best performing Adjunct faculty member at the University of Massachusetts – Lowell.

Doran, P., January 2003, Conducted Seminar, "*Delivery Methods for Public Works Projects*" Massachusetts Municipal Association, Annual Conference, Boston, Massachusetts.

Doran, P., January 2001, Conference Speaker, "*Implementation of Design-Build-Operate Project – The City of Taunton, Massachusetts Experience – Part 1*", New England Water Environment Association Annual Conference, Boston, Massachusetts.

Doran, P., May 2000, Conducted Seminar, "*Design-Build and Design-Build-Operate project delivery approaches*", New England Environmental Expo, Boston, Massachusetts.

Doran, P., April 1997, Conducted Workshop, "*Revitalizing Water and Wastewater Infrastructure: Municipal Partnering with the Private Sector,*" New England Environmental Expo, Boston, Massachusetts.

Doran, P; January 1997, Seminar Speaker at Boston Society of Civil Engineers, Engineering Management Group's Seminar on Privatization, Boston, Massachusetts.

Doran, P; January 1997, Participant in Workshop, "*Procurement for Public/Private Partnerships,*" City of Newport, Rhode Island.

Doran, P; August 1996, Participant in Workshop, "*Assessment for Public-Private Partnerships for Wastewater Treatment Facilities,*" presented at IBC USA's Contract Operations Conferences, Chicago, Illinois.

John M. Henderson, P.E.
Senior Project Manager

EDUCATION AND SPECIAL TRAINING

B.S., Civil Engineering, Worcester Polytechnic Institute, 1984
B.A., Geography, Middlebury College, 1976

REGISTRATIONS / CERTIFICATIONS

Professional Engineer: Massachusetts, 1989

ARTICLES

Noonan, David C., and John M. Henderson, "Groundwater Development and Management Planning for the Coastal Plain of New Jersey." Proceedings of Eastern Regional Groundwater Conference, 1985.

Henderson, John M., William A. DiTullio, Paul M. Williams. "Risk Driven Site Investigations: Two Case Studies of Leaking Underground Storage Tanks." Proceedings of Eastern Regional Groundwater Conference, 1987.

Henderson, John M. "Groundwater Quality and Treatment." Proceedings of the Groundwater Protection and Development Technical Assistance Program. 1991.

Henderson, John M. "Use of Particle Counting for Treatment Plant Optimization." New York Water Works Association, 1993.

Henderson, John M. "Streaming Current Detection for Optimization of Coagulation." Proceedings of Operational Control of Coagulation and Filtration Processes Seminar. 1994.

Kroll, G., J. Henderson, J. Slivka, J. McMahon. "Innovative Plant Renovation with High-Rate Clarification." Proceedings AWWA Convention. 1995.

Henderson, John M., A. Pincince, P. Heidell. " Disposal of Residuals from Walnut Hill Water Treatment Plant" WEF/AWWA Joint Residuals and Biosolids Management Conference. 1999

Henderson, John M., C. Udden."UV Upgrades and Retrofits – Case Studies in MA, CT and NY", New England Water Works Association, 2003.

HONORS

American Consulting Engineers Council, National Excellence Award - Environmental Studies, 1988

American Society of Civil Engineers, Chairman, Outstanding Engineering Management Group, 1992

Diamond Award for Engineering Excellence from the Consulting Engineers Council of PA for Innovation in Water Treatment Plant Design, 1998

Boston Society of Civil Engineers Presidents Award, 1999

John M. Henderson, P.E.
Senior Project Manager

QUALIFICATIONS

Mr. Henderson is the Water Program Director for Tetra Tech in the North East and has more than 20 years of experience in all aspects of the study, piloting, design, construction and startup of water treatment plants for both municipal and industrial water supplies and for engineering studies and reports including water supply master plans, groundwater management remediation and development plans, distribution system studies, and design of distribution storage and large diameter transmission and pumping facilities. Specific areas of expertise include DAF, membrane treatment, Cryptosporidium control, disinfection byproducts control, ozone and biologically active granular-activated carbon filters and all aspects of conventional treatment. Mr. Henderson has been responsible for the engineering for water supply master plans and capital improvement programs and system facilities design for numerous local, regional and international clients including Waterville Me, Shrewsbury Ma, Stoughton Ma, the Massachusetts Water Supply Authority (MWRA), Allentown PA and Sao Paulo, Brazil. As the vice chair of the New England Water Works Association's Filtration Committee, Mr. Henderson was invited to participate on the New England Water Works Association's Ad Hoc Committee to provide comment to EPA on the proposed Disinfection Byproducts Rule and the Stage 2 Long Term Enhanced Surface Water Treatment Rule.

RELEVANT EXPERIENCE

Water — Municipal

- South Weymouth Naval Air Station (SoWey NAS) Redevelopment Project, LENNAR Partners, Weymouth MA. Mr. Henderson is the project manager responsible for developing the water and wastewater infrastructure for the redevelopment of the SoWey NAS. The project is a sustainable, "smart growth" approach to development and is currently the largest single development project in the State of Massachusetts. The project requires the development of a regional water supply capable of meeting the average day base demand of 1.0 mgd or more of potable water, 0.5 mgd of irrigation water and an on-site wastewater treatment plant designed for a maximum day flow of 2.0 mgd and capable of treating the wastewater to reuse standards required for irrigation water. A membrane bio-reactor process has been proposed for the wastewater treatment facility. A 5-10 mgd seawater desalination plant with membrane filtration followed by Reverse Osmosis RO membranes has been proposed and is being studied as the most attractive water supply alternative capable of economically meeting the Base demands as well as a well documented regional water supply deficit.
- Blue Hills Covered Storage Facility, Massachusetts Water Resources Authority (MWRA), Boston, Massachusetts.

John M. Henderson, P.E.
Senior Project Manager

- Mr. Henderson is the project manager for the conceptual design and Owners Representative Services for the design-build delivery of two 10 million gallon covered water storage tanks. Both cast-in-place and wire wound pre-stressed concrete (AWWA D10 Type III) tanks are being considered. The conceptual design included the siting, sizing and hydraulic design for the tanks and conceptual cost estimates as well as an evaluation of the pros and cons of the two basic construction methods for water storage tanks. The hydraulic evaluation included extensive Computational Fluid Dynamic (CFD) modeling of the distribution system and the storage tanks to determine the appropriate hydraulic elevation and tank design to promote fill and drain cycles and to recommend an inlet-outlet design to maximize mixing within the tanks to best maintain chlorine residual and water quality within the tank.
- Chicopee Valley Aqueduct (CVA) Ultraviolet (UV) Disinfection Treatment Study, Massachusetts Water Resources Authority (MWRA), Boston, Massachusetts. Mr. Henderson is a senior technical advisor for the MWRA UV Disinfection Treatment Study which is piloting a 6 mgd Trojan Swift medium pressure (MP) UV reactor over a 9-12 month period in order to evaluate operating characteristics under the full range of seasonal water quality conditions. The testing and data collection will address practical and performance issues associated with UV technology such as bulb life, tube degradation and fouling, tube cleaning methods, sensor types and reliability, dose delivery algorithms and long-term effects of polychromaticity on dose delivery. In addition, two 100 gpm Wedeco low pressure high output (LPHO) small scale reactors will be used to evaluate the effects of pre-chlorination on UV treatment and lamp sleeve fouling rates. The CVA is an unfiltered water supply from the Quabbin Reservoir which provides an average flow of 16 MGD to several communities in western Massachusetts. UV will provide the second means of primary disinfection that is required for unfiltered surface water supplies under the Long Term 2 Enhanced Surface Water Treatment Rule.
- Lake Whitney Water Treatment Plant, South Central Connecticut Regional Water Authority (RWA). Mr. Henderson was the project manager for the new 15-mgd Lake Whitney water treatment plant design for the Regional Water Authority, New Haven, Connecticut. The plant will have an innovative treatment process including: dissolved air flotation (DAF), ozonation, and deep bed granular activated carbon (GAC) filters with the ability to add UV disinfection in the future. In addition the treatment facility is being designed with a ground source heat pump heating system, a "green" vegetated roof system, a natural stormwater and site runoff treatment system and a number of other ecologically and environmentally friendly features that will make this an educational model for ecological designs. The LWWTP is replacing an existing 100 year old slow sand filter plant that is located in a very publicly sensitive area. Therefore, the cornerstone of the project is public involvement and community relations, to ensure that the plant can be sited without difficulties. The architectural features of the plant are being designed by Steven Holl Architects and the project has been selected

John M. Henderson, P.E.
Senior Project Manager

for an international architecture exhibit on Architecture and Water at New York's Van Allen Institute of Architecture.

- Shipyard Development Desalination Facility, Massachusetts American Water Works Company, Hingham, Massachusetts. Project manager for the site selection and conceptual design 0.5-mgd seawater desalination facility. The study evaluated permitting, water quality, and hydro-geology in selecting a site and developing preliminary capital and operating cost estimates for a desalination facility to augment Hingham's potable water supply. The study included water quality sampling and bench scale testing to looked at both a direct sea water intake and a saltwater infiltration intake to determine the intake impacts on process requirements and capital and operating costs.
- Walnut Hill Water Treatment Plant, Massachusetts Water Resources Authority (MWRA), Boston, Massachusetts. Project manager for the site selection and conceptual design of a 405-million gallons per day (mgd) filtration facility and a 50-million gallon (mg) clear well for the MWRA. The process facilities include dissolved air flotation clarifiers, ozonation, biologically active carbon filters, and corrosion control. The conceptual design includes the evaluation and optimization of process performance and design criteria, as well as facilities layout and control strategies.
- Design manager for final design of chemical feed systems, residuals treatment and handling systems, the supply system intake modifications and rehabilitation, and the plant waste system for the Walnut Hill WTP.
- Design manager for rehabilitation of the 100 year old Wachusett Aqueduct Intake to replace existing manual control valves and piping with modern automated valves and piping. The project required the demolition of existing 48 inch gate valves and turbine generator piping in this Historic Landmark facility. New sleeve valves and piping were designed to control flows from 25 mgd to 325 mgd and to burn more than 100 feet of excess hydraulic head without damage to the valves, piping or historic structure and will be used as a stand-by water supply for the Walnut Hill WTP.
- Design Manager for the rehabilitation and upgrade of the 35 year old Cosgrove Intake and Power Station, including maintenance on all intake screens and sluice gates, rehabilitation of the existing Turbine Power Generators, replacement of existing Howell-Bunger valves with new, fully automated sleeve valves capable of providing flows of up to 450-mgd to the Cosgrove Tunnel.
- Project manager for the evaluation and conceptual design of renovations to rehabilitate the 100-year old Wachusett Aqueduct. This 100 year old 14 ft diameter, horse shoe shaped gravity aqueduct is 9 miles long. Alternative methods of rebuilding, slip lining, cleaning and

relining, and/or grouting this stand-by aqueduct were evaluated and a shotcrete liner was recommended as the most cost-effective repair for the aqueduct.

- Water Treatment Plant Evaluation, Lee Massachusetts. Expert review of treatment process, hydraulics, capital costs and design costs for a 1-mgd water treatment plant and 1.6 million gallon water storage tank. The new treatment facility failed to perform as intended due to a number of design and construction deficiencies. Hydraulic control improvements, blending of raw water supplies, modifications to the chemical feed and modifications to the process controls were recommended and implemented to correct the performance problems with the treatment facility.

- Water Treatment Plant, Allentown, Pennsylvania. Designed a 30-mgd upgrade/expansion of the city's conventional water treatment plant that incorporated high-rate, inclined-plate settlers and dual media filtration. Treatment options for two springs with a combined capacity of 13-mgd were evaluated and designed to satisfy the state's treatment requirements for groundwater under the influence of surface water. The design received the 1998 Diamond Award for Engineering Excellence from the Consulting Engineers Council of PA for Innovation in Water Treatment Plant Design.

- Water Treatment Plant, Patriot Paper Corporation, Hyde Park, Massachusetts. Designed a 3.25-mgd adsorption/clarifier filtration water treatment plant to treat water from the Neponset River for use by Patriot Paper as process water. This design/build project required the piloting of three different process systems, including dissolved air flotation clarifiers, to determine the most cost-effective treatment process and the necessary design criteria.

- Water Treatment Plant Evaluation, Burlington Vermont. Expert review of treatment process and plant performance as part of comprehensive performance evaluation for the City of Burlington's water treatment plant. The focus of the evaluation was to determine if the 1970's facilities including super pulsator high rate clarifiers and shallow sand automatic backwash (ABW) filters could perform adequately and reliably to produce water with a turbidity of less than 0.5 NTU for the city's drinking water supply as well as supply to an IBM chip factory.

- Groundwater Facilities, Stoughton, Massachusetts. Responsible for the exploration testing, design, and development of the remaining groundwater supplies within the town. This work included a town-wide hydrogeology study, the testing, permitting and design of the required pumping and treatment facilities for the Cedar Swamp well field, and a fractured bedrock test well investigation program. As part of an evaluation of the town's overall water supply system, a distribution study has also been completed.

- Water Treatment Plant, Kennebec Water District, Waterville, Maine. Project manager/engineer for the piloting and design of a 12-mgd adsorption clarifier/filtration water

John M. Henderson, P.E.
Senior Project Manager

treatment plant. The design and construction of two 6-mg and one 4-mg pre-stressed concrete water storage tanks are also a part of this project.

- Water Facilities Improvement Project, Shrewsbury, Massachusetts. Project manager for the water facilities improvement project, which included the design of a 4.4-mgd water treatment plant designed to remove volatile organic chemicals, control dissolved manganese, and lower the corrosivity of the water from the largest single groundwater production well in Massachusetts. Also responsible for the design of two large diameter gravel packed wells to augment the town's water supply, a computer analysis of the town's distribution system, and the design of a new 1.25-mg steel water storage tank. Currently designing a new 1-mgd booster pumping station for Shrewsbury. Also currently the project manager for the design and construction of a 1.25-mg pre-stressed concrete water tank for the town.
- Teaching Assistant - Lenox Institute of Research, Lenox Massachusetts. Taught international students and engineers water chemistry and process engineering for dissolved air flotation (DAF) water treatment facilities and equipment.

Groundwater — State

- Hydrogeologic Assessment and Groundwater Management Study, Camden, New Jersey. Project engineer for a hydrogeologic assessment and groundwater management study for the New Jersey Department of Environmental Protection, which won the 1988 American Consulting Engineering Council National Excellence Award for environmental studies. In this study of the greater Camden Metropolitan area, coordinated the field investigations and the preliminary design work required to establish a regional groundwater management and water supply plan, as well as the 54-mgd water treatment plant and large diameter distribution facilities required to implement the recommended plan.
- Well Projects, Massachusetts. Project engineer for a 2-1/2 inch test well investigation and the design of three 12 by 8-inch gravel packed production wells and a pumping station for Attleboro, Massachusetts. Also the project engineer for the design, installation, and new source approval process for a fractured bedrock water supply well for MIT/Lincoln Laboratories in Groton, Massachusetts.

Design/Feasibility Study — State

- Preliminary Design and Feasibility Study, Rhode Island. For the Rhode Island Water Resources Board, conducted a preliminary design and feasibility study of a 10-mile long, large diameter (24 to 42-inch) transmission main and pumping facilities to convey potable water from Providence, Rhode Island, across the Narragansett Bay to the east bay communities of Barrington, Bristol, and Warren. For the Bristol County Water Authority, was involved in the final design of the cross-bay pipeline and was responsible for the final

John M. Henderson, P.E.
Senior Project Manager

design of an 8.2-mgd booster pumping station required to deliver water to portions of the east bay communities.

Water — International

- Water and Wastewater DB Proposal, Iraq Reconstruction Program. Process lead design engineer to evaluate, assess and design a 5 mgd brackish water desalination treatment plant and develop cost estimates for an Indefinite Duration Indefinite Quantity (IDIQ) DB proposal for the $1.1 Billion Iraq Reconstruction Program. The project entailed collecting, analyzing and bench scale testing of water quality samples from the Euphrates River near Al Ramadi Iraq and selecting the most reliable and appropriate process design to meet the project objectives. The selected treatment process included Pall membrane pretreatment followed by Reverse Osmosis.
- Wadi Main Treatment Plant, Amman Jordan. Process lead design engineer to evaluate, assess and design a 10 mgd brackish water desalination treatment plant and develop cost estimates for a firm fixed price design build proposal. Both high rate conventional and micro-filtration membrane pretreatment systems were evaluated to treat the feed water for Reverse Osmosis membranes required for desalination. Super pulsators, actiflow and up flow clarifiers were compared with Norit and Zenon membrane systems for the RO pretreatment process.
- Alto Boa Vista Water Treatment Plant, Sao Paulo, Brazil. Project manager for 1-year pilot study to investigate process improvements for the plant. The study investigated process modifications to address recurring and increasing problems of taste and odor and to increase the plant capacity from 12 m/s to 16 m/s. The study recommended the addition of new potassium oxidation chemical feed systems, conversion of the existing sedimentation basins to two-tray clarifiers, the addition of intermediate ozonation facilities, and the conversion of the existing anthracite/sand filters to granular activated carbon filters. Developed a complete construction phasing plan to accomplish $100-million capital improvement plan while maintaining operations at the 30-year-old treatment plant.
- Residuals Treatment Facility, Mansuora Egypt. Performed an evaluation of residuals handling and treatment alternatives for the 55-mgd Mansuora WTP and developed preliminary design of sand drying beds sized for the seasonally variable residuals production and the seasonal climate variations.
- Water Treatment Plant Preliminary Design, Al Awat Jordan. Evaluated treatment alternatives for three spring fed water supplies. Developed preliminary designs for membrane filtration and UV disinfection of the three supplies with a combined capacity of 2.2 mgd.

John M. Henderson, P.E.
Senior Project Manager

PROFESSIONAL ORGANIZATIONS / ASSOCIATIONS

American Society of Civil Engineers
Chairman, 1998 ASCE National Convention, Local Organizing Committee
ACEC Environmental Affairs Committee
Boston Society of Civil Engineers
- Management Committee, Chair
American Water Works Association
New England Water Works Association
Groundwater Committee
Filtration Committee, Vice Chair
Program Committee
Ad Hoc Committee on Stage 2 DBP/LT2 Rule
National Water Well Association
Water Environment Federation

TECHNICAL
PROPOSAL

WATER UTILITIES OVERSIGHT SERVICES

RFP-1306-061505

Prepared For:
THE CITY OF NASHUA

JULY 2005

R·W·BECK

July 14 2005

R·W·BECK

City of Nashua
Central Purchasing Office
229 Main Street
Nashua, NH 03061

Dear Community Leaders,

Subject: **RFP1306-061505 - Water Utility Oversight Services**

The City of Nashua (City) and the Merrimack Valley Regional Water District (MVRWD) have undertaken a prudent but locally uncommon process of acquiring the assets of the private water company that has been the local utility for generations. Customers have important concerns about the cost of service and whether an adequate supply of safe drinking water is assured by the long-range plans of the private company. There are also important concerns about the need to be better stewards of the watershed.

Since 1942, R. W. Beck has specialized in engineering-based management consulting services associated with municipal utility creation and operations. More important to Nashua and MVRWD, contract development, negotiations and oversight of water utility operations are our signature strength. We are broadly recognized in the water industry for our expertise advising owners on procurement, contract development, negotiations and contractor oversight, for a wide variety of services related to utility operations, maintenance and management.

R. W. Beck is renowned as an Independent Engineering advocate for municipalities, and has been consistently recognized nationwide for saving utilities money through innovative funding, contracting, operating, and business process strategies. By company mission, we are committed to objective, third-party independent engineering reviews. Therefore, we do not perform contract operations or complete design/build projects for clients. This standing is unique, and others cannot make such definitive 'no conflicts' declarations to the City and MVRWD. Owners and the financial community trust R. W. Beck to do the right thing, because of our status as an Independent Engineer. Our approach provides you the highest value because we expertly leverage the power of the free market to find the best, most valuable ideas and services for our clients through effective procurement, contracting and oversight. Our customers say it best. Please refer to Appendix A for several letters of reference. One example:

> *"Over the years, the Authority has come to know R. W. Beck as a trusted business partner. As an Independent Engineer, it is clear that they always endeavor to put the needs of the Authority first. R. W. Beck's reputation in the bond market is excellent. Their advice is sound, straightforward and timely."*
>
> ***Ms. Claire Bennitt, Chairperson, South Central Connecticut Regional Water Authority***

Qualifications and Experience. Our qualifications and experience are detailed in Section 1 of our proposal. We offer this proposal in association with Tetra Tech, Inc. to gain their considerable water systems engineering, watershed management, and utility security planning expertise. Tetra Tech is one of the largest water engineering companies in America. Tetra Tech completed the comprehensive evaluation of the Pennichuck Water System for the City, in support of the utility taking, so they are very familiar with the issues associated with creating a community-owned utility for greater Nashua. We have preserved Nashua's investment in this evaluation by subcontracting with Tetra Tech.

Personnel Plan. Section 2 presents our Personnel Plan. Our project manager is a committed and concerned neighbor. Paul Doran, P.E., a long-time resident of Hollis, New Hampshire, raised his family locally and ran an engineering business in Nashua for many years. So Paul is very familiar with the institutional, political, and regulatory aspects of managing utilities in New Hampshire. More important to the City and the MVRWD, Mr. Doran is a recognized industry leader in contract oversight, having

The Corporate Center, East Wing 550 Cochituate Road P.O. Box 9344 Framingham, MA 01701
Phone (508) 935-1600 Fax (508) 935-1888 Fax (508) 935-1666

spent much of his 30+ year career overseeing operations contractors and managing oversight contracts for major water utilities around the country. In fact, he has been involved in this line of work since the earliest privatized municipal operations contracts. As you will read in letters of reference included in Appendix A of our proposal, Mr. Doran is highly commended by his past contract oversight clients. Furthermore, backed by the extensive resources of R. W. Beck and Tetra Tech, Mr. Doran can provide your new utility extensive expertise in our specialties: start-up and operation of new municipal utilities, and contractor oversight. We provide you a seasoned group of professionals that are highly regarded for fair negotiation and oversight of tightly-framed operation and maintenance contracts that provide affordable service.

Sensitive to the critical importance of effective intergovernmental relations to the creation and commissioning of the community-owned utility, our project team includes important New Hampshire thought leaders. These leaders have many years of experience as public servants in local, state and federal government: John Clements, former New Hampshire Commissioner of Public Works and Highways; and Jeffrey Taylor, former Director, New Hampshire Office of State Planning. Their knowledge, insight, integrity and effective working relationships at all levels of government could be invaluable to the utility, particularly for regulatory compliance and grant-funding.

Technical Approach. Section 3 describes our Technical Approach. Priority challenges for the new utility early-on are likely to include: implementing effective watershed management; obtaining debt financing to pay for the acquisition and asset renewal resulting from deferred maintenance; fostering public support for the new utility; implementing effective management policies and procedures; recruiting and training leadership staff; and maintaining affordable rates to adequately cover the true cost of expected service levels, now and in the future. The new community-owned utility must build a strong foundation to successfully manage these challenges. We believe that effective long-range planning will be critical to the utility's success and we feature it in our Technical Approach.

Our proposed work plan is comprehensive in this context and describes how early planning should focus on the fundamentals – preserving acquired assets. The O&M contractor's condition plan we recommend will provide the current condition of all equipment and structures, their remaining useful life, and prioritize what must be replaced or upgraded. A relative ranking of mission-critical equipment will be identified so that the utility knows where to spend its limited capital most effectively to manage operations risks. The suggested work plan is a practical approach to managing the water system assets, and it provides a powerful long-range planning tool.

Thank you for the opportunity to propose on this important and exciting project. We hope that you consider our proposal favorably. Please call Paul Doran directly with any questions you might have. He can be reached during the day at (603) 493-2419 / pdoran@rwbeck.com. Paul's home phone number is (603) 465-7082.

Very truly yours,

R. W. BECK, INC.

Stephen R. Gates, P.E., DEE
Client Services Director

Paul B. Doran, P.E.
Senior Associate

TABLE OF CONTENTS

Letter of Transmittal

SECTION

Firm Qualifications and Experience 1

Personnel 2

Technical Approach 3

APPENDICES

- **APPENDIX A: Client Letters of Reference**
- **APPENDIX B: Resumes of Project Team**

R·W·BECK

SECTION 1

FIRM QUALIFICATIONS AND EXPERIENCE

R. W. Beck is a highly specialized, engineering-based management consulting firm. Employee-owned since its founding in 1942, R. W. Beck's 500+ professionals are clear industry leaders in providing the unique management consulting associated with the creation of new utilities, regional authorities, and joint-action agencies such as the Merrimack Valley Regional Water District (MVRWD). From its traditional base of providing professional consulting and engineering services in the public utility industry, R. W. Beck has become known as an Independent Engineering advocate for municipalities, and has consistently been recognized nationwide for saving utilities money through innovative funding, contracting, operating, and business process strategies.

R. W. Beck has maintained offices in New England to serve the management consulting needs of utilities throughout the region continuously for forty years. Today, the firm offers a complete range of consulting and engineering services related to the operation, planning, organization, financial analysis, administration and design of water, wastewater, electric, gas and solid waste utilities. Our experience includes planning, technical and economic feasibility, management and finance-related services; economic, rate and environmental impact studies; water resources management; solid waste management; electric power supply planning and marketing; computer systems applications; and expert witness testimony. R. W. Beck provides engineering-based consulting – we integrate our engineering talent with managerial, financial, training, organizational, and operational expertise to find the best solutions to the challenges of utility operations and management.

This multi-faceted organization allows us to provide the resources of a large interdisciplinary pool of engineering, economic, sociological, and environmental talent and still retain personal and individual relationships with clients. We emphasize a close working relationship with our clients to ensure that the client is continually aware of the progress and status of the project and that the clients' requirements are being met.

For the City of Nashua's (the City) Water Utility Oversight Contract, R. W. Beck has chosen to complement its engineering-based management consulting expertise by engaging Tetra Tech, Inc. as a subcontractor. Tetra Tech completed the "Comprehensive Review of Pennichuck Water System" report for the City and has provided additional support during initial feasibility analyses associated with plans to create the community-owned water utility to serve greater Nashua.

The following pages detail the directly related experience of R. W. Beck and Tetra Tech concerning the planned Water Utility Oversight Contract.

What Makes R. W. Beck Valuable to Nashua and MVRWD

- Engineering-based management consultant
- Specialize in contractor oversight
- In-depth experience with utility regionalization and municipalization
- Independent – no conflicts
- Serving New England utilities for over 30 years

R. W Beck team experience is highlighted as follows:

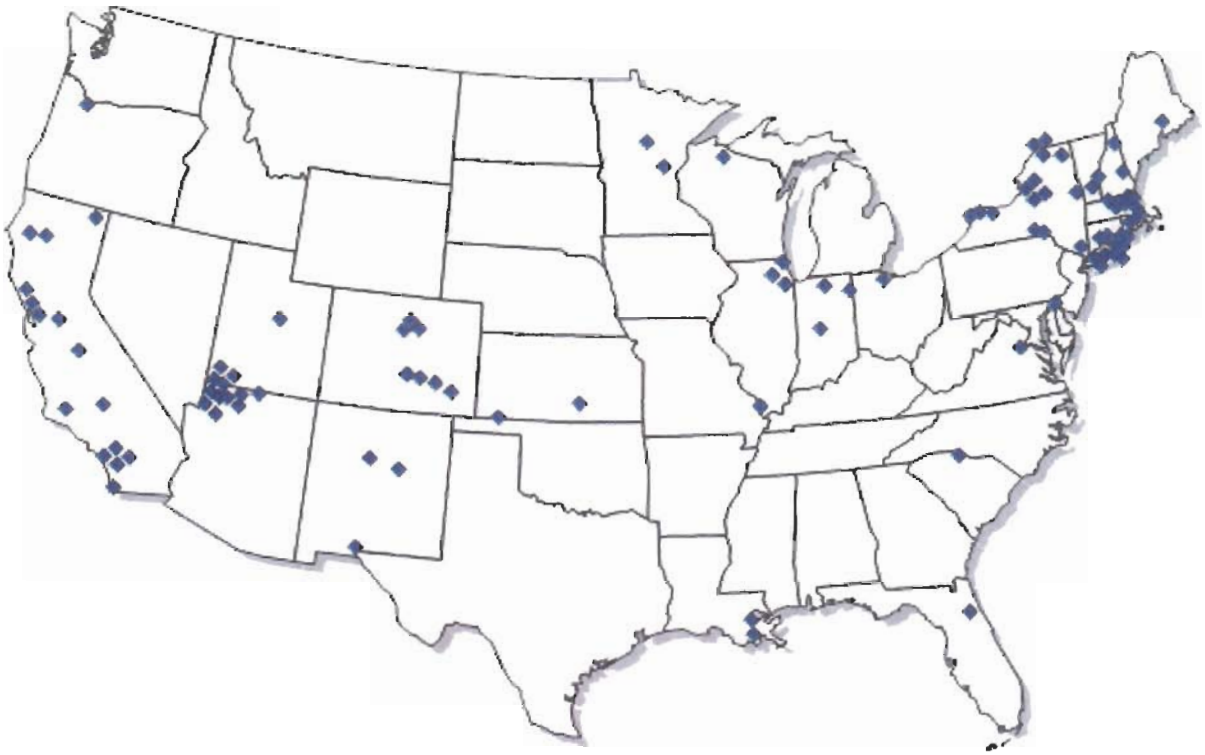
Expertise	Page
Regionalization	1-2
Contractor Oversight	1-8
Independent Engineering	1-11
Capital Improvement	1-14
Rate and Financial	1-19
Security Planning and Vulnerability Analysis	1-23
Water Systems Planning, Design and Construction	1-25
Water Systems Analysis and Planning	1-27
Watershed Management	1-28

R·W·BECK

R. W. BECK SPECIALIZES IN THE MUNICIPALIZATION AND REGIONALIZATION OF UTILITIES

Nationwide, R. W. Beck is recognized as the leader in establishing new utilities and joint-action agencies. Pictured below, are the locations of R. W. Beck's work in assessing the feasibility of and helping to establish new municipal and regional utilities.

R. W. Beck will provide consulting expertise and advice to the City of Nashua and the MVRWD, which is well grounded with extensive experience in all of the engineering and financial implications of starting a new municipal utility by taking over the assets and liabilities of a private enterprise. Providing engineering-based management consulting advice to emerging community-owned utilities is R. W. Beck's specialty.



R. W. Beck has specialized in helping create municipal utilities across the country since 1942.

R. W. Beck has extensive in-depth experience with Utility Regionalization and Municipalization. The following project descriptions are representative of R. W. Beck's regionalization experience.

Municipalization of New Haven Water Company, Connecticut

Owner: South Central Connecticut Regional Water Authority (SCCRWA)

R. W. Beck was retained by SCCRWA to perform a feasibility study of SCCRWA's acquisition of a major investor-owned water utility, the New Haven Water Company in 1977 and has provided engineering-based management consulting continuously, ever since. The original study included a technical review of all of the Company's major water system facilities; a survey of their operations and maintenance to ascertain the value and condition of each asset; the ability to finance the acquisition; and the impact on ratepayers. R. W. Beck prepared the Consulting Engineer's Report used for financing SCCRWA's purchase of the Company, and for initial capital improvements.

Relevance to Your Project

- ☑ Creation of a new municipal utility
- ☐ Contractor Oversight
- ☑ Independent Engineer – provided third party validation of utility management in support of funding
- ☑ Capital Project Implementation
- ☐ Project Engineering – Planning, CIP prioritization, design or construction management.

R. W. Beck's examinations included the technical investigation and evaluation of all facilities owned and operated by the Company, a review of the company's 10-year capital budget, technical review of the company's books of account and other records, as well as evaluation of operations and system management.

The firm also reviewed operating and repair records as well as preventive maintenance programs. In addition, water use records were examined, and customer usage was compared with SCCRWA's water supply for various portions of the system as an indication of system condition. SCCRWA's facilities are located in New Haven, Connecticut and supply water services to approximately 104,220 customers in Bethany, Branford, Cheshire, East Haven, Hamden, Milford, New Haven,. North Branford, North Haven Orange, West Haven, and Woodbridge. Water supplied is equal to approximately 73.4 million gallons per day.

R. W. Beck has also served SCCRWA as its Independent Engineer for each of its subsequent financings. In total, R. W. Beck has assisted SCCRWA in the issuance of approximately $500,000,000 of revenue bonds since its inception.

Municipalization of Jamaica Water Supply Company

Owner: City of New York

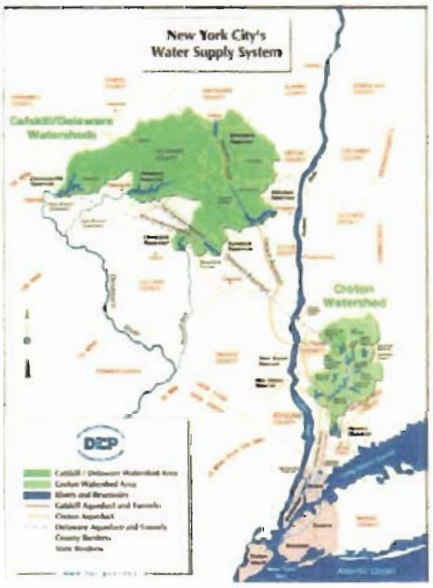
The Jamaica Water Supply Company (JWSC) served a population of approximately 500,000 in the Borough of Queens, New York City and was the only private water company providing service within City limits. The rates charged by the private utility were considerably higher than those in the rest of the City. Over drafting of the groundwater table by the wells that serve the JWSC system was a concern, and the system began to experience problems with groundwater quality, particularly due to industrial chemicals.

These concerns prompted New York City to retain R. W. Beck to evaluate the feasibility of the City taking over the portion of the JWSC system within the City limits. The scope of the services was comprehensive and included engineering, operational, financial, and legal evaluations.

Relevance to Your Project

- ☑ Creation of a new municipal utility
- ☐ Contractor Oversight
- ☑ Independent Engineer – provided third party of utility management in support of funding
- ☐ Capital Project Implementation Support
- ☑ Project Engineering – Planning, CIP prioritization, design or construction management.

At the time of the study, the City's water supply system was incapable of delivering the JWSC requirements without reducing the pressure in the City's system to unacceptably low levels. The existing City distribution system was capable of supplying only one-half of the JWSC system demands. Part of R. W. Beck's analysis, therefore, evaluated an interim solution whereby the City would supply part of the JWSC water system demands and a number of the system's wells would remain in service to deliver the balance.



Since the City would be assuming the responsibility for the JWSC system and would use its reservoirs, pumping stations and many of the wells for some period of time, R. W. Beck conducted an evaluation of the condition and operation of the existing system facilities. The firm reviewed the operating staff and operating procedures to identify the staffing requirements and costs that the City would likely experience if it assumed responsibility for the operations.

Another key aspect of system takeover by New York City was the price that the City would need to pay the water company for its facilities. R. W. Beck estimated the system value using several different measures, including original cost less depreciation, replacement cost new less depreciation, and earnings value, to provide the City with an estimate of fair purchase price for the system.

Through a subconsultant, Morgan Guarantee Trust, R. W. Beck also evaluated the legal prerogatives of the City for the takeover and the methods available for financing the purchase of the system.

Municipalization of Florida Water Services, Inc.

Owner: Florida Water Services Authority

R. W. Beck served as Independent Engineer for the feasibility of the possible sale of the largest privately held water utility in Florida, Florida Water Services (FWS), to the Florida Water Services Authority (comprised of the cities of Gulf Breeze and Milton, Florida). FWS serves over 800,000 accounts in 26 Florida counties. R. W. Beck's services included the preparation of an Independent Engineers (IE) Report that was used in the sale of $500 million in municipal utility bonds. Due to time constraints associated with the planned sale closing date and financing the bonds, R. W. Beck's review was completed in approximately six weeks.

Relevance to Your Project

- ☑ Creation of a new municipal utility
- ☐ Contractor Oversight
- ☑ Independent Engineer –provided third party validation of utility management in support of funding
- ☐ Capital Project Implementation Support
- ☑ Project Engineering – Planning, CIP prioritization, design or construction management.

R. W. Beck's principal responsibilities included:

- Developing a detailed accounting of all FWS assets;
- Permit reviews to ensure that all facilities were in compliance;
- Inspections of above ground assets at all 156 FWS systems;
- Conducting a depreciation analysis of all below grade assets (pipes) to ensure that adequate funding had been allocated for system repairs and replacements;

- Reviewing water and wastewater plant capacity data as well as community growth projections in order to determine when additional plant facilities would be required;
- Developing a revised repair and replacement capital budget;
- Developing a revised "growth" capital budget;
- Conducting a organizational and management review;
- Beach scene from Pensacola, Florida; and
- Reviewing operations and maintenance budgets for each utility.

In order to complete the review within the time period allotted, ten teams of two professionals each were utilized to inspect facilities.

Based on R. W. Beck's review, the 5-year CIP for FWS was increased from $150 million – to just under $177 million. R. W. Beck determined that additional capital was needed to account for inflation as well as additional repair and replacement at a number of existing facilities that R. W. Beck determined to be in poor condition.

Utility Regionalization

Owner: San Diego County Water Authority, California

R. W. Beck has worked with the San Diego County Water Authority for over 10 years, beginning with serving as project manager on the feasibility study of whether to acquire the San Diego Gas and Electric Company system as an option to their merger with the Southern California Edison Company. Since then, R. W. Beck has:

- Performed a financial review of debt structure, operating reserves, and risk management.
- Evaluated funding sources for their 10-year Capital Improvement Program.
- Recommended revenue plan restructuring to stabilize income by shifting partially from commodity- to facility-based rates and charges.
- Assisted with development of a major revision to the methodology for calculating and recovering demand charges.
- Assisted in litigation support.

Relevance to Your Project

- ☑ Creation of a new municipal
- ☐ Contractor Oversight
- ☑ Independent Engineer – provided third party validation of utility management in support of funding
- ☐ Capital Project Implementation Support
- ☑ Project Engineering – Planning, CIP prioritization, design or construction management.

Municipalization of Consumer's Ohio Water Company

Owner: City of Geneva, Ohio

The City of Geneva, Ohio retained R. W. Beck to review the feasibility of municipalizing the existing water distribution assets located within the city, which were owned and operated by Consumer's Ohio Water Company. R. W. Beck also reviewed the physical condition of the Consumer's Ohio water distribution assets located within the City and conducted an appraisal of those assets.

The scope of R. W. Beck's feasibility study included estimating the annual operating results of the proposed Water System over the study period (20 years) under a set of reasonable assumptions regarding such factors as the purchase price of the system, start-up costs, water rates, customer growth, and operation and maintenance expenses, among others. Additionally, R. W. Beck was retained by the City to provide an opinion of value, using the Income, Cost, and Marketing approaches to value, of the water distribution facilities located within the City. The results of the study are to be used by the City to determine appropriate sales price for an anticipated condemnation proceeding.

Relevance to Your Project

- ☑ Creation of a new municipal utility
- ☐ Contractor Oversight
- ☑ Independent Engineer –provided third party validation of utility management in support of funding
- ☐ Capital Project Implementation
- ☐ Project Engineering – Planning, CIP prioritization, design or construction management.

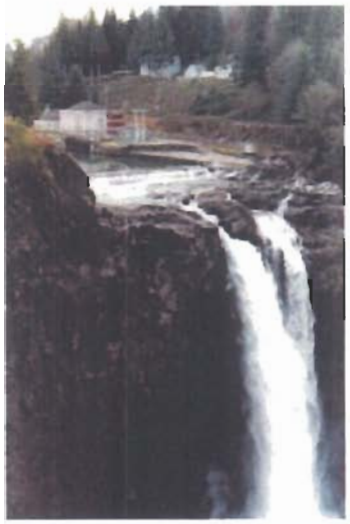
Evaluation of Lake Tapps Municipal Water Rights

Owner: Cascade Water Alliance, Bellevue, Washington

R. W. Beck is working with the Cascade Water Alliance (CWA) to evaluate issues regarding CWA's potential purchase of the retired White River Hydroelectric Project and associated water rights from Puget Sound Energy (PSE). CWA is comprised of eight municipalities and districts that joined together to provide water supply for their current and future water demands. Collectively, the membership of CWA serves approximately 300,000 retail water customers in the region outside Seattle, Washington.

Relevance to Your Project

- ☑ Creation of a new municipal utility
- ☐ Contractor Oversight
- ☑ Independent Engineer – provided third party validation of utility management in support of funding
- ☑ Capital Project Implementation Support
- ☐ Project Engineering – Planning, CIP prioritization, design or construction management.



The White River Project was built by PSE in 1911. Water is diverted from the White River and transported to the Lake Tapps Reservoir. Lake Tapps is popular for recreational use during the summer months and Pierce County maintains several parks and boat ramp facilities on the lake.

In January 2004, PSE retired the hydroelectric project. R. W. Beck assisted CWA in negotiations with PSE to purchase 61,400 acre feet of water from Lake Tapps for municipal water use. In May 2005, CWA and PSE announced that an agreement had been reached to purchase the water rights and associated land and facilities for $37 million, which was close to the value estimated by R. W. Beck.

R. W. Beck assisted CWA in the following areas:

- Determine the fair market value of the Lake Tapps municipal water right
- Identify the costs and risks to CWA of acquiring the Lake Tapps facilities:
  - Annual cost to operate and maintain the reservoir and diversion structures
  - Future capital expenditures
  - Costs and liabilities associated with owning a recreational lake
  - Compliance with Endangered Species Act and future regulations
  - Water quality issues
  - Site contamination costs
  - Dike safety and retirement costs
- Identify the value of Lake Tapps to other parties:
  - Homeowners – value of lake front property
  - County – property tax revenues; recreational resource
  - Corps of Engineers – needs to operate fish trap facilities
  - PSE – avoid Project dismantlement and remediation costs
- Examine alternative cost sharing agreements between CWA and other beneficiaries of the lake to help pay for lake management costs.
- Work with the CWA Executive Board to develop acquisition strategy and assist in negotiations with PSE and other parties.

CONTRACTOR OVERSIGHT SERVICES

R. W. Beck has extensive experience in contractor oversight services for water and wastewater utilities, including oversight of contracts for concessions, contract operations, design-build (DB), design-build-operate (DBO) and build-own-operate-transfer (BOOT). R. W. Beck's participation in these projects dates back more than 20 years for both our public sector and private sector clients. The projects include water, wastewater, power plant, and solid waste management facilities and they range in capital project cost form approximately $10 million to $300 million. The following project descriptions are representative of R. W. Beck's extensive contractor oversight experience.

Seymour Water Treatment Plant Contract Operations Oversight

Owner: Greater Vancouver Regional District (GVRD)

R. W. Beck is assisting GVRD with using a design-build-operate (DBO) project delivery approach for a new 265-MGD ozonation and filtration plant for its Seymour water source-one of three major sources serving the region around Vancouver. R. W. Beck's role in the project is to provide assistance and guidance to GVRD related to the design/build and contract operations process. Services include refining the project concept, developing performance specifications, developing procurement documents, assisting with the selection of a shortlist of qualified proposers, reviewing proposals, assisting with contract negotiations and overseeing design, construction, commissioning, and operations.

Relevance to Your Project
☑ Creation of a new municipal utility
☑ Contractor Oversight
☐ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

The Seymour Project is a cornerstone of the GVRD's program to provide high-quality water to the greater Vancouver area and is the largest water treatment plant in North America being developed using the DBO process. The decision to use the DBO is based on careful consideration of water quality, cost, and schedule requirements.

Program Management and Operations Contract Oversight

Owner: Tampa Bay Water, Florida

The Tampa Bay Water Authority (TBW) is a regional wholesale water agency created to develop and operate the water supply for the Tampa Bay region. TBW was created as a regional water authority in 1998 to address pressing regional water supply issues for the 2,000,000 citizens in the greater Tampa area. With limited water supply in the area, and a rapidly growing population, it was critical for the local communities to come together to collaborate – rather than compete – to assure safe and adequate water for everyone in the region.

Relevance to Your Project

- ☐ Creation of a new municipal utility
- ☑ Contractor Oversight
- ☑ Independent Engineer – provided third party validation of utility management in support funding
- ☑ Capital Project Implementation Support
- ☑ Project Engineering – Planning, CIP prioritization, design or construction management.

R. W. Beck was engaged by TBW shortly after its inception. TBW hired R. W. Beck to perform a comprehensive review of its planned $900 million CIP needed to create an additional 90 MGD of potable water by 2007. The goal of the review was to determine the fastest, least costly means to complete the projects. R. W. Beck's recommendations for how to implement the CIP were approved unanimously by TBW's Board of Directors.

R. W. Beck is now assisting TBW with the procurement and implementation of several projects through public/private partnerships, including a 66 MGD surface water treatment facility and a 25 MGD seawater desalination water treatment facility. We prepared the design-build-operate (DBO) terms and conditions and procurement documents for the surface and groundwater treatment projects. We also assisted with development of terms and conditions and documents for BOOT procurement. Firm responsibilities include the development of risk allocation methodology; risk-based cost impact analysis for DBO procurement; development and assistance with the pre-qualification, evaluation of contractors, and proposals for DBO; and assistance with the negotiations of the DBO procurement. R.W. Beck has full contractor oversight responsibility, including the contractors responsible for contact operations of facilities valued at $250,000,000 and annual operating budgets of $25,000,000. Both of these facilities began commercial operation in 2003 and R. W. Beck maintains responsibility for oversight of the operations contractors.

As part of each OM&M agreement, R. W. Beck and the OM&M contractors are required to perform certain periodic tasks that ensure the proper administration of the contract. These tasks include a semi-annual facility inspection, annual plant survey and report, annual review meetings, independent review of monthly service fee billings, review of annual settlement statement, annual review of revised record drawings, review use of reserve funds, assisting in the reapplication of regulatory permits as well as assisting legal, financial and risk managers with their reviews of annual insurance renewals, financial credit ratings and potential uncontrollable circumstances.

Water Treatment Facilities Contract Operations Oversight

Owner: Seattle Public Utilities (SPU)

Facing the challenges of complying with more stringent drinking water standards, increasing its water system's flexibility, and minimizing rate increases, SPU elected to develop two water treatment projects — the Tolt Treatment Facilities and Cedar River Facilities — using an innovative design/build/operate (DBO) contracting approach. The DBO approach combines design, construction, and long-term operation of the facility into one contractual agreement. The 120 MGD Tolt Project, which provides roughly one-third of the drinking water for 1.25 million people in the Seattle metropolitan area, is one of the largest water treatment plants in the United States to be developed using this type of contracting. R. W. Beck led a team of consultants supporting SPU with implementing the DBO process and overseeing the operations contractor.

Relevance to Your Project

- ☐ Creation of a new municipal utility
- ☑ Contractor Oversight
- ☑ Independent Engineer – provided third party validation of utility management in support of funding.
- ☑ Capital Project Implementation Support
- ☑ Project Engineering – Planning, CIP prioritization, design or construction management.

Tolt DBO Procurement and Oversight - SPU entered into a DBO agreement which saved nearly $70 million when compared with a similar project developed using a conventional design/bid/build, City-operated approach. This confirmed SPU's expectations of the potential benefits of DBO contracting — benefits that arise from synergistic thinking between designers, constructors, and operators and from placing long-term responsibility for the facility under a single contract guarantor. The DBO process was initiated in an effort to reduce capital and operating costs, after SPU completed the project's design concept.

The R. W. Beck team conducted intensive workshops with SPU and its legal and financial advisors to develop an overall strategy and approach for the DBO procurement. During the solicitation process, R.W. Beck prepared the RFQ documents, reviewed Statements of Qualifications, and recommended four teams for short-listing. We prepared performance specifications for the facility and established the characteristics and cost of the benchmark facility. We also helped evaluate proposals and provided SPU with support throughout the DBO contract negotiations process. Subsequently, R. W. Beck provided contractor oversight during design, construction, commissioning and operations project phases.

Cedar River DBO Procurement and Oversight - Approximately two-thirds of the drinking water for 1.25 million people in the Seattle metropolitan area originates in Seattle's Cedar River water supply system. SPU retained R. W. Beck to lead a multidisciplinary team to develop and implement the Cedar Treatment Facility at Lake Youngs using an overall DBO approach, with certain DB elements being turned over to SPU for operation. The R. W. Beck team assisted with procurement strategy development, preparation of procurement documents (RFQ, RFP, and technical and performance specifications), the evaluation of proposers, negotiations, and oversight of design, construction, commissioning, and operations.

INDEPENDENT ENGINEERING

Perhaps more than anything else, clients value R. W. Beck's independence. R. W. Beck is an engineering-based management consultant that does not perform major design work; does not provide contract operations services and does not complete design/build projects. Rather, by strategic intent, we are always on the side of the Owner as an advisor and advocate in an oversight role. R. W. Beck's status of Independent Engineer provides the highest value to Nashua and MVRWD because:

- R. W. Beck will **not** compete for design work for Nashua or MVRWD because it is a conflict of interest.
- R. W. Beck **will** provide procurement and contracting expertise to help Nashua and the MVRWD go to the marketplace and find the best value for all the services it might need, including O&M, engineering, and water resource planning.
- R. W. Beck provides high creditability on Wall Street for debt financing for Nashua and the MVRWD.
- R. W. Beck has no contracts with contract operation companies, so it has no conflicts of interest.
- R. W Beck's standing in the marketplace is unique in this regard and is highly valued by our clients.

The following several project descriptions summarize some of R. W. Beck's experience as an Independent Engineer.

Independent Engineering for Financing

Owner: Rhode Island Clean Water Finance Agency

R. W. Beck prepared an Independent Engineer's Report which was included as part of the Official Statement prepared by the Rhode Island Clean Water Finance Agency (the "Agency") and issued as part of the sale by the Agency of $30,000,000 of revenue bonds. The Agency will use the proceeds of the bonds to provide a loan to the City of Cranston, Rhode Island (the "City") which in turn will fund a loan to Triton Ocean State LLC (Triton). The City will lease its wastewater treatment system (the "System") to Triton for a 25-year period and Triton will lease, operate, and maintain the System and design and finance certain improvements (the "Capital Improvements") to the System.

Relevance to Your Project

- ☐ Creation of a new municipal utility
- ☐ Contractor Oversight
- ☑ Independent Engineer – provided third party validation of utility management in support funding
- ☐ Capital Project Implementation Support
- ☐ Project Engineering – Planning, CIP prioritization, design or construction management.

R. W. Beck's report addressed technical, environmental, and economic matters of interest and concern to prospective bond purchasers including the following matters: the capabilities of the various project participants including the operation and the EPC contractor; the current condition of the existing System; the status of the existing operations and identification of areas of where the System is out of compliance; the terms and conditions included in the operating and construction agreements; the ability of the proposed Capital Improvements to bring the System back into compliance; and the development of projected operating results for the term of the bonds. Following financing, R. W. Beck provided construction monitoring services.

Independent Engineering for Public/Private Partnership

Owner: Camden Water Department, New Jersey

R. W. Beck was retained to serve as independent engineer related to the financing for a 20-year concession granted to a private operator of the Camden, New Jersey water system. The project included a detailed review of the projected operations and maintenance expenses, maintenance and capital funding reserves, staffing, as well as a review of the services agreement. In addition, sensitivity analyses were conducted to address potential fluctuations inherent in long-term services agreements of this type to determine the potential effect on debt service coverage. The firm also performed management and staff interviews of the private operator and prepared a comparative rate analysis of regional utilities with similar characteristics.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☐ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

Consulting for Bond Financing

Owner: Guam Waterworks Authority (GWA)

UBS Financial Services, Inc. is R. W. Beck's client during preparation of a Consulting Engineer's Report for GWA. This is the first bond financing project that GWA has undertaken. The proceeds are to be used for capital improvement projects, which are largely required to meet the requirements of a Stipulated Order from the Environmental Protections Agency. This project is ongoing and the size of the bond issue has yet to be determined, but is expected to be approximately in the range of $100 million. Money will be used for a number of activities including improving the water transmission facilities, providing for changes to the chlorination systems, water storage facilities as well as wastewater treatment facilities.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☐ Capital Project Implementation
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

Independent Engineering for Revenue Bond Financing

Owner: Virgin Islands Water and Power Public

Recognizing the financial, management and other benefits of having a Independent Engineer's report, Virgin Islands Water and Power urged Public Resources Management Group, Inc, to retain R. W. Beck, Inc. The report was prepared to assist in refunding all or a portion of its existing indebtedness. Topics included in the report were: (1) discussion of existing water production and distribution facilities; (2) discussion of the management of the system; (3) projected sales, customers, revenues and expenditures; (4) projecting capital needs; (5) regulatory requirements.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☐ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

Independent Engineering in Support of Revenue Bond Financing

Owner: Northeast Maryland Waste Disposal Authority

R. W. Beck was retained to prepare an Independent Engineer's Report for this project, located on an 8-acre site in the City of Baltimore, Maryland, and designed to process approximately 200 wet tons per day of sludge from Baltimore's Back River Wastewater Treatment Plant. Its annual design capacity is approximately 55,000 tons. The facility incorporates sludge composting technology which produces a marketable compost material used as a soil conditioner.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☐ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

R. W. Beck was retained by the Northeast Maryland Waste Disposal Authority to provide Independent Engineering Services in support of revenue bond financing for proposed capital improvements to the facility. Specific services included review of:

- Contracts between the City, the Authority, the Company, and other participants.
- City's estimates of historical and projected quantities of sludge generated by the Wastewater Treatment Plants.
- Company's Capital Improvement Program (CIP).
- Status of operating permits and approvals.
- Actual and projected levels of facility production and operation.
- Historical operational and maintenance expenses and the method used to develop future expenses.
- Regional market for compost sales.
- Review of project confirming that the CIP was completed.

CAPITAL IMPROVEMENT PLAN MANAGEMENT

Often, major utilities require an independent review of their capital improvement planning in order to maximize the leverage of the limited availability of capital; prioritize needs to assure adequate service levels; and to stabilize rates. R. W. Beck is regularly engaged by utility clients to provide an Independent Engineer's view of planned capital improvements. R. W. Beck views a utility's CIP as a business system, which combines important organizational, financial, and political issues together into an integrated action plan. Clients find high value in R. W. Beck's independent reviews, because of our ability to prioritize their needs and define ways to save them money.

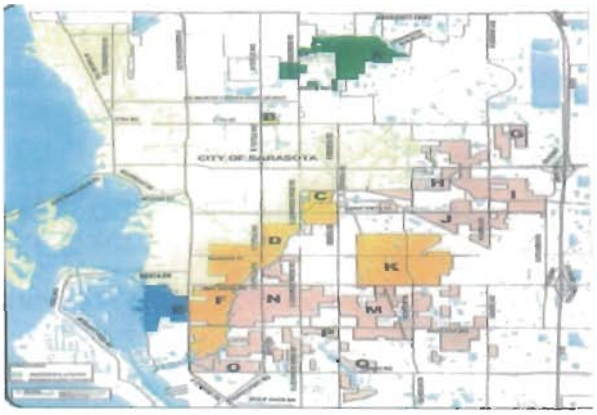
The following project descriptions are representative of R. W. Beck's experience in capital improvement plan management.

Review and Recommendations of Five-Year Capital Improvements Plan (CIP)

Owner: Sarasota County Utilities, Florida

As a result of significant growth in the Sarasota County Utilities (SCU) customer base, the acquisition of several private water company assets, and requests for the development of various specific projects by the Sarasota Board of County Commissioners (BCC), SCU found itself in the midst of having to critically evaluate its 5-year CIP. Due to limited financial resources, SCU performed a critical evaluation of which projects currently included in their CIP must be developed as planned, deferred or put on hold indefinitely, as well as determine the appropriate funding level for these various projects.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☑ Project Engineering – Planning, CIP prioritization, design or construction management.



"R. W. Beck Conducted an Independent Analysis of Our CIP That I Use As A Bible".

Rick Howell, Utilities Director.
Sarasota County, Florida

R. W. Beck was retained by SCU to work with County staff to prioritize the various projects currently included in SCU's 5-year CIP and recommend appropriate funding levels for those projects that must be developed to meet the needs of the community. R. W. Beck staff worked with a broad internal stakeholder group including staff from various County departments/business units (utilities, stormwater, public works, real estate and finance) to determine the appropriate CIP funding level going forward. As part of the project, R. W. Beck staff reviewed County data and information supporting the various proposed projects, holding one-on-one meetings with staff from the various business units, and worked to develop consensus as to the appropriate funding level and set of projects to be included in SCU's 5-year CIP.

R. W. Beck provided the following services: CIP review; funding recommendations; and project evaluation.

Water Plan 2020

Owner: County of Kauai Department of Water, Hawaii

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☐ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☑ Project Engineering – Planning, CIP prioritization, design or construction management.

R. W. Beck is working with the Department of Water on the development of a 20-year comprehensive water plan to establish a viable long-range integrated capital improvement plan for the Department's service area on Kauai. The primary focus of this effort is balancing future water needs with water affordability on the island. Components of the study include projected population growth on the island, assessing water system vulnerability and appropriate service levels, balancing financial planning requirements with rate adjustments, and addressing a number of policy-related elements. The project includes development and use of 13 hydraulic analysis models ranging in size from several hundred to several thousand pipes. These models all include multiple sources, reservoirs and pressure zones. An important part of the project centers on public involvement and the development of a strategy that will enhance the public's understanding of the Department's goals, operational requirements and related costs.

In conjunction with development of a water master plan, R. W. Beck facilitated multiple workshops with the Board, senior management, key staff, and other opinion leaders. The purpose of the workshops was to prioritize strategic objectives for the Department and identify potential organizational enhancements, performance metrics, and process improvements. Throughout these work sessions, team members learned ways of enhancing their listening, communication, and strategic skills. All-hands meetings were held during the planning process to seek input and feedback from staff and to gain endorsement of strategic issues, goals, and actions. Core planning team members also engaged board members to solicit input and feedback.

The results of the project will include a 20-year capital improvement plan and a corresponding financial model that will be a tool for the Department to evaluate future operating and capital expenditure scenarios. These scenarios will be evaluated in a rate model to determine rate level impacts. Rate options will be evaluated, including reviews of agriculture rates and facilities charges.

Capital Improvement Program Review

Owner: San Francisco Utilities Commission, California

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☑ Project Engineering – Planning, CIP prioritization, design or construction management.

The San Francisco Public Utilities Commission (SFPUC) developed a proposed $3.6 billion Capital Improvement Program (CIP) to be implemented over the next 13 years. The proposed CIP represented a tenfold increase in the annual project delivery rate over the SFPUC's recent activity.

R. W. Beck conducted an independent engineering review to verify the validity of the proposed capital projects, assess the SFPUC's capabilities to implement the program, and review the financial assumptions regarding bond funding. Our project work was then reviewed and coordinated through a Blue Ribbon Panel appointed by the City of San Francisco.

This review considered three aspects of the proposed CIP. The first was an independent process review of the validity of the individual projects that formed the CIP including the sizing and need for the improvements. The second aspect was the process used to select among competing alternatives. The final consideration was the scheduling and prioritization of projects. The SFPUC's implementation plan and an independent opinion of its ability to successfully implement the program in a timely and efficient manner were reviewed. The SFPUC's Long-Range Financial Plan was also reviewed.

A Blue Ribbon Panel was convened to examine the CIP review prepared by R. W. Beck. R. W. Beck's final report received a very favorable reception from the Blue Ribbon Panel and the $3.6 billion CIP was approved by the SFPUC Board of Commissioners. Approval to sell bonds to finance the CIP was received from the voters in November 2002. As a result of R. W. Beck's recommendations, a new Assistant General Manager position has been approved and hired, and organizational changes have been implemented. In a May 2002 letter to the PUC, the Blue Ribbon Panel commended R. W. Beck's analysis of the proposed CIP. The letter states, "The Blue Ribbon Panel finds that the R. W. Beck work is very competent, comprehensive, rigorous, accurate and on target for this stage in the program."

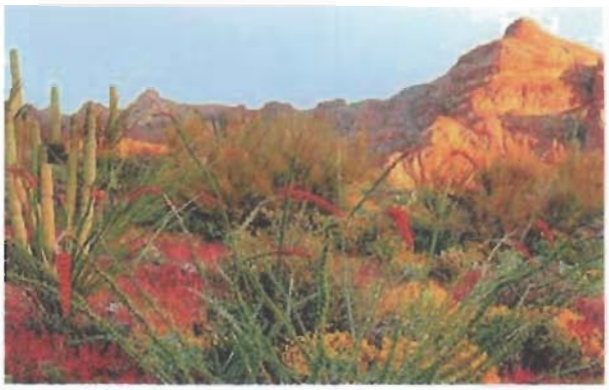
Capital Replacement Planning Study

Owner: Central Arizona Project (CAP)

Relevance to Your Project
☑ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☑ Project Engineering – Planning, CIP prioritization, design or construction management.

CAP is a multi-county water conservation district that supplies untreated Colorado River water to the cities of Phoenix and Tucson as well as numerous other municipalities, irrigation districts, and private water companies in central Arizona. The CAP system includes 330 miles of lined canals, pumping plants, underground siphons and tunnels, and a regulatory storage dam and pump generation facility that was completed between 1975 and 1994.

CAP retained R. W. Beck to prepare a capital replacement planning analysis to estimate the future major capital renewal and replacement costs that CAP is likely to face in the future. As a key element of this work, R. W. Beck developed an inventory database of the CAP system facilities, their original and replacement costs, condition assessment, and expected useful lives. This database was organized by type of facility according to repair requirements and expected useful lives for use with R. W. Beck's Replacement Planning Model™ to estimate annual capital replacement funding requirements for a 50-year period. The results of the study were presented to CAP's Board of Directors and were used to help evaluate the adequacy of current capital reserve funds and to assess whether related property taxes and water rates could be reduced. A final report was delivered to CAP in April 2002.



R. W. Beck was retained in 2004 to update the Replacement Planning Model with more recent data and updated assumptions, and to provide training of CAP staff in the use of the Replacement Planning Model. A key strategy of the 2004 update is an expanded role of the client in completing the update. To facilitate the client's long-term use of the replacement planning model, R. W. Beck provided model training up front, so that the client develops the ability to operate and make necessary adjustments to the model.

Infrastructure Master Plan

Owner: Portland Water Bureau, City of Portland, Oregon

R. W. Beck is managing this $1 million infrastructure master plan. The purpose of the plan is to address future Bureau issues concerning supply, conveyance and the role the Bureau will maintain or expand within the region as a major water supplier. An extensive planning process was developed to ensure Bureau consensus and involvement in the decision development and the ultimate Capital Improvement Program. We also included regional stakeholders in the planning effort to understand and incorporate their issues and concerns.

The Master Plan will be used as a tool for future contract negotiations with regional water purveyors and also to provide future scenarios to meet changes resulting from growth and regulatory impacts. The project includes development of a capital improvement program, a process for future CIP planning, a decision process for CIP prioritization, and an infrastructure resource model.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☐ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☑ Project Engineering – Planning, CIP prioritization, design or construction management.

Assessment of Water/Wastewater Infrastructure Capital Costs

Owner: Confidential Client, New Hampshire

R. W. Beck was retained by a Confidential Client to develop a capital improvement plan (CIP) for water and wastewater infrastructure improvements necessary to provide year round service to the landmark Mount Washington Hotel and Resort complex. Our efforts included evaluation of the existing infrastructure, the fast-tracked identification of the necessary improvements, development of a regulatory approval strategy and identification of the technologies that would permit cost effective year-round operation of the water and wastewater utilities in an extreme environment. Detailed estimates of costs of various remedial options were prepared for consideration.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☐ Independent Engineer – provided third party validation of utility management in support funding.
☑ Capital Project Implementation Support
☑ Project Engineering – Planning, CIP prioritization, design or construction management.

RATE STUDIES AND FINANCIAL ANALYSIS

Another important consideration for water utilities, particularly in the case of the City of Nashua and the MVRWD, is cost-of-service analyses and rate determination. Naturally, given its utility management consulting pedigree, R. W. Beck offers deep experience in all aspects of rate-making consulting. Some examples follow.

Sewer and Stormwater Rate Study Review

Owner: St. Louis Sewer Rate Commission, Missouri

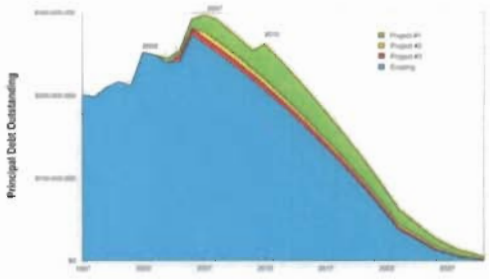
Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

In 2002, the firm was selected to represent the St. Louis Sewer Rate Commission (the Commission), a newly created Commission consisting of 15 members, to review and recommend changes in sewer rates. As a result of historical controversy and court actions regarding rate setting, among other things, the Commission was created as a result of a voter referendum to make recommendations regarding the rates, charges and fees of the St. Louis Metropolitan Sewer District (the District) and to minimize or eliminate controversy. Prior to creation of the Commission, the rates, charges and fees of the District were established by the Board of Trustees of the District. The District provides sanitary sewer service and stormwater service to approximately 425,000 residential and non-residential customer accounts within an area of approximately 524 square miles, including the City of St. Louis, Missouri and most of the County of St. Louis. The District operates 9 treatment plants that process approximately 320 MGD; maintains nearly 9,000 miles of sewers and 260 pump stations and employs over 800 people. Many of the non-residential industrial customers are large users of sewer service and are "Fortune 500" entities which include aerospace technology, automotive manufacturing and assembly, bottling and brewing, chemicals and medical supplies, to name but a few.

To meet its projected capital needs of approximately $3.5 billion, the District initiated a financing plan that calls for the issuance of large amounts of indebtedness, subject to approval of local voters, and the raising of user fees (rates). In its filing before the Commission, the District applied for user fee increases that would increase the average monthly bill for a single family residence from 67 percent to 191 percent during a three-year period, subject to the level of indebtedness authorized by the voters. R. W. Beck personnel performed a review of the District's filing to ensure that industry standards were recognized, user fees (rates) were established at reasonable levels and were established equitably among customer classes and customers within a class; and that the goals and objectives of the Commission were being achieved. As a part of the Commission's review of the District's filing, procedural schedules were established, interventions by customers and groups of customers were granted, discovery activities were conducted, testimony was heard and cross examined, and briefs and reports were filed. Unlike many governmental rate setting processes, the Commission's formalized rate setting process provided a structured forum for all parties to be heard and questioned and for a record to be created upon which findings of fact and recommendations can be made.

User Rate Impact Study

Owner: City of Woonsocket, Rhode Island



R. W. Beck personnel worked with the City to develop a public-private partnership strategy, including a long-term analysis of capital financing options and user rate impacts. R. W. Beck staff led the financial review of proposal finalists for the long-term DBO engagement and a developed a cost-risk methodology to determine the financial implications of various risk allocations. R. W. Beck personnel also determined the ability of the proposers to provide financial considerations and competitive service fees, while maintaining a stable and affordable user-rate structure.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

Integrated Financial Planning Model

Owner: City of Tempe, Arizona

R.W. Beck personnel developed a comprehensive financial model for the City of Tempe that integrates the City's capital improvement program with its budget and revenue management systems. The spreadsheet-based model develops 20-year budget and rate projections for the City's drinking water, wastewater, and irrigation systems. The model allows the City to run an infinite number of "what if" analyses to determine the budgetary and user rate impacts associated with alternative capital improvement programs. The model also facilitates rate sensitivity analyses at the customer class level to determine appropriate rate making policy for the City.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

Water Wheeling Rate Strategy Development

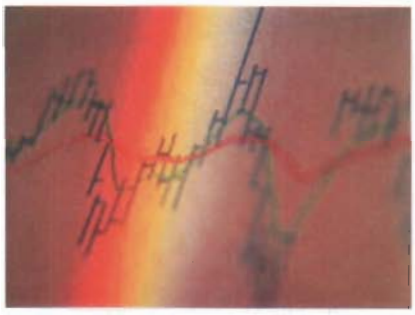
Owner: Metropolitan Water District of Southern California

R. W. Beck personnel assessed the Metropolitan Water District's proposed 'wheeling' (moving) rate methodology. Specific tasks included conducting a comprehensive review of the District's wheeling rate proposal, analyzing the utility's budget, capital improvement plans, existing rate structures, and other documentation in order to deem the rate-setting methodology appropriate and supportable. The rate methodology was analyzed and reviewed based on general terms of fairness and equity, as well as its ability to recover all fixed and variable costs associated with the wheeling of water through the District's vast distribution system.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

Financial Consulting to Water Utilities

Owner: U.S. Department of Agriculture



Under a contract with the Department's 'Technitrain' Program, R. W. Beck personnel oversaw and provided financial management and rate-setting assistance to more than 200 small water, wastewater, and solid waste utilities. This assistance included the analysis and modifications of user rate structures for water utilities that were either under regulatory compliance orders; applying for federal financial assistance; or both. Most of these assignments were from the ground up, requiring comprehensive cost-of-service analyses, budget development, infrastructure financing plans, and short-term/long-term rate structure development.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support funding
☑ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

Comprehensive Review of Water and Sewer System Rate Studies

Owner: City of Tallahassee, Florida

Since 1966, the firm has provided consulting services to the state's capital City in the areas of utility rates and utility finance. The City owns and operates a municipal electric generation, transmission and distribution system; a natural gas distribution system; a potable water supply and distribution system; and a wastewater treatment, collection and disposal system. The City provides utility services to customers located inside the City limits and in the surrounding unincorporated urban fringe.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

The firm provides consulting services which include advice, counsel, direction and training to the City for preparation of cost-of-service studies; design of cost-based rates using generally accepted rate-making practices and American Water Works Association recommendations; development of impact fees recognizing industry practices, regulatory guidelines and judicial rulings; and design of cost-based rates and charges for fire protection service and miscellaneous charges for customer requested services. Additional services performed included the attendance and participation in public hearings and meetings with developers and builders, and the preparation of necessary certificates required by the City's applicable revenue bond resolution.

Water Rate Study

Owner: Department of Water Supply, County of Maui, Hawaii

R. W. Beck is preparing a comprehensive water rate study for the Department of Water Supply. The study will determine revenue requirements for a five-year study period and will include a cost-of-service study for the test year, fiscal year 2006. In addition, several rate design options will be evaluated including a potential change to customer classes, surcharges for pumping and drought rates.
R. W. Beck will be working closely with several agencies involved in the
rate study process including the Department staff, the Board of Water Supply, the County Council, and an ad hoc stakeholders committee.

Relevance to Your Project
☐ Creation of a new municipal utility
☐ Contractor Oversight
☑ Independent Engineer – provided third party validation of utility management in support of funding
☑ Capital Project Implementation Support
☐ Project Engineering – Planning, CIP prioritization, design or construction management.

R. W. Beck has chosen to complement its engineering-based management consulting expertise on this project by proposing Tetra Tech as a subcontractor. Based on its considerable directly related experience, Tetra Tech will be responsible for hydraulic modeling and related engineering called for in Task 6 of your RFP and all work associated with Security Planning. Tetra Tech would also be available to assist with other water system engineering that might be required by the client as needs arise.

TETRA TECH, INC.

Tetra Tech, Inc. is a leading provider of consulting, engineering and technical services. With almost 9,000 associates located in the United States and internationally, the company supports commercial and government clients in the areas of resource management and infrastructure. Tetra Tech's services include research and development, applied science and technology, engineering design, construction management, and operations and maintenance.

Tetra Tech Company Facts

- Worldwide provider of consulting engineering and technical services
- 10th largest American engineering firm
- Employees: Almost 9,000
- Revenue: Annually $1.1 billion

Tetra Tech provides services to protect and improve the quality of life through responsible resource management and sustainable infrastructure. The company continuously adapts its service to provide for society's changing needs and to meet customer expectations.

Tetra Tech seeks clear sustainable solutions that improve the quality of life. Taking this responsibility seriously, our work often places us at the center of our clients' challenges regarding environment, safety, and sustainability. These challenges involve the opinions of many stakeholder groups from the public, industry, and government who seek our advice on complex issues. To provide solutions to these challenges, Tetra Tech believes in maintaining our technical objectivity, and as a policy, we do not own individual technologies. Tetra Tech will support R. W. Beck in the areas of the project related to facilities engineering, including hydraulic modeling and review of security plans, vulnerability analysis, and emergency response plans.

SECURITY PLANNING AND VULNERABILITY ANALYSIS

Tetra Tech is exceptionally qualified to conduct vulnerability assessments at water utility facilities because our company has expensive experience in the design of such facilities. Tetra Tech is ranked as the 10th largest design firm in the United States and 1st in Water Supply, Treatment and Desalination and Transmission Lines and Aqueducts (*Engineering News Record*, Top 500 Design Firms Sourcebook 2005). Our staff is experienced (and certified where applicable) in the use of various vulnerability and risk methodologies including: the Risk Assessment Methodology for water utilities (RAM-W) and Risk Assessment Methodology for chemical facilities (RAM-CF) developed by Sandia National Laboratories, vulnerability self assessment tool (VSAT), and other methodologies developed by industry groups, DOD, DOE, and private parties.

Since September 11, 2001, Tetra Tech has been assisting numerous water utilities evaluate the risks to the security of water supply systems from potential terrorist actions or other emergency situations, in compliance with the Public Health, Security and Bioterrorism Preparedness and Response Act. This work has been performed for clients such as Boston, Massachusetts; Worcester, Massachusetts; Brookline

Massachusetts; Shreveport, Louisiana; Little Rock, Arkansas; Westminster, Colorado; and, Flagstaff, Arizona, among others. Tetra Tech has performed security assessments following the methodology developed by Sandia National Laboratories.

The following project descriptions are representative of Tetra Tech's in-depth security planning experience with water utilities.

Water Vulnerability Assessment

Owner: Boston Water and Sewer Commission

Tetra Tech performed a water systems vulnerability assessment for the Boston Water and Sewer Commission (BWSC), a large water supplier in Massachusetts that serves a daily population of over 1 million people. The distribution system consists of over 1,000 linear miles of pipe with numerous connections to neighboring towns, all of which are serviced by the Massachusetts Water Resources Authority (MWRA), providing an average of over 80 MGD of water to BWSC's water system. Also included in the assessment were critical MWRA facilities such as pump stations, water storage tanks, numerous interconnections and master meter locations that supply the BWSC system, as well as, the inspection and assessment of a high pressure fire system pump station which serves the downtown. The vulnerability assessment resulted in a summary report documenting the susceptibility of the system to biological, chemical, physical, and "cyber" attack and recommended facilities improvements, modifications to operating and maintenance practices and additional training needs. Tetra Tech also conducted a review of the BWSC's Water Operations Emergency Response Plan resulting in numerous recommendations for additional improvements.

Water System Vulnerability Assessment

Owner: City of Worcester, Water Filtration Plant, Massachusetts

Tetra Tech performed a water systems vulnerability assessment for this large water supplier in Massachusetts. The water system serves a population of 200,000 with a 50-MGD treatment plant. The water system included thousands of linear feet of water main, several water intakes, 10 reservoirs, and several pumping stations. The vulnerability assessment process Tetra Tech followed included: meetings with key water systems staff, review and analysis of plans of the system, and inspection of the system facilities including the control systems. Based on the findings of our interviews, plan reviews, and system inspections, a summary report was prepared documenting our observations regarding the susceptibility of the system to biological, chemical, physical, and "cyber" attack. The report presented recommendations to improve certain facilities and changes in operations and maintenance.

Water System Vulnerability Assessment

Owner: Town of Brookline, Massachusetts

Tetra Tech conducted a water system vulnerability assessment and developed an emergency response plan for the Town of Brookline, which owns and manages a water distribution system that delivers potable water to a population of 60,000. The water system includes two independent distribution systems that are interconnected for emergency purposes. Tetra Tech was responsible for evaluating the Town's distribution system and key components' exposure to potential threats, as well as the infrastructure overall condition to determine the criticality and vulnerability within the system. Phase two of the project included assessing the Town's emergency response readiness and operations and developing an emergency response plan based on the recommendations from the vulnerability assessment.

WATER SYSTEMS PLANNING, DESIGN AND CONSTRUCTION

Tetra Tech completes more water system design work than anyone, according to trade journal, Engineering News Record. Tetra Tech is highly experienced in all aspects of water system engineering, including: water supply, distribution and storage; water system analysis and planning; and water system vulnerability and security assessment.

Table 1-1, at the end of this section, summarizes Tetra Tech's recent water systems experience. Brief project descriptions, which are representative of their water system engineering experience follow.

Comprehensive Review of the Pennichuck Water System

Owner: City of Nashua, New Hampshire

Tetra Tech conducted a comprehensive review of the Pennichuck Corporation, the largest investor-owned water utility holding company in New Hampshire. Pennichuck provides water to the City of Nashua and 22 other communities in southern New Hampshire and Massachusetts. This was a critical evaluation for the City of Nashua because Pennichuck had entered into an agreement to merge with Philadelphia Suburban, also an investor-owned utility company headquartered in Pennsylvania.

The City is concerned about the volume and quality of water available to its citizens and businesses. Tetra Tech is providing the overall project management and is responsible for the assessment of the water supply system, distribution system, safe yield, future supply and demand, capital improvements and watershed management components of this study. The project team is investigating Pennichuck Corporation's assets and liabilities, Philadelphia Suburban, and outlining the regulatory/legal review. Tetra Tech is provided recommendations to the City of Nashua related to possible acquisition of the water company.

Utilities Design and Engineering for the Walnut Hill Water Treatment Plant

Owner: Massachusetts Water Resources Authority

Tetra Tech is providing design and construction engineering services on several components of the 450-MGD Walnut Hill Water Treatment Plant. Services to date have included assessment and design of an alternate water distribution system that will supply potable and fire protection services to Marlborough, Southborough, Northborough and the Westborough State Hospital.

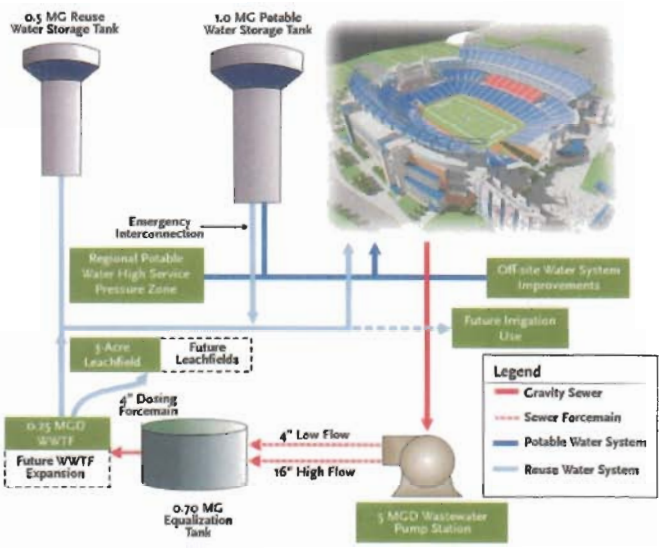
Tetra Tech's water distribution system design provided for five miles of water main ranging from 8 inches to 16 inches, including a bridge crossing. In addition, Tetra Tech conducted a feasibility assessment and designed a temporary 3,500-(gpm) water booster station to provide the sole source of supply for the Town of Northborough and the Westborough State Hospital. As part of the Walnut Hill project, Tetra Tech also designed a 1,200-gpm sanitary sewer pump station.

Final Design and Permitting, New Football Stadium and Economic Development Complex

Owner: New England Patriots, Foxborough, Massachusetts

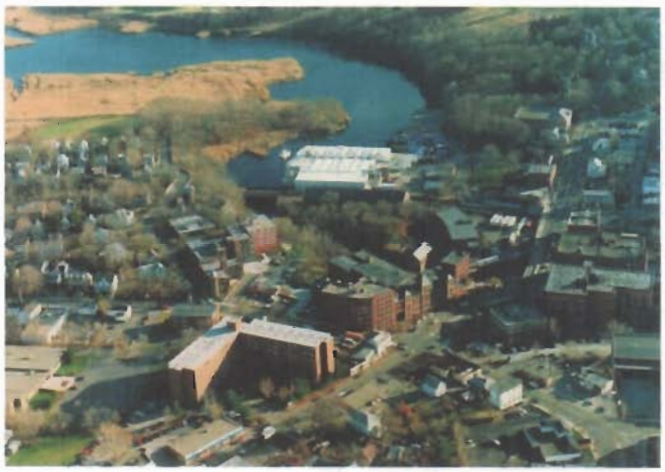
Tetra Tech was responsible for the planning and design of an innovative water supply system for the 68,000-seat Gillette Stadium. The water supply improvements include a new 1.0-MGD elevated water storage tank, a water reuse system, approximately 10,000 linear feet of 8- to 16-inch water distribution mains and a groundwater irrigation supply development.

Tetra Tech assessed the existing 0.5 MGD elevated water storage tank at the site and proposed a new 1.0-MGD elevated water storage tank, using a design-build procurement approach. This approach allowed bidders to propose alternative tank designs, which helped determine the most cost-effective solution for the client.



Blue Hills Covered Storage EIR/Conceptual Design Project

Owner: Massachusetts Water Resources Authority (MWRA), Quincy, Massachusetts



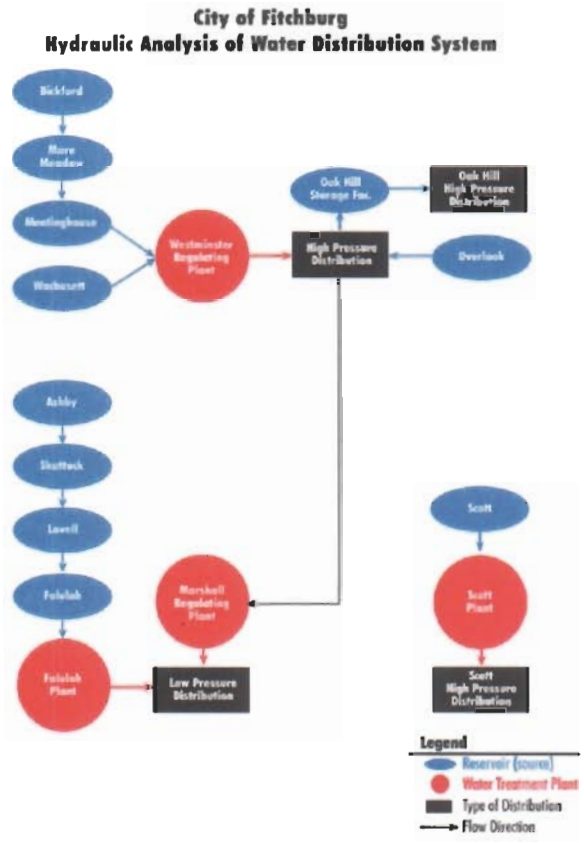
Tetra Tech is managing the evaluation of alternatives to provide 20 million gallons of storage for the Southern Low Service Area of the MWRA's Metropolitan Boston water distribution system located at the Blue Hills Reservoir in Quincy. The project includes siting of storage facilities; conceptual design of the storage facilities and three to five miles of large diameter connecting water main; preparation of an Environmental Notification Form (ENF); and Environmental Impact Report (EIR), if required. Tetra Tech's approach to this project will result in a plan that satisfies the MWRA's storage needs and also assures broad stakeholder acceptance of the project.

Tetra Tech is also providing Owner's Representative services for the proposed design-build procurement of the Blue Hills Covered Storage Project.

WATER SYSTEMS ANALYSIS AND PLANNING

Hydraulic Analysis of the Water Distribution System

Owner: Department of Public Works, City of Fitchburg, Massachusetts



Tetra Tech conducted a hydraulic analysis of the city's complex water distribution system, a multiple source, multiple pressure zone system that serves approximately 40,000 people. The project included population and water user projections for a 50-year planning period, an assessment of the existing water system, an evaluation of alternative sites for new treatment facilities, a computer analysis of the distribution network, and a determination of storage needs, as well as the preliminary siting of facilities.

Using this information, the city was able to identify short- and long-term system requirements and develop an $11-million, 5-year capital improvement program. Tetra Tech's master planning services included the identification of system modifications that would be necessary if the water supply required filtration, such as construction of a new water treatment plant, water storage tanks, booster stations; and replacement of transmission pipes, as well as pipeline cleaning and lining.

Reuse Plan for the South Weymouth Naval Air Station Base

Owner: South Shore Tri-Town Development Corporation

The South Shore Tri-Town Development Corporation is implementing a Reuse Plan for the South Weymouth Naval Air Station, which is located in the towns of Weymouth, Abington, Rockland, Massachusetts. A consultant team led by Tetra Tech was selected to implement the development program.

Water supply and wastewater infrastructure impact issues will be highlighted in the Draft Environmental Impact Report (DEIR) for the Base Master Plan. These considerations will include:

- development of an overall water budget for the site, balancing the water supply, sewage discharge and stormwater recharge of the development
- creation of measures to reduce water consumption and minimize irrigation requirements
- recycling of treated wastewater (if on-site treatment facility) for non-potable water uses, including irrigation.

Tetra Tech is committed to securing the permitting, building the infrastructure, and advancing the project on-time; in short -creating value for the property.

Work on the water system planning includes assessment of the existing system and modeling future development scenarios. WaterCad modeling software was used to assess future development scenarios based on a calibrated existing system model. The existing system model was developed from distribution system maps and pressure and flow data collected from hydrant flow data.

Infrastructure/Utilities Services for the Boston Convention and Exhibition Center

Owner: Massachusetts Convention Center Authority

Under subcontract to HNTB/Rafael Vignoly Architects, Tetra Tech provided infrastructure planning, permitting, design and construction-related services for the $700-million convention center.

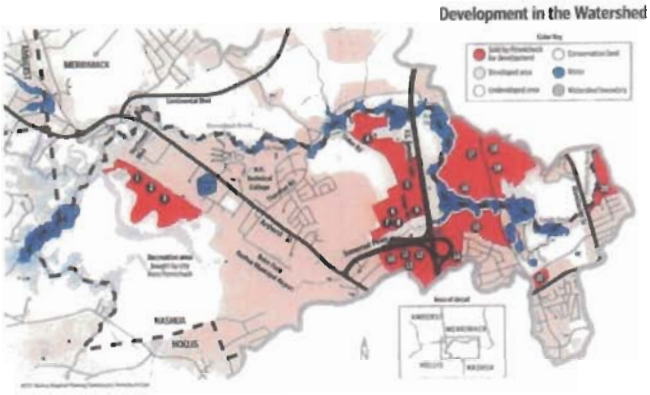
Tetra Tech designed the convention center's on-site water, stormwater and wastewater utility systems. Utilities include relocation of a large-diameter potable water transmission main, separation of combined sewer systems adjacent to the project, and construction of a 72-inch storm drain and outfall to handle drainage from the facility's 40-acre roof – the largest roof structure in New England. Tetra Tech was responsible for hydraulic modeling, detail design and preparation of construction bid packages and construction services for these improvements.

WATERSHED AND WATER RESOURCE MANAGEMENT AND PROTECTION

Tetra Tech has provided watershed resources planning support to public and private sector clients throughout the United States since 1966. Tetra Tech's reputation as national leaders in the water resources arena was solidified in the early 1980's when they established the Water Resources Center (Center) and were awarded the first in a series of national watershed assessment and management contracts with USEPA's Office of Water. For over 20 years the Center has been USEPA's prime contractor in support of their watershed and water quality programs. In addition to their national role in researching and developing watershed management tools and practices, the Center has been asked by other federal agencies (e.g., Army Corps of Engineers), more than 40 states, and numerous local and municipal to provide technical assistance in designing and implementing watershed management programs and plans for their waters. In response to these requests, Tetra Tech's Water Resource Center has grown from a core staff of 40 professionals in 1992 to more than 300 professional scientists and engineers in 2005.

Tetra Tech has been able to recruit and retain national experts in all facets of watershed and water quality studies. Their ability to encourage these experts to retain largely project-based technical roles ensures that our clients get what they pay for and that our staff is mentored by the best in the business. As an example, Dr. Leslie Shoemaker has been with Tetra Tech for 14 years. Dr. Shoemaker is a nationally recognized expert in watershed management and water resources modeling and her advice is oft-requested by public and private entities across the United States. For example, in 2002, when a large

group of academic researchers based at the University of California at Davis, along with federal and state agencies, were looking for help to identify and design an integrated approach to developing planning level models and a watershed plan for Lake Tahoe, they specifically requested Dr. Shoemaker's involvement and advice. Dr. Shoemaker is currently leading a team of modelers and scientists (including Tetra Tech staff) as they develop a highly innovative and visible watershed-planning model that will be used to plan future activities in the watershed.



Tetra Tech's Water Resources Center is the recognized leader in Watershed Protection by USEPA.

Our professional experience has resulted in an unmatched knowledge base built from our direct involvement in many related projects and key watershed management components. This comprehensive knowledge base provides the resources and technical foundation for an effective evaluation of any existing or proposed water resources protection program for the community-owned water utility in Nashua.

The following summarizes some of our key technical experience in resource management and protection planning:

- **Watershed Management.** Watershed management is the organizing framework promoted by USEPA, U.S. Army Corps of Engineers, and other federal and state agencies. We have supported USEPA 's writing and training on the guiding principles of watershed management and the technical procedures needed to implement it. Recently we wrote the new Watershed Handbook for USEPA, that provides detailed guidance on watershed management procedures, technical analysis, and implementation and tracking. In addition, the guidance explains how to comply with the nine elements of USEPA's recently released 319 guidance.
- **Forest Management**. We have evaluated the impacts of forest harvest, forest fires, and forest road management on water quality conditions for such high profile watersheds as Lake Tahoe. Though our involvement in developing the forestry guidance for the Nonpoint Source Program, we maintain an inventory of the latest research into management techniques and effectiveness.
- **BMP Tools.** We have also developed tools to assess management practices, in more detail than the traditional percentage reductions used in so many studies. The Integrated Stormwater Decision Support Framework (ISMDSF), funded by the USEPA ORD NERL Edison Laboratory, provides a new technique for predicting the impact of management on a watershed scale. This system allows us to evaluate changes in hydrology and pollutant loading by modeling the physical features of management practices. This integrated decision-support system provides the needed link between management action, source loading, stressors, and water quality endpoints. Ultimately this system will provide tools to optimize watershed management activities to meet identified water quality goals.

The following are sample watershed management planning projects for protection of water supplies. All of these projects are fundamentally based on watershed protection strategies that include protection and restoration of environmental resources.

Watershed Protection Plan

Owner: Massachusetts Water Resources Authority, Boston, Massachusetts

Tetra Tech completed watershed protection plans for the watersheds of the Wachusett and Quabbin Reservoirs, and the Ware River, which supply drinking water to more than 2.5 million people in the Boston Metropolitan Area. The goal of this project was to develop a comprehensive program to assist the MWRA and MDC in complying with the USEPA Surface Water Treatment Rule. The project characterized the watersheds and identified and prioritized existing and potential threats to water quality. It also involved an assessment of the relative severity of these threats and the development of protection plans to prevent future contamination of the water supplies. The final plans contained prioritized, comprehensive strategies to protect the watersheds, including local initiatives, increased staffing, stringent monitoring of water quality, structural controls, and the acquisition and/or further protection of sensitive watershed lands. The project required coordination with federal, state, regional and local agencies, as well as the 26 watershed communities. The plans were instrumental in USEPA's landmark decision to grant the MWRA a bare waiver from the filtration requirement of the Surface Water Treatment Rule (SWTR) under the federal Safe Drinking Water Act (SDWA).

Protection and Management of Water Supplies

Owner: Orange Water and Sewer Authority, Carrboro, North Carolina

Tetra Tech has conducted five projects for OWASA supporting protection or management of their water supplies for the Towns of Chapel Hill and Carrboro. Work has included a watershed management study for each primary drinking water supply (reservoir and watershed data analysis; linked watershed and lake response modeling; buildout analyses; evaluation of best management measures); stakeholder facilitation and outreach for the Cane Creek Reservoir planning effort; development of a targeted land acquisition model for the Cane Creek watershed; evaluation of the causes of increased treatment problems due to raw water quality and the opportunities for inlake management; and a compilation of public comment on acquisition of an active quarry for additional water supply storage.

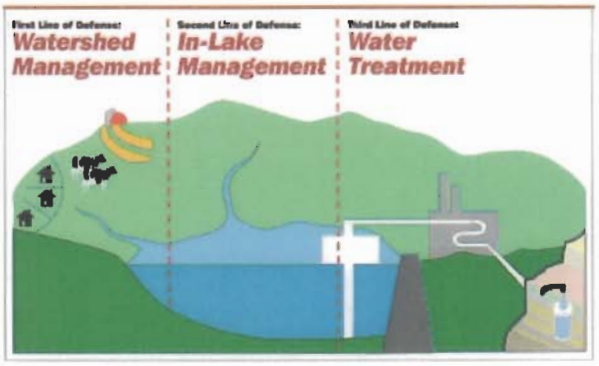
Watershed Protection

Owner: Land Use and Environmental Services Agency, Mecklenburg County, North Carolina

Tetra Tech has conducted three projects for Mecklenburg County supporting watershed protection including downstream water supplies. Work has included HSPF and SWAT watershed modeling, HEC1-HECRAS modeling, stream channel stability risk assessment, build-out analyses, evaluation of existing regulations, low impact development (LID) design examples and outreach, BMP evaluation, design performance standard evaluation, development and application of a Site Evaluation Tool (SET), cost analysis of alternative management options and scenarios, stakeholder facilitation, and ordinance and design manual consultation.

Cane Creek Reservoir Watershed Assessment and Management Planning

Owner: Orange Water and Sewer Authority (OWASA)



Tetra Tech staff conducted a comprehensive watershed and water supply protection study for the Cane Creek Reservoir, and assisted the Orange Water and Sewer Authority (OWASA) in developing a management plan for the resource. Working with a 22-member stakeholder advisory committee, Tetra Tech staff identified key indicators linked to multiple management objectives addressing public health, water quality, aesthetics, economic considerations, recreation, and community character. Existing water quality and supporting data were compiled and analyzed to characterize watershed conditions. The assessment provided a baseline for existing water quality conditions, and helped identify water quality parameters of greatest interest. Additionally, recommendations were provided to OWASA to streamline its watershed and lake water quality monitoring program.

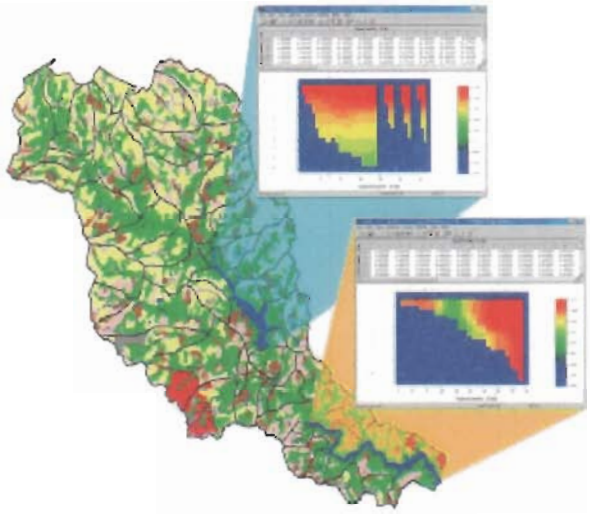
Tetra Tech developed a comprehensive linked land use - watershed loading - lake response modeling framework to assess impacts of alternative management scenarios for specified indicators. The models were applied to future land use conditions forecast for build-out and 25% of build-out under various zoning and best management practice scenarios.

A facilitated process using the modeling framework and stakeholder advisory committee input produced four viable management scenarios containing different mixes of best management practices, zoning restrictions, land purchase and protection by the utility, and engineered stormwater controls. Tetra Tech then designed and produced community outreach materials to communicate management alternatives under consideration, and encourage public response. A ballot was designed for OWASA to compile public input effectively, and help in establishing the preferred plan.

Follow-up work has included developing criteria for targeting land for acquisition by the utility, and providing additional technical support in analyzing management options.

Watershed Modeling and Management for Patuxent Reservoirs Watershed

Owner: Washington Suburban Sanitary Commission and Prince George's County, Maryland



Tetra Tech has provided comprehensive water quality assessment and modeling support for more than 5 years to aid the Washington Suburban Sanitary Commission (WSSC), Maryland Department of the Environment, and local municipalities (Prince George's, Howard, and Montgomery Counties) in watershed planning and protecting water quality in two drinking water supply reservoirs. Tetra Tech developed a watershed action plan and a monitoring database, and subsequently a dynamic, linked watershed and reservoir modeling system.

Tetra Tech's developed a comprehensive model that simulates hydrologic and water quality conditions throughout the watershed. The model represents hydrodynamic and water quality response in two reservoirs, the main stem river, and major contributing tributaries. Tetra Tech developed and calibrated reservoir models for the T. Howard Duckett (Rocky Gorge) and Triadelphia Reservoirs. Objectives of the reservoir modeling effort included: (1) simulate hydrodynamics and water quality constituents in multiple dimensions, (2) assess the potential for eutrophication, (3) estimate the reservoirs' assimilative capacities for pollutants impacting DO and eutrophication, and (4) use the linked watershed-reservoir modeling system to evaluate holistic management alternatives, including current, past, and future conditions. Results from this modeling effort and the models themselves will be used for regional water quality assessment, watershed and resource management, source water protection, and TMDL development by WSSC, the state, and municipalities.

TABLE 1-1

Tetra Tech, Inc.
Select Water Treatment and Distribution Experience

Client	Water Distribution Modeling	Water Distribution Design	Storage and Booster Pump Stations	Water Treatment Evaluation	Water Treatment Design	Water System CIP	Economic Analysis	Permitting	Pilot Studies	Construction Administration	Operator Training
Pennichuck Water System, Nashua, NH				√		√	√				
MA DPW, Fitchburg, MA	√	√	√	√	√	√	√	√	√	√	
MWRA, Marlborough, MA	√	√		√	√	√	√	√		√	
New England Patriots Foxborough, MA	√	√	√	√	√	√	√	√		√	
MWRA Quincy, MA	√	√	√					√		√	
South Shore Tri-County Development Corp., South Weymouth, MA	√	√	√	√	√	√	√	√		√	
MA Convention Center Auth., Boston, MA	√	√			√			√		√	
Woodbridge Booster Station, Ashland, MA					√			√		√	
Boston Water and Sewer Commission, MA	√	√	√			√	√	√		√	
City of Edgewater, FL	√	√		√	√	√	√	√	√	√	√
City of Lakeland, FL	√	√	√	√	√	√	√	√	√	√	√
City of Miramar, FL	√	√	√	√	√		√	√	√	√	√
City of Naples, FL	√	√		√		√	√	√	√	√	√
City of North Miami Beach, FL	√	√	√	√	√	√	√	√	√	√	√
City of Palm Bay, FL	√	√	√	√	√	√	√	√	√	√	√
City of Port St. Lucie, FL	√	√	√	√	√	√	√	√	√	√	√
Detroit, MI	√	√	√	√	√	√	√	√	√	√	√
Milwaukee, WI	√	√	√	√	√	√	√	√	√	√	√
Ypsilanti, MI	√	√	√	√	√	√	√	√	√	√	√
Washington, D.C	√	√	√	√	√	√	√	√	√	√	√

Client	Water Distribution Modeling	Water Distribution Design	Storage and Booster Pump Stations	Water Treatment Evaluation	Water Treatment Design	Water System CIP	Economic Analysis	Permitting	Pilot Studies	Construction Administration	Operator Training
Warren County, OH	√	√	√	√	√	√	√	√		√	
Atlanta, GA	√	√	√	√	√	√	√	√	√	√	√
Lexington, KY	√	√	√	√	√	√	√	√	√	√	√
Cincinnati, OH	√	√	√	√	√	√	√	√	√	√	√
Sand Springs/Sapulpa, OK	√	√	√	√	√	√	√	√	√	√	√
City of Bartlesville, OK	√	√	√	√	√	√	√	√	√	√	√
Kent County Water Authority, RI	√	√	√					√		√	
City of Broomfield, CO	√	√	√	√	√	√	√	√	√	√	
Castle Rock, CO	√	√	√	√		√	√	√		√	
Centennial Water and Sanitation District, CO	√	√	√	√		√	√	√		√	
San Diego County Water Authority, CA	√	√	√	√	√	√	√	√	√	√	
City of Los Angeles, CA	√	√	√	√	√	√	√	√	√	√	

R. W. BECK PROVIDES NASHUA SPECIALIZED EXPERTISE TO FACILITATE TRANSITION TO PUBLIC OWNERSHIP AND OPERATIONS

R. W. Beck specializes in providing the enginering-based management consulting services needed to provide contractor oversight and related planning, organzational development, financial analysis, and economic feasibility consulting associated with the creation of a new community-owned water utility, such as is in process in greater Nashua.

Our Team. R. W. Beck proposes on this project in association with Tetra Tech, one of the largest and most qulaified water engineering companies in the world. Key staff from Tetra Tech will support R. W. Beck in the areas of water system engineering, security, and construction mangement.

The R. W. Beck team of individuals shown in the proposed Organizational Chart on the following page, provides the City and MVRWD with the full range of skills and expertise needed to effect a smooth utility ownership transition from private to public. On average, each of these staff members brings more than 20 years of experience in the planning, design, management, operation and maintenance of water utility systems throughout the United States. The organizational structure has been crafted to address the specific requirements of the oversight services as outlined in your RFP. In addition, we have committed additional staff with expertise in areas that will add value to the City and MVRWD, as you consider expansion of the system beyond the initial acquisition of PWW.

Local Presence. Our Project Manager is a committed and concerned neighbor. Paul Doran, P.E., a long-time resident of Hollis, New Hampshire, raised his family locally and ran an enginering business in Nashua for many years, So, Paul is very familiar with the institutional, political, and regulatory aspects of managing utilities in New Hampshire. More important to the City and MVRWD, Mr. Doran is a recognized industry leader in contract oversight, having spent much of his 30+ year career overseeing operations contractors and managing oversight contracts for major water utilities around the country. In fact, he has been involved in this line of work since the earliest privatized municipal operations contracts. As you will read in the letters of reference included in Appendix A of this propsoal, Mr.Doran is highly commended by his past contract oversight clients. He will work from our office at 889 Elm Street, in Manchester and will be readily available to you at any time, day or night.

Sensitive to the critical importance of effective intergovernmental relations to the creation and commissioning of the community-owned utility, our project team includes several important New Hampshire thought leaders,

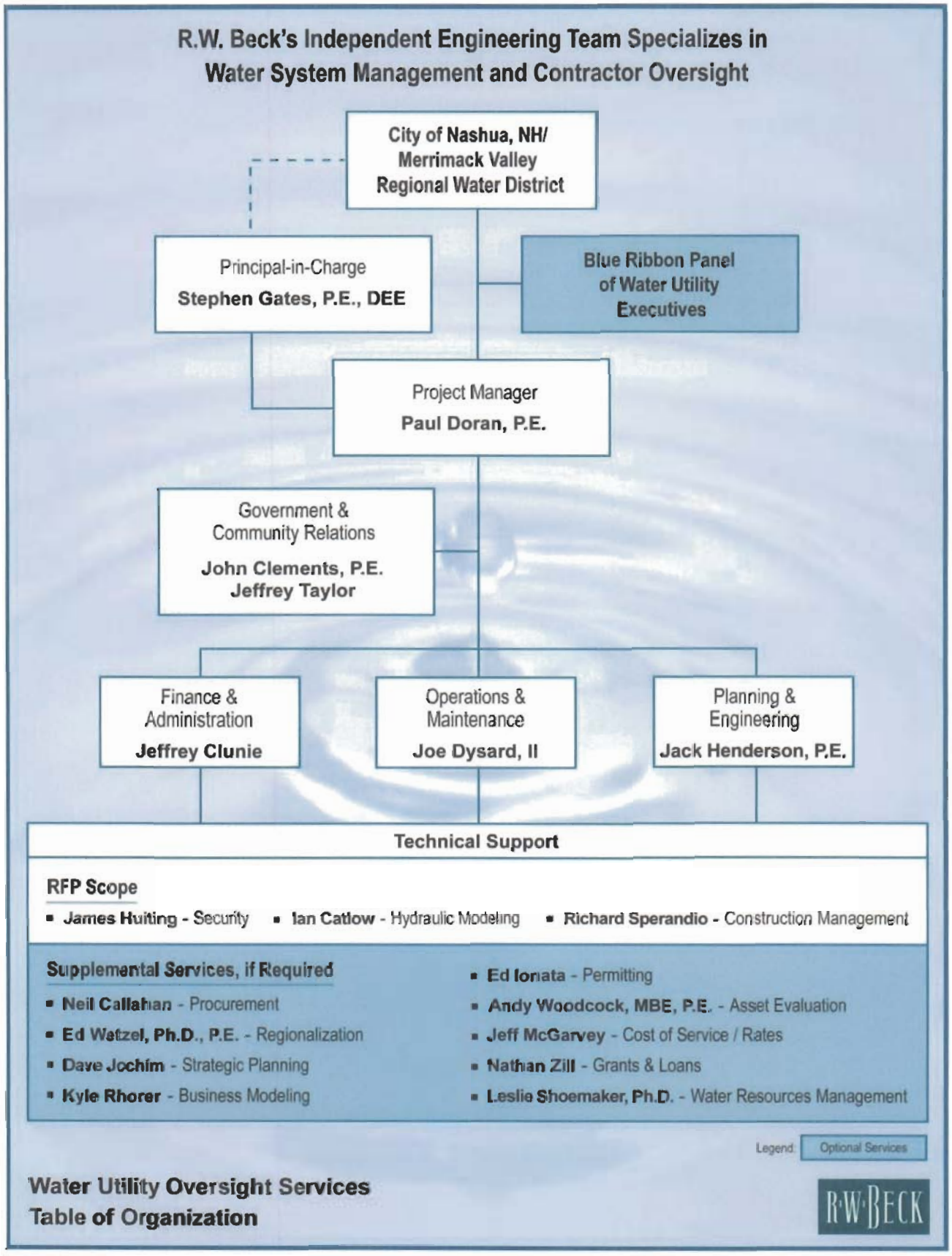
The R. W. Beck team of municipalization specialists and experienced public servants will help get the new community-owned utility broadly accepted at the least cost.

"Working with Mr. Doran, I found him to be proficient in the many complexities of private operations and maintenance services, in the technical and engineering aspects of operations and highly responsive in serving the needs of the Bureau of Water."
Kenneth R. Skov
Superintendent of Water
City of Waterbury, CT

R·W·BECK

with many years of experience as public servants in local, state and federal government: John Clements, former New Hampshire Commissioner of Public Works and Highways; and Jeffrey Taylor, former Director of the New Hampshire Office of State Planning. Their collective knowledge, insight, integrity and effective working relationships at all levels of government could be invaluable to the City and MVRWD, particularly regarding regulatory compliance and grant funding.

Blue Ribbon Panel. R. W. Beck also suggests that the City consider creating a Blue Ribbon Panel, composed of senior executives from regional water authorities around the country, who have been active participants in the creation of their regional water utilities. The Blue Ribbon Panel would meet with the City and MVRWD leaders periodically (e.g., semi-annually) to share lessons learned from their utility start-up experiences. Each meeting agenda would focus on current, pressing issues that the new utility might wish to seek advice on. Other major water utilities have used similar Blue Ribbon Panels with good success to help their leadership address a variety of priority issues; taking advantage of the experience of their peers. We have had preliminary discussions with executive level staff at the South Central Connecticut Regional Water Authority; Tampa Bay Water; and the Newport News Water Authority. All parties have expressed serious interest in assisting your new community-owned utility in greater Nashua get started. R. W. Beck could approach other utility executives, if the City and MVRWD were interested in creating a Blue Ribbon Panel for advice and support.


R.W. Beck's Independent Engineering Team Specializes in Water System Management and Contractor Oversight
City of Nashua, NH/ Merrimack Valley Regional Water District
Principal-in-Charge
Stephen Gates, P.E., DEE
Blue Ribbon Panel of Water Utility Executives
Project Manager
Paul Doran, P.E.
Government & Community Relations
John Clements, P.E.
Jeffrey Taylor
Finance & Administration
Jeffrey Clunie
Operations & Maintenance
Joe Dysard, II
Planning & Engineering
Jack Henderson, P.E.
Technical Support
RFP Scope
James Huiting - Security
Ian Catlow - Hydraulic Modeling
Richard Sperandio - Construction Management
Supplemental Services, if Required
Neil Callahan - Procurement
Ed Watzel, Ph.D., P.E. - Regionalization
Dave Jochim - Strategic Planning
Kyle Rhorer - Business Modeling
Ed Ionata - Permitting
Andy Woodcock, MBE, P.E. - Asset Evaluation
Jeff McGarvey - Cost of Service / Rates
Nathan Zill - Grants & Loans
Leslie Shoemaker, Ph.D. - Water Resources Management
Legend:
Optional Services
Water Utility Oversight Services
Table of Organization
R·W·BECK

The following pages summarize the relevant experience of the individuals proposed for this assignment. Complete resumes can be found in Appendix B of this proposal. The project team will work under the direction of the Project Manager, who will call upon the team resources as needed throughout the course of this engagement.

Stephen Gates, P.E., DEE **Role: Principal-in-Charge**

Steve Gates, who recently joined R. W. Beck as a Client Services Director for the Boston Office Water/Waste Practice, has 29+ years of environmental engineering experience providing program management, management consulting, facilities planning, detailed design and construction management for a wide variety of environmental engineering projects throughout Northeastern United States and Canada. He has successfully managed, planned, and designed construction of environmental facilities for public and commercial clients valued well over US$2 billion. He has worked for a variety of regional authorities, including the Massachusetts Water Resources Authority; the Regional Municipality of Ottawa; the South Central Connecticut Regional Water Authority; and the South Florida Regional Water Management Authority.

Key Strengths

- Over 29 years environmental engineering experience
- Planned, designed, and managed environmental engineering projects for public and private clients valued over US$2 billion
- In-depth experience in alternative project delivery methods
- Directed a wide array of projects for federal, municipal and county governments

In his role as Principal-in-Charge, Mr. Gates is responsible for ensuring that the appropriate resources needed by the City are dedicated to you, and made available in a timely fashion. He is also responsible for assuring a high level of quality on all work products.

Paul Doran, P.E. **Role: Project Manager**

Paul Doran is a Senior Water Consultant in the National Owner Advisory Services Practice of R. W. Beck. Having over 30 years of consulting experience in sanitary, environmental and general civil engineering, Mr. Doran has managed numerous major projects in municipal water supply, treatment, storage and distribution systems. His experience covers all facets required by Nashua, including planning, design, management and operations. Mr. Doran has significant, specific oversight consulting experience with various types of public/private partnerships throughout New England. For example, after assisting the City of Taunton with the procurement of a Design/Build/Operate (DBO) contractor for their treatment plant expansion, he provided contract oversight services for the first seven years of operations following project completion. Mr. Doran has also served as project manager for operations contactor oversight in Plymouth, MA; for the Upper Blackstone Water Pollution Abatement District, Millbury, MA; Stockton, CA; Lee, MA; Waterbury, CT; and Sioux City, IA.

Key Strengths

- 30 plus years consulting experience in civil and environmental projects
- Innovative procurement/oversight of DB and DBO Alternative Project Delivery methodologies
- Extensive experience in Owner's Independent Engineering Reviews of Water/Wastewater Utilities
- Project Manager on 7 water utility operations oversight projects
- Contributing Author on 7 private operation and maintenance contracts

As Project Manager, Mr. Doran will serve as the day-to-day contact with the City for the R. W. Beck team and will perform the majority of the work associated with oversight of the water utility operations contractor. As a resident of Hollis, New Hampshire for over 20 years, he is intimately familiar with the

institutional, political, and regulatory aspects of managing public utilities in New Hampshire. In addition, the Doran Family is firmly established within the community, attending Nashua schools and working in the Nashua hospitals. His physical proximity to Nashua makes him instantly available to meet with staff, Council or board members, and attend public meetings whenever needed.

John Clements, P.E. **Role: Government and Community Relations**

John Clements is a 40-year professional, having played a significant role in several private, governmental and trade organizations in New Hampshire. He is intimately familiar with community relations issues in New Hampshire, having served as State Commissioner of Public Works and Highways; Associate Administrator of the Federal Highway Administration; Board Member for the New Hampshire Business and Industry Association; New Hampshire Business Development Corp., and the New Hampshire Industrial Development Authority.

Key Strengths

- Experienced public servant
- 35 years working with local communities throughout NH
- Credible spokesperson for government

Mr. Clements' assignment is to support the City in their efforts to gain widespread public acceptance for the acquisition and subsequent operation of the PWW system. In addition, he can assist the MVRWD in assessing public reaction and developing communications strategies surrounding future system expansion.

Jeffrey Taylor **Role: Government and Community Relations**

Jeffrey Taylor has a distinguished 31-year career. He has exceptional strong skills in: conceptual abilities, coupled with experience in practical applications; ability to lead group discussions, and to keep all focused on the task at hand; extensive experience in economic development and related land use planning issues; and able to foster inter-disciplinary communication. Mr. Taylor was the Director of the New Hampshire Office of State Planning and throughout the years has had extensive dealings with state agencies.

Key Strengths

- 31+ years in public service
- Served in New Hampshire politics for many years
- Respected consensus builder on vital public issues

Mr. Taylor's assignment is to support the City in their efforts to gain widespread public acceptance for the acquisition and subsequent operation of the PWW system. In addition, he can assist the MVRWD in assessing public reaction and developing communications strategies surrounding future system expansion.

Jeffrey Clunie **Role: Finance and Administration**

Mr. Clunie's areas of specialization include project development, vendor procurement, contract negotiations, risk assessment, and the preparation of consulting engineer's reports used in the financing of infrastructure projects. Mr. Clunie has served as the Project Manager for the preparation of more than 70 Independent Engineer's Reports used in the issuance of more than $7.0 billion of revenue bonds. The size of the financings has ranged from $7 million to $370 million. He understands potential investors' concerns regarding technology, environmental, contractual and financial issues. As part of his responsibilities during preparation of these reports, Mr. Clunie has made numerous presentations to the rating agencies and bond insurance companies.

Key Strengths

- Over 30 years of consulting experience
- Oversaw over 100 infrastructure projects for public and private clients
- Prepared over 70 Independent Engineering Reports
- Issuance of more than $7.0 billion of revenue bonds

For Nashua, Mr. Clunie is available to ensure that future capital needs can be funded through revenue bond issues, and that the rate structure is appropriate given the operating expenses and debt service.

Joe Dysard, II **Role: Operations and Maintenance**

Joe Dysard is a Senior Director in R. W. Beck's Infrastructure Practice with over 32 years of experience in the water and wastewater industry. Prior to joining the firm in 1996, he spent over 25 years with a major investor-owned water utility holding company. While with the investor-owned water utility holding company, Mr. Dysard spent seven years as President of various companies under his direction in seven states. Mr. Dysard specializes in utility operations management, strategic planning, acquisitions and mergers, organizational restructuring, public/private/partnerships, and contract management.

Key Strengths

- Over 32 years of utility management experience in the water and wastewater industry
- Liaison for over 30 infrastructure projects
- Managed operation of 81 water systems in 15 states
- Specializes in utility operations management

Mr. Dysard will assist the Project Manager with reviewing the activities of the O&M contractor, including maintenance plans, staffing, operational procedures, plant performance, vulnerability and emergency response plans, billing system and customer relations programs.

Jack Henderson, P.E. **Role: Planning and Engineering**

Jack Henderson has more than 20 years of experience in the planning, process evaluation, design, construction and start-up of water treatment and transmission facilities. He has also completed numerous water supply investigations, distribution system models, and design of storage and large diameter transmission and pumping facilities for the Massachusetts Water Resources Authority and other local agencies.

Key Strengths

- 20 years experience in water system design/evaluation and construction
- Knowledge of local/national regulatory issues
- Expertise in distribution system modeling

Mr. Henderson role will be to support the Project Manager on engineering tasks such as facilities condition assessment, hydraulic modeling, security planning, plant performance, construction coordination and CIP review.

James Huiting, P.E. **Role: Security**

Mr. Huiting has more than 23 years of experience in the civil and environmental engineering field, with a strong emphasis on hands-on water resources engineering and project management. Mr. Huiting has supplemented his engineering background with education and project experience in vulnerability analysis, emergency action plans, information technology (IT) applications, and grant applications. In addition to vulnerability and assessment projects, Mr. Huiting brings substantial experience in civil and environmental engineering: planning, design, and construction of water-resources infrastructure, regional planning, computer applications, and general project management.

Key Strengths

- 23 years experience in civil and environmental engineering
- Extensive experience in vulnerability analysis and emergency action plans
- Expertise in grant applications

Mr. Huiting will support the Project Manager on related security plan review and security planning.

Ian Catlow **Role: Hydraulic Modeling**

Mr. Catlow is responsible for civil and environmental engineering design tasks, including the design of sanitary and storm sewers, groundwater modeling, and hydraulic modeling.

He has considerable experience working with public and private entities. A reprehensive listing of projects where he has used his expertise in hydraulic modeling are as follows: Boston Water and Sewer Commission; Massachusetts Convention Center Authority; Town of Southbridge, Massachusetts; City of Waltham, Massachusetts; Boston Water and Sewer Commission; The Rivers School Weston, Massachusetts.

Key Strengths

- Civil Engineer
- Extensive experience in hydraulic modeling projects
- Expertise in both civil and environmental engineering design tasks

Mr. Catlow responsibilities will support the Project Manager on hydraulic modeling tasks.

Richard Sperandio **Role: Construction Management**

Mr. Sperandio is a Vice President with Tetra Tech, Inc. With 30 years of experience, he has been involved in a variety of program management and construction management projects, as well as numerous projects involving the planning, design and construction of commercial, municipal, and military facilities, airfields, runways, taxiways, aprons, roads, and infrastructure involving water distribution and treatment, wastewater collection, pumping and treatment, and stormwater systems.

Key Strengths

- 30+ years of experience
- Extensive project experience involving construction management
- Expertise in program management and procurement

Mr. Sperandio also has extensive experience in procurement including preparation of contract scope of work documents, management of subcontractors, and change orders.

Mr. Sperandio's responsibilities will support the Project Manager on construction administration and oversight.

ADDITIONAL TEAM MEMBERS PROVIDE TECHNICAL SUPPORT AS NEEDED

As an engineering-based management consultant with deep experience in the creation and management of utilities, R. W. Beck has a variety of subject-matter experts that the City of Nashua may wish to call upon to supplement its available resources as the community-owned utility is created. The following is representative of additional staff expertise R. W. Beck in association with Tetra Tech could make available to the City and the MVRWD should special needs arise in the future, which are beyond the oversight contractor's scope of work as currently conceived.

Neil Callahan **Role: Procurement**

- Participated as Project Manager or Senior Operations Consultant in over a dozen major Public/Private Partnership procurements in nine states, Canada, the Caribbean and Mexico.
- Project Manager for procurement and continuing oversight services on 60 MGD Surface Water Treatment Plant for Tampa Bay Water.
- Assisted Tampa Bay Water with procurement, contract negotiations, design review, construction and operations oversight on correction of 25 MGD seawater desalination facility.
- Feasibility evaluation of 50 MGD seawater desalination facility for San Diego County Water Authority, including contract evaluation, risk assessment, project costs and energy concerns.

Ed Wetzel, Ph.D., P.E. **Role: Regionalization**

- Conducted over 20 due diligence investigations and negotiations for purchase of private utilities by government. Acquisitions have involved negotiated settlements and condemnation, with settlements ranging from $3 million to $136 million.
- Assisted in the creation and implementation of the Seacoast Utility Authority and the Florida Governmental Utility Authority, supported by revenue bond issues of $65 million and $460 million, respectively. Required preparation of bond reports and presentations before bond rating agencies.
- Conducted numerous Master Plans for several large regional water systems.

David Jochim, P.E. **Role: Strategic Planning**

- Has more than 30 years of consulting experience associated with planning and implementation of large capital facilities for public water systems.
- Has developed over a dozen water system master plans, provided oversight and QA/QC to large capital improvements programs up to $3.6 billion.
- Helped develop strategic and business plans for water agencies throughout the United States.
- Adept at meeting facilitation and incorporating diverse stakeholder interests into a finished work product.

Kyle Rhorer, MBA **Role: Business Modeling**

- Over 16 years of experience, specializing in the areas of strategic planning, capital financing, financial management and controls, and the development of public-private partnerships for utility infrastructure.
- Worked with the City of Woonsocket, Rhode Island to develop a public/private partnership strategy, including long-term analysis of capital financing options and user rate impacts.
- Developed a comprehensive financial model for the City of Tempe, Arizona, integrating the capital improvement program with their budget and management systems. Resulted in a 20-year budget and rate projection for the City's water, wastewater and irrigation systems.

Edward Ionata **Role: Permitting**

- Specializes managing all facets of project management, including permitting and construction.
- Expertise includes fast-track and design-build delivery methods.
- Extensive experience directly managing multi-disciplinary public and public-private partnership projects.

Andy Woodcock, MBA, P.E. **Role: Asset Evaluation**

- Special expertise in due diligence investigations, utility valuations, financial feasibility analyses and business plans.
- Participated in over 60 water and wastewater utility system valuations and acquisitions throughout the eastern United States.

Jeff McGarney **Role: Cost of Service / Rates**

- Developed procedures and supervised the preparation of extensive computer models for utility rate studies, financial control, data retrieval and analysis, financial feasibility studies, and capital financing alternatives.
- Conducted rate and cost-of-service studies for over two dozen utilities.
- Numerous presentations of his rate investigations and financial feasibility analyses to bond insurers and rating agencies.

Nathan Zill **Role: Grants and Loans**

- Preparation of grant applications and grant amendments on behalf of municipalities for funding from State and Federal agency programs.
- Assisted with State Revolving Loan Fund submittals for two dozen clients.
- Prepared project plans for six communities regarding the new Drinking Water Revolving Fund (DWRF) Loan.

Leslie Shoemaker, Ph.D. **Role: Water Resources Management**

- Nationally recognized expert in watershed management
- Developed watershed management plan for Lake Tahoe—politically sensitive and high profile.
- Lead author of the USEPA Model Compendium for Watershed Assessment.
- Completed numerous watershed management and reservoir protection plans for water utilities nationwide.

Please refer to Appendix B for the detailed resumes of the R. W. Beck project team.

PROFESSIONAL SERVICES AGREEMENT

This **PROFESSIONAL SERVICES AGREEMENT** ("Agreement") is dated October 12, 2005, by and between **R. W. Beck, Inc.** ("CONSULTANT"), with offices at Corporate Center, East Wing, 550 Cochituate Road PO Box 9344, Framingham, Massachusetts 01701+9344 and **City of Nashua, New Hampshire** ("OWNER"), with offices at 229 Main Street, Nashua, NH 03061.

NOW, THEREFORE in consideration of the promises herein and for other good and valuable consideration, the parties agree as follows:

1. **Scope of Services**: CONSULTANT and OWNER agree CONSULTANT will perform water utility oversight services as described in the Scope of Services attached as Exhibit A in accordance with the schedule set forth therein for water utility oversight in Nashua, New Hampshire. The CONSULTANT designates Paul B. Doran, P.E., as the CONSULTANT's Project Manager for services to the OWNER. If a replacement project manager is required, the CONSULTANT will notify the OWNER in writing and such replacement will be subject to approval by the OWNER, which shall not be unreasonably withheld.

2. **Independent Contractor**: CONSULTANT is an independent contractor and is not an employee of OWNER. Services performed by CONSULTANT under this Agreement are solely for the benefit of OWNER. Nothing contained in this Agreement creates any duties on the part of CONSULTANT toward any person not a party to this Agreement.

3. **Standard of Care**: CONSULTANT will perform services under this Agreement with the degree of skill and diligence normally practiced by professional engineers or CONSULTANTs performing the same or similar services. No other warranty or guarantee, expressed or implied, is made with respect to the services furnished under this Agreement and all implied warranties are disclaimed.

4. **Changes/Amendments**: This Agreement and its exhibits constitute the entire agreement between the Parties and together with its exhibits supersede any prior written or oral agreements. This Agreement may not be changed except by written amendment signed by both Parties. The estimate of the level of effort, schedule and payment required to complete the Scope of Services is reflected herein. Services not expressly set forth in this Agreement or its exhibits are excluded. CONSULTANT shall promptly notify OWNER if changes to the Scope of Services affect the schedule, level of effort or payment to CONSULTANT and the schedule and payment shall be equitably adjusted. If CONSULTANT is delayed in performing its services due to an event beyond its control, including but not limited to fire, flood, earthquake, explosion, strike, transportation or equipment delays, act of war, or act of God, then the schedule or payment under the Agreement shall be equitably adjusted, if necessary, to compensate CONSULTANT for any additional costs due to the delay.

5. **Fee for Services**: The fee for the services under this Agreement will be based on the

following.

A. For *OWNER's Support for Public Utility Commission Proceedings* outlined in the Scope of Services of this Agreement: The fee will be based on the actual hours of services furnished multiplied by CONSULTANT's Billing Rates included in Exhibit B, plus all reasonable expenses directly related to the services furnished under this Task.

B. For *Initial Tasks* outlined in the Scope of Services of this Agreement: A Fixed Fee of Two Hundred Thirty Thousand Dollars (U.S. $230,000.00) including expenses directly chargeable the services furnished. The fixed fee is valid until December 31, 2005, after which the fixed fee will be escalated beginning July 1, 2006 in accordance with the Consumer's Price Index (CPI) for the Boston-Brockton-Nashua area, except the portion of the index associated with energy or fuel costs shall not increase by more than 10 % in any given year. The revised price and escalation will be set forth in an Amendment to this Agreement.

C. For *Recurring Tasks* outlined in the Scope of Services of this Agreement: The fee will not exceed a maximum of Three Hundred Fifteen Thousand U.S. dollar (U.S. $315,000.00), including expenses directly chargeable the services furnished, without obtaining the prior written authorization of OWNER. CONSULTANT shall not be required to furnish services or incur expenses above the maximum amount without written authorization and additional funding from the OWNER. This maximum amount is valid until December 31, 2005. Pricing for subsequent years will be escalated beginning July 1, 2006 in accordance with the Consumer's Price Index (CPI) for the Boston-Brockton-Nashua area, except the portion of the index associated with energy or fuel costs shall not increase by more than 10 % in any given year,. The annual price and escalation will be set forth in an Amendment to this Agreement.

6. **Payment**:

A. OWNER shall pay CONSULTANT for *OWNER's Support for Public Utility Commission Proceedings* services based upon monthly invoices in an amount equal to actual hours of services furnished multiplied by the Billing Rates attached as Exhibit B, plus reasonable expenses at cost and at cost plus 10% for the services of any SubCONSULTANT.

B. OWNER shall pay CONSULTANT the Fixed Fee for *Initial Tasks* upon submission of 8 monthly invoices equal to $230,000 divided by 8 each.

C. OWNER shall pay CONSULTANT for *Recurring Services* furnished under this Agreement upon submission of monthly invoices in an amount equal to actual hours of services furnished multiplied by the Billing Rates attached as Exhibit B. Additionally, the OWNER shall reimburse CONSULTANT monthly for reasonable expenses at cost and at cost plus 10% for the services of SubCONSULTANTs.

D. OWNER shall pay CONSULTANT for *Supplemental Services* furnished under this Agreement upon submission of monthly invoices in an amount equal to actual hours

of services furnished multiplied at then current Billing Rates. Additionally, the OWNER shall reimburse CONSULTANT monthly for reasonable expenses at cost and at cost plus 10% for the services of SubCONSULTANTs.

Except in connection with *OWNER's Support for Public Utility Commission Proceedings* services, rates included in Exhibit B are valid until December 31, 2005, and subject to review and annual adjustment beginning July 1, 2006 in accordance with the Consumer's Price Index (CPI) for the Boston-Brockton-Nashua area, except the portion of the index associated with energy or fuel costs shall not increase by more than 10% in any given year, which will be set forth in an Amendment to this Agreement.

OWNER shall pay CONSULTANT in U.S. dollars within thirty (30) days of receipt of invoices less any disputed amounts. However, CONSULTANT acknowledges that OWNER may elect to defer payment for *OWNER's Support for Public Utility Commission Proceedings* services until approval of OWNER's fiscal year 2006/2007 budget and OWNER shall notify CONSULTANT in writing if deferral is elected. CONSULTANT agrees to such deferral until the earlier of (1) [30] days after approval of OWNER's fiscal year 2006/2007 budget, or (2) September 1, 2006.

If OWNER disputes any portion of the invoice, the undisputed portion will be paid and CONSULTANT will be notified in writing, within ten (10) days of receipt of the invoice of the exceptions taken. CONSULTANT and OWNER will attempt to resolve the payment dispute within sixty (60) days or the matter may be submitted to arbitration as provided below.

Additional charges for interest shall become due and payable at a rate of one and one-half percent (1-1/2%) per month (or the maximum percentage allowed by law, whichever is lower) on the unpaid, undisputed invoiced amounts except interest will be waived for *OWNER's Support for Public Utility Commission Proceedings* services if such invoices are paid by September 1, 2006. Any interest charges due from OWNER on past due invoices are outside any amounts otherwise due under this Agreement. If OWNER fails to pay undisputed invoiced amounts within sixty (60) days after delivery of invoice or by September 1, 2006 for *OWNER's Support for Public Utility Commission Proceedings* services, CONSULTANT, at its sole discretion, may suspend services hereunder or may initiate collections proceedings, including mandatory binding arbitration, without incurring any liability or waiving any right established hereunder or by law.

7. **Indemnity**: To the extent permitted by law, CONSULTANT agrees to indemnify, defend and hold harmless OWNER and its Mayor, Aldermen, other elected and appointed officials, CONSULTANTs and employees, individually and in their representative capacities, from and against any liability (including without limitation, reasonable costs and attorneys' fees) incurred by OWNER to the extent caused by CONSULTANT's negligent acts, errors or omissions, including judgments in favor of any third party.

To the extent permitted by law, OWNER agrees to indemnify, defend and hold harmless CONSULTANT and its directors, officers, shareholders, employees and

subCONSULTANTs from and against any liability (including, without limitation, reasonable costs and attorney's fees) incurred by CONSULTANT to the extent caused by OWNER's negligent acts, errors or omissions, including judgments in favor of any third party.

Each Party (the "First Party") specifically and expressly waives its immunity under applicable worker's compensation and industrial insurance laws regarding liability against the other Party (the "Second Party") for actions brought by any of the First Party's employees against the Second Party, to the extent the liability is caused by the First Party's negligent acts, errors or omissions.

OWNER agrees to use language acceptable to CONSULTANT in all third party O&M, procurement, construction and/or EPC contracts relating to services furnished under this Agreement, including but not limited to terms which provide: i) contractor(s) shall indemnify and hold harmless OWNER and CONSULTANT from any and all loss, damage, claim, or liability (including, without limitation, reasonable attorneys' fees) incurred by OWNER or contractor and arising from work performed for OWNER by contractor or its subcontractors; provided, however, that OWNER and CONSULTANT shall not be indemnified for any loss, damage, claim, or liability resulting solely from the negligent acts, errors, or omissions of OWNER or CONSULTANT; and ii) each and every contractor (a) to purchase and maintain Commercial General Liability Insurance in limits appropriate for the size of the contract (b) to name OWNER and CONSULTANT as additional insureds. OWNER and CONSULTANT will be added to the contractor's policy using ISO Endorsement CG2032 0798 or equivalent.

8. **Re-performance of Services**: If OWNER believes any of the services provided under this Agreement do not comply with the terms of this Agreement, OWNER shall promptly notify CONSULTANT to permit CONSULTANT an opportunity to investigate. If the services do not meet the applicable standard of care, it will promptly re-perform the services at no additional cost to OWNER, including assisting OWNER in selecting remedial actions. If OWNER fails to provide CONSULTANT with prompt notice of non-compliance and an opportunity to investigate and reperform its services, CONSULTANT's total obligation to OWNER will be limited to the costs CONSULTANT would have incurred to re-perform the services.

9. Section Intentionally Left Blank.

10. **Insurance**: CONSULTANT shall maintain insurance with the following required coverages and minimum limits and upon request, will provide insurance certificates to OWNER:

Worker's Compensation	Statutory
Employer's Liability	U.S. $1,000,000
Commercial General Liability	U.S. $1,000,000 per occurrence
	U.S. $1,000,000 aggregate
Comprehensive General Automobile	U.S. $1,000,000 combined single limit

Professional Liability U.S. $1,000,000 per claim and in the aggregate

11. **Work Product**: OWNER shall have the unrestricted right to use the documents, analyses and other data prepared by CONSULTANT under this Agreement ('Work Products'); provided, however OWNER shall not rely on or use the Work Products for any purpose other than the purposes under this Agreement and the Work Products shall not be changed without the prior written approval of CONSULTANT. If OWNER releases the Work Products to a third party without CONSULTANT's prior written consent, or changes or uses the Work Products other than as intended hereunder, (a) OWNER does so at its sole risk and discretion, (b) CONSULTANT shall not be liable for any claims or damages resulting from the change or use or connected with the release or any third party's use of the Work Products and (c) OWNER shall indemnify, defend and hold CONSULTANT harmless from any and all claims or damages related to the release, change or reuse.

12. **Limitation of Liability**: No employee of CONSULTANT shall have individual liability to OWNER. To the extent permitted by law, the total liability of CONSULTANT, its officers, directors, shareholders, employees and subCONSULTANTs for any and all claims arising out of this Agreement, including attorneys' fees, and whether caused by negligence, errors, omissions, strict liability, breach of contract or contribution, or indemnity claims based on third party claims, shall not exceed One Million Dollars (U.S. $1,000,000)..

    Due to the anticipated integrated nature of the construction phase services of OWNER and CONSULTANT, the parties agree that the construction contractors and vendors will remain exclusively responsible for compliance with contract requirements. Any construction phase observation or inspection by CONSULTANT or OWNER is intended solely to provide greater assurance that deficiencies in the contractor's work are discovered as early as possible. CONSULTANT has no legal or financial responsibility for OWNER's claims against a contractor or vendor arising from a contractor's or vendor's failure to comply with its contract or warranty obligations; provided, however, that CONSULTANT remains liable to OWNER for negligent actions or failures to act relating to observed conditions or circumstances which CONSULTANT knew or should have known, constituted deficient construction not in accordance with design requirements; provided, further, that CONSULTANT's liability in those cases of negligent actions or failures to act relating to observed conditions shall be limited to U.S. $1,000,000 in the aggregate for claims which arise from a single project.

13. **No Consequential Damages**: In no event and under no circumstances shall CONSULTANT be liable to OWNER for any principal, interest, loss of anticipated revenues, earnings, profits, increased expense of operation or construction, loss by reason of shutdown or non-operation due to late completion or otherwise or for any other economic, consequential, indirect or special damages in excess of $1,000,000 and only if not excluded by insurance.

14. **Information Provided by Others**: OWNER shall provide to CONSULTANT in a timely manner any information CONSULTANT indicates is needed to perform the services

hereunder. CONSULTANT may rely on the accuracy of information provided by OWNER and its representatives.

15. **Opinions of Cost**: CONSULTANT does not control the cost of labor, materials, equipment or services furnished by others, nor does it control pricing factors used by others to accommodate inflation, competitive bidding or market conditions. CONSULTANT estimates of operation expenses or construction costs represent its best judgment as an experienced and qualified professional and are not a guarantee of cost. This section does not apply to the cost of CONSULTANT performing the Scope of Services.

16. **Safety and Security**: CONSULTANT has established and maintains programs and procedures for the safety of its employees. Unless specifically included as a service to be provided under this Agreement, CONSULTANT specifically disclaims any authority or responsibility for job site safety and safety of persons other than CONSULTANT's employees. CONSULTANT shall not provide any such services and disclaims any responsibility under this Agreement related to site security or the assessment, evaluation, review, testing, maintenance, operation or safety practices or procedures related to security.

17. **Level of Authority**: CONSULTANT provides its services, comments, opinions and recommendations solely as a CONSULTANT to OWNER. The parties acknowledge that primary responsibility for any design and construction remains with the OWNER and its contractors, and operation of any facilities remains with the OWNER and operator. Employees of CONSULTANT will not perform any of the responsibilities of OWNER, OWNER, contractors, or operator, nor issue directions as to construction, facility operation or safety precautions and programs in connection with the facilities.

18. **Termination**: Either Party may terminate this Agreement upon thirty (30) days prior written notice to the other Party. OWNER shall pay CONSULTANT for all services rendered to the date of termination plus reasonable expenses for winding down the services. If either Party defaults in its obligations hereunder, the non-defaulting party, after giving seven (7) days written notice of its intention to terminate or suspend performance under this Agreement, may, if cure of the default is not commenced and diligently continued, terminate this Agreement or suspend performance under this Agreement.

19. **Dispute Resolution**: CONSULTANT and OWNER shall attempt to resolve conflicts or disputes under this Agreement in a fair and reasonable manner and agree that if resolution cannot be made to attempt to mediate the conflict by a professional mediator (except for payment disputes which may be submitted directly to arbitration). If mediation does not settle any dispute or action which arises under this Agreement or which relates in any way to this Agreement or the subject matter of this Agreement within ninety (90) days after either requests mediation, the dispute or conflict shall be subject to arbitration in English under the rules governing commercial arbitration as promulgated by the American Arbitration Association and shall take place in Nashua, New Hampshire.

Arbitrability shall be subject to the Federal Arbitration Act.

20. **Administration by the OWNER:.**

a. General Administration. Except as otherwise provided by this Agreement, in performing its obligations under this Agreement, CONSULTANT shall report to and act under the direction of the Mayor of the City of Nashua, and such persons designated in writing by the Mayor. Except as otherwise provided, CONSULTANT shall make all reports to the Mayor and the Mayor's designee(s).

b. Policy Administration. All matters of policy shall be determined by the Board of Aldermen. For the purpose of this Agreement, matters of policy includes (but is not limited to), questions related to rates, terms of service, long-term capital improvements and other matters. In performing its obligations under this Agreement with respect to matters of policy, CONSULTANT shall report to and act under the direction of the Board of Alderman, and such persons designated in writing by the Board.

If CONSULTANT requires a policy decision of any nature, CONSULTANT shall provide notice of the required decision and a recommendation to the Board of Aldermen. To the extent that obligations under this Agreement concern both general administration and matters of policy, CONSULTANT shall report to and act under the direction of the Board of Alderman.

21. **Miscellaneous**:

a. This Agreement is binding upon and will inure to the benefit of OWNER and CONSULTANT and their respective successors and assigns. The OWNER may assign this Agreement to Merrimack Valley Regional Water District (MVRWD), however, neither Party may assign its rights or obligations hereunder to any other entity without the prior written consent of the other Party.

b. Any notice required or permitted by this Agreement to be given shall be deemed to have been duly given if in writing and delivered personally or five (5) days after mailing by first-class, registered, or certified mail, return receipt requested, postage prepaid and addressed as follows:

OWNER:	City of Nashua, New Hampshire
Attention:	Mayor
Address:	229 Main Street, Nashua, NH 03061
CONSULTANT:	R. W. Beck, Inc.
Attention:	Paul B. Doran, P.E. Senior Water Consultant
Address:	Corporate Center, East Wing, 550 Cochituate Road PO Box 9344, Framingham, Massachusetts 01701+9344

With a copy to:
Lin Ross (such copy not to be considered notice)
1001 Fourth Avenue, Suite 2500 Seattle
Washington 98154-1004 USA

c. OWNER expressly agrees that all provisions of the Agreement, including the clause limiting the liability of CONSULTANT, were mutually negotiated and that but for the inclusion of the limitation of liability clause in the Agreement, CONSULTANT's compensation for services would otherwise be greater and/or CONSULTANT would not have entered into the Agreement.

d. If any provision of this Agreement is invalid or unenforceable, the remainder of this Agreement shall continue in full force and effect and the provision declared invalid or unenforceable shall continue as to other circumstances.

e. This Agreement shall be governed by, and construed in accordance with, the laws of the State of New Hampshire.

f. In any action to enforce or interpret this Agreement, the prevailing party shall be entitled to recover, as part of its judgment, reasonable attorneys' fees and costs from the other party.

g. This Agreement shall not be construed against CONSULTANT only on the basis that CONSULTANT drafted the Agreement.

h. Notwithstanding any statute to the contrary, the Parties agree that any action to enforce or interpret this Agreement shall be initiated within two (2) years from the time the party knew or should have known of the fact giving rise to its action, and shall not in any case be initiated later than six (6) years after CONSULTANT completes its Scope of Services under this Agreement.

i. This Agreement may be executed in multiple counterparts, each of which shall be deemed to be an original instrument, but all of which taken together shall constitute one instrument.

IN WITNESS WHEREOF, the Parties have signed this Agreement the date first written above.

City of Nashua, New Hampshire

Signature _____
Name _____
Title _____
Date _____

Signature _____
Name _____
Title _____
Date _____

R. W. Beck, Inc.

Signature _____
Name _____
Title _____
Date _____

Attachments

Exhibit A – Scope of Services
Exhibit B – Hourly Billing Rates

OWNER'S SUPPORT FOR PUBLIC UTILITY COMMISSION PROCEEDINGS

PUC Task 1 O&M Service Agreement Negotiations Support

Under the direction of the OWNER's law firm Upton-Hatfield, LLP (Upton), the CONSULTANT will support the OWNER with development and negotiation of its Service Agreement for Water Utility Operations and Maintenance with a private Operation and Maintenance Contractor (O&M Contractor) as requested. The CONSULTANT will attend applicable negotiation sessions with the O&M Contractor, review draft agreements prepared by Upton, and provide comments in the form of Technical Memoranda. The CONSULTANT will also contribute to the development of Technical Appendices to be included with the Service Agreement as attachments.

As of October 12, 2005, the CONSULTANT started work on this PUC Task 1.

PUC Task 2 Consulting Support for PUC Proceedings

Under the direction of Upton and as requested, the CONSULTANT will support the on-going proceedings before the New Hampshire Public Utilities Commission (Commission) under docket DW 04-048 related to the filing by the OWNER to take the utility assets of Pennichuck Water Works, Inc. (PWW).

OWNER'S SUPPORT FOR BONDING REQUIREMENTS

The CONSULTANT will perform the following services

A) Prepare information requirements for OWNER's Chief Financial Officer
B) Oversight of any technical, lock-box items required by OWNER's Chief Financial Officer
C) Oversight of appropriate rate structure in place for bonds requirements
D) Oversight of any requirements by the bond insurers, if any
E) Oversight and assurance of annual reporting forms by OWNER
F) Oversight and assurance of reporting requirements monthly and annually for the bond trustees
G) Development of reporting forms from the O&M Contractor and oversight that proper O&M Contractor reporting to the Finance Department is completed, including, but not limited to, the following:
    1) Revenues, monthly and totalized year to date, projected and actual
    2) Expenses, monthly and totalized year to date, projected and actual
    3) Capital expenses, monthly and totalized year to date, projected and actual
    4) Long-term improvements, monthly and totalized year to date, projected and actual
H) Oversight of any information and reporting required by the O&M Contractor for the OWNER for GASB requirements

I) Meetings required
   1) Monthly with the OWNER's Chief Financial Officer
   2) Monthly with Finance Committee
   3) Quarterly with Aldermen
   4) Annual or semi-annual, as/if required, for PUC and bond agents

J) Oversight and assurance that appropriate collection procedures are in place to satisfy bond holders

OVERSIGHT OF OWNER'S WATER ORDINANCE

The CONSULTANT will oversee that the provisions of the OWNER's Water Ordinance is being adhered to by the O&M Contractor, with respect to the following areas:

1) Applicable rate structures
2) Turn-on and shut-off policy
3) CIAC policies
4) Backflow prevention program
5) Conservation plans
6) Contamination mitigation
7) Watershed protection and management
8) Jobbing policies and fees

OVERSIGHT OF STATE, FEDERAL AND LOCAL PERMIT COMPLIANCE

The CONSULTANT will oversee that the O&M Contractor and the OWNER have in place the following permits:

A) Water treatment permits
B) Water withdrawal permits
C) Dam and reservoir permits
D) Pumping and storage permits
E) Transmission and distribution permits
F) Security requirements
G) Reliability requirements
H) Vulnerability assessment requirements
I) Dig-Safe requirements (if subscribed to)

OVERSIGHT OF OM&M CONTRACTOR SERVICE AGREEMENT –BASIC SERVICES

The CONSULTANT will provide basic oversight of the Service Agreement between the OWNER and the O&M Contractor to ensure the general provisions and requirements are being met by the O&M Contractor.

OVERSIGHT OF OM&M CONTRACTOR SERVICE AGREEMENT – INITIAL TASKS

The O&M Contractor and the OWNER will be involved in the necessary one-time activities related to the transfer of Pennichuck Water Works properties, information, and employees from a privately owned regulated utility to a municipally owned public utility (Transition Period). Also, the Transition Period is designed to provide for an orderly transfer and disposition of data, facts, figures, information, plans, IT facilities, computer programs, records, historic information, materials, equipment, buildings, land, property, and all other things necessary to conduct the water business as usual for the OWNER.

The CONSULTANT will provide the following Initial Tasks in support of the OWNER during the Transition Period. The CONSULTANT anticipates that there will be the need for additional CONSULTANT services during the Transition Period. These additional services will be provided, when authorized by the OWNER, as Supplemental Services described in this Exhibit A.

Initial Task 1 - Evaluate Maintenance Plan

Review the O&M contractor's proposed Final Maintenance Plan to determine its compliance with the requirements of the O&M contract. It is expected that the Maintenance Plan will include the following:

- Initial Asset Condition Assessment; Functional Assessment, Structural Assessment and Predictive Maintenance Report;
- risk analysis of asset failure;
- predicted rates of asset deterioration;
- the cost-effective point at which to renew, repair or replace an asset;
- the failure modes for each asset;
- conditions under which failures will most likely occur;
- consequence of reduced performance;
- planned facility changes that will eliminate the need for the asset;
- schedule of maintenance activities over the term of the O&M service contract; and
- well-defined costs of maintenance by type and year.

Deliverable

Prepare a Summary Letter Report of findings.

Initial Task 2 - Evaluate Initial Inventory

Review the O&M contractor's Final Initial Inventory for completeness. Review the O&M contractor's proposed procurement of additional quantities of consumables and/or equipment.

Check and verify that the final procurement quantities are appropriate for the O&M contractor to perform its services under the O&M Service Contract.

The Final Inventory includes: chemicals, fuel, general supplies and materials, spare parts, tools and equipment, vehicles (other than those identified to be retained by PWW), rolling stock, spare parts, hand tools, furniture and fixtures, computers and communications equipment. Equipment comprising the initial inventory does not include the PWW fixed assets that are included in the detailed Asset Inventory and condition assessment performed as part of Initial Task 4 - Evaluate Condition Plan.

Deliverable

Prepare a Summary Letter Report of findings.

Initial Task 3 - Evaluate Initial Staffing

Review the O&M contractor's Final Staffing Plan for the following:

- the number and type of employees required, including third-party contractors, to operate, maintain and manage the acquired assets in accordance with the O&M service contract and the law;
- an organizational chart that lists job roles and responsibilities of proposed staff;
- adequate coverage present at the acquired facilities for each shift seven days-per-week, and, for facilities to be left unattended, how emergency coverage will be handled;
- the qualifications of management, supervisory, technical, laboratory, and operating personnel required to be licensed and/or certified by the State for O&M;
- the availability and commitment of specialists, on-site or as part of a technical support group, as necessary, in water treatment, process control, instrumentation, trouble shooting, emergency management, and other skills necessary to perform according to contract requirements;
- a technical support group that will provide on-call back-up advice, expertise and quality control, management, maintenance and facility repair to assist the operational staff and ensure performance according to contract requirements and to assist in the design and construction of any needed and authorized improvements to the acquired assets.

Deliverable

Prepare a Summary Letter Report of findings.

Initial Task 4 - Evaluate Condition Assessment Plan

Review the appropriateness and adequacy of the O&M contractor's Condition Assessment Study where representations of the condition of the Water Utility as of the Service Commencement Date have been made. In addition, review the proposed work to be performed,

anticipated to include a Functional Evaluation, a Structural Evaluation, identification of Mission Critical equipment, and Predictive Testing Analysis. Participating with the O&M Contractor during its conduct of the Conditions Assessment Study shall be provided to the OWNER as a Supplemental Service described in this Exhibit A.

Deliverable

Prepare a Summary Letter Report of findings.

Initial Task 5 - Evaluation of Existing Hydraulic Models

Collaborate with the O&M contractor and utility staff to evaluate the existing model to determine if its level of detail is sufficient for accurate evaluations of system hydraulics and water quality under varying, existing and future operating conditions. Determine how the existing model was calibrated and if additional calibration or field data validation is needed to produce accurate results. Evaluate the strengths and weaknesses of existing models and generate a list of recommended improvements for future modeling work. Evaluate the existing model software in comparison to other available modeling software to determine which package best meets the utility's current and future needs.

Deliverable

Prepare a report summarizing the conclusions and recommendations of the modeling evaluation and to guide future system modeling work.

Initial Task 6 - Conduct Long-Range Planning

Working closely with the O&M contractor and key staff from the City and MVRWD, assist in creating a Long-Range Plan. The initial plan will focus on near-term priorities over the first five years. Focus on the CIP needed to renew and replace assets to maintain the established and planned levels of service.

Initial Task 7 - Review Security Plans

Review the existing Vulnerability Assessment (VAs), Emergency Preparedness and Response Plan (EPRP), risk assessments, and other appropriate security plans or programs required by state and federal law. Benchmark these documents against EPA Office of Water's "Instructions to Assist Community Water Systems in Complying with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002",; "Emergency Preparedness and Response Plan Guidance for Small and Medium Community Water Systems to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002".

Deliverable

Prepare a Technical Memorandum detailing completeness and practicality of existing Plans.

OVERSIGHT OF OM&M CONTRACTOR SERVICE AGREEMENT – RECURRING TASKS

Recurring Tasks will begin on the date the O&M Contractor begins to provide the OWNER OM&M Services. As defined in the O&M Contractor's Agreement with the OWNER, this date is known as the Service Commencement date. The Recurring Tasks will continue over the term of the O&M Contractor's Agreement with the OWNER.

Recurring Task 1 - Represent the OWNER in Negotiations

Within the limits of allowance specified in the Assumptions Section of this Agreement, provide technical assistance to the OWNER and represent the OWNER in discussions and/or negotiations with the O&M Contractor and others as requested. If additional services are needed for this task, they will be performed by the CONSULTANT as Supplemental Services as authorized by the OWNER.

Recurring Task 2 - Audit Performance of Contractor Planned Maintenance Activities

Annually review the O&M Contractor's compliance with contract terms requiring adequate planned maintenance which usually include: preventive maintenance, predictive maintenance testing, and corrective maintenance and for appropriateness in preventing, minimizing and delaying asset failures or shutdowns resulting in unplanned maintenance.

Deliverable

Prepare a Summary Letter Report of findings. Make recommendations on changes that would enhance system performance.

Recurring Task 3 - Review O&M Contractor Unplanned Maintenance Requests

Perform an evaluation of the O&M Contractor's renewal, repair and replacement maintenance (RRRM) requests to check that they are reasonable and appropriate. Evaluate the conditions leading up to the RRRM event to determine if the events are traceable to O&M Contractor non-performance of its contract obligations and contract conditions, or if the contractor failed to properly and faithfully execute the approved Maintenance Plan.

The CONSULTANT will also review unplanned maintenance considering the approved CIP to determine the least-cost alternative plan of action based on a life-cycle cost analysis of the asset.

Deliverable

Prepare a Summary Letter Report of findings.

Recurring Task 4 - Review and Evaluate Operational Data

Review operations data and work with the O&M contractor to assess its completeness and accuracy, including reviewing and checking the O&M contractor's QA/QC procedures for analytical tests and its' calibration of devices and instruments used to collect and record data.

Check operating data as they pertain to regulatory requirements, design limits or license to make sure that the facility is operating as required. Operating data to include:

- Raw Water Quality and Quantity
- Finished Water Quality and Quantity
- Chemical Use Data
- Filter Backwash Water Quality and Quantity
- Waste Backwash Water Quality and Quantity
- Recycle Water Quality and Quantity
- Residuals Production Data
- Filter Run Times and Unit Filter Run Volumes
- Other Process Performance Parameters

Deliverable

Prepare a Summary Letter Report of findings.

Recurring Task 5 - Review and Evaluate Test Results for External Reports

Review reports prepared for submittal to the regulatory agencies, the OWNER and the public to confirm that appropriate data is accurately collected and reported. Review the O&M contractor's QA/QC program for analytical tests and calibration of devices and instruments used to monitor and record process performance and water quality to confirm appropriate quality management procedures are in place by the O&M contractor.

Review of the sampling and monitoring programs to confirm that the programs are designed to monitor the performance of the treatment facilities and water quality within the distribution system and storage facilities. Monitor the data collection process for compliance with the O&M contract for collecting all of the required data and using the proper sampling and analytical procedures.

Recurring Task 6 - Review and Test Security Plan

Conduct continuing reviews of the O&M Contractor's Security Plans. On an annual basis, review and assess the number and type of incidents and prepare a summary, evaluate the response to each incident to determine if it was in accordance with the Security Plan and if the response required by the plan was appropriate. When necessary, recommend modifications to the Security Plan or improvements to the facilities to enhance and strengthen security and to provide appropriate responses to each incident.

The CONSULTANT will assess the appropriateness and timeliness of the O&M contractor's response and provide recommendations on ways to improve the detection, delay and response to various threats.

Deliverable

Prepare a Summary Letter Report of findings.

Recurring Task 7 - Coordinate Construction

Construction coordination will be provided on an "as-needed" basis throughout the term of the O&M contract. Prepare and submit to the OWNER, a Construction Administration Plan (CAP) for project organization and the performance of oversight of future construction and provide construction administration of the capital improvements in accordance with the approved CAP.

Within the limits of allowance specified in the Assumptions Section of this Agreement, monitor the construction work for compliance with the contract documents; prepare the procedures for and witness start-up tests; observe acceptance testing; and represent the utility according to industry standards for construction administration services. If additional services are needed for this task, they will be performed by the CONSULTANT as Supplemental Services as authorized by the OWNER.

Work with the O&M contractor to coordinate the construction work to minimize interference with normal operation of the water system. Construction oversight and coordination tasks will be performed in accordance with industry standards as defined by the National Society of Professional Engineers.

Recurring Task 8 - Long-Range Planning

As the utility matures, the CONSULTANT will support it with ongoing, annual updates to the Long-Range Plan. We envision a highly collaborative process with key stakeholders to assure that the Long-Range Plan remains current with the highest priorities of the utility's leadership. As an engineering-based management CONSULTANT, with deep experience with water utility municipalization and operations, The CONSULTANT is well suited to assist the OWNER and MVRWD in providing excellent service to its customers at the least cost, while enhancing the local environment.

Recurring Task 9 - Review Capital Improvement Plans

With input from the results of the Condition Plan Evaluation (Task 4); the Hydraulic Model Evaluation (Task 5); and the Security Plan Review (Task 8), review the CIP to confirm critical elements such as: affordability, consistency with the selected rate structure, deferred and ongoing asset renewal and replacement, and the future needs of the utility are addressed..

Coordinate the CIP with the Asset Register database and identification of ranking of Mission Critical Equipment replacement or upgrade.

Review the O&M contractor's assessment of impacts of asset failure to determine if an asset is mission critical and the consequences to the utility if the asset becomes non-operational, and utility impact of an asset that is operating at a sub-standard level, has defects (a condition in an

asset that may prevent it from operating as intended), is in poor condition or has a low Functional/Structural Evaluation.

The above services will be performed within the limits of allowance specified in the Assumptions Section of this Agreement. If additional services are needed for this task, they will be performed by the CONSULTANT as Supplemental Services as authorized by the OWNER.

SCHEDULE

The CONSULTANT's support of Public Utilities Commission Hearing Tasks were started on October 12, 2005.

The CONSULTANT support of the OWNER's bonding requirements will be ongoing throughout the term of this Agreement.

The CONSULTANT's oversight of the OWNER's Water Ordinance requirements and the oversight of State, Federal and Local permit requirements will be ongoing throughout the term of this Agreement.

The Initial Tasks will be completed within 8 months of notice to proceed after utility taking, or in a time frame as mutually agreed.

The Recurring Tasks will be completed annually, in a timely manner throughout the term of this Agreement.

Any Supplemental Service the OWNER requests the CONSULTANT to undertake will be performed to the schedule negotiated as part of the scope of the Supplemental Service requested.

ASSUMPTIONS

The scope of services and associated pricing of the CONSULTANT are based on the following assumptions, clarification and information/assistance being provided in a timely manner. If these items or the anticipated level of effort are inaccurate, additional services may be required.

1. OWNER shall provide the following information and data, and as requested by CONSULTANT, on which it can rely in performing services under the Agreement.

   (a) O&M contractor's final draft Maintenance Plan

   (b) O&M contractor's final draft Initial Inventory

   (c) O&M contractor's final draft Initial Staffing Plan

   (d) O&M contractor's final draft Condition Plan and Asset Register

   (e) O&M contractor's final draft Billing Procedures and Standard Operating Procedures

   (f) All existing hydraulic models including network diagrams, pipe condition data, fire flow data, and output analysis

   (g) Operation manuals and shop drawings, and record drawings for all utility capital assets including, but not limited to: reservoirs; dams; aqueducts; pumping stations; treatment facilities; pipelines; and treated water tanks and related accessories and appurtenances throughout the entire water system

   (h) Complete systems operations and maintenance records for calendar years 2000-2006

   (i) Any and all facility plans, master plans and/or capital improvement plans completed for the water system, in whole or in part, from January, 1980 to December 31, 2006

   (j) As-bid plans and specifications for any and all capital construction projects, related to the water system that are on-going at the time of Notice to Proceed.

2. The budgeted level of effort for Initial Tasks is based on the following:

   - Includes fourteen (14) OWNER meetings over the Initial Task period.
   - Includes two (2) meetings with Mayor and Board of Aldermen over the Initial Task period.
   - Includes ten (10) full-day and five (5) half-day meetings with O&M contractor over the Initial Task period.
   - Includes the review of the following O&M contractor deliverables:
     - One (the final) staffing plan
     - One (the final) maintenance plan
     - One (the final) initial inventory
   - Single review of the existing Vulnerability Assessment and Emergency Response Plan.

3. The budgeted level of effort for Recurring Tasks is based on the following:

- Includes two (2) OWNER meetings per month over the first year of service.
- Includes one (1) meeting with Mayor and Board of Aldermen each month over the first year of service.
- Includes three (3) full-day on-site meetings per month with O&M contractor over the first year of service.
- Annual review of the Vulnerability Assessment and Emergency Response Plan for updates.
- Includes an allowance of $20,000 for Recurring Task 1 representing the OWNER in OWNER Negotiations during the first year. This allowance is for R.W. Beck, Inc. to represent the OWNER in any O&M Contractor Service Agreement Amendments that may become necessary due to changes in O&M scope of services, occurrence of Uncontrollable Circumstances, occurrence of Changes in Applicable Law, and the addition of engineering and/or construction projects.
- Includes an allowance of $40,000 for Recurring Task 7 - Construction Coordination during the first year based on the construction of improvements to the water treatment plant and the water distribution system needs. Acting as an extension of OWNER staff, this allowance is for R.W. Beck, Inc. to represent the OWNER's interest in any construction work for the newly acquired water utility, to include coordination with the various OWNER agencies and departments impacted by pipeline and other construction projects.
- Includes an allowance of $20,000 for Recurring Task 9 - Review of the O&M Contractor's first year Capital Improvement Plan. This allowance is for R.W. Beck, Inc. to work with the O&M Contractor in the selection and prioritization of capital projects for the new utility in the first year of operations

SUPPLEMENTAL SERVICES

If authorized in writing by the OWNER on a task by task basis in every case, the CONSULTANT shall furnish or obtain from others, Supplemental Services of the following types:

- grant funding assistance including applications and support for government grants or loans; preparation of environmental assessments or impact statements;
- preparing engineering analyses, feasibility studies, conceptual or detailed designs; financial consulting including the preparation of feasibility studies, cash flow analyses, economic evaluations, cost of service analyses, rate schedules or appraisals;
- Independent Engineering and other assistance in obtaining financing; services resulting from the need for the OWNER to engage more separate prime contractors for planning studies, engineering, equipment procurement, operations, maintenance or construction; preparation of operations and maintenance manuals;
- strategic planning; community outreach, public and government relations;
- watershed protection and management planning;
- training and staff development; organizational development; construction inspection/resident engineering;
- preparing to serve or serving as a CONSULTANT or witness in litigation, public hearings or other legal or administrative proceeding;
- other services in connection with the Project, including services normally furnished by the OWNER or O&M contractor; and
- services not otherwise provided for in this Agreement.

SUPPLEMENTAL TASK 1 – Transition Services

The CONSULTANT has included several services in the Initial Tasks of this Agreement that will be performed during the Transition Period. The CONSULTANT anticipates that there will be additional services that the OWNER will need during the Transition Period, such as needed Information Technology (IT) reviews, engineering services, finance and accounting services, forming a strategy for the transition of all information from Pennichuck to the City and a strategy for the control of the IT assets, licenses, and accounting information needs, including;

- IT strategic planning; software license control procedures, budgetary estimations; third-party expert identification, bid specifications and selection.
- Implementation plans.
- Project management and budgetary control.

- Data migration and communication needs.
- On-going IT support as needed.
- Capital asset accounting transfer.
- Integration of capital asset accounting into City's capital asset records.
- Transitional reporting of information necessary for bond compliance.

These additional services will be provided, when authorized by the OWNER, as Supplemental Services

SUPPLEMENTAL TASK 2 - Community Outreach

Successful start-up of the new community-owned water utility will require the support and involvement of a number of local governments, the state, and the general public. This task will include Assisting the OWNER to establish a positive community relations using a variety of media and approaches over an extended time period, facilitate periodic workshop-type meetings to create and refine information that the differing audiences need to know, educate the public on water system issues, and help the OWNER to establish the participation and buy-in of all government entities and agencies that affect the acquisition, start-up and operation of the new community-owned water utility.

SUPPLEMENTAL TASK 3 - Comprehensive Watershed Protection Planning Program

Building upon the watershed services provided by the O&M Contractor, develop and implement a "source protection" program to create a detailed watershed management plan that begins to develop and implement an aggressive source protection program. Both the source protection and watershed management plan would include the following:

- an accurate technical basis for setting source protection priorities;
- participation of local communities in stewardship and public education about drinking water supplies;
- coordination with key elected officials, planning and zoning commissions, economic development commissions, conservation commissions and inland wetlands commissions, the Nashua Regional Planning Commission, regarding development issues, site plan reviews, and subdivision regulations;
- inspect existing land uses for compliance with local and state water quality protection regulations;
- cooperation among municipalities within MVRWD to control land uses in critical areas;
- cooperation among municipalities within MVRWD to purchase or acquire additional land for source protection;
- support the return of the remaining Southwood properties to watershed protection or obtain conservation easements, per the New Hampshire Forest Program;

- support additional New Hampshire water source supply protection regulations;
- comprehensive monitoring of water quality in the watersheds and aquifer recharge area;,
- maintenance of accurate maps that delineate watershed boundaries along with land use;
- coordination with state and local agencies in investigating contamination incidents;
- inspection and patrols of watershed resources;
- implementation of security measures on a priority basis;
- implement Best Management Practice to remediate non-point source contamination; and
- development of an emergency spill response protocol.
- Identify violations of state and local water supply protection regulations and inform land OWNERs and appropriate enforcement agencies when violations occur.
- Maintain records of chemical use and potential contaminant routes at specific sites for use in water quality investigations and land use risk assessment.
- Educate property OWNERs and the employees of business establishments on the watershed about water supply protection issues.
- Ensure that land management techniques used at the utility's facilities and properties are exemplary and in compliance with all applicable State and Federal regulations to serve as a model for others.

SUPPLEMENTAL TASK 4 – Water Conservation Program Implementation

The CONSULTANT will review the O&M Contractor's water conservation plan, make any required modifications to the plan and administer and implement the plan within the service area.

SUPPLEMENTAL TASK 5 – Professional Engineering Services

The CONSULTANT will perform Professional Engineering services for the OWNER as required.

SUPPLEMENTAL TASK 6 – Engineering Management Services for OWNER CIAC Projects

The CONSULTANT will perform activities associated with providing water service to new customers in the OWNER's service area, including review, inspection and monitoring of developer water main extensions and new service line installations in accordance with Applicable Law and OWNER standards. In addition, the CONSULTANT will perform other support services to the OWNER by overseeing and managing the O&M Contractor's supplementary services under CIAC, including interfacing and coordinating activities with other departments of the OWNER.

SUPPLEMENTAL TASK 7 - Financial Consulting

Construct a financial model for the utility prior to final acquisition. In preparation for this business modeling, the OWNER may wish to take the following steps before taking possession of the utility:

1. **Initiate detailed engineering due diligence on system assets.** The OWNER has been provided very limited access to the PWW sites and records. Prior to a final commitment to purchase price, the OWNER should conduct site visits, condition assessments and record review to better understand deficiencies and capital needs.
2. **Evaluate O&M costs and renewal and replacement needs.** Experienced plant operations personnel should review the existing O&M costs and R&R allowances. These costs should be reviewed considering likely increases resulting from enhanced treatment to meet new regulations.
3. **Develop an OWNER's financial planning model.** A financial model will be constructed to help calculate debt service coverage and projected rate increases. These tools allow the OWNER to analyze "what if", with input variables such as interest rates and timing of capital expenditures. Once developed, ongoing models become important planning tools for the utility's annual budgeting, rate setting and managing capital.

SUPPLEMENTAL TASK 8 - Strategic Planning

Develop a simple but iterative process, which integrates the strategic plan with the utility's annual budget cycle. This service helps to insure that short- and-long term business strategies are accounted for in the OWNER/District's annual budget planning process. It is recommended that the management of the new community-owned utility update and drive the strategic plan forward one year at a time and revise it on an annual basis. We offer the OWNER and MVRWD a planning process that produces practical, flexible, and useful strategic and business plans.

SUPPLEMENTAL TASK 9 - Grant Funding Assistance

The CONSULTANT will provide grant funding assistance to the OWNER in obtaining State and Federal grants, including the Drinking Water Revolving Fund (DWRF) loan programs; State Revolving Fund (SRF) loan programs; Community Development Block Grant (CDBG) programs; Rural Development Water and Waste Disposal grant and loan program; EPA's Environmental Programs and Management (EPM) Grants Program; Special Appropriations Projects (SPAPs) administered under EPA's State and Tribal Assistance Grants (STAG) Program; and many others.

EXHIBIT B
CONSULTANT BILLING RATES

R. W. BECK INC.

Billing Rates $/Hour(*)			Category/Project Roles
12.00	-	72.00	Clerical, Administration, Junior Engineers and Technicians
84.00	-	120.00	Staff Engineers, Consultants and Technicians
132.00	-	168.00	Senior Engineers, Consultants and Technicians, and Project Managers
180.00	-	240.00	Executive Engineers and Consultants, Senior Project Managers, and Principals
252.00	-	295.00	Executive Engineers and Consultants, Executive Project Managers, and Senior Principals

Billing rates are based on actual salary paid and inclusive of allowances for personnel benefits and multiplier.