ARCADIS Design & Consultancy for natural and built assets

New Street Reservoir Water Storage and Pumping Facilities
Design, Permitting and Construction Administration Services

Project No. 16-P-64

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PASSAIC VALLEY WATER COMMISSION

NEW STREET RESERVOIR WATER STORAGE AND PUMPING FACILITIES DESIGN, PERMITTING AND CONSTRUCTION ADMINISTRATION SERVICES

PROJECT NO. 16-P-64

1. FIRM EXPERIENCE

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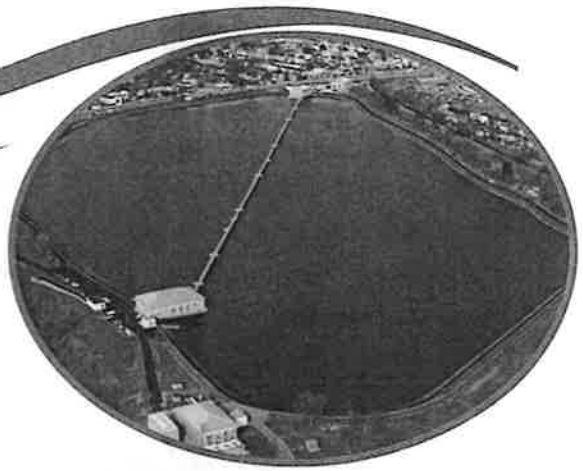
1. FIRM EXPERIENCE



About Arcadis

Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets.

Renowned for the size and complexity of our world-class projects, we combine a deep knowledge of local conditions with fresh global perspectives for unique, integrated solutions. From feasibility studies through implementation and maintenance, Arcadis is all about balance: between the creative and the functional, the innovative and the tried and true, present needs and future legacy.

Arcadis operates in four business lines - water, infrastructure, environment and buildings. We rank among the top management and engineering consultancies in the world. We have been recognized in Engineering News-Record as one of the top water supply firms locally and nationally year after year. Our most recent rankings are presented below.

FIRM RANKINGS

ENR Engineering News-Record

- **#2** 2015 Top New Jersey Design Firms (NJ)
- **#1** 2015 Top Water Supply Firms (NY, NJ, CT)
- **#7** 2015 Top 20 Water Firms (National)
- **#13** 2015 Top 500 Design Firms (National)
- **#7** 2015 Top 200 Environmental Firms (National)

Quick Facts

U.S. HEADQUARTERS

630 Plaza Drive,
Suite 10

Highlands Ranch, CO
80129

NJ OFFICE LOCATIONS

- Fair Lawn
- Cranberry
- Edison
- Branchburg

EMPLOYEES

- 27,000+ (worldwide)
- 6,200+ (U.S.)

OFFICES

- 300+ (worldwide)
- 160+ (U.S.)

ANNUAL REVENUE

$3.8 Billion

WEBSITE

www.arcadis.com

Introducing CallisonRTKL

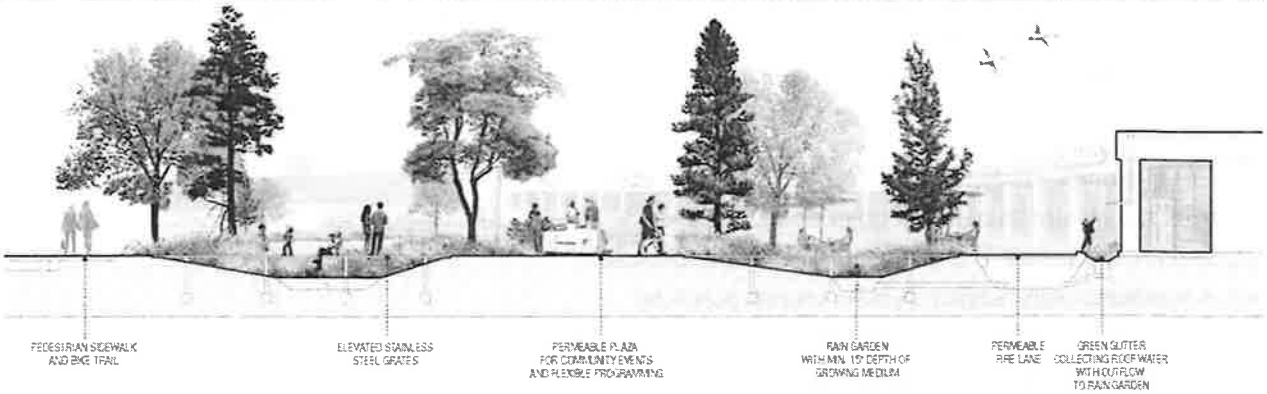
CALLISONRTKL
A DESIGN CONSULTANCY OF ARCADIS

Arcadis acquired Callison in 2014, providing a global platform for our services and access to the formidable resources of one of the world's most diverse consultancies. The acquisition brings together the strengths of two global powerhouses in commercial architecture, design and planning—Callison and RTKL, who was acquired by Arcadis in 2007.

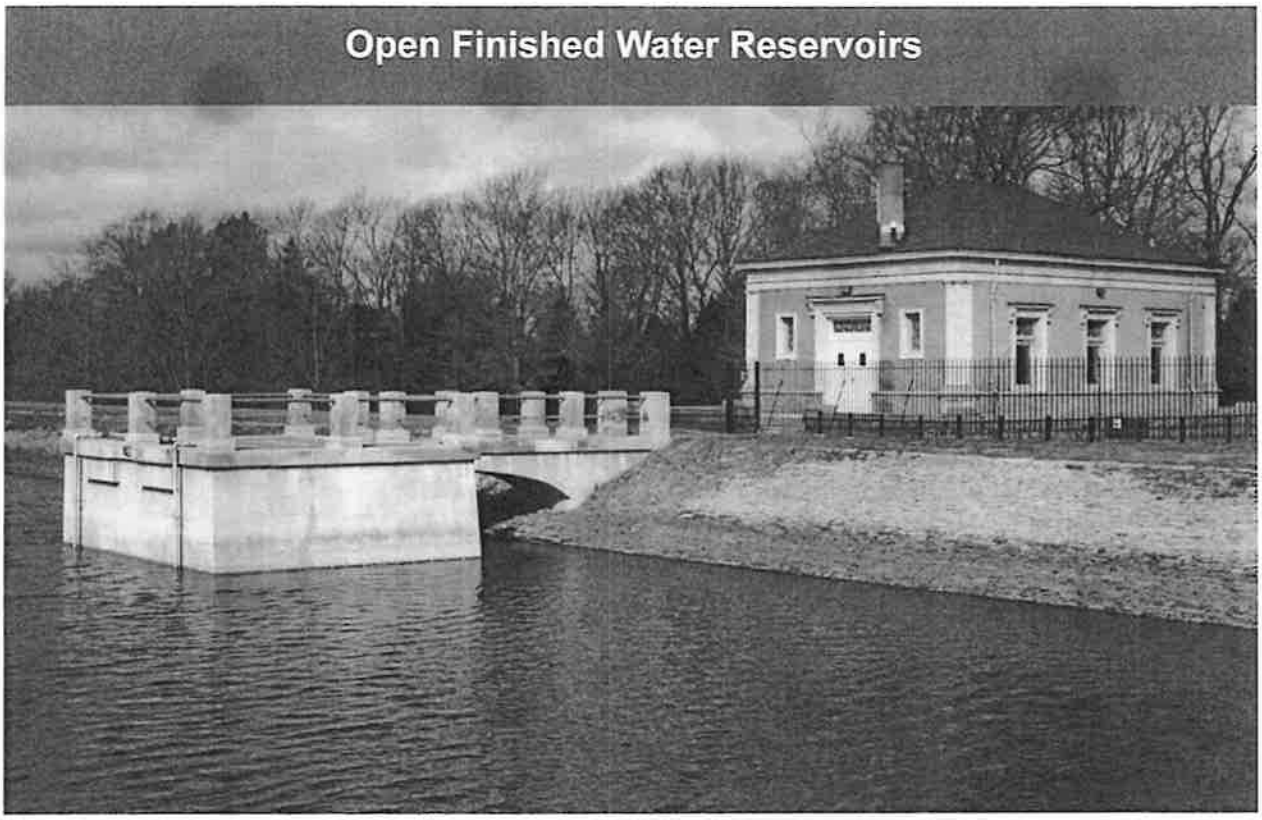
CallisonRTKL is an architectural practice unparalleled in its focus on outcomes and performance, deep knowledge of its markets and regions and, most importantly, quality design. **Their landscape architecture studio will be utilized on this project to provide stakeholders with visual representations of the proposed alternatives.**

At CallisonRTKL, architecture is our primary instrument for making the world a better place. Every day, our studios around the world blend exceptional design skills, superior project management capability, and creative vision to produce buildings that have long-lasting positive economic, social and environmental impact on communities and organizations.

U.S. Capital Visitors Center
Washington, DC
CallisonRTKL was commissioned to provide a 580,000-SF screening and orientation center for visitors awaiting entry into the Capitol. The facility not only functions effectively for security purposes, but also provides educational resources for the American public and international visitors in a setting befitting one of world's most memorable structures.



Bay Park Sewage Treatment Plant Landscape Architecture, Nassau County, NY
Working jointly with Arcadis, CallisonRTKL is reprogramming 29 acres of parkland to the east and west of the Hurricane Sandy-damaged Bay Park STP, enhancing value to the local community through the reconstruction of pedestrian walking paths, playgrounds and pavilions.

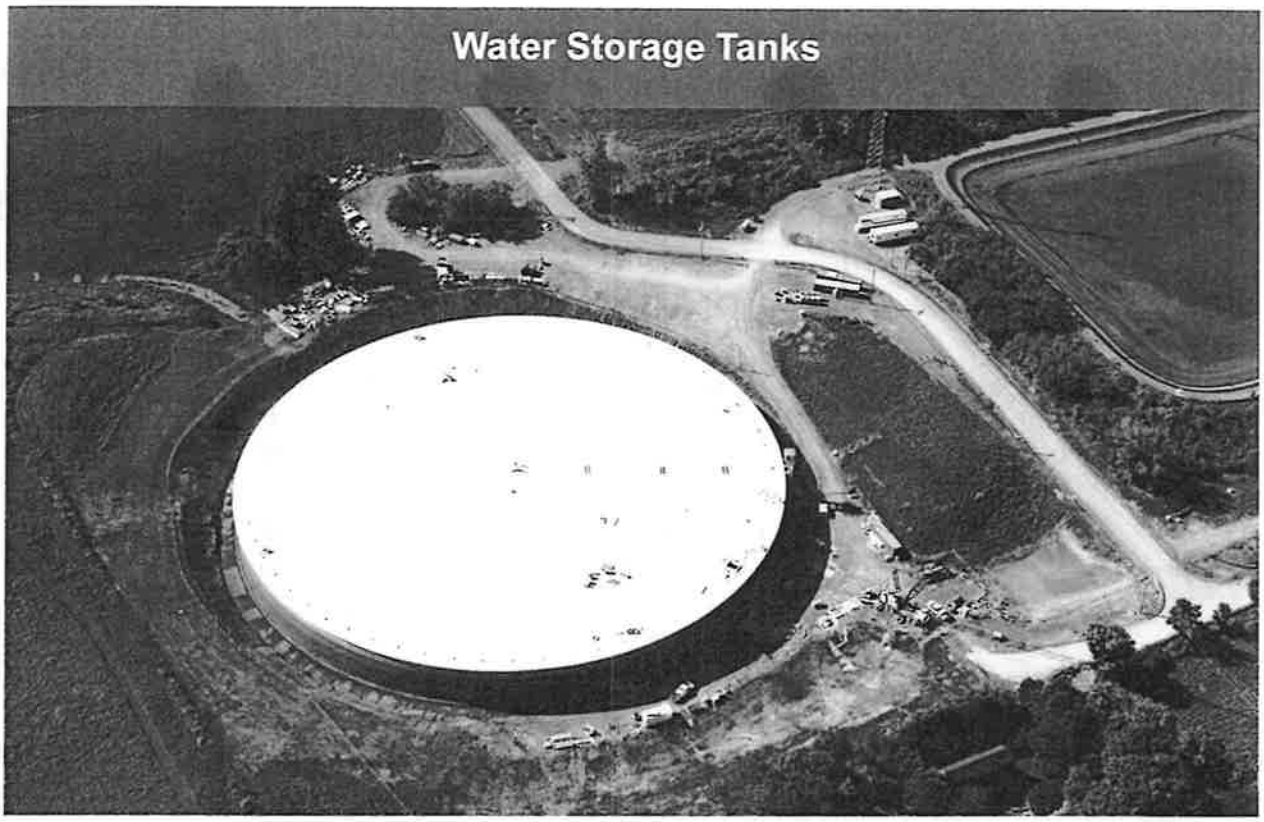


Open Finished Water Reservoir and LT2 Compliance

Arcadis is the national leader in evaluating and improving water quality in open finished water reservoirs as well as developing innovative and cost-effective Long-Term 2 Enhanced Surface Water Treatment Rule solutions (while also assuring compliance with Stage 2 D/DBPR, Lead and Copper Rule (LCR), and other regulations). Our expertise, which has been developed and refined by our previous work at more than 40 reservoirs totaling more than 10 billion gallons (BG) of finished water storage, assures PVWC of a sound and comprehensive LT2 compliance strategy for your project.

As further demonstrated in the table on the opposite page and the following pages of this Section, our team has completed design and construction at more than 40 open finished water reservoirs across the country. This directly relevant experience in not only identifying, but fully implementing each of the alternatives uniquely allows our team to deliver for PVWC.

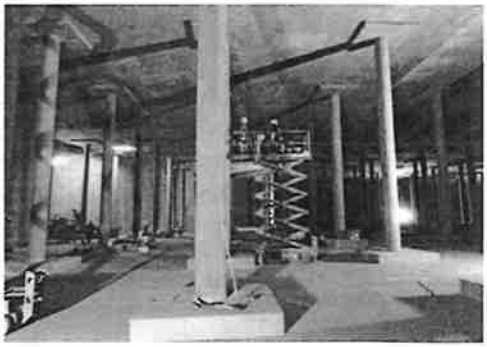
Over the past ten years, our project management team has led Open Reservoir LT2ESWTR compliance treatment evaluations, designs, and construction for 15 reservoirs, and they have authored a peer-reviewed article in AWWA's *Journal*.



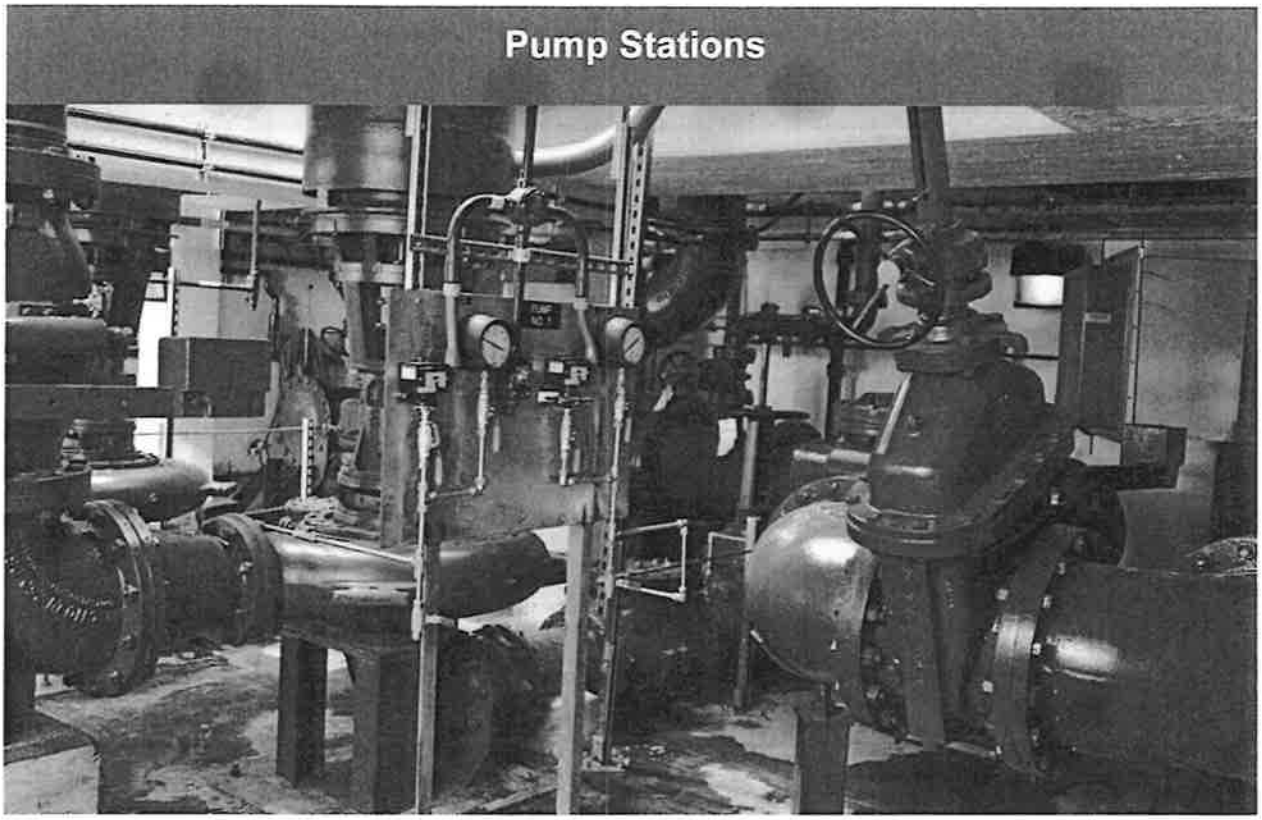
Pre-stressed Concrete Water Storage Tanks with a Focus on Sustainability

Arcadis has been involved in the planning, design and/ or construction of over 6.5 billion gallons (BG) of finished water storage including more than 100 circular AWWA D110 prestressed concrete water storage tanks. Our project team has worked together on several previous finished water storage projects and have completed a combined total of more than 15 projects totaling more than 1,650 MG over the past ten years.

This breadth of experience instills confidence that our design, and your final construction project are based upon a wealth of real-world knowledge. The primary benefit of this experience gives you confidence that we can successfully design and implement the alternative of choice effectively and efficiently.



Our Project Team's experience with the evaluation, design, and construction of more than 1650-MG of finished water storage projects provides PVWC the necessary confidence that we can successfully design and implement the alternative of choice effectively and efficiently.



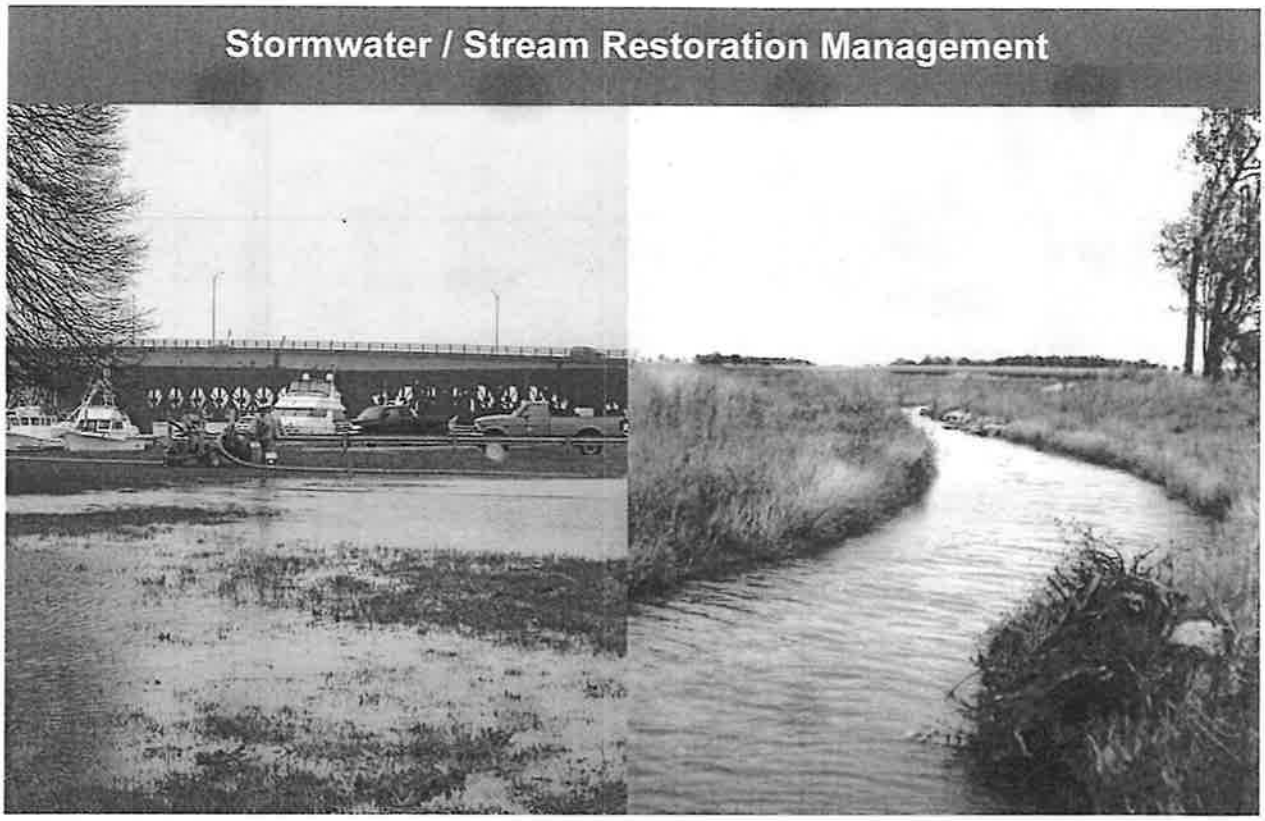
Pump Station Experience

Arcadis has designed pumping stations for all types of water supply facilities. Our work includes numerous pumping stations to boost pressure in high service zones and to transport or distribute treated water. Our projects include new facilities, and the rehabilitation and/or expansion of existing facilities.

For energy considerations, the selection of the pump drive is especially important. Our designs include constant-speed and two-speed motor drives as well as variable-speed drives. Special attention is given to energy-efficiency and reliability. In designing a pumping station, our engineers carefully research local electric rate structures to achieve the lowest power costs.

In designing the layout of pumping stations our engineers take into consideration the needs of the operators, providing convenient access and paying particular attention to specifying materials and equipment that will give long life and require low maintenance. Instrumentation and control systems are designed with efficiency and flexibility in mind, to optimize operations.

An important part of the VE Evaluation will be demonstrating to the public that their concerns and preferences are considered and folded into the final design.

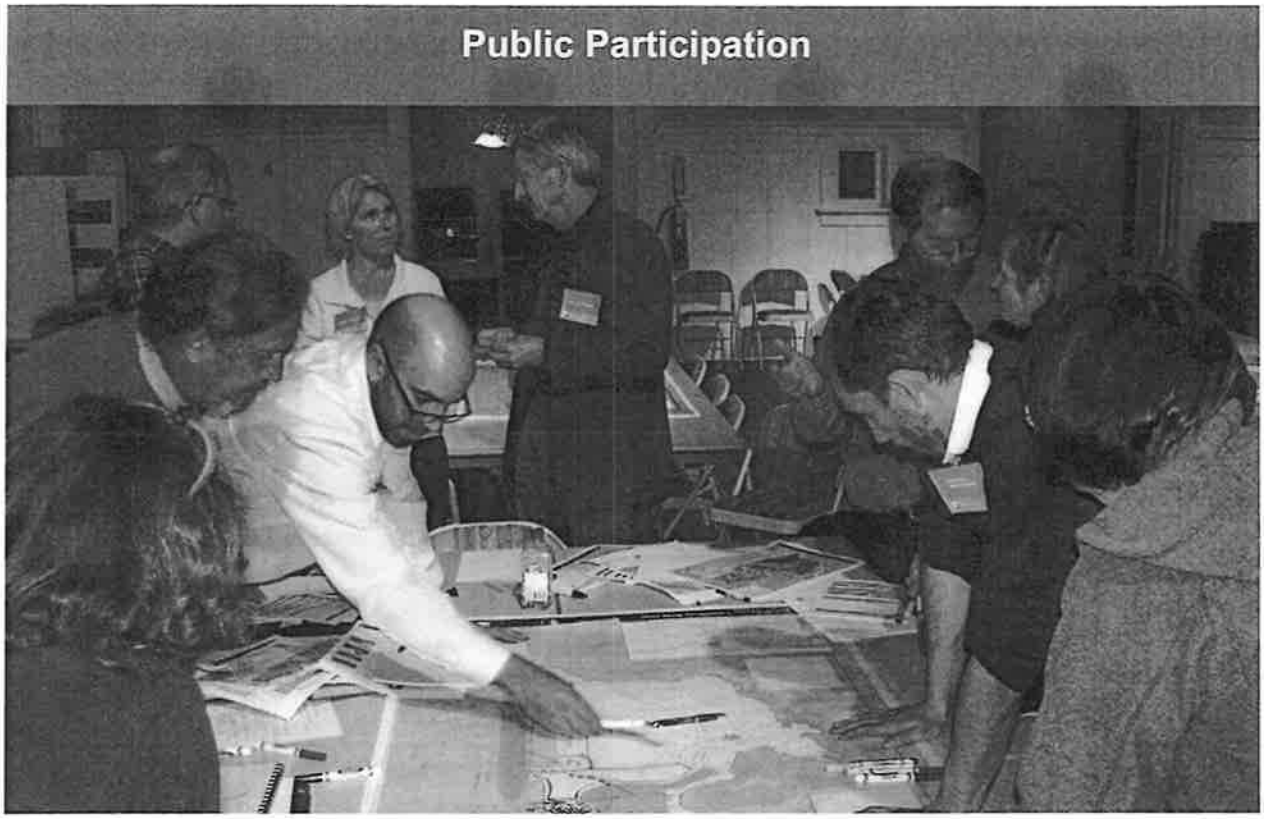


Stormwater / Stream Restoration Management

Arcadis recognizes the importance of identifying and solving the right problems when addressing stormwater management challenges. We have worked with numerous clients nationwide to develop and implement practical watershed restoration projects such as pond retrofits, site retrofits, and green stormwater infrastructure. Rather than recommending costly solutions that might not address real water quality issues, we focus on verifiable water quality problems and emphasize cost-effective solutions.

Our experience encompasses the creation of stormwater utilities; development of comprehensive wet-weather flow control plans; and development and implementation of diverse strategies to control, capture, treat and/or monitor stormwater discharges in order to achieve and maintain regulatory compliance. We have performed stormwater management projects ranging in magnitude from individual sites to complete river basins and provided program management services that leverage scarce municipal financial resources while maximizing the use of water resource assets.

Arcadis is a recognized leader in stormwater management planning and design. Our innovative solutions range from using green infrastructure (GI) to solve flooding problems in urban areas to developing models and identifying practical implementable floodplain management and mitigation plans.



Public Participation

A successful public works project must have citizen support to minimize adverse impacts on the community and avoid delays from community opposition. Arcadis has extensive experience in planning and conducting effective public participation programs for environmental projects. One example is a planning project for nine shoreline towns in Connecticut. Our plan addressed citizens' concerns about population growth and resulted in a sewer avoidance program that emphasized small community systems rather than large, centralized facilities. Our projects in such diverse locations as Ringwood, New Jersey, and Parker, Arizona, have required extensive public participation programs to address citizens' concerns about the cost of and need for sewerage systems. Our efforts for these types of projects involve public meetings, coordination with advisory committees, compilation of mailing lists, preparation of project newsletters and press releases, and development of project web sites. In virtually every case, public participation definitively shapes the outcome of the project.

Public relations staff at Arcadis have experience conducting public meetings, preparing project news releases and press releases and developing and maintaining project websites, as shown in the screenshot above.

For the Lower Passaic River Restoration project, Arcadis provided updates via a project website to address questions and concerns from local residents, provide updates on project progress to date, and increase awareness about how the project is designed to protect the public and environment.

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PRE-STRESSED CONCRETE TANKS (WINDOM 15-MG AND SPTP CLEARWELLS - TWO AT 5.3-MG)

Erie County, NY

CLIENT

Erie County Water Authority

KEY FEATURES

- Design and construction of 15-MG pre-stressed Windom tank (largest in world at time of construction)
- Construction of pre-stressed concrete tank in footprint of previous open reservoir
- Removal of existing reservoir floor slab and preparation of reservoir floor for new tank foundation
- Study of alternative inlet and outlet conditions and baffle walls to meet CT requirements
- Hydraulic modeling of existing and proposed transmission/ distribution systems
- 90-mgd Pump Station Evaluation and Design and Construction of Improvements

Arcadis had performed water supply master planning for the Erie County Water Authority for more than 30 years.

Windom Storage Tank

During a master plan update in the 1980s, we recommended providing 15 million gallons of covered storage at the site of an existing 10 million gallon open reservoir.

Our services included design plans and specifications, construction administration, and full-time construction inspection for a **new 15-MG precast pre-stressed concrete water tank (at the time this matched the largest pre-stressed concrete tank in the world).**

The $4.5 million project began in August 1990 with the tank being placed in service, on schedule, in December 1991. **The tank was constructed in the same location as the former open reservoir** which required removal of the floor slab, isolating the transmission main interconnections (48-in and 54-in outlet), and **preparation of the previous reservoir floor for the new tank foundation**.

Pump Station/Clearwells at the Sturgeon Point Treatment Plant

The Erie County Water Authority retained Arcadis for a study, design report, final design, and construction phase engineering for a comprehensive water supply project that included:

- Two at-grade clearwell tanks totaling 10.6 million gallons for filtered water storage.
- A 90-mgd, low-head transfer water pumping system.
- A 90-mgd, high-service delivered water pumping system.
- 2,400 feet of water transmission main, ranging in size from 42-inch to 60-inch diameter.
- A new pump station building and appurtenances.

The pumping station is located at the Authority's Sturgeon Point Water Treatment Plant. The $20-million project was divided into separate phases for the study/design report, clearwell design and construction, and pump station design and construction.

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PRE-STRESSED STORAGE TANKS FOR EASTERN RESERVOIR (20-MG & 30-MG) AND WESTERN RESERVOIR (20-MG)

Syracuse, NY

CLIENT

Metropolitan Water Board and Onondaga County Water Authority

KEY FEATURES

- Same project, design, and construction management team for this project
- Design of two 20 MG and one 30 MG pre-stressed concrete tanks
- Optimization of tank sizing, height, and piping/valving configuration to balance water supply & water quality goals
- Optimization of geotechnical program to take advantage of H&A's experience
- Bid prices for Eastern 30-MG and Western 20-MG of $25 million vs. $43 million initial estimates
- Fast-track design schedule progressing from 30% to bid documents in approximately 4-months
- Minimized construction waste and optimized bid prices by following sustainable design practices such as recycling the existing asphaltic concrete liner

The Metropolitan Water Board (MWB), located in Syracuse, New York, owns and operates the Eastern and Western Reservoirs, which currently are **open finished drinking water distribution reservoirs**. Through an agreement with the Onondaga County Water Authority (OCWA), MWB's primary customer, OCWA will **design, construct, and operate three new AWWA D110 pre-stressed concrete storage tanks to replace these facilities.** This reservoir replacement project will gain compliance with the United States Environmental Protection Agency (EPA) Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which requires Public Water Suppliers (PWS) that store finished drinking water in an open reservoir to do either of the following:

- Cover the finished water storage facility
- Treat the discharge of the uncovered finished water storage facility

Design Phase Services

The new facilities have been constructed directly adjacent or within the existing earthen embankment reservoirs. Building on Arcadis and Haley & Aldrich's past experience of constructing similar tanks within former reservoirs, a thorough evaluation of the soils was completed during the geotechnical analysis. Additionally, detailed water quality protection and water supply measures were considered when developing the required construction staging.

The project scope included:

- Site survey and geotechnical investigations to support design and bidding efforts.
- Optimization of tank geometry to meet distribution system requirements and minimize construction costs.
- Development of drawings and specifications for two 20-MG and one 30-MG AWWA D110 pre-stressed concrete tanks.
- Design of internal piping and fittings to ensure good mixing within he tank and future compliance with Stage 2 D/DBPR regulations.
- Design of associated site piping, valve, flow meters, roadway, and stormwater improvements.
- Design of electrical and telemetry modifications.

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LOUDONVILLE RESERVOIR 40-MGD UV FACILITY AND 20-MG TANK

Albany, NY

CLIENT

City of Albany

KEY FEATURES

- Design for 20-MG covered storage facility including encroachment on existing earthen embankment
- Design and construction for 40-mgd UV treatment facility
- SEQRA compliance
- LT2ESWTR compliance strategies
- NYS DOH approved for LT2ESWTR
- NYSERDA Funding
- 2004 ACEC Platinum Award

Arcadis has been working with the City of Albany (City) to provide regulatory compliance planning and associated design, construction and operations assistance for the 211-million-gallon (MG) Loudonville Reservoir.

As part of the City's proactive approach to **compliance with the then proposed Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)**, Arcadis was engaged to provide engineering design services and regulatory coordination with the New York State Department of Health for the **design of 20 MG of covered storage** and the design and construction a 40 mgd Ultraviolet Light (UV) Treatment Facility.

UV Treatment Facility. The ACEC award winning 40 mgd UV Treatment Facility was constructed to provide an additional barrier to microorganisms prior to distribution from the uncovered storage reservoir. UV disinfection, when operated in conjunction with the chlorine disinfection required to maintain residual within the distribution system, is highly effective against nearly all microorganisms. After evaluating alternative UV technologies and examining the requirements of this specific facility, Arcadis recommended a medium-pressure system. The UV Treatment Facility consists of four 10-mgd UV reactors, making it one of the largest UV potable water installations in the United States.

The 40-mgd UV Treatment Facility was designed and constructed in 2002 and came on line in April 2003. In addition to meeting the compressed design and construction schedule, the $3.7 Million Dollar project came in on budget. Arcadis and the City received the 2004 American Council of Engineering Company's (ACEC) Platinum award in the category of water and wastewater. The facility remains the largest operating UV treatment facility in New York State.

Covered Storage. Arcadis evaluated alternatives to provide sufficient covered storage to meet daily distribution storage requirements. Three covered storage alternatives were evaluated, including two separate 10 MG tanks, two concentric 10 MG tanks, and a single 20 MG tank. The single 20 MG tank configuration was selected based on construction costs, site constraints, visual impact, and the aggressive construction schedule required to minimize the downtime of the existing basins during the

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LT2ESWTR COMPLIANCE FOR DENISE RESERVOIR

Rochester, NY

CLIENT

Monroe County Water Authority

KEY FEATURES

- Developed Master Plan to optimize distribution system storage and achieve LT2ESWTR
- Design of floating cover over existing open reservoir
- NYSDOH coordination on reservoir covering and LT2 Compliance
- NYSDEC Dam Safety regulatory coordination
- Project bid price of $2.3 million versus $5 million originally budgeted for project
- Project received 2007 APWA Monroe County/Genesee Valley Branch Structural Project of the Year Award

Arcadis evaluated system-wide distribution system demand/ storage needs and developed alternatives for covering the 55-MG Denise finished water reservoir. We developed three conceptual alternatives:

- **A floating cover**
- **A concrete cover**
- **Replacement of the reservoir with new concrete tanks**

Arcadis also developed conceptual designs for security improvements including perimeter fencing, lighting, remote monitoring with CCTV, and intrusion detection systems (including infrared and microwave technologies).

Each of the conceptual designs was evaluated on its ability to meet more than 12 independent evaluation criteria including operational flexibility and regulatory compliance impacts (primarily Stage 2 D/DBPR and LT2ESWTR). Additionally, construction costs, operating costs, and project life cycle cost estimates were developed.

Arcadis also prepared an evaluation of the ultimate storage capacity of the site. This storage capacity analysis included a detailed review of the authority's historical demand data and future demand projections to identify future events that would likely require the building of additional storage capacity at the site.

Design and Construction Phase Services

Arcadis developed detailed design and bid documents for installation of a floating cover over the existing 55-MG finished water reservoir. The project was undertaken after the earlier master plan identified a floating cover as the most cost-effective method of complying with the future LT2ESWTR.

The preliminary design report included the following evaluations:

- Review of patching technologies and products for repairing the existing asphaltic concrete liner prior to installation of the floating cover
- Review of reinforced polypropylene and Hypalon as material options for floating cover and underlying chafing strip
- Review of historical operating levels and recommendations on chafing strip installation and future operating requirements once the floating cover is installed.

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RESERVOIR OPTIMIZATION PROGRAM: LT2ESWTR/STAGE 2 D/DBPR IMPACTS EVALUATION & HIGHLAND RESERVOIR LINER DESIGN AND CONSTRUCTION

Rochester, NY

CLIENT

City of Rochester

KEY FEATURES

- Evaluated LT2ESWTR alternatives for potential Stage 2 D/DBPR impacts
- Developed bench-scale and pilot-scale testing to optimize Hemlock Filtration Plant for TOC removal & to lower DBP formation in the distribution system
- Designing Improvements for Highland Reservoir including a new liner, mechanical piping, and structural rehabilitation
- Evaluating UV installation options at the Reservoirs
- NYSDEC Dam Safety Inspection & Permit
- Working with the City to identify alternative funding sources and sustainable design practices

Faced with a Bi-Lateral Compliance Agreement, a tight budget and schedule, known leakage, aging mechanical infrastructure, and **potentially difficult public acceptance issues associated with heavy construction within a popular National Historic Registered Park, the City of Rochester turned to Arcadis for help**. To meet all of the City's technical, operational, cost, and schedule goals, Arcadis applied their thorough knowledge of geomembrane lining systems and latest trenchless technology solutions, a sustainable design philosophy, and creative visioning. They then developed and implemented cost-effective, minimally disruptive approaches including materials recycling and infrastructure rehabilitation rather than replacement to maintain the historic appeal of the sensitive site.

Background

Rochester's Highland Reservoir is located in Highland Park, a National Historic Landmark. The Reservoir was originally constructed circa 1875-1876. Shortly after it was placed in service, Fredrick Law Olmsted was commissioned to design Highland Park. This year marked the 120th Anniversary of the park, which continues to be a source of pride and a focal point of the local community.

The reservoir is a critical element of the City's water supply system. However, the reservoir was known to have substantial leakage which was adversely affecting the park and potentially posing a public safety concern. Additionally, the reservoir no longer complied with New York State Department of Environmental Conservation (NYSDEC) Dam Safety Regulations or recently promulgated U. S. Environmental Protection Agency's (USEPA) Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).

The City hired Arcadis to implement a liner installation and reservoir rehabilitation project to correct deficiencies. Complicating the technical difficulties of constructing the project was the equally important requirement that the historic appeal of the reservoir be maintained and construction impacts on the popular and historic park be minimized.

Robert L. Morrison
Director, Rochester Water Bureau

"The City came to Arcadis with a specific budget to fix our historic drinking water reservoir and they successfully delivered this award-winning project - within budget - while carefully protecting the historic nature of this reservoir. They effectively navigated a myriad of permit requirements to secure approval from NYSDEC and SHPO for this reservoir, which is listed on the National Register of Historic Places."

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NASH HILL RESERVOIR
Ludlow, MA

CLIENT

Massachusetts Water Resources Authority

KEY FEATURES

- Evaluated alternatives to provided covered storage to 25 million gallons
- Provided 5 alternatives for outdoor storage including concrete, steel, and aluminum reservoirs and floating membrane cover
- Estimated construction costs and conducted a feasibility study
- Client selected two 12.5-MG precast, prestressed concrete reservoirs

Arcadis, as a subconsultant to Weston & Sampson, Inc., **evaluated alternatives for providing 25 million gallons of covered storage at the Nash Hill Reservoir**. Covered storage is required in order to comply with a consent order with the Massachusetts Department of Environmental Protection.

Services provided by Arcadis included:

- **Evaluation of five covered storage alternatives** outlining the relative advantages and disadvantages of the following technologies:
  - Cast-in-place concrete reservoirs.
  - Circular precast prestressed concrete reservoirs.
  - Circular welded steel reservoirs,
  - Flexible membrane floating cover.
  - Fixed rigid cover of concrete or aluminum.
- Preparation of alternative assessments for covered storage facilities and developed construction cost estimates in the feasibility study report.
- Preparation of preliminary opinions of probable construction cost for the structural components of alternatives evaluated.

The selected alternative, based on the concept report and discussions with MWRA, consists of two 12.5-MG precast, prestressed concrete reservoirs. One reservoir will initially be constructed adjacent to the existing earthen dike reservoir. When completed, this tank will be placed in service, the existing reservoir will be decommissioned, and the second precast, prestressed reservoir will be erected within the footprint of the former reservoir. Arcadis identified detailed design criteria for the proposed precast, prestressed tanks and developed preliminary design drawings.

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ALVARADO WATER TREATMENT PLANT FINISHED WATER STORAGE RESERVOIRS (TWO AT 21-MG) AND EARL THOMAS RESERVOIR (35-MG)

San Diego, CA

CLIENT

City of San Diego

KEY FEATURES

- Construction of two 21-MG pre-stressed concrete tanks within the footprint of the existing reservoir.
- Piping and valving of multiple large storage tanks on one site.
- Alvarado Reservoirs won Award for Visionary Design - Progressive Architecture (1998).
- Construction of 35-MG Earl Thomas reservoir (the largest pre-stressed tank in the world at time of construction) was also within the footprint of a cast-in-place concrete reservoir.
- Earl Thomas reservoir included PV Solar panels for 1 Megawatt of electricity generation
- Incorporation of architectural design elements & landscaping features to highlight the existing registered historic landmark structures on the site
- 2004 Award of Merit for Outstanding Civil Engineering Project from ASCE
- 2006 San Diego Chapter of ACI Water Resources Project of the Year Award
- 2007 Recipient of Structural Engineering Association of San Diego Excellence in Structural Engineering Award

Arcadis assisted the City of San Diego in developing a system wide water quality master plan (1992) for its drinking water facilities. Upgrading and expanding the Alvarado Water Treatment Plant was among the Phase 1 recommendations of the master plan. The 120-mgd facility had been placed in service in 1950. Arcadis provided complete engineering services for the Alvarado project, including facility assessment and planning, analysis of treatment and siting alternatives, regulatory and permitting assistance, environmental documentation, utility procurement assistance, geotechnical investigations, surveying, conceptual design, preliminary and final design, cost estimating, bid phase assistance, construction administration services, startup assistance, O&M manual preparation, and preparation of record (as-built) documents.

Alvarado WTP Finished Water Storage

The improvements were built in phases, beginning with the construction of two 21-MG reservoirs, followed by the Phase 1 expansion from 120 to 150 mgd, and, finally, the Phase 2 expansion from 150 to 200 mgd. Arcadis coordinated all the work with several regulatory and governmental agencies, including the California Department of Health Services, the State Water Resources Control Board, the California Regional Water Quality Control Board, the County Department of Health Services, Hazardous Materials Management Division, and the local air pollution control district.

Alvarado Storage Reservoirs. **The plant's regulating reservoir was demolished and replaced with two circular pre-stressed concrete reservoirs on the same site.** Each reservoir is 311 ft in diameter and 37 ft deep, holds 21 MG, and includes reservoir inlet, outlet, overflow, and underdrain piping, as well as inlet and outlet vaults and the reservoir overflow structure. **Chemical feed equipment and piping, and associated electrical and control systems were included.**

The reservoirs are partially buried, and the project artist incorporated a pedestrian bridge that leads to a Native Plant Demonstration Garden on top of one of the reservoirs. Covering approximately one third of the reservoir, the garden features many plants native to southern California. Landscaping and irrigation plans were incorporated into the reservoir design as well. **The new reservoirs won an award and have received significant publicity.**

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LT2ESWTR COMPLIANCE FOR HILLVIEW RESERVOIR

Yonkers, NY

CLIENT

New York City Department of Environmental Protection

KEY FEATURES

- Developed report on LT2ESWTR compliance options
- Design and Construction of Sediment Removal, Dividing Wall Extension, and Dividing Wall Buttress Improvements at the Reservoir
- Evaluation of incorporation of wind and/or solar technologies as part of the cover design
- Water quality, hydraulic, circulation, and alternative disinfection studies
- Designed 100-ac concrete cover as well as conception designs for floating and aluminum cover
- ACEC NY Engineering Excellence (Honor Award)
- AAEE Excellence in Environmental Engineering (Grand Prize)
- Construction Management Association of America Project of the Year Award 2001
- NYS DOH Administrative Order and USEPA LT2ESWTR negotiations
- NYS SEQR Process including full EIS development
- NYSDEC Dam Safety investigations, Emergency Action Plan (EAP) development, and permit applications

Hillview Reservoir is a critical link in New York City's water supply system, through which passes 85 to 90 percent (peak flow of 3,000 mgd) of the city's water from the upland watersheds into the distribution system. The 90-ac, 900-MG reservoir, constructed in 1910, has functioned as a balancing reservoir, a constant pressure source, and a feed and disinfection point since it began operation almost 100 years ago. Arcadis has provided since 1996 and continues to provide numerous construction management, design, and planning engineering services for the NYCDEP at Hillview.

LT2ESWTR Compliance Evaluation. NYCDEP has been under an Administrative Order to cover Hillview Reservoir since 1996. In 2006, NYCDEP requested that Arcadis re-evaluate their selection of a concrete cover and **investigate other alternatives including an aluminum cover, concrete cover, replacement with concrete tanks, and a floating cover**. This evaluation considered life cycle costs, water quality impacts, operational restrictions, regulatory requirements, and security issues. UV-light disinfection was also considered as a compliance alternative.

The report was presented to an independent Technical Advisory Committee (TAC) and the original recommendation that NYCDEP continue to pursue a concrete cover was confirmed by both the evaluation and the TAC.

Concrete Cover Design. Arcadis completed the original concrete cover design in 1998 and updated the design to meet the latest NYS Building Code requirements. The 60% and 90% design documents were reviewed by a Value Engineering (VE) team hired by NYC's Office of Management and Budget.

The design concept included cast-in-place ring wall and footings, pre-cast concrete columns, beams, and double-tees, and a cast-in-place diaphragm on the deck. A 'green' roof was proposed over top of the 100-ac cover to retain and treat stormwater.

NYSDOH & USEPA Negotiations. Arcadis has continued to support NYCDEP in their efforts to negotiate modifications to their current Administrative Order to delay implementation of the concrete cover. We have developed and assisted with sampling programs, prepared technical reports illustrating the construction impacts on the system as a whole, and documented and analyzed potential water quality risks of Hillview remaining as an open reservoir.

ARCADIS Design & Consultancy for natural and built assets

CROTON FILTRATION PLANT CONSTRUCTION MANAGEMENT

Bronx, NY

CLIENT

New York City Department of Environmental Protection

KEY FEATURES

- Construction of a new water treatment plant completely underground
- Largest "living green roof" in New York

Arcadis, as a member of a joint venture, is providing Construction Management (CM) services for the construction of New York City's $2.5 Billion, 290-mgd Croton Water Treatment Plant Project. The entire Croton Water Treatment Plant, with a footprint of approximately 550 feet by 700 feet, is being constructed underground within the confines of Van Cortlandt Park and the Mosholu Golf Course in the Borough of the Bronx. **With the exception of small entry and chemical unloading buildings the entire facility will be built underground.** Many aspects of the project require the close interaction of the Arcadis CM team with New York City Department of Parks administrative and operations personnel and the golf course franchisee "The First Tee", which is a non-profit organization. The Mosholu Golf Course being kept in continuous operation during the construction of the water treatment plant.

The site preparation phase (contract CRO-311) consisted of the removal of 200,000 cubic yards (CY) of soil and 950,000 CY of rock, leaving an excavation measuring 683 x 555 x 90 feet deep for the new treatment plant. The cost of construction for the site preparation contract was approximately $113 million, and work was completed ahead of schedule.

A portion of the work performed under the site preparation contract consisted of off site roadway improvements that were implemented prior to the construction of the Croton Water Treatment Plant. Improvements included:

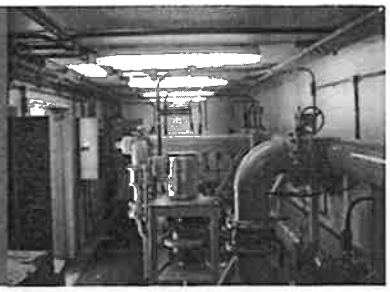
- The widening of the I-87 (Major Deegan Expressway) 233rd Street Exit Ramp on the approach to Jerome Avenue
- The widening of 233rd Street on the approach to Jerome Avenue
- The reconstruction of the Mosholu Golf Course entrance for use as the construction site entrance

The work at these locations included the obtaining NYCDOT permits, removal of trees, maintenance and protection of traffic, construction of new roadways including curbs, sidewalks, guide rails, relocation of fire hydrants, and installation of new signage. It also included the installation and relocation of street lighting and traffic signals. The approximate cost of the traffic improvement work was $1.6 million.

ARCADIS Design & Consultancy for natural and built assets

NILSEN WATER BOOSTER PUMP STATION

Mahwah, New Jersey



CLIENT
Township of Mahwah

REFERENCE
Brian T. Campion
Business Administor
475 Corporate Drive
Mahwah, NJ 07430
201.529-5757

CONTRACT FEE
$186,500

YEAR COMPLETED
2009

The Township of Mahwah water supply system has approximately 1,500 customers and an average daily demand of approximately 350 gpm (0.5 mgd), a maximum daily demand of approximately 700 gpm (1 mgd), and a peak hour demand of approximately 1850 gpm (2.6 mgd). Water is supplied from several Pump Stations. The East Crescent Booster Station operates at a constant flow rate determined on a daily basis based on the anticipated demand (varies according to the time of year and recent zone-wide water usage). Hourly demand exceeding the water supplied from the East Crescent Booster Station had been supplied by the East Slope Booster Station, which is controlled to maintain a constant level near full capacity at the Nilsen Water Storage Tank. Instantaneous peak demands that cannot be met by the East Slope Booster Station and East Crescent Booster Station are met by gravity supply from the Nilsen Tank. When the demand subsides, the Nilsen Water Storage Tank is refilled with a combination of water pumped from the East Slope and East Crescent Booster Stations.

The Township of Mahwah was plagued by complaints of low water pressure from customers located in the Township's Masonicus (high) pressure zone. Arcadis investigated the complaints and presented several alternative solutions to the Township to address the pressure concerns. The Township elected to raise the pressure gradient in the zone above the overflow elevation of the existing Nilsen storage tank by installing a booster pump station on the tank's outlet which could be bypassed if necessary in the event of a fire.

Arcadis prepared a hydraulic analysis of the zone to demonstrate to the state regulatory agency that Mahwah could satisfy its regulations regarding distribution system storage for fire protection with the proposed pump station. Subsequent to acceptance of the hydraulic evaluations, the New Jersey Department of Environmental Protection (NJDEP) authorized the Township to construct the Nilsen Water Booster Station. The new Pump Station was designed by Arcadis to maintain a critical pressure in the Township, with its primary use occurring during the summer and during times when the Nilsen Storage Tank requires to be drawn down for circulation reasons.

A remote pressure monitoring station was provided within the Masonicus service zone. When pressure at that site drops below 2 psi of the setpoint, the Nilsen Water Booster Station is called to run. When the station is no longer in operation, the Tank Level

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WATER TREATMENT PLANT, ELEVATED WATER STORAGE TANK AND WATER MAIN IMPROVEMENTS

East Windsor, New Jersey

CLIENT

East Windsor Municipal Utilities Authority

REFERENCE

Richard Brand, Executive Director
7 Wiltshire Drive
East Windsor, NJ 08520
609.443.7600

CONTRACT FEE

$1,136,300

YEAR COMPLETED

2009

Planning and Design. The East Windsor Municipal Utilities Authority (EWMUA) has experienced a rapidly expanding customer base due to development activity during the past 20 years. As part of the EWMUA's Utility Infrastructure Master Plan, Arcadis evaluated potential new well sites to provide East Windsor Township with additional water supply. We identified a number of sites as possible candidates, but they all had significant permitting and potential contamination issues. We found that Wells 3 and 7 could produce a combined output of 2,000 gallons per minute (gpm), but the treatment plant at Well 7 had the capacity to treat a maximum of only 1,000 gpm (a pipeline runs from Well 3 to Well 7). We therefore recommended that the treatment plant capacity at Well 7 be expanded from 1,000 gpm to 2,200 gpm.

The main design components for the expansion of the Well 7 treatment plant are summarized below:

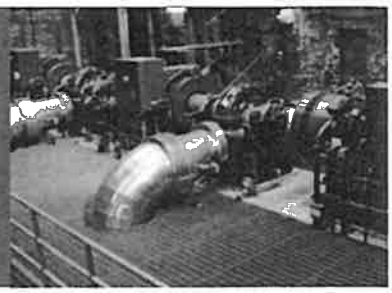
- **Pretreatment:** Addition of a second aeration unit. The existing detention tank was retained because of site and aesthetic constraints, but we implemented adjustments to the lime feed and tank operating level to improve iron oxidation.
- **High Service Pumps: Replacement of existing high service pumps and their relocation to an alternate location to improve access for maintenance.**
- **Filtration:** Expansion of the filter plant room and optimization of floor space usage by replacing the four existing vertical pressure filters with four 10-ft by 22-ft horizontal pressure filters.
- **Chemical Systems: Replacement of lime, fluoride, polymer, and corrosion control systems.** Replacement of the existing chlorine gas system with a calcium hypochlorite (tablet) system.
- Replacement and relocation of backwash tank and decant pump systems.
- Replacement of chlorine contact tank (designed to be in compliance with provisions of the Ground Water Rule, as needed).
- **Replacement of emergency generator and fuel tank.**
- Renovation of the existing treatment plant building.

Extensive permitting/regulatory approvals for the project involved the New Jersey Department of Environmental Protection (NJDEP)

ARCADIS Design & Consultancy for natural and built assets

CROSS RIVER AND CROTON FALLS PUMPING STATIONS

Bedford and Carmel, New York



CLIENT

New York City Department of Environmental Protection (NYCDEP)

REFERENCE

Paul Smith,PE
Bureau of Engineering Design and Construction
96-05
Horace Harding Expy
Corona, NY 11368
718.595.6080

CONTRACT FEE

$9 million

YEAR COMPLETED

Cross River PS - November 2013
Croton Falls - Ongoing

The Cross River and Croton Falls Pumping Stations are key components of the New York City Water Supply system located on the upper reaches of NYCDEP East-of-Hudson system, within the Croton watershed. The existing pumping stations, located at the base of the Cross River and Croton Falls dams, allowed transfer of water from the Croton system to the Delaware system by discharging into Kensico Tunnel Shafts 13 and 11, respectively. Arcadis, as part of a joint venture, is leading the effort to design and reconstruct the pumping stations and remediate the shafts so that they can serve the NYCDEP's current and future needs.

The Cross River Pump Station had a capacity of 27 mgd, while the existing Croton Falls Pump Station had a capacity of 65 mgd. Under the scope of these projects, the Cross River Pumping Station was recently constructed and upgraded to 60 mgd, whereas the construction of the new 180 mgd Croton Falls Pumping Station is scheduled to be substantially complete in May of 2017.

Cross River Pump Station - Town of Bedford, Westchester County, NY

The existing pumping station was demolished and the new pumps are now located inside the existing Delaware Aqueduct Shaft 13 building. This approach did not require an increase in the building footprint and saved millions of dollars in capital costs.

Three 20-mgd horizontal split-case pumps with 1000 hp motors were installed on the ground floor level of the Shaft 13 building. Additional features in the superstructure include an electric traveling bridge crane, cage hoists with motors, electric conduits, pull boxes and electrical control equipment, new isolation valves and state-of-the-art flow control equipment and instrumentation features.

Croton Falls Pump Station – Town of Carmel, Putnam County, NY

The existing pump station was demolished and a new pump station building was constructed which houses six 30-mgd horizontal split-case pumps with 1250 hp motor. The building is approximately 16,960 square feet in area and 45 feet in height.

A new 84-inch steel suction header was installed to connect the new pumping station to an 84-inch header from the gate chamber in the Dam.

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ARDSLEY ROAD PUMP STATION AND REEVES NEWSOM WATER SUPPLY STATION IMPROVEMENTS

Scarsdale, NY

CLIENT

Village of Scarsdale

REFERENCE

Stephen Johnson
Water Superintendent
Village of Scarsdale
1001 Post Road
Scarsdale, NY 10583
914.722.1138

CONTRACT FEE

Ardsley Road PS:
Compensation for Design & Construction - $715,965
Reeves Newsom WSS:
Compensation for Design & Construction - $1,191,811

YEAR COMPLETED

Ardsley Road PS - 2012
Reeves Newsom - 2016

Arcadis was awarded the 2016 American Water Works Association Project of the Year Award for the Reeves Newsom Water Supply Station.

Arcadis has been assisting the Village of Scarsdale for over 10 years with its water supply system. The Village has two drinking water booster pump stations, the Reeves Newsom Water Supply Station (RNWSS) and the Ardsley Road Pumping Station (ARPS). Both stations are booster stations to supplement pressure and further treat water from the New York City water supply system. The RNWSS boosts water from New York City's Kensico Reservoir as part of Westchester County Water District Number 1's Kensico-Bronx Pipeline and also has a backup connection through Shaft 22 of the Delaware Aqueduct as part of the Water District. The ARPS obtains water through a connection to the Catskill Aqueduct with a backup supply from United Water New Rochelle. The ARPS was initially constructed in the 1920s with the last major upgrade completed in the 1960s.

Both stations provide secondary chlorination as well as pH adjustment and corrosion control chemical addition. The Village's primary drinking water supply is provided through RNWSS with the ARPS as a backup supply. As a result, of ARPS being the backup supply, it had not been under regular operation for over 25 years.

Our work for the Village of Scarsdale began with an initial planning study which evaluated current and future water demands, treatment needs, and supply and distribution conditions in order to ensure a reliable water supply for the Village for many years to come. It included a hydraulic model of the Village's entire water distribution system as well as planning-level evaluations of alternatives and estimated costs. This model identified critical capacity and system delivery issues by identifying flow demand conditions, delineating suction and discharge head conditions, establishing the design pumping capacity for both stations and ultimately producing recommended pump sizing criteria.

The ultimate plan included upgrades to both the RNWSS and the ARPS. However, in order to be able to take equipment at the RNWSS out of service for upgrades, the ARPS needed to be upgraded to provide a reliable source of supply. To date, improvements to ARPS have been completed, and construction at RNWSS is complete. Both upgrades are complete station upgrades, with all mechanical, electrical and controls systems being replaced.

The ARPS improvements upgraded the reliable capacity of the station from 3.4 mgd to approximately 4.0 mgd. Because the

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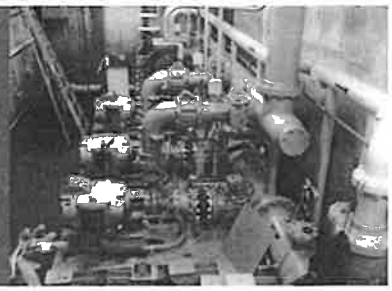
WESTCHESTER COUNTY WATER DISTRICT #3 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

Mt. Pleasant, NY



CLIENT

Westchester County Department of Environmental Facilities

REFERENCE

Mr. Thomas J. Lauro, PE
Commissioner
Westchester County Department of Environmental Facilities
270 North Avenue, 6th Floor
New Rochelle, NY 10801
914.813.5450

CONTRACT FEE

$2,139,000

YEAR COMPLETED

2013

Westchester County (County) Water District No. 3 (WD #3) serves the Valhalla Campus at the Grasslands Reservation as well as a number of buildings off of the Valhalla Campus. Water for WD #3 is supplied by the Gate of Heaven Pumping Station (GOH PS), which previously obtained water via a connection to the New York City Department of Environmental Protection's (NYCDEP) Catskill Aqueduct, and pumped it to an elevated storage tank. The NYCDEP's Catskill Aqueduct was to be shut down a number of times, with extended shutdowns starting in January 2012, in order to perform work required for the Catskill/Delaware Ultraviolet Light Disinfection Facility (Cat/Del UV Facility). Because adequate backup supply did not exist to supply WD #3 during extended Catskill Aqueduct shutdowns, an alternative supply of water was obtained for WD #3 to serve during these Catskill Aqueduct shutdowns and into the long-term.

Alternatives to supply water to WD #3 during extended Catskill Aqueduct shutdowns were evaluated. The selected alternative was to connect to a new raw water pipeline from Kensico Reservoir being provided to the Town of Mt. Pleasant by the NYCDEP. Under this project, **Arcadis designed a new raw water transmission main from Commerce Street through the NYCDEP's property within Gate of Heaven Cemetery to a new Gate of Heaven pumping station adjacent to the existing pumping station**. This new pumping station is equipped with UV disinfection equipment, in order to be consistent with the NYCDEP's Filtration Avoidance Determination (FAD) and associated UV Administrative Consent Order which require the NYCDEP and those connected to its water supply system to provide UV disinfection for its Catskill and Delaware water supplies by 2012. **In addition to the new transmission main and pumping station, the project included upgrades to the existing sodium hypochlorite, caustic and orthophosphate systems at the GOH PS, a new standby generator, and tank level and water quality information telemetered from an existing elevated storage tank.**

The new raw water transmission main is a 16-inch ductile iron pipeline that included both trenchless and cut-and-cover construction. The trenchless section was constructed via microtunneling and crosses under a highway, railroad tracks, and a culvert. The pumping station is a pre-fabricated pumping station, which includes horizontal end-suction pumps and UV disinfection, with an architectural façade, designed to fit in with the nature of the

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WATERSHED MANAGEMENT - STORMWATER PONDS AND RETROFITS TASK ORDERS

Chesterfield County, VA

CLIENT
Chesterfield County, Department of Environmental Engineering

REFERENCE
Scott Smedley, PE
Phone: 804.751.2311

CONTRACT FEE
Engineering Fees: $497,621
Construction Cost: $24,075,000

YEAR COMPLETED
2016

Arcadis assisted Chesterfield County in the development of the compliance plan for the stormwater MS4 permit and its Chesapeake Bay TMDL requirements. The implementation of the compliance plan includes the preparation of watershed management plans, monitoring activities, and identification and design of stormwater control measures (new and retrofits of existing facilities) meet the required pollutant (nutrients and sediment) removal targets.

Stormwater Ponds and Construced Wetlands

Arcadis provided Professional Engineering Services for design of stormwater BMP retrofits at the James River High School and Betty Weaver Elementary School sites. Stormwater management for the sites is currently provided by two wet ponds and one dry detention pond. The purpose of the BMP retrofit designs is to improve the water quality treatment efficiency of the BMPs by reducing the nutrient and sediment loads leaving the site. Arcadis evaluated the following alternatives and prepared designs and construction documents:

- **Conversion of the dry detention basin to a constructed wetland**
- **Enhancement of the wet ponds, which includes construction of forebays, vegetated shelves, baffles, and aeration to increase treatment efficiency and facilitate regular maintenance activities**
- Enhancement of the wet ponds to increase treatment capacity by increasing volume through dredging and forebay installation

The tasks conducted by Arcadis included survey, data collection, drainage area delineation, infrastructure condition assessment, and load calculation. With this data Arcadis obtained required environmental permits and designed the retrofits to meet the project goals. **Designs included H&H modeling, pollutant load calculations, determination of design elevations and BMP parameters, and design of final contours and inlet and outlet structures.** Preliminary version of the plans, cost estimates, and basis of design reports were submitted to the County for review. The 90% plans were submitted for County review and coordinated with multiple agencies, including VDOT. County comments were incorporated and final design (bid-ready documents) were prepared. Construction administration and support is planned for 2016.

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POCOSHOCK CREEK STREAM RESTORATION, TASK ORDER 3A

Chesterfield County, VA

CLIENT
Chesterfield County, Department of Environmental Engineering

REFERENCE
Scott Smedley, PE
Phone: 804.751.2311

CONTRACT FEE
Engineering Fees: $389,732
Construction Cost: $1,250,000

YEAR COMPLETED
2016

Arcadis used natural channel design methods to provide stable stream designs on approximately 4,800 linear feet of Pocoshock Creek. The drainage area at the downstream project limits is 2.3 square miles. **Restoration activities include grading along the floodplain, installation of various grade control structures and cobble as channel substrate enhancement, seeding, matting, and planting.** The removal of large specimen trees was minimized, with a goal of reusing cleared trees (as root wads) within the restored channels.

The goals of the Pocoshock Creek stream restoration project are to improve the functions and value of the impaired stream channel by improving water quality and aquatic habitat in the creek, **establishing a geomorphically stable stream channel using natural channel design principles**, and reducing the sediment load carried from the creek to Falling Creek Reservoir. **Arcadis collected sediment samples to characterize the stream, banks, and floodplains** to apply the protocols identified in the *"Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects"*. The protocol analysis was used to optimize pollutant (nutrients and sediments) removal efficiency in order to align the project with the County's MS4 and Chesapeake Bay TMDL compliance plans by contributing to the nutrient/sediment reduction goals.

Arcadis supported the County in public meetings by preparing plan composites showing the entire restoration project, property lines, and impacted areas. In addition, poster displays of the stream restoration techniques being used (e.g., boulder cross vanes, J-hooks, A-vanes, root wads, rock step pools for outlet protection, etc.) facilitated understanding and acceptance of the final project.

Arcadis also obtained the existing hydrologic/hydraulic models from FEMA and coordinated the preparation of a Conditional Letter of Map Revision (CLOMR). A LOMR will be obtained after the project is completed. Permitting activities required conducting an acoustic survey for the long-eared bat and its habitat as well as the typical wetlands identification, avoidance, and minimization tasks.

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KETTLE POND OUTFALL IMPROVEMENTS AND JAMES RIVER SHORELINE STABILIZATION

Newport News, VA

CLIENT
City of Newport News

REFERENCE
James Clark, PE
Phone: 757.926.8655

CONTRACT FEE
Engineering Fees: $14,924

YEAR COMPLETED
Ongoing

North shore of the James River at the Mariners' Museum showing erosion encroaching upon Museum Drive. The shoreline stabilization design will stabilize the area with a combination of rip rap and living shoreline. The design is anticipated to provide for mitigation of the impact of the outfall construction and will result in habitat along the river.

At the City's request, Arcadis designed improvements to the existing nonfunctional outfall structure within Kettle Pond to eliminate overtopping of Museum Drive due to flooding of Kettle Pond during rainfall events, including the 100-year storm event *(photo above depicts Kettle Pond overtopping Museum Drive during the August, 2012 storm event)*. The property for the Pond and shoreline is wholly owned by the Mariners' Museum and required careful coordination with Museum land use plans and requirements. Portions of the project area have experienced significant erosion over the past decades to the degree that Museum Drive, a City maintained roadway, is in need of protection. The drainage basin and sub basins were delineated and field verified as part of a comprehensive analysis of the watershed.

A Pondpack model of the system using TR-55 methodology was developed and populated with surveyed values for major culverts and weirs to increase the accuracy of the model. **Arcadis recommended the design and construction of a new outlet structure and 36-inch diameter RCP outfall that discharges to the James River.** The proposed outfall structure was designed with a number of low flow orifices to establish additional water quality volume within the Pond while maintaining the existing normal pool elevation. Provisions for traffic control and Contractor haul routes and laydown areas were coordinated with the Museum and included in the plans. The design was carefully coordinated with the design of a constructed Island within the Pond by the Newport News Public Arts Foundation.

During the study phase of the project **Arcadis promoted the use of a living shoreline as an alternative to a rip rap revetment in order to enhance the natural environment, save cost associated with hardened facilities and as compensatory mitigation for the proposed impact associated with the outfall improvements**. Final design documents for the overall project were completed to the satisfaction of the City and the Museum and made use of HRPDC specifications, City standards and Arcadis standard technical specifications. In addition to development of an Erosion and Sediment Control Plan (ESCP) and Stormwater Pollution Prevention Plan (SPPP), Arcadis provided environmental permitting services for both the project, as well as the constructed island through development of a Joint Permit Application.

ARCADIS Design & Consultancy for natural and built assets

ENGINEERING ANALYSIS, DESIGN/BUILD, AND COMPREHENSIVE COMMUNITY ENGAGEMENT PROGRAM

Passaic River, NJ

CLIENT

Confidential Client - Former Chemical Processing Facility

Culminating a long-term and very detailed remedial investigation, risk assessment, feasibility study, and multi-jurisdictional regulatory review, Arcadis successfully designed and implemented a contaminated sediment removal remedy for the Lower Passaic River adjacent to the Ironbound community in Newark, New Jersey. The site contained some of the highest soil and sediment concentrations of dioxins in the world. Phase I of the project was completed in 2012 by constructing a sheet-pile containment wall around the site, dredging 40,000 cubic yards of material, transporting it by slurry through a pipeline to a dewatering facility, and then containerizing it for multi-modal transport for disposal out of state.

The Arcadis in-house Technical Communications team designed a comprehensive community relations strategy and full suite of tools to identify and manage stakeholder engagement and public participation needs before and during the work. Several months before the removal action began, Arcadis worked closely with USEPA and several Federal and State partners to proactively involve the affected communities and Community Advisory Group (CAG) in the decision making process. For example, **Arcadis facilitated CAG/public workshops to design truck routes through sensitive neighborhoods and determine how best to prevent and mitigate impacts from odor, noise, light, and vibration during the work**.

Arcadis also worked closely with USEPA public participation specialists to design and manage a comprehensive complaint management system, including a multi-language hotline and rapid response process to manage impacts to surrounding areas. In addition, Arcadis designed and managed a public outreach website on behalf of USEPA and the entire project team. The website featured interactive maps, news/status updates, and near real-time reporting of monitoring data. Community feedback indicated very favorable appreciation of the weekly reporting of dredging progress and monitoring results ranging from health and safety and construction related parameters to quality of life metrics. Although the project is now complete, the website remains active at: www.passaicremovalaction.com

ARCADIS Design & Consultancy for natural and built assets

PASSAIC VALLEY WATER COMMISSION

NEW STREET RESERVOIR WATER STORAGE AND PUMPING FACILITIES DESIGN, PERMITTING AND CONSTRUCTION ADMINISTRATION SERVICES

PROJECT NO. 16-P-64

2. PROJECT STAFF

2. PROJECT STAFF

Approach To Project Staffing

Arcadis' goal for every project is a fully satisfied client and we understand that the critical element is people. Therefore, we staff our projects so our clients receive excellent technical expertise delivered through a responsive local leadership team.

We recognize that no two clients, projects, or even reservoirs are exactly alike. The project team proposed for this project have directly applicable technical expertise and local knowledge and was assembled to provide:

- An understanding of the PVWC's system gained through previous experience with PVWC projects.
- National experience in the assessment of water storage reservoirs, optimization of distribution systems, development of regulatory compliance programs, and evaluation of cover and treatment alternatives for open reservoirs.
- Effective project management as exhibited through team building, project delivery, and change control procedures.

Arcadis has formed a local team of talented engineers and consultants with extensive technical experience working on similar water storage projects.

Critical Project Team Features Necessary for a Successful Project

Extensive experience in evaluating, selecting, and designing LT2 compliance projects

Relationships and professional qualifications to understand and negotiate future permitting submissions

Knowledge of the regional water supply history, issues and concerns to ensure that PVWC's record of reliability and "a good neighbor" is maintained

Propensity to identify and secure external funding

Familiarity with PVWC's distribution system so MOPO activities can proactively be addressed

Proven ability "to get the job done" with specific, focused roles and responsibilities

Proposed Subconsultants

To complement the in-house expertise of Arcadis, we have brought on several specialty subconsultants whom we have worked with in the past. The experience and qualifications of these firms is described below.

Borbas Surveying and Mapping, LLC

For nearly 30 years, the Borbas Surveying and Mapping, LLC team has built a reputation of integrity, honesty, and accuracy. They supply services to federal, state, and local government entities as well as small-business consultants, engineers, architects, international energy firms, attorneys, and mapping companies.

They are registered with the federal government, as well as being a registered New Jersey Small Business Enterprise and an authorized New York corporation.

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

Converse Consultants

The Converse Professional Group, doing business as Converse Consultants, is a consulting engineering firm that provides Geotechnical Engineering, Engineering Geology, Soils and Materials Testing and Inspection, Environmental Services, Water Resources Management and Occupational and Environmental Health and Safety Services.

Their experienced and dedicated team of professionals partners with clients to provide innovative solutions on projects since 1946.

Oweis ENGINEERING INC.

Oweis Engineering, Inc.

Oweis Engineering Inc. (OEI) is an engineering consulting company that provides geotechnical, environmental and geo-environmental engineering services for various infrastructure facilities including industrial and residential buildings, dams, highways, bridges, tunnels, rail and subway systems, landfills and many other civil engineering facilities.

OEI is a 100% Woman Owned Business Enterprise with SBE, WBE and DBE certifications in New Jersey and New York.

Nasco Construction Services, Inc.

We will utilize a professional cost estimating firm, (Nasco), to obtain real-time feedback on potential cost savings scenarios, ultimately resulting in a continuous process of value engineering implemented throughout the design. Nasco specializes in preparing cost estimates for all design and construction disciplines. They have over 40 years of estimating experience and regularly estimate over 250 projects per year in all areas of construction; including new construction, renovations and rehabilitations of various projects. Their high quality work will keep cost awareness and cost control at the forefront of the design process.

Key Staff

The key to a successful project lies in the experience of the individuals that will be leading the project. We have selected a well-rounded team that is local and brings a variety of discipline-specific experience that will be required under this contract. The following pages present the expertise and qualifications of our project director, project management staff for design and construction, task leaders and other key support staff. ***Resumes are presented at the end of this section.***

Name, Project Role and Bio	Relevant Project Experience
 **John McCarthy, PE, BCEE** **Project Director** Mr. McCarthy's experience includes planning, design and construction of water supply, transmission, treatment, storage and distribution facilities. As he has done for our similar projects for other client, Mr. McCarthy will use his in-depth knowledge of the treatment and storage of water to assist PVWC with understanding how system operations and demand scenarios will be handled under the various alternatives. As Project Director, John will personally ensure that the full resources of the firm are made available to this assignment on a timely basis, as well as maintain responsibility for overall technical quality assurance and quality control.	• Demonstrated ability to deliver large, complex projects on-schedule and under-budget • Commitment to ensuring the right people are available for the project • Extensive experience with reservoir tank and cover projects • Successfully designed and constructed reservoir compliance projects with National Park Service and National Historic Register aspects • Secured financing through NJEIT Loan Program for multiple projects
 **Michael Mondello, PE, PMP** **Project Management, Design Phase / Project Coordinator** Mr. Mondello has been involved with several large-scale potable and reclaimed water projects including the design of reservoir improvements, water distribution systems, pumping stations, and treatment facilities for large multi-year projects. Mr. Mondello has shown his ability to manage large and complex projects to stay within their budgets, identify and incorporate scope changes early, and manage project schedules.	• Demonstrated project management experience on similar water supply projects with specific strengths in risk management, schedule management, document control, quality control and health and safety • In-depth knowledge of design phase project delivery for water clients in NJ including United Water and North Jersey District Water Supply Commission • Over 13 years of management experience with detailed design and regulatory compliance
 **John Orecchio** **Project Management, Construction Phase** Mr. Orecchio has over 20 years of extensive field experience in the operations and maintenance of water and wastewater treatment facilities. This experience includes planning, construction management, start-up, testing, troubleshooting, operator training for multi-million dollar projects, and hands-on testing of computer monitoring and control systems ranging from programmable logic controllers to distributed control systems.	• More than 20 years of extensive field experience • Water treatment facility operation and start-up • Computer and control system testing experience • NJEIT-funded projects

Name, Project Role and Bio	Relevant Project Experience
 **Thomas Husband, PE** **Maintenance of Plant Operations (MOPO)** Mr. Husband has over 40 years of extensive experience in the construction of a variety of public and private projects. His accumulated work experience with consultant engineering firms, general contractors, and specialty subcontractors on technically diverse projects has provided him with expertise in project controls and scheduling to bringing such projects to successful completion.	• Successful track record performing resident observation during construction • Extensive experience coordinating construction activities at operating water and wastewater facilities • Experience working as a general contractor then consultant provides valuable insight to mitigate construction delays • Certified in numerous construction safety practices
 **Brian Farrelly, PE, CCM** **Constructability and MOPO** Mr. Farrelly has extensive experience as a Resident Engineer on large construction projects, including Combined Sewer Overflow (CSO) facilities, water and wastewater treatment facilities, landfills and environmental cleanup projects, and large scale underground utility projects. Mr. Farrelly's responsibilities have included project planning, scheduling, change order negotiation, oversight of construction activities and construction administration.	• More than 25 years of extensive field construction experience at water and wastewater facilities • Oversaw more than 100 construction staff at Croton Water Filtration Plant (Bronx, NY), built completely underground
 **Mark Lenz, PE** **Value Engineering** Mr. Lenz leads the study, design, and construction of water treatment and distribution facilities including, liner systems, floating covers, concrete covers, prestressed concrete tanks, and water treatment plants (both new facilities and rehabilitation upgrades of existing).	• Managing large multi-faceted projects • National expertise developing open reservoir LT2ESWTR compliance • Strong change order record (0.3% on $70 million of construction in last four years) • Design of largest prestressed concrete tanks in NY State • Navigated Highlands Reservoir Project through National Historic Register Approvals process
 **Joanne Iwaskiw** **Value Engineering** Ms. Iwaskiw is experienced in permitting and regulatory compliance. Her project management experience encompasses coordination of environmental assessments, environmental impact statements, siting studies and analyses, and site planning and development.	• Environmental compliance experience with NJDEP, as well as NEPA and USACOE regulations • Proven ability to navigate permitting processes, large and small • National Historic Register success • National Park Service experience

ARCADIS Design & Consultancy for natural and built assets

JOHN MCCARTHY, PE, BCEE

Project Director / Value Engineering

EDUCATION

- BS Civil Engineering, University College Dublin National University of Ireland 1988
- MS Water Resource Engineering, University College Dublin National University of Ireland 1990

YEARS OF EXPERIENCE

- Total - 28

PROFESSIONAL REGISTRATIONS

- Professional Engineer- NJ, NY, PA, VT, MI
- Board Certified Environmental Engineer

PROFESSIONAL ASSOCIATIONS

- American Water Works Association
- Building Officials and Code Administrators International
- Institute of Engineers of Ireland
- International Ozone Association

Mr. McCarthy is a nationally-recognized expert in the field of drinking water supply. He has focused throughout his career on water distribution and treatment. Mr. McCarthy's project management experience includes design and construction in the fields of civil, structural, and environmental engineering. Throughout his career he has focused on the design and construction of water and wastewater supply, transmission, treatment, and distribution facilities.

Project Experience

Basis of Design Report

Passaic Valley Water Commission, Little Falls, NJ

Managed basis of design for upgrade of 75-mgd Little Falls Water Treatment Plant to meet Stage 1/2 D/DBP and IESWTR, expansion to 110 mgd, and development of a 30-year master plan.

Weehawken Reservoir Cover Feasibility Study

United Water New Jersey, Weehawken, NJ

Project engineer for the feasibility study of covering an open 69-MG potable reservoir, or replacing it with a 25-MG prestressed or welded steel reservoir. In addition to many hydraulic considerations, the feasibility study also included preliminary design of a pump station.

Wellfield Facility Plan

Township of Mahwah, Mahwah, NJ

Project Officer in responsible charge for the comprehensive evaluation of Mahwah's existing wellfield/distribution system and the development of recommendations for improvement. This work was undertaken to ensure Mahwah's wellfields continue to meet future New Jersey and federal regulations.

Automation of Water Supply System

New Jersey Water Supply Authority, Somerville, NJ

Project manager responsible for the preparation of a study and report evaluating the feasibility of automation of portions of the Delaware and Raritan Canal water supply system. Work included the evaluation and recommendation of instrumentation and control equipment to provide better control of the system.

MICHAEL MONDELLO, PE, PMP

Project Management Design Phase / Detailed Design-Design Quality Leader / Public Relations Consultant Coordination

EDUCATION

- MBA Business Administration Manhattan College 1999
- BS Civil Engineering Lehigh University 1994

YEARS OF EXPERIENCE

Total - 22

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NY, NJ, FL
- Project Management Professional (PMP) - US
- Envision™ Sustainability Professional - US

PROFESSIONAL ASSOCIATIONS

- American Water Works Association
- Project Management Institute

Mr. Mondello has been involved with several large-scale potable and reclaimed water projects during his career including the design of water distribution systems and treatment facilities, project management for large multi-year projects, and working with various regulatory agencies to acquire permits and approvals. Mr. Mondello has shown his ability to manage large and complex projects from a project controls perspective, managing projects to stay within their budgets, identifying scope changes and incorporating them into the contract early, and managing project schedules so projects are completed within the expected duration. His project management experience also includes regulatory compliance, subconsultant management, document management, quality control, meeting facilitation, constructability, health and safety and risk management.

Project Experience

General Consulting Services

North Jersey District Water Supply Commission, Wanaque, NJ

Project Engineer for a two-year general consulting contract that includes the design of a replacement roof for the Low Lift Pumping Station, improvements to the Waste Wash Water Basin, conveyance of residuals from Equalization Tank 3 (ET3) to the new centrifuge building, a taste and odor control feasibility study, and other assignments. Responsibilities include budget, scope, schedule, and subconsultant management for the contract. Task Manager on the ET3 assignment, coordinating with the Commission and with the Arcadis design team.

Hillview Reservoir Concrete Cover Design

New York City DEP, Yonkers, NY

Deputy Project Manager on the project team to design a permanent concrete cover over the 90-acre Hillview Reservoir. Responsibilities included coordinating the design team with the team developing the Environmental Impact Statement (EIS), mainly AKRF, and performing a preliminary constructability assessment of the project. The concrete cover design consisted of a reinforced concrete topping slab cast above precast double-tee beams. The double-tee beams would span in the north-south direction. The double-tee beams would be supported by precast inverted-tee girders at the interior spans and spandrel beams at expansion joints. The inverted-tee girders would be supported by precast columns spaced on a 45-foot by 45-foot grid. Along the perimeter of

JOHN ORECCHIO

Project Management Construction Phase

EDUCATION

- AS Engineering Science Passaic County Community College 1989

YEARS OF EXPERIENCE

Total - 30

PROFESSIONAL REGISTRATIONS

- 40-hour Hazardous Waste Operations Emergency Response Certification
- Certified Construction Documents Technologist (CDT)

PROFESSIONAL TRAINING

- Confined Space Entry Training

Mr. Orecchio has 30 years of extensive field experience in the operations and maintenance of water and wastewater treatment facilities. This experience includes planning, construction management, start-up, testing, troubleshooting, operator training for multi-million dollar projects, and hands-on testing of computer monitoring and control systems ranging from programmable logic controllers to distributed control systems.

Project Experience

Combined Sewer Overflow Screening Facility

City of Newark, Newark, NJ

Provided inspection services for construction of the $10 million Rector/ Saybrook CSO screening facility built under a NJDOT Contract for reconstruction of NJ Route 21. Provided on-site Construction Management Services, including: project oversight, being the main point of contact with the owner; maintaining the Engineer's Field Office; process and review shop drawing submittals; process, review, and respond to Requests For Information; process and recommend action for contractors' payment requests; held monthly progress meetings; coordinated training of owners' personnel; and inspected and approved all construction.

Various Projects

Township of Mahwah, Mahwah, NJ

- Provided construction management and inspection services for numerous projects, including:
- Water Main Upgrades: Provided supervision of personnel providing inspection services for the construction of water main upgrades throughout the Township.
- Water Main Construction: Provided ACAD drafting services for the preparation of contract drawings for the construction of a 12" water main.
- Water and Sewer Infrastructure: Provided inspection services in the capacity of Utility Engineer for the Township for water and sewer infrastructure construction.
- Water Storage Tank Construction: Provided inspection services for the construction of a 3.0 million-gallon, precast, pre-stressed water storage tank.

Justin D. Mahon, PE, BCEE

Value Engineering / Permitting & Approvals Task Leader

EDUCATION

- AB-Sc Engineering, Urban Studies, Brown University, 1973
- MS, Civil Engineering, New Jersey Institute of Technology, 1977

YEARS OF EXPERIENCE

- Total - 43

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NJ
- Board Certified Environmental Engineer (BCEE)

QUALIFICATIONS

- QUAL2E (Water Quality Model)
- Small Wastewater Systems, Innovative/ Alternative Wastewater Technologies

PROFESSIONAL ASSOCIATIONS

- American Academy of Environmental Engineers
- American Society of Civil Engineers
- American Water Works Association, Member NJAWWA Water Utilities Council
- Authorities Association of New Jersey, Member Water Committee
- North American Lake Management Association
- Water Environment Federation

Mr. Mahon has more than 40 years of experience in the planning, design, construction, start-up and opertion of water and wastewater facilities most of which were in New Jersey. He is active in the AWWA New Jersey Section including as a member of the Water Utilities Council. His experience relevent to permitting services for PVWC's New Street Reservoir and Pumping Facilities.

Project Experience

Wastewater Service Consulting

Alpine 3 L.L.C., Alpine NJ

Project manager providing owner's agent services regarding regulations, agency requirements and other aspects of obtaining approval of wastewater services for a land development project. Provided planning board testimony and expert testimony in New Jersey Superior Court regarding the project.

Special Consulting

Bergen County Utilities Authority, Little Ferry, NJ

Provided advice during discharge permit negotiations with the state regulatory agency.

Drainage Investigation

Borough of Westwood, Westwood, NJ

Investigations for planning board testimony regarding the potential flooding impacts of a commercial development.

Wastewater Facilities

Brass Castle, LLP, Washington Township (Warren County), NJ

Project Manager for services including securing permits for a system serving a shopping center.

Multi-disciplinary Permitting Efforts

Confidential Client, New Jersey

Managed multi-disciplinary permitting efforts to enable cleanup of a contaminated site by an industrial client.

FRANK BELARDO

Resident Observation

EDUCATION

- BS, Civil Engineering, Stevens Institute of Technology

YEARS OF EXPERIENCE

Total - 3

PROFESSIONAL CERTIFICATIONS

- Pipeline Assessment Certification Program (PACP)

Mr. Belardo is a project engineer in Arcadis' Northeast Water Business Line. His experience includes construction engineering, assessment and design work on water, sewer and CSO projects in New York and New Jersey. He also has field experience where he was the lead investigator in determining the conditions of sewers and an inspector on several municipal engineering projects.

Project Experience

Tide Gate Study Conceptual and Final Design

Passaic Valley Sewerage Commission, Newark, NJ

Served as a field engineer in the inspection and oversight of tide gate installations on the Passaic River. The work includes the demolition, rehabilitation and replacement of tide existing tide gates in Paterson, NJ.

Epa Reports, Discharge Reports, and Monthly Pvsc Coordination

Jersey City Municipal Utilities Authority, Jersey City, New Jersey

Provided engineering services to comply with ordinances in regards to the discharge of combined sewer outfalls. Responsibilities included interpreting rainfall model results and completing Discharge Monitoring Reports (DMR) on a monthly basis as required by the New Jersey Pollutant Discharge Elimination System (NJPDES) CSO permit.

Phase VI and VII Sewer Capacity Study

Jersey City Municipal Utilities Authority, Jersey City, NJ

Provided engineering services which utilized the Pipeline Assessment Certification Program (PACP) to evaluate the condition on combined sewers. Responsibilities included review and assessment of sewer videos to determine appropriate rehabilitation measures.

Phase V Sewer Rehabilitation Design Services

Jersey City Municipal Utilities Authority, Jersey City, NJ

Provided engineering services which included quantity take-offs, developing an engineer's opinion of cost estimate, development and review of project specifications, engineering planning services and design drawing review. The work includes the demolition and replacement of existing sewers in urban, residential streets of Jersey City, NJ.

ARCADIS Design & Consultancy for natural and built assets

EUGENE BOESCH, PHD

Cultural Resources

EDUCATION

- BA Anthropology New York University 1978
- MA Anthropology/ Archaeology New York University 1980
- MPH Anthropology/ Archaeology New York University 1985
- PhD Anthropology/ Archaeology New York University 1994

YEARS OF EXPERIENCE

Total - 36

PROFESSIONAL REGISTRATIONS

- Engineer in Training
- Certification in Archaeological Field Research
- Certification in Teaching Archaeology
- Qualified Archaeological Consultant

PROFESSIONAL TRAINING

- Aerial Photographic and Other Photography Techniques for Archaeological Investigation
- Historic Preservation at the Community LevelRemote Sensing Techniques in Archaeological Investigations
- Remote Sensing Techniques in Archaeological Investigations

Dr. Eugene Boesch is the Arcadis principal investigator for cultural resource investigations in the Eastern and Midwestern United States. He has a Ph.D. in Anthropology specializing in Pre-Contact period, Historic period, and Industrial archaeology, the types of resources most commonly encountered in the area. He also has conducted or supervised Historic American Engineering Record Surveys for numerous industrial complexes at superfund sites in New York and New Jersey. Dr. Boesch meets or exceeds the Secretary of the Interior's standards for conducting cultural resources investigations, having over 35 years experience conducting all levels of archaeological investigations, particularly in the New Jersey – New York area including 20 years experience undertaking cultural resource work at regional superfund and other industrial sites. He has supervised all phases of archaeological investigation for federal, state, and local governments as well as for private clients. His years of experience has resulted in the development of excellent, long term professional working relationships with regional SHPO and THPO allowing for easy compliance with regulations without project delays. He is fully supported by Cultural Resource/Historic Preservation specialists engaged as needed to work on projects, including industrial historians, HABS/HAER/HAL – level photographers, and other historic preservation specialists.

Project Experience

City Cemetery

City of Newark, Newark, NJ

Principal Investigator. Stage Ia archaeological investigation.

Cornell-Dubilier Superfund Site

OFA - Kansas City District, South Plainfield, NJ

Project Coordinator of Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) recordation of historically significant properties at the site.

Environmental Assessment for Rehabilitation/ Replacement of the Woodland Avenue Viaduct

Westchester County Department of Planning, White Plains, NY

Completed a Stage Ib archaeological investigation of the Bronx River Parkway Reservation corridor, as well as Stage II and III work to recover

JAMES M. CALLAHAN, PE

Mechanical Systems

EDUCATION

- MS Environmental Engineer Manhattan College 1990
- BS Mechanical Engineer Manhattan College 1986

YEARS OF EXPERIENCE

- Total - 30

PROFESSIONAL REGISTRATIONS

- Professional Engineer-NY
- LEED Accredited Professional

PROFESSIONAL ASSOCIATIONS

- American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- United States Green Building Council

Mr. Callahan specializes in the design and engineering of heating, ventilating, and air conditioning (HVAC) systems. He is experienced in design of heating systems with steam, hot water, oil, gas, and electricity, as well as central air conditioning systems, forced air systems, fan coil systems, chilled water refrigeration systems, heat recovery systems, and industrial ventilation and exhaust systems. He is responsible for air filtration, temperature and humidity control, corrosion, and water treatment. Mr. Callahan has designed fire protection employing wet sprinkler systems, aqueous film-forming foam (AFF) systems, and other clean agent fire protection systems.

Project Experience

Materials Recovery Facility Upgrade

Westchester County, Yonkers, NY

Lead Mechanical Engineer responsible for investigating the feasibility of replacing the existing commingled process system with a modernized system. Reviewed facility "as-built" drawings and proposed equipment layouts to identify ductwork, fire protection sprinkler and plumbing and drainage piping interferences. Developed a conceptual design and construction cost estimate for addressing these conflicts. A site visit was conducted to validate the conceptual design.

County Environmental Information Center

Essex County, Roseland, NJ

Responsible for mechanical design components and systems within the center. Applied US Green Building Council USGBC LEED design process and packaged the design for submission for accreditation.

Coney Island Wastewater Treatment Plant

New York City DEP Bureau of Water Supply, Brooklyn, NY

Mechanical design included the addition of four dual-bed carbon adsorbers, ducted in parallel to provide additional secondary treatment to the facilities existing wet-scrubber systems. Each of the adsorbers and fan systems is sized for approximately 15,000 cfm. The design includes carbon adsorbers, FRP transfer fans, ductwork, and controls.

RICHARD CARDAZONE, PE, BCEE

O&M / Start Up & Training

EDUCATION

- MS, Environmental Science, Rutgers University 1982
- BS, Environmental Science, Rutgers University 1981
- Course work in engineering, New Jersey Institute of Technology

YEARS OF EXPERIENCE

Total - 33

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NY
- Board Certified Environmental Engineer
- WW Trmt Plnt Oper - Class 4 - New Jersey, NJ

PROFESSIONAL ASSOCIATIONS

- New Jersey Water Environment Association, Member
- New York Water Environment Association, Member
- Water Environment Federation, Member
- American Water Works Association, Member

Mr. Cardazone specializes in wastewater treatment plant startup, operations, and training, having started and commissioned some of the largest water and wastewater facilities in the U.S., with particular emphasis on troubleshooting biological treatment processes. He also has experience in facility maintenance management, industrial pretreatment, wastewater regulations, laboratory operation, and collection system operation and maintenance.

Project Experience

On-Line O&M Manual Phase 2

Bergen County Utilities Authority, Little Ferry, NJ

Developed an on-line O&M Manual for the entire plant and collection system. Developed / updated content, scanned equipment manuals, developed process schematics, and incorporated scanned and electronic engineering drawings. Based on Arcadis' database-driven information access system (IAS) platform.

Coney Island WWTP Information Access System/O&M

New York City DEP, Brooklyn, NY.

Project manager for a multimedia information access system (IAS) for the Coney Island wastewater treatment facility. The project includes network improvements, web-based reference system, electronic O&M manual, and electronic document management system.

Startup and Operations Services for the Wards Island Water Pollution Control Plant

New York City DEP, Randalls Island NY

Lead the startup planning, testing, training, and O&M documentation for a series of complex systems, including two remote grit / screening facilities, sludge thickening systems, and a full BNR upgrade to the aeration system. Critical issues involve unit and system performance, project milestones, resource-limited owner staff, and interproject coordination. Services / deliverables include startup plans, startup assistance, supplemental operations support, system O&M manuals, system training, SOP development and training, and equipment field testing and troubleshooting.

ARCADIS Design & Consultancy for natural and built assets

DAVID CRAWFORD, RA, LEED AP

Architectural

EDUCATION

- BS Architecture Catholic University of America 1983

YEARS OF EXPERIENCE

Total - 33

PROFESSIONAL REGISTRATIONS

- Professional Architect - NY, VA, TX, AZ
- Leadership in Energy and Environment - NY

PROFESSIONAL ASSOCIATIONS

- United States Green Building Council

Mr. Crawford's portfolio of design and construction projects include water and wastewater treatment facilities, office buildings, laboratories, visitors' centers, maintenance facilities, pumping stations, transfer stations and sustainable building designs as well as renovations, alterations, and additions associated with each of these project types. His project responsibilities include programming and project planning, design and specification development, technical oversight, quality control and coordination, constructability/bidability reviews and value engineering. He has experience in evaluating existing buildings and performing site inspections. As the technical leader of the architectural group he is responsible for the development of architectural concepts and establishing the technical approach for architectural projects nationwide. He is also responsible for the development and maintenance of the architectural design process procedures, the architectural standard specification program, and the architectural quality assurance/quality control program.

Project Experience

Central Monitoring Building at Hillview Reservoir

New York City DEP BEDC, Yonkers NY

Architect in Charge for the design of a sustainably designed three story, 34,000 square foot, multi-purpose building nested in the south embankment of the Hillview Reservoir. The building will house the Department of Environmental Protection (DEP) Police, Water Quality Laboratories and the Bureau of Water and Sewer Operations and their respective offices, laboratories, personnel facilities, conference rooms, storage areas, monitoring and control room and lunch room. All the secure spaces are connected by a common vertical circulation core accessed by the first floor multi-story lobby. Responsibilities included design quality leader for all design disciplines and sub-consultants, administer of the Leadership in Energy and Environmental Design (LEED) certification process and oversight of compliance with the Design Quality Management Manual baseline requirements.

Upgrading of Watershed Wastewater Treatment Plants

New York City DEP, NY.

Architect in Charge for the design and construction of three wastewater treatment plants that were constructed at Grand Gorge, Pine Hill, and Tannersville. The architectural challenge for Tannersville and Grand

KORI DONISON

Construction Administration/Office

EDUCATION

- BS Environmental Engineering Science, Massachusetts Institute of Technology, 2003
- M.Eng Civil Engineering, Environmental and Water Studies Track, Massachusetts Institute of Technology, 2004

YEARS OF EXPERIENCE

Total - 12

PROFESSIONAL REGISTRATIONS

- Fundamentals of Engineering
- Certified Construction Documents Technologist

Ms. Donison has provided technical assistance on a variety of water and wastewater projects. Field experience includes MS4 outfall mapping, outfall pipe inspection, illicit connection testing, industrial pretreatment sample collection, and field verification of as-built drawings. Technical capabilities include sewer system modeling using XP-SWMM and PCSWMM, GIS mapping and data preparation, WATER CAD modeling and time-of-arrival dye test data analysis. Regulatory familiarity includes the New Jersey stormwater regulations.

Project Experience

System-Specific Initial Distribution System Evaluation (IDSE)

Passaic Valley Water Commission, Passaic, NJ

Combined three distribution system models using GIS and calibrated the resulting WaterCAD/WaterGEMS model using existing system operations data.

Engineering Services for Work Associated with Commission Owned Pipelines

North Jersey District Water Supply Commission, NJ

Currently working with a team to prepare for condition assessment of features throughout NJDWSC's system. Work includes processing information from the client to determine which assets will be investigated, developing a database to store condition assessment information, and reviewing as-built drawings. A model of NJDWSC's system will be constructed using GIS data representing the system. Bentley's WaterGEMS software has been selected for model construction.

Water System Improvements

Manchester Utilities Authority, Haledon, NJ

Developed a distribution system model representing the Manchester Utilities Authority's system using Bentley's WaterGEMS software. The model consisted of five pressure zones, several booster stations and larger pump stations, and four tanks. Demand data from the MUA's billing system was geocoded and assigned to the corresponding sections of the model. The model was used to determine areas of high and low pressure to aid in the development of a capital improvement plan.

BRIAN FARRELLY, PE, CCM

Constructability and MOPO

EDUCATION

- BS Civil Engineering Columbia University 1989
- ME Environmental Engineering Manhattan College 1994
- ME Construction Management Columbia University 2010

YEARS OF EXPERIENCE

Total - 27

PROFESSIONAL REGISTRATIONS

- Professional Engineer NY
- Certified Construction Manager (CCM)
- Certified Construction Documents Technologist (CDT)

Mr. Farrelly has extensive experience as a Resident Engineer on large construction projects, including CSO facilities, water and wastewater treatment facilities, landfills and environmental cleanup projects, and large scale underground utility projects. Mr. Farrelly's responsibilities have included project planning, scheduling, change order negotiation, oversight of construction activities and construction administration. For the past ten years, he has worked exclusively on New York City Department of Environmental Protection projects as Resident Engineer. Mr. Farrelly has extensive experience with permit tracking for New York City/State agencies including FDNY, NYCDOB, NYCDEP, and NYSDEC.

Project Experience

Croton Water Filtration Plant

New York City DEP, Bronx, NY.

Currently serving as resident engineer on this $2.8 billion dollar new construction of a 290-mgd facility. It is a Dissolved Air Flotation plant which includes the installation of over 100 water treatment process pumps, seventy chemical tanks and feed systems, twenty UV disinfection units, 108 flocculators/mixers, a new 13.2 kV electrical service and many other electrical, HVAC and plumbing systems. This project has several complex construction issues including management of five Wick's Law contracts, construction of the entire plant below grade, limited site access and staging areas, utility installation in city streets and coordination with NYC Park Department and MTA, complex community relation issues and construction of a 400,000 square foot green roof above the entire plant. Manages the resident engineering staff of over 75 full time employees as well as other sub-consultants. Is the direct point of contact for the NYCDEP on all construction related matters.

Spring Creek Auxiliary Water Pollution Control Plant Upgrade

New York City Department of Environmental Protection, Brooklyn, NY.

As the resident engineer, worked with a staff of ten people to perform all construction management and administrative responsibilities on the $90 million dollar upgrade of an existing combined sewer overflow (CSO) facility. The project included a new odor control building, existing

ARTHUR FERNANDEZ

Resident Observation

EDUCATION

- BS Civil Engineering New Jersey Institute of Technology 2005

YEARS OF EXPERIENCE

Total - 11

PROFESSIONAL REGISTRATIONS

- Fundamentals of Engineering - NJ
- Construction Documents Technologist

PROFESSIONAL TRAINING

- CM's Liability for Construction Safety
- CPR
- Catalyst 102 - Primevara P6 CPM Scheduling training
- Confined Space Entry Training
- Fall Protection Training
- First Aid
- Implementing Safety in a National Multi-Site Environment #CM845
- OSHA 10hr Training
- Construction Safety 10 Hr
- Confined Space Entry

PROFESSIONAL ASSOCIATIONS

- ASCE North Jersey Branch
- New York Water Environment Association

Mr. Fernandez is experienced in administration and inspection of a variety of infrastructure construction projects in the New York Metropolitan Area. Experience includes contract administration and inspection for the following types of projects: Installation of water mains and sewer extensions, construction of drinking water pumping and storage facilities, construction of advanced wastewater treatment plants and construction of combined sewer overflow screening facilities. He has also recently assisted New York City DEP with scheduling and delay analysis for several significant construction contracts. Typically, Mr. Fernandez's work includes addressing all correspondence from the client and contractor, estimating and negotiation of change orders, processing of payments, inspection, and construction management and keeping a current project website.

Project Experience

Sheldon Avenue REI

New York City Department of Design and Construction, Staten Island, NY

Senior Inspector for the $48 Million Sheldon Avenue REI Contract for DDC. Will oversee three inspectors and a DDC intern. Contract includes water main installations and relocations, sanitary and storm sewer installations and construction of a "best management practices" stormwater management system which is part of Staten Island's "Bluebelt".

Construction Administration-Well 7, Tank, & Main

East Windsor Municipal Utilities Authority, East Windsor, NJ

As Resident Engineer, provided the main communication link between East Windsor, the contractors, NJDEP and the design team. Managed RFI's, change orders, submittals, payment requests, and inspected the work. A separate contractor was used for each of the three portions of work, requiring extensive field coordination to provide seamless integration of the project elements through start up and SCADA operation. This project utilized an electronic document management system whereby all correspondence, shop drawings, schedules, and construction documents were uploaded to a project website for tracking and use by multiple parties.

RICHARD GILMOUR, AICP, PP

Site Plan Approvals

EDUCATION

- MS, Planning, Ohio State University- Main Campus, 1984
- BS, Anthropology, Ramapo College of New Jersey, 1979

YEARS OF EXPERIENCE

Total - 32

PROFESSIONAL REGISTRATIONS

- Certified Planner – (AICP)
- Licensed Planner (NJ)

PROFESSIONAL ASSOCIATIONS

- American Planning Association
- National Association of Environmental Professionals
- American Institute of Certified Planners

Mr. Gilmour has more than 32 years of experience in managing assessment and permitting of infrastructure projects. His experience includes coordinating environmental impact studies, permit application packages, projecting and analyzing population and employment data, conducting land use, socioeconomic, visual impact, and other analyses for major infrastructure projects. Prior to joining Arcadis, Mr. Gilmour completed numerous environmental assessments for projects throughout New York.

Project Experience

Cross River and Croton Falls Pump Stations

New York City DEP Bureau of Water Supply, Carmel, NY.

Task Leader responsible for managing the acquisition of more than 30 regulatory approvals and permits for reconstruction of the existing 27 MGD and 60 MGD pumping stations at the Cross River Reservoir and Croton Falls Reservoir, respectively The Cross River and Croton Falls pumping stations were designed to transfer water from the Croton Reservoir System to the Delaware Aqueduct System by discharging water into Kensico Tunnel shafts 13 and 11, respectively. Permits were successfully acquired from State and local agencies, including the following: NYSDOH, NYSDEC, NYC Art Commission, Towns of Carmel, Bedford and Somers. The success of the permitting program was due, in part, to extensive coordination between the design team, DEP, State and local regulatory officials and the development of a regulatory compliance strategy plan that guided the team throughout the process. A permit tracking list also allowed the team to keep track of the status of permit applications on a monthly basis and be proactive in addressing potential issues.

Delaware Aqueduct Shaft 6 Improvements, Construction Phase

New York City DEP, New York, NY.

Advised client on requirements for compliance with applicable federal, state, and local laws and regulations related to impacts on water quality, air quality, and noise from reconstruction of shafts of the Delaware Aqueduct.

THOMAS HUSBAND, PE
MOPO

EDUCATION

- BCE Civil Engineering Manhattan College 1975
- MEng Environmental Civil Engineering Manhattan College 1980

YEARS OF EXPERIENCE

Total - 41

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NY

PROFESSIONAL ASSOCIATIONS

- Construction Management Association of America

Mr. Husband has extensive experience in the design and construction of a variety of public and private projects. He has worked as the overall construction project director of large industrial projects as well as design engineer for a major environmental consultant. His accumulated work experience with consultant engineering firms, general contractors, and specialty subcontractors on technically diverse projects has provided him with expertise in project controls and scheduling to bringing such projects to successful completion.

Project Experience

Sheldon Avenue REI
New York City Department of Design and Construction, Staten Island, NY

Resident Engineer for the $48 Million Sheldon Avenue REI Contract for DDC. Directing a staff of six to oversee the project. Contract includes water main installations and relocations, sanitary and storm sewer installations and construction of a "best management practices" storm water management system which is part of Staten Island's "Bluebelt".

Odor Control Design
Nassau County Dept. of Public Works, Nassau County, NY

Performed construction cost and constructability evaluation for installation of proposed odor control work. This included site visits – development of construction schedule and sequence of work due to project site limitations and maintain plant operations.

Flushing Bay CSO, CS-4-4 Combined Sewer Overflow Retention Facility
NYCDEP, Flushing, NY

Construction manager for $160 million project. Responsible to manage contractors in the construction of a major CSO Facility for the NYCDEP. Responsible for the scheduling and coordination of four prime contractors.

JOANNE IWASKIW

Value Engineering

EDUCATION

- BS Mechanical Engineering Manhattan College 1989

YEARS OF EXPERIENCE

Total - 26

PROFESSIONAL REGISTRATIONS

- Engineer in Training

Ms. Iwaskiw is experienced in permitting and regulatory compliance for environmental projects, including coordinating Environmental Impact Statements (EIS) and Environmental Assessments (EAS) in accordance with National Environmental Policy Act (NEPA), Connecticut Environmental Policy Act (CEPA), State Environmental Quality Review Act (SEQA), City Environmental Quality Review (CEQR). Her expertise includes acquisition of Federal, State, and Local permits and processing of application packages, and other analyses for major solid waste, wastewater, water, utility, and hazardous waste projects. Her project management experience encompasses coordination of environmental assessments, environmental impact statements, siting studies and analyses, and site planning and development. She has unsurpassed experience working with key Federal, State, and NYC and Local regulatory stakeholders coordination. She was the key leader in developing the New York City Department of Environmental Protection (NYCDEP) - Permit Tracking Database and regulatory Compliance Plans incorporated into NYCDEP Project Delivery Manual (PDM) used as guidance by NYCDEP and consultants to monitor, track, and measure compliance performance during design, construction, and operations.

Project Experience

Delaware Aqueduct Rondout-West Branch Tunnel and Shaft Rehabilitation Project

New York City DEP, Putnam and Ulster Counties, NY.

Responsible for the preparation of the Environmental Assessment Form in accordance with New York State's State Environmental Quality Review (SEQR) Act and acquisition of regulatory approvals and permits for the Rondout-West Branch Tunnel and Shaft rehabilitation project of the Delaware Aqueduct, a key part of the New York City water supply system. The project includes site improvements at several shaft locations required to respond to a tunnel emergency and in preparation for the planned tunnel repair. The assessment includes an analysis of impacts on wetlands, fisheries, endangered species, sediments, tree removal, benthic and plankton resources, and water quality; and construction-related issues like noise, traffic, air, odor, and others. Permits will be acquired from federal, state, and local agencies, including the U.S.

LAUREN KELLEY

Environmental Reviews/Land Use Permitting

EDUCATION

- BS, Environmental Science - Ecology, University of Illinois at Urbana-Champaign, 2006

YEARS OF EXPERIENCE

Total - 10

PROFESSIONAL REGISTRATION

- OSHA 40-Hour HazWOPER (8-2007) & OSHA 8-Hour HazWOPER Refresher (12-2013)
- Waypoint Technology Group Certification in GPS Mapping with TerraSync Professional, Pathfinder Office, and Trimble GeoXT and GeoXH GPS Units (5-2007)
- Rutgers University Cook College (New Brunswick, NJ) Wetland Delineator Certification Program (6-2007)
- Ecological Society of America

Ms. Kelley has experience with preparation of environmental assessment statements, biological assessments, wetland delineation reports, and land use and environmental permit applications for federal agencies and state and local agencies in the northeast region. Ms. Kelley has experience with natural resource inventories, including wetland delineations and biological surveys, freshwater and marine macrobenthic invertebrate sampling, and submerged aquatic vegetation surveys. Ms. Kelley's experience includes development of regulatory compliance management documents and tracking of permitting requirements during design and construction phases of projects.

Project Experience

Edgewater Plant Outfall Extension

Bergen County Utilities Authority, Little Ferry, NJ

Completed the regulatory compliance requirements for project activities associated with construction of an outfall extension into the Hudson River. Prepared and submitted federal, state, and local permitting documents, including applications for an US Army Corps of Engineers Individual Permit; National Marine Fisheries Service Essential Fish Habitat Assessment, NJ Department of Environmental Protection Waterfront Development Individual Permit, State Water Quality Certificate, Acceptable Use Determination, Tidelands Utility License, and a NJ State Pollutant Discharge Elimination System Surface Water Individual Permit; and Borough of Edgewater Site Plan Approval. Assisted with the planning documentation to meet the requirements of NJ Environmental Infrastructure Trust funding, including preparation of a Level 2 Environmental Review and public hearing advertisement.

Ford Well Field

Township of Mahwah, Mahwah, NJ

Supported field efforts and permitting requirements for a municipal water system improvement project. Completed wetland and steam bank delineations and prepared applications for and obtained NJ Department of Environmental Protection Division of Land Use Regulation Freshwater Wetlands General Permits and Flood Hazard Area Individual Permit. Assisted with identification and design of a mitigation site to offset permanent losses to forested riparian zone.

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RYAN KOWALSKI, PE

Instrumentation & Controls

EDUCATION

- BS Electrical Engineering Hofstra University NY 1995

YEARS OF EXPERIENCE

Total - 20

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NY, CT, MA, VA
- RAM-W
- ControlLogix Advanced Certification

PROFESSIONAL ASSOCIATIONS

- Water Environment Federation
- New York Water Environment Association

As a professional engineer (Control Systems) licensed in NY, CT, MA and VA, Mr. Kowalski is responsible for project and program management, design and construction supervision of SCADA, instrumentation and automation systems for wastewater and water treatment systems. As part of control system design delivery, he has performed either quality control reviews or led discipline design teams for over 40 different projects, ranging from small telemetry systems to SCADA installations for large, urban treatment plants. His focus is on process control automation evaluation and design, telemetry and network design, configuration, evaluation of instrument systems, system startup commissioning, and training of operators on automation systems.

Mr. Kowalski was the lead control systems engineer for the award-winning Arlington County Water Pollution Control Plant Phase 7A and 7B Upgrades (VA), which won the Association of Civil and Environmental Engineers' (ACEE) highest distinction for design (Design Grand Prize Award) in 2011. Mr. Kowalski is also currently a Water Environment Federation Automation of Resource Recovery Facilities Task Force Member.

Project Experience

Site Security Improvements

Passaic Valley Water Commission, Little Falls, NJ

Assessed need and developed specifications and drawings for fence intrusion detection system, video surveillance equipment, central monitoring control station, electronic access control system, proposals for vehicle restraint system, and infrared perimeter motion detection system.

Oxygenation Basin Improvements

Passaic Valley Sewerage Commissioners, Newark, NJ

Design for oxygenation system retrofits. Site assessment of existing conditions, evaluation report, and requirements for upgrades to automated oxygenation system controls. Developed design for improvements to aerators and oxygenation tanks. Instrumentation design lead, including startup support.

MARK LENZ, PE

Value Engineering / Water Storage Facilities

EDUCATION

- MS, Environmental Engineer, Cornell University, 1996
- BS, Environmental Engineer, Cornell University, 1995

YEARS OF EXPERIENCE

- Total - 20

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NY

Mr. Lenz is considered an industry expert in regards to large finished water storage facilities having worked on the study, design, and construction of more than 18 such facilities totaling over 1.6 billion gallons. On these projects he has developed operational and capital improvements to achieve regulatory compliance, improve water quality, reduce maintenance, and increase operational flexibility while meeting aggressive schedules and stringent budgetary constraints. He also has a long history of working for NYCDEP at the Hillview Reservoir site and other portions of the Water Supply System.

Project Experience

Reservoir and Water Quality Improvements Program

City of Rochester Department of Environmental Services, Rochester NY

Principal-in-charge and Project Manager for the design and construction of improvements at the City of Rochester's 26-MG Highland Reservoir, 66-MG Rush Reservoir, and 144-MG Cobbs Hill Reservoir. As part of the City's overall LT2ESWTR and NYS Dam Safety compliance approach led the design and implementation of structural, mechanical, electrical, and building improvements. The project included lining Highland Reservoir and installation of bird wires and sonicators to maintain water quality in the open reservoir; floating cover and liner at Rush Reservoir and associated mechanical and dam safety improvements; structural and mechanical improvements at Cobbs Hill Reservoir which will also remain as an open reservoir after project completion.

Hillview Reservoir LT2ESWTR Compliance

New York City DEP, Yonkers NY

Project Manager for a detailed alternatives evaluation for achieving LT2ESWTR compliance at NYCDEP's 90-acre, 900-MG Hillview Reservoir. Evaluated water quality and construction impacts of implementing floating cover, fabric cover, aluminum cover, and concrete cover alternatives. The evaluation including capital cost estimates and life cycle analyses were subject to independent reviews by both a Technical Advisory Committee (TAC) and Value Engineering (VE) team.

ROBERT LEPSIC

Stream Restoration

EDUCATION

- BS in Biology, Clarion University of Pennsylvania, 1991
- Aquatic Insect Collection Protocols Workshop, NC Division of Water Quality, 2001
- River Restoration and Natural Channel Design, Wildland Hydrology, 2001
- Applied Fluvial Geomorphology, Wildland Hydrology, 1998
- River Morphology and Applications, Wildland Hydrology, 1999
- River Assessment and Monitoring, Wildland Hydrology, 1999
- Basic Wetland Delineation, Wetland Training Institute, Inc., 1996

YEARS OF EXPERIENCE

Total - 20

Robert Lepsic has over 20 years of experience in the environmental field. While with Arcadis, Mr. Lepsic has conducted numerous stream and wetland delineations, assessments, restoration feasibility studies and developed restoration plans for nearly 8 miles of stream and over 200 acres of wetlands. His stream assessments and restoration designs utilize natural channel design methodology developed by Dave Rosgen. Mr. Lepsic is also well versed in natural resource investigations, including wetland and stream delineations, natural community assessments and endangered species surveys. He has conducted the natural resources investigations all through the south east. The information collected was used to prepare 401/401 permit applications and/or used to prepare NEPA documents.

Project Experience

Pocoshock Stream Restoration

Chesterfield County, Chesterfield, VA

Responsible for the design of 5,000 linear feet of urban stream. The project was prompted by the Chesapeake Bay Total Maximum Daily Loads (TMDL) requirements to reduce TSS, nitrogen and phosphate loading in the watershed. Existing conditions were surveyed and evaluated to determine the current nutrient loading. Areas that were contributing the highest amount of nutrients were identified by calculating bank erosion rates for the reach. Restoration and stabilization practices were focused on these areas. However, a holistic approach was taken to restore and stabilize the entire reach.

Long Branch Stream Restoration

CSXT, Greenville, SC

Conducted stream surveys for the development of a restoration plan for 1,200 feet of urban stream. Stream surveys included the identification and recording of the stream thalweg, water surface, bankfull and top of bank. A topographic survey of the surrounding area was also performed. Additional stream surveys included bankfull identification and verification using regional curves, pebble counts, geometry measurements, bank erosion estimates and vegetation inventories. Performed annual post construction performance monitoring surveys and analysis for the 5 year monitoring period. Monitoring included the collection and analysis of all field data and preparation of annual monitoring report.

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LAILANI METZLER

O&M

EDUCATION

- BS Environmental Engineering Rutgers University 1996

YEARS OF EXPERIENCE

Total - 21

PROFESSIONAL REGISTRATIONS

- Engineer in Training - NJ
- Certified Process Hazard Analysis Team Leader
- Construction Documents Technologist - NY

Ms. Metzler has a diverse background in water and wastewater facility operations and management, including operations and maintenance best practices assessments, operations and maintenance documentation both paper-based and web-based, field inspection of process operations and equipment condition, facility startup, operator training, and implementation of facility computerized maintenance management systems (CMMS). Her experience encompasses long-term strategic planning for asset management and operation optimization. Ms. Metzler has also assisted utilities to implement several regulatory mandated programs such as the Environmental Protection Agency's (EPA) Comprehensive Management, Operation and Maintenance (CMOM) Program for buried infrastructure, EPA's Risk Management Programs and the Occupational Safety and Health Administration's (OSHA) Process Safety Management program for hazardous substances, and Emergency Response programs.

Project Experience

On-Line O&M Manual

Bergen County Utilities Authority, Little Ferry, NJ

Managed task for the design and development of a multimedia Information Access System IAS for the wastewater treatment plant. Project included the development of operation and maintenance information for the new sodium hypochlorite facilities, the implementation of an electronic document management system, and staff training of the overall information system use and update. Conducted an extensive evaluation of the utilitys Computerized Maintenance Management System CMMS. The current CMMS was compared to "industry best practices" and reliability centered maintenance RCM methodology to develop and document recommendations that will help the utility align current needs with future CMMS improvements.

On-line O&M Manual and Maintenance Management System

City of Norwalk, Norwalk, CT

Managed task for the design and development of an online operations and maintenance (O&M) manual for the Norwalk Water Pollution Control Facility following the 1995-1996 Expansion and Upgrade Project. The

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GREG MOORE, PE
Electrical

EDUCATION
- BS Electrical Engineering University of Bridgeport 1989

YEARS OF EXPERIENCE
Total - 27

PROFESSIONAL REGISTRATIONS
- Professional Engineer
- Certified Construction Documents Technologist

PROFESSIONAL TRAINING
- Harmonic Analysis and Power Factor Studies
- Per Unit and Symmetrical Component Analysis
- Protective Device Coordination Analysis
- Short Circuit Analysis

Mr. Moore specializes in electrical engineering. His work has involved various aspects of design of large and small municipal and industrial wastewater treatment, process, and pharmaceutical facilities including but not limited to the design of power distribution including medium voltage, generator, lighting, grounding, control schematics and wiring interconnections. In addition Mr. Moore develops the Division 16 Electrical Specifications for the projects. Mr. Moore also has performed construction administration on many projects, overseeing the installation of electrical work. In addition, he has performed electrical inspections of installed electrical work on various projects and pre-design inspections of various facilities evaluating their electrical capability. In addition he has performed energy audits for existing facilities, designed fire alarm detection and alarming systems and security systems.

Project Experience

Sludge Thickening/Dewatering Facility Improvements
Bergen County Utilities Authority, Little Ferry, NJ

Responsible for design of lighting, grounding, interconnection, lightning protection, power utilization, power distribution systems, and all other electrical aspects (short-circuit analysis, voltage drop calculations, etc.). Design also included power distribution and controls for two odor control carbon absorbers which controlled the odors at the facility.

Morris Cove Pump Station
City of New Haven Water Pollution Control Authority, New Haven, CT

Responsible for design of lighting, grounding, interconnection, lightning protection, power utilization, power distribution systems, and all other electrical aspects (short-circuit analysis, voltage drop calculations, etc.). Provided electrical cost estimates for project, wrote the specifications for electrical products and installation procedures, reviews shop drawing submittals, and provides construction administration for the electrical work. Provided shop witness testing of five 150HP, 18-pulse variable-frequency drives.

Central Monitoring Building at Hillview Reservoir
New York City DEP Bureau of Water Supply, Yonkers, NY

Responsible for design of power, lighting, grounding, interconnection, lightning protection, and all other electrical aspects of the central

TIFFANY NOVAK

Environmental Reviews/Land Use Permitting

EDUCATION

- Graduate studies in MA Environmental and Corporate Law Ohio University
- BS Environmental Science University of Delaware 2000
- MS Geography Specializing in Climatology University of Delaware 2004

YEARS OF EXPERIENCE

Total - 12

PROFESSIONAL REGISTRATIONS

- Envision Sustainability Professional Credential

PROFESSIONAL ASSOCIATIONS

- Union of Concerned Scientists

Ms. Novak has 12 years of experience working on water resources, and transportation projects and specializes in regulatory compliance, permitting, facility planning, NEPA Environmental Assessments and property and real estate issues. She is responsible for the preparation of Environmental Assessment (EA) forms and statements and the preparation of Categorical Exclusion (CE) documents for the NEPA process, as well as environmental permit applications. She has also been responsible for the management, coordination, and implementation of community outreach efforts, organizing public meetings, and obtaining legal access agreements with industrial and private residential property owners. She has experience in coordinating projects for regulatory compliance under both the State Environmental Quality Review Act (SEQRA) for New York State and the City Environmental Quality Review (CEQR) for New York City. She also has experience with reviewing and evaluating property ownership and easement issues.

Project Experience

Metropark NEPA Categorical Exclusion

New Jersey Transit, Woodbridge, NJ

Prepared Categorical Exclusion (CE) document for Rehabilitation or Reconstruction of Existing Rail or Bus Buildings or Ancillary Facilities as part of the National Environmental Policy Act (NEPA) process. Categories addressed in the CE included Air Quality, Noise and Vibration, Land Use and Zoning, Land Acquisition, Aesthetics and Visual Impacts, Community Disruption, Traffic and Parking, Historic and Archaeological Resources, Environmental Justice, Parklands, and Consistency with the Local Master Plan.

Newark Penn Station NEPA Categorical Exclusion

New Jersey Transit, Newark, NJ

Prepared Categorical Exclusion (CE) document for Rehabilitation or Reconstruction of Existing Rail or Bus Buildings or Ancillary Facilities as part of the National Environmental Policy Act (NEPA) process. Categories addressed in the CE included Air Quality, Noise and Vibration, Land Use and Zoning, Land Acquisition, Aesthetics and Visual Impacts, Community Disruption, Traffic and Parking, Historic and Archaeological Resources, Environmental Justice, Parklands, and Consistency with the Local Master Plan.

ROBERT OSTAPCZUK, PE, BCEE

Water Storage Facilities

EDUCATION

- BS Environmental Engineering Rensselaer Polytechnic Institute 1996

YEARS OF EXPERIENCE

Total - 21

PROFESSIONAL CERTIFICATIONS

- Professional Engineer - NY
- Board Certified Environmental Engineer (BCEE)
- Certified Construction Documents Technologist (CDT)

PROFESSIONAL AFFILIATIONS

- American Water Works Association
- New York Water Environment Association
- Water Environment Federatio

Mr. Ostapczuk has a broad range of experience with the planning, design and construction of drinking water storage facilities. He has been invloved with the assement and evalaution of over 20 existing water storage tanks ranging in 10,000 gallons to 1.5M gallons for rehabilitation purposes. Mr. Ostapczuk has been the Project Engineer and Design Quality Leader on four new water storage tanks greater than 20 MG.

Project Experience

Storage Planning

Metropolitan Water Board, Clay, NY

Design Quality Leader responsible for the detailed design of two 20 MG and one 30 MG prestressed concrete tanks in accordance with AWWA D110 Type I and Type III tanks. The project is being completed in order to meet LT2 ESWTR requirements for uncovered finished water storage reservoirs and is currently under construction.

Ultraviolet Disinfection Facility and Covered Storage

City of Albany, Albany, NY

Project Engineer responsible for the detailed design of a 20 MG Type III prestressed concrete tank in accordance with AWWA D110. The design was complete to meet the requirements of LT2 ESWTR for uncovered finished water storage. CFD modeling of the tank was completed in order to demonstrate the effectiveness of the inlet piping mixing system.

Western and Eastern Tank Design

Onondaga County Water Authority, Syracuse, NY

Design Quality Leader responsible for the design, permitting and preparation of Construction Documents for three AWWA D110 water storage tanks. The project goal was to bring the Metropolitan Water Board MWB and Onondaga County Water Authority OCWA into compliance with LT2EWSTR by replacing three uncovered finished reservoirs with two 20 MG and one 30 MG water storage tanks. Both AWWA D110 Type I and Type III tanks were utilized in the Bid Documents to reduce construction costs. Approvals for the Project were received from NYS DOH water supply, NYS DEC SPDES and Dam Safety and NYS OPRHP Cultural Resources.

DINESH PATEL, PE

Constructability and MOPO

EDUCATION

- BS Civil Engineering Sardar Patel University, India 1977

YEARS OF EXPERIENCE

Total - 36

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NY, IL

Mr. Patel has extensive experience in the construction management for water and wastewater treatment facilities. He has been involved in the construction of facilities for the New York City Department of Environmental Protection for over 36 years. Currently, he is a deputy construction manager on the Tallman Island WWTP where he is responsible for the $ 280 million construction upgrade of the 107 mgd plant. Prior to this, he was a construction manager for the Catskill and Delaware Ultraviolet (UV) Water Disinfection Facility, a $1.3 Billion construction contract with consent order dates, located in Westchester County. The project included construction of world's largest ultraviolet disinfection facility as well as three off-site contracts. The UV disinfection facility enhance the disinfection and improve the quality of water supplied to New York City's nine million residents from the Catskill and Delaware watersheds. The project has been substantially completed on schedule and it is in close out phase.

Project Experience

Tallman Island WWTP Construction Management
NYCDEP, College Point, NY

Construction manager responsible for administration of contract documents and management of construction inspection staff, for a construction contract totaling $280 Million. Included in the project were biological nutrient removal facilities, digestion, chlorination rehabilitation of four thickeners, new Main sewage Pump station and return activated sludge facilities and new boilers, in addition the upgrade included replacement of the existing 5kv primary power distribution system with a temporary and permanent 27kv substation facilities. The project is a major rehabilitation of this aging facility which was originally constructed in 1937. The project include the rehabilitation of four 83-foot diameter sludge digesters, fitting them with new aluminum domes, gas removal , new waste gas flare, gas booster pump station to provide digester gas to fire two new 350 hp boilers.

CAT/DEL UV Disinfection Facility Construction Management
NYCDEP, Valhalla, NY

Construction manager responsible for administration of contract documents and management of construction inspection staff, for

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SETH SCHNEIDER, PE

Pumping Station / Start Up & Training

EDUCATION

- MS Environmental Engineer Massachusetts Institute of Technology 1997
- BS Civil and Environmental Engineering Cornell University 1996

YEARS OF EXPERIENCE

Total - 21

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NY

PROFESSIONAL ASSOCIATIONS

- NYWEA
- New York Chapter AWWA
- Westchester Water Works Conference

Mr. Schneider has 21 years of experience in planning, detailed design, construction administration and project management for complex water and wastewater projects. He has extensive experience with a range of wastewater treatment plant projects from the 250 MGD Wards Island WWTP to the 5.5 MGD Port Chester WWTP. Mr. Schneider is an Arcadis Certified Project Manager and has undergone extensive training in scope, schedule and budget control of projects. He excels in keeping project teams organized and motivated to meet strict schedule and budget constraints. He is an excellent communicator, and always ensures regular touch points with clients and project teams.

Project Experience

Water Districts 1 and 3: Comprehensive Study and Improvements

Westchester County, NY

Led the conceptual design of two new drinking water pump stations to supply Westchester County Water District No. 3 (WD3), which consists primarily of the County-owned Valhalla campus at the Grasslands Reservation. Conceptual design included detailed distribution system modeling using EPANET software. Also led the evaluation of alternative water supplies to WD3 during short-term shutdowns of the NYCDEP's Catskill Aqueduct and we are evaluating long-term water supply alternatives that meet all Filtration Avoidance Determination (FAD) requirements for County Water Districts Nos. 1 and 3.

Ardsley Road Pump Station and Reeves Newsom Water Supply Station Upgrades

Village of Scarsdale, Scarsdale, NY

Lead the design and project management for the complete station upgrades for the Ardsley Road Pumping Station and Reeves Newsom Water Supply Station. The upgrades included new pumps with VFDs, new piping and valves, chemical systems including tablet chlorination systems for secondary chlorination, pH adjustment and orthophosphate addition for corrosion control, complete electrical and controls systems upgrades, architectural, plumbing and HVAC upgrades. Also led the permitting and approval process for these projects which included NYC DEP and Westchester County DOH approvals.

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VISHAL B. SHAH, PE

NJEIT Financing Assistance

EDUCATION

- BS, BioEnvironmental Engineering, Rutgers University, 1995
- MS, Environmental Engineering, Rutgers University, 1999

YEARS OF EXPERIENCE

- Total - 17

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NJ
- Underground Storage Tank Certification
- Wetlands Delineation

QUALIFICATIONS

- 24-Hr Supervised Field Training
- Hazard Communications
- IATA/DANGEROUS GOODS TRAINING Initial/ Refresher
- Initial 40 Hour Hazardous Waste Operations Safety Training
- Hazardous Waste Operations Site Supervisor
- Hazardous Waste Management
- USACE Contractor Quality Management Trained

PROFESSIONAL ASSOCIATIONS

- American Water Works Association, Member
- Water Environment Federation, Member

Mr. Shah has a participated in a number of financial studies. His experience includes the development of financial tools to assist utilities and communities in understanding the impacts of proposed capital improvements on the current and future rates of their users and assisting decision makers in prioritizing the improvements. Mr. Shah has assisted in the preparation of various state revolving grant/low interest loan efforts for utilities, as well as assisting municipalities in preparation of bond ordinance for improvements that will be funded through water and wastewater service charges. He also has experience in the planning, development and implementation of various municipal programs including management of projects from grant/loan applications and permitting through operations.

Project Experience

SRLF Assistance

Bergen County Utilities Authority, Little Ferry, NJ

Assisted the Authority in procuring over $135 million from the State Revolving Loan Program administered by the EIT/NJDEP from 2005 to present and over $8 million in grant from the NJDEP Sewer Infrastructure Improvement Act and EPA federal assistance program and over $5 million in American Recovery and Reinvestment Act funding (of which $2.6 million in principal forgiveness. Prepared the loan application and planning documents that presented the capital improvements required for meet existing conditions and evaluated the total capital costs and annual operation and maintenance costs, as well as estimated annual or monthly costs to the end user and user cost to income ratio. Assisted the client in securing financing under the smart growth initiative and coordinated with other project engineering firms and bond counsel to submit the appropriate documentation within the loan deadlines to secure the financing. Served as the Authority's liaison from the project preplanning meeting to escrow closing for the last nine years.

SRLF Assistance

East Windsor Municipal Utilities Authority, East Windsor, NJ

Assisted the Authority in securing approximately $16 million in EIT/ NJDEP loan financing for various water supply improvements to address the current and future growth demand. Prepared the loan application and planning documents that presented the capital improvements required for meeting existing conditions and the future growth consideration to determine reserve capacity.

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SHANNON SPENCE, PE

Security

EDUCATION

- BS, Civil Engineering, Cooper Union for the Advancement of Science and Art, 1996

YEARS OF EXPERIENCE

- Total - 28

PROFESSIONAL REGISTRATIONS

- Professional Engineer- NY, FL, VA
- Certified Construction Documents Technologist

Ms. Spence leads Arcadis' Security Services Group and is a Certified Arcadis project manager. Responsible for the security aspects of all design projects including vulnerability assessments, physical security, cyber security and contaminant warning systems. She has managed the largest of Arcadis' security design projects for water and wastewater treatment facilities. Trained in the EPA-sponsored Risk Assessment Methodology for Water (RAM-W™), Ms. Spence has provided guidance to numerous water facilities in the performance of vulnerability assessments under the Bioterrorism Act. She is familiar with the evaluation of threats, and the appropriate detect/ deter/ response actions necessary to mitigate vulnerabilities. As a control systems engineer, her expertise in electrical and systems control design has led her to designing security systems including intrusion detection, access control systems, motion detection, and digital video recording systems. She is considered a national leader in the area of water sector security, participating on Water Sector standards setting committees, executing research projects and managing the security and preparedness column in the Journal AWWA.

Project Experience

Security Upgrades

North Jersey District Water Supply Commission, NJ

Construction Manager for a large security upgrade. Acted as owner's agent in evaluating physical security design proposals and overseeing construction of security enhancements at two major reservoirs, two large pumping stations, a 210-million gallon / day (MGD) water filtration plant and multiple other facilities.

Multi-Year Security Enhancement Project

Bergen County Utilities Authority, Little Ferry Plant, NJ

Project Manager of multi-year security enhancement project at this large wastewater facility. Based on an engineering review of existing vulnerability assessment designed physical security systems including electronic access control, CCTV system and reconfiguration of the front entrance. Developed alternative procurement approaches to safeguard critical information during the public bid process.

SUSAN TAURO

Public Relations Consultant Coordination

EDUCATION

- BA/Government, Cornell University, 1990

YEARS OF EXPERIENCE

Total - 26

PROFESSIONAL TRAINING

- eLearning Tools and Techniques Environmental Communications Technical Writing and Editing Presenting Data and Information Quality Assurance
- Grant Writing
- Proposal Development Desktop Publishing

PROFESSIONAL ASSOCIATIONS

- International Association for Public Participation

Ms. Tauro has 26 years of experience in environmental communications, including community outreach, public education and affairs, project management, technical writing/ editing, e-learning and training modules, and grant writing. She specializes in managing communications and public outreach programs for high-profile, large-scale environmental projects at a variety of sites. As such, Ms. Tauro has been responsible for developing and managing numerous public education and outreach projects on behalf of many clients, including those focused on community and economic redevelopment, industrial site remediation, residential cleanup, power generation, industrial hygiene, health and safety, and pollution prevention. She has designed, developed and delivered a multitude of community fact sheets, educational presentations, loan and grant applications, environmental assessment reports, work plans, technical memoranda, journal articles, and other similar documents. From these varied projects, Ms. Tauro is experienced in preparing educational and informative materials for a variety of audiences and situations. Her experience includes working with corporate clients, associations, technical consultants, government entities from all levels, community groups, and other involved parties to manage and produce quality work products in short turnaround times.

Project Experience

Development of Enterprise-Wide Radon Assessment Communications and Training Toolkit

Pharmaceutical Client

Brainstormed, designed, and developed content for enterprise-wide radon communications and training toolkit to inform and train the client's employees on the issues surrounding radon assessment and mitigation. Oversaw the design and development of communication approaches, messages, and tools for employees and facility managers to use to communicate radon sampling events and mitigation approaches at the client's facilities worldwide. Tools included key messages, frequently asked questions (FAQs), staff emails, newsletter articles, fact sheets, training modules, posters, staff presentations, meeting handouts, and standard operating procedures about assessing and mitigating radon.

ROBERT TITUS, PE

Stream Restoration / Stormwater/Flood Hazard Mitigation

EDUCATION

- BS, Civil Engineering, University at Buffalo, 1993

YEARS OF EXPERIENCE

Total - 22

PROFESSIONAL REGISTRATIONS

- Professional Engineer - NY
- Certified Floodplain Manager - US

Mr. Titus has extensive experience with the analysis, modeling and design of hydrologic and hydraulic systems. Mr. Titus has worked on a broad range of projects from the initial stages of planning through design, construction and operations. Such projects include stormwater management, dam engineering, water and WWTP hydraulics, stream channel hydraulics, site planning and watershed planning for industrial, residential, municipal, and commercial clients. Mr. Titus possesses knowledge and experience in the permitting and review process. Many of his projects involved the submittal of engineering drawings and reports to local and state agencies for review and demonstration of compliance with regulations. Specifically, Mr. Titus has prepared: Stormwater Pollution Prevention Plans (SWPPPs) for projects across New York State to demonstrate the projects' compliance with the State Pollution Discharge Elimination System (SPDES) General Permit for stormwater discharges from construction activity GP-0-10-001, applications for Dam Permits for modifications to existing permitted dams and for the creation of new dams, Emergency Action Plans for dams, Engineering Assessments for dams, and Engineering Reports for all types of projects in his experience. He has used a variety of computer programs such as HEC-1, TR-55, and PondPack for hydrologic modeling; HEC-RAS and HEC-2 for hydraulic modeling; and Microsoft Excel and StormCAD for storm piping design.

Project Experience

Swinks Mill Road Stream Restoration

Fairfax County, Fairfax County, VA.

Performed a detailed study of the local floodplain of a semi-mountain stream. Used Arc-GIS to delineate the stream watershed boundary and computed approximate peak flow rates using the Anderson Method. Entered stream-cross sections and their characteristics into HEC-RAS to analyze the effect of the predicted flow on the stream channel. The floodplain in the project area could then be delineated based on the HEC-RAS results. The purpose of the project was to develop two conceptual alternatives for stream restoration and flooding alleviation. The existing stream was flooding and damaging the property of an adjacent private residence. Although the home was in a known 100-year floodplain, the alternatives were developed to minimize the flooding and erosion. It was found during the HEC-RAS modeling process that the stream normally flows in the super-critical regime during storm

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CORINNE TUOZZOLI, PE, J100

Security

EDUCATION

- BS, Civil Engineering, University of Rhode Island, 2003
- MS Environmental Engineering University of Hartford 2014

YEARS OF EXPERIENCE

Total - 13

PROFESSIONAL REGISTRATIONS

- Professional Engineer - CT, MA
- J100 RAMCAP: Risk and Resilience Management of Water and Wastewater Systems
- Construction Documents Technologist
- ICS 100
- ICS 200

Ms. Tuozzoli is a member of Arcadis' Security Services group. She is involved in the planning and design of security projects including risk assessments and physical security. She also has experience in many phases of civil and environmental engineering projects including facilities planning, preliminary and detailed design, permitting, and construction services. Her experience includes site design, water distribution, wastewater collection, and septic system design. She is also certified in J100 RAMCAP: Risk and Resilience Management of Water and Wastewater Systems, the industry standard methodology for risk assessments in the water sector.

Project Experience

Hillview Reservoir Chlorine Addition Facility

New York City DEP, New York NY

Construction administration support for the security portion of the reconfiguration of the front entrance for easier entry of large trucks into this facility, one of their most critical. The design included a ballistic guardhouse, multiple entrance/exit lanes with K8-rated cantilever gates and wedge barriers, truck turnaround, IP CCTV cameras, access control, and fence intrusion system.

Improvements Phase I and Vulnerability Assessment

Bergen County Utilities Authority, Little Falls NJ

Engineer on a multi-year enhancement project at this large wastewater facility. Design included physical security systems including electronic access control, CCTV system and reconfiguration of the front entrance. Oversaw security portion of construction administration. The project also includes the creation of a SCADA System Operations and Maintenance Manual.

Little Ferry Security Phase II

Bergen County Utilities Authority, Little Ferry NJ

Engineer on a multi-year security enhancement project at this large wastewater facility. Design included physical security systems including electronic access control, CCTV system and reconfiguration of the front entrance. Involved in construction administration and O&M manuals.

PHIL WALKER (Architectural)

AICP, LEED AP BD+C

Senior Associate Vice President

Phil's portfolio includes a diverse body of international and domestic work, including mixed-use communities, brownfield redevelopments, and urban and suburban physical master planning.

SELECT EXPERIENCE

Heartland Town Center , 182.90-HA mixed-use redevelopment, "smart growth" master plan includes 9,000-SF residential, 1 million-SF retail and hospitality, 3 million-SF workplace and 105,000-SF civic and community components, Islip, NY

Merrifield Town Center, 10.90-HA mixed-use development, includes 600,000-SF street-level retail, 150,000-SF mid-rise office space, 1,000 residential units, 120.000-SF cinema, and 4,269 parking spaces, Merrifield, VAI

The Hill Center , 26,942-SM lifestyle center, mixed-use main street format with office above retail, Nashville, TN

RiversEdge at Port Imperial , 9-story, 236-unit luxury residential building, Weehawken, NJ

Entertainment City Qatar , 101.20-HA lifestyle development, master plan and design guidelines for benchmark mixed-use entertainment-focused city, includes residential, retail, commercial and theme park, Doha, Qatar

Entertainment City Mumbai , 175.60-HA mixed-use master plan, includes entertainment, residential, retail, hospitality and commercial components, Mumbai, India

Porta Moda Tunisia , 199.90-HA waterfront community, master plan and conceptual design, includes retail, resort, residential, entertainment, business and technology components, Tunis, Tunisia

Alphaville Dias Branco 204,514,100-SF, 4,695.0-AC, masterplanning design, Fortaleza, Brazil

Alphaville Duas Unas 3,459.5-AC, 14,000,000-SM master plan, including corporate campus, town center and hospital, Recife, Brazil

Alphaville Jacuhy master plan for mixed-use development, Recife, Brazil

Xuhui New Waterfront Competition , 16.20-HA mixed-use waterfront master plan, includes residential, retail, office and hospitality components, Shanghai, China

Food City Abu Dhabi , 111.30-HA city master plan, conceptual design, includes culinary-driven research and development, distribution and transportation facilities, retail and restaurant, residential, hospitality and conference center and a culinary institute, Abu Dhabi, United Arab Emirates

Al Reggah District Master Plan , 876-acre master plan, including residential districts featuring a green spine park and waterfront, Jubail Industrial City (JIC), Saudi Arabia

East Caicos , new resort community, includes master plan and design for residential villages, golf courses, public facilities and infrastructure on uninhabited island, VA

YEARS' EXPERIENCE

15 Years

EDUCATION

Rhode Island School of Design , Bachelor of Architecture

Rhode Island School of Design , Bachelor of Fine Arts

LICENSES AND CERTIFICATIONS

Certified Planner, American Institute of Certified Planners

USGBCI, LEED Accredited Professional

LEED AP BD+C

ARCADIS Design & Consultancy for natural and built assets

PASSAIC VALLEY WATER COMMISSION

NEW STREET RESERVOIR WATER STORAGE AND PUMPING FACILITIES DESIGN, PERMITTING AND CONSTRUCTION ADMINISTRATION SERVICES

PROJECT NO. 16-P-64

3. PROJECT APPROACH

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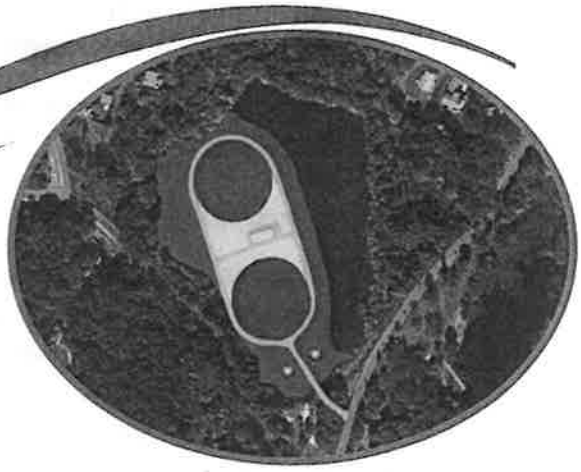


Conceptual rendering of the New Street Reservoir showing tanks with partial reservoir remaining and water features visible from the entrance.

Project Scope

Outlined in this section is the proposed Project Scope. A list of assumptions used in developing this scope and the associated budget is included in Section 4.

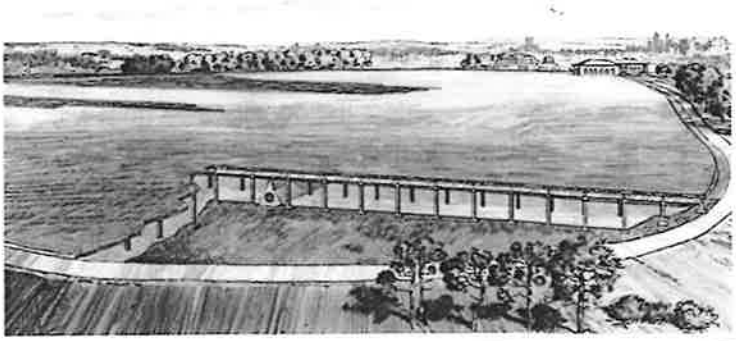
Task 1 – Information Review and Value Engineering

Arcadis will review existing reports, maps, flow data, system demands, facility drawings, and operating records associated with New Street Reservoir. We will also visit the project site and associated facilities to discuss standard operating procedures and practices.

In conducting staff consultations, record documentation and existing conditions will be important considerations for the purpose of system design, construction sequencing and maintenance of reservoir and plant operations (MOPO). Task 1 will establish the basis of design elements to be implemented and will include the results of the value engineering decisions and determinations concerning the suitability and reliability of the improvements to meet the intended objectives.

We will perform a value engineering analysis as proposed in the Conceptual Design Report. The value engineering phase will be the opportunity to determine the best approach and will consider the following options:

1. Locating storage at another site
2. Treating the water after it leaves New Street Reservoir (including corrosion inhibition)
3. Covering the reservoir with a floating cover
4. Submerging the tanks under the reservoir water surface and pumping to maintain pressure
5. Decommissioning the reservoir and maintain it as a non-functioning waterbody

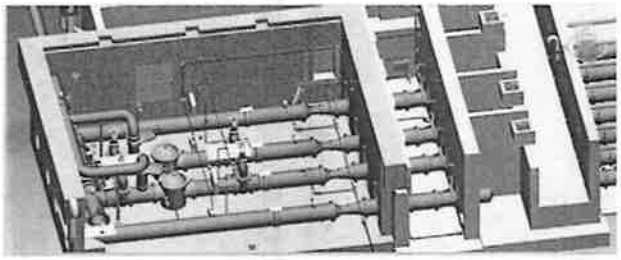


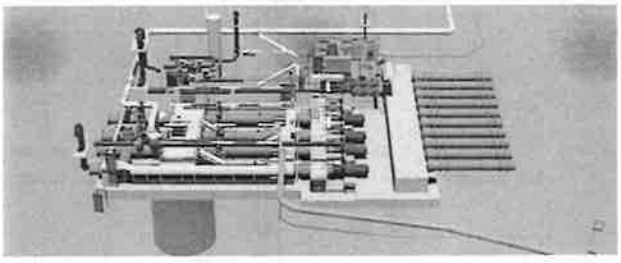
Arcadis developed a concept for a finished water reservoir cover design for the New York City water supply system.

Arcadis will evaluate different approaches to minimize the visual impact of the tanks and incorporate the best approach into the design. Arcadis will evaluate ways to camouflage the tanks such as the inclusion of berms with trees or architectural features such as stone or other natural-looking walls. We will evaluate the use of water features and landscaping to beautify the site.

CallisonRTKL is an Arcadis company with a landscape architecture studio that has worked on a wide variety of project types around the world. Their philosophy is to create spaces that bring balance to the built and natural environments.

In addition, Arcadis will use 3D CAD for the design of the facilities. **We have been successfully using this invaluable tool when trying to convey what the finished product will look like to the public and other stakeholders.** In addition to the design advantages, it will allow live demonstrations of visual impact, or lack thereof, during public meetings.





We have found that the use of 3D CAD typically helps the public and stakeholders visualize what will be designed, making it easier to get early buy-in.

Using CallisonRTKL's expertise and the power of 3D CAD, we will be able to convey to all interested parties, how the alternate site layouts look from different vantage points, angles, and under different camouflaging configurations.

We will prepare up to three alternate site layouts and elevation drawings and renderings to be used at public meetings.

Arcadis will use 3D CAD for the design of the facilities. In addition to the design advantages, this will enable viewing the alternate site layouts from different vantage points, angles, and under different camouflaging configurations. This will allow live demonstrations of visual impact, or lack thereof, during public meetings as well.

Arcadis will evaluate re-routing Slippery Rock Brook through the project site and incorporate a retention pond that will be aesthetically pleasing, but also address the stormwater run-off requirements of the project. As discussed further below, the most efficient option will likely be to utilize the remaining areas of the New Street Reservoir, after its removal, for stormwater and floodplain management. A mapped, 100-year floodplain currently exists in the area, which makes the site layout of the tanks challenging, but affords additional opportunities to make the stormwater management have multiple functions. The site can be laid out to incorporate the stormwater controls along with the floodplain management requirements and the requests of the public. It will be possible to make the location a benefit to the community as it can incorporate constructed wetlands, a benefit for flora and fauna, and could even be an educational facility. The combined use of the land for water supply, floodplain management and habitat regeneration could be a means to make the project more appealing to the local population. The security of the new tanks and pumping station must, of course, be a top priority for this effort.

Since the installation of two new tanks represents a significant increase in impervious area, it is expected that stormwater management facilities will be required in full conformance with New Jersey requirements. Stormwater Management facilities will be planned for the finished site after the New Street Dam has been removed and the new tanks are in place. Arcadis will follow the requirements for Stormwater Pollution Prevention in accordance with NPDES permit requirements and the New Jersey Stormwater Management Law.

It is likely that any revisions to the floodplain in this area will require a modification to the current FIRM, which would include revising the FEMA hydraulic model and submitting a Letter of Map Revision (LOMR) to FEMA so that the updates can be made to the FIRM. Since the final stormwater and floodplain management layout is unknown, this effort is not included in this proposal.

Task 5 – Geotechnical Investigation and Evaluation

Arcadis will hire a reputable geotechnical firm with whom we have worked in the past, such as Converse Consultants or Oweiss Engineering, Inc., to perform geotechnical investigations at the New Street Reservoir site. Details of these investigations are summarized below.

The geotechnical subcontractor will perform one site visit and desktop geotechnical investigation consisting of the following tasks at the New Street Reservoir:

- Characterize soil conditions around the reservoir
- Prepare a report that summarizes local subsurface and bedrock conditions for the project site, sufficient to provide the tank constructor with adequate information on which to base their bids.
- Geotechnical investigations will include 12 borings along the reservoir banks, and other methods to characterize, evaluate, and design to the subsurface conditions. It is proposed that these methods are GPR, radio frequency surveys, soundings.

It is understood that the reservoir cannot be drained during the design phase for the purpose of conducting borings in the proposed footprint of the tanks. Following AWWA recommendations, the tank constructor will be responsible for the foundation design of the proposed tanks. AWWA recommends that borings be done in the actual footprint of the proposed tank structure. Considering that no boring information in the immediate footprint of the tanks will be available to bidders, it will be required in the contract documents that the general contractor / tank constructor perform geotechnical investigations at the reservoir floor for their foundation design once the reservoir has been drained in the early stages of construction. We will provide an allowance in the construction contract to deal with any design changes necessary as a result of these investigations.

It is our opinion that a desktop evaluation will be sufficient to provide bidders with adequate information on which to base their bids.

We have used this approach outlined above successfully on other projects with various tank manufacturers. We feel that it provides the best value to PVWC.

Task 6 – Progress Meetings

Arcadis will attend monthly progress meetings throughout the project design period. As described in the RFP, we have assumed that each meeting will last a full day. Each meeting will be attended by the Project Manager, along with one other key team member, depending on the focus of the meeting. This additional key team member could represent a focus in design, permitting, or financial assistance, for example. Two additional meetings beyond the monthly progress meetings

If, during the progress of Task 8, there are PVWC comments or changes made that affect the basis of design, the BODR will be updated to reflect these changes.

Drawings and Specifications

Drawings will be prepared in AutoCAD 2015 on 24"x36" sheets, segregated by discipline, and signed and sealed by a Professional Engineer licensed in the State of New Jersey. Line types, fonts, and other drawing elements will be prepared in accordance with industry standards. A title block and sample drawing sheet will be submitted to the Commission for review and approval before any drawings are completed.

Technical specifications will be prepared in Microsoft Word using the format and font specified in the RFP. The technical specifications will be in the 16 division format. The commission will provide Arcadis with the remaining documents (except the Bid Form) in electronic format.

Arcadis will submit 5 sets of the drawings and specifications as well as electronic (pdf) versions at the 30%, 60%, 90%, and 100% design level. Each design level will incorporate the Commission's comments from the previous design level submittal.

Tanks

The tanks at New Street Reservoir will be designed in accordance with AWWA D-110. The design of these tanks typically involves a high level of coordination with the tank constructor for input during the design, and Arcadis has a long history of successful working relationships with the leading tank constructors in the industry. We will leverage these relationships to provide a cost effective design with minimal exposure to change orders during construction.

Two 20-mgd pre-stressed concrete water storage tanks for the Metropolitan Water Board (Syracuse, NY)

- SCADA with backup power
- Security (Fence & Card Access)
- Electrical for I&C & Security

An FTP site (Orion web based document management system) will be maintained throughout the design and construction of the project for transmission and review of documents.

Task 9 – Permitting

Arcadis will prepare the necessary applications and provide technical input as required to assist the Commission in securing the required permits and approvals. We will estimate the review time for each permit that should be anticipated and identify any "roadblocks" that could delay the process. The Commission will submit the applications and pay all permit fees.

Arcadis will prepare for and attend up to 15 meetings or public hearings related to permit approvals as requested by the Commission.

Based on our review of the RFP, land use mapping, and available information, Arcadis has identified the following permits and approvals that we anticipate will be required:

- NJEIT Level 2 Environmental Review
- NJDEP Flood Hazard Area Individual Permit
- NJDEP OW/FWW Individual Permit
- NJDEP Dam Removal Permit
- NJDEP Bureau of Water System and Well Permitting
- NJDEP 5G3 Stormwater General Construction Permit
- Soil erosion and sediment control plan application
- Site Plan Approval from the Borough of Woodland Park Planning Board and/or Municipal Council

Further discussion of each type of permit or approval is provided below.

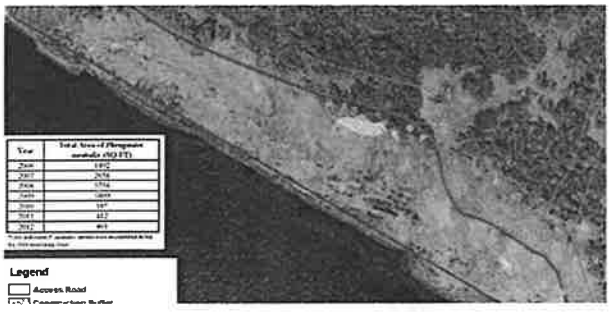
New Jersey Environmental Infrastructure Trust (NJEIT) Environmental Review/Report

The Commission will seek funding under the NJEIT Fund (as described in Task 11 below) for this project, which will require completion of an environmental review under N.J.A.C. 7:22-10. We will prepare letters of correspondence to request information from the NJDEP Natural Heritage Program (NHP) and United States Fish and Wildlife (USFWS) regarding the potential for threatened and endangered species habitat to be present within or in the vicinity of the site. Results from the NJDEP DLUR, NJDEP NHP, and USFWS, and information gathered from the NJDEP Landscape Project (Version 3.1) mapping, and the site visit memorandum will be used to complete the environmental review.

We will prepare a Level 2 Environmental Review for the New Street Reservoir site since there are potential impacts to environmental resources and cultural resources, incorporating a summary of planned project activities, an analysis of potential impacts to environmental and cultural resources, an alternatives analysis, and report figures, as well as a summary of public involvement. We assume one round of comments will be received from the NJDEP and will prepare a response to comment document to address comments. We will prepare for and attend a public hearing, which is required for Level 2 projects, prepare responses to public comments received, and prepare a summary of the public hearing and comments to submit to NJDEP. It is assumed PVWC will provide the public hearing location, date, and time and notify the public.

NJDEP reviews of Environmental Review documents typically require one to four months to complete, depending on the complexity of the project. We would anticipate that this project would be closer to four months or more due to the presence of potential impacts to environmental resources.

and permit figures, plans, and photographs. The permit application will include documentation for a Freshwater Wetlands Line Verification Letter of Interpretation to confirm freshwater wetland boundaries, in accordance with N.J.A.C. 7:7A-3.4, incorporating the proposed wetland delineation. We assume one round of comments will be received from the NJDEP DLUR and will prepare a response to comment document to address comments.



Arcadis designed wetland mitigation and permitting services in Paerdegat Basin (Brooklyn, NY) which required extensive agency coordination including NYSDEC, USACE, NYCDPR and NYCDOT.

Arcadis will assist the PVWC to identify appropriate mitigation options for planned project activities that will result in permanent fill within the FHA, floodway, State Open Waters, and potentially Freshwater Wetlands, to support issuance of the above permits. We assume the PVWC will identify potential mitigation locations and/or bank and credit opportunities. All public hearings and meetings with the NJDEP DLUR to support issuance of these permits, including a pre-application conference, are assumed to be covered in the allowance of 15 meetings stipulated in the RFP.

NJDEP Dam Removal Permit

A Dam Removal Permit will be required for decommissioning of the New Street Reservoir Dam. A permit application containing all relevant forms and information will be prepared. Arcadis will prepare for and attend a public hearing, which is required for issuance of the Dam Removal Permit, prepare responses to public comments received, and prepare a summary of the public hearing and comments to submit to the NJDEP. It is assumed PVWC will provide the public hearing location, date, and time and notify the public.

NJDEP Bureau of Water Systems and Well Permitting

Modification to a water system requires the preparation of a permit application. A permit application containing all relevant forms will be prepared for the project. It is not anticipated that NJDEP will require a full permit application for the addition of emergency standby power at the new pumping station, however some formal correspondence with them on this topic is anticipated, as the addition of this standby power capacity is a significant factor in the overall reliability of PVWC's water system.

NJDEP Stormwater General Construction Permit

Upon certification of the soil erosion and sediment control (SESC) Plan by the Hudson Essex Passaic Soil Conservation District, discussed below. Arcadis will e-file the appropriate documentation to gain coverage under the NJDEP 5G3 Stormwater General Construction Permit to authorize construction activities that disturb 5,000 square feet or more of land.

summarized in accordance with the major project subdivisions and areas of work.

Quantities will be determined by using an electronic digitizer and excavation/backfill estimation software.

We have extensive experience with both steel and prestressed concrete tank manufacturers and we have successfully engaged them in the cost estimating projects so that there is "buy-in" and no surprises on bid day.

Pricing will be derived from Nasco's in-house database as well as the solicitation of vendor prices for equipment and specialty items as necessary. The estimate will reflect the site conditions as well as the current bidding climate to which Nasco will add escalation as marketplace conditions deem appropriate.

Once each cost estimate has been produced by Nasco, the estimate will then be reviewed by the design team to confirm consistency with the plans and specs used as input for the estimate. Through this cost estimate resolution process, the cost estimate to be used by PVWC for budgeting and financial planning purposes will reflect the latest design developments.

Task 11 – Financing Assistance

Arcadis will assist PVWC in pursuing financing for the project through the New Jersey Environmental Infrastructure Financing Program (NJEIFP), administered by the New Jersey Environmental Infrastructure Trust (NJEIT) and NJDEP and will identify other sources of funding if available.

The NJEIFP loan funding cycle begins in August or September of the State Fiscal Year and continues until the loan closing, which is now typically 18 months later. The major elements of the NJEIFP that we anticipate assisting PVWC with to secure approval for the loan closing is as follows:

- Pre-Application Meeting
- Letter of Intent
- Planning Document (also known as the Project Report)
- Loan Application (with the design documents and permits to be provided in Tasks 8 and 9)

For new improvements, the NJDEP typically requests a pre-application planning meeting to gain a better understanding of the improvements prior to the Planning Document submittal. At this meeting, the NJDEP will assign the environmental level for each improvement and determine the environmental review required for the project. We have assumed one 4-hour meeting that will be scheduled with the NJDEP in August or September.

Following the meeting, we will commence with the Letter of Intent and Planning Document prior to the deadline of the first week of October. As the authorized user, we will complete the web-based Letter of Intent. We will notify PVWC when it is ready for review and submittal. One Letter of Intent will be prepared for this project.

Concurrently, we will assist PVWC with the Planning Document submittal. For this submittal, we intend to submit the previously-prepared Water Storage Improvement Feasibility Study and Water Storage Improvements Final Conceptual Design Report as the Planning Document. Since these two reports address the proposed improvements and address the majority of the requirements identified in the N.J.A.C. 7:22-3 and 7:22-4.

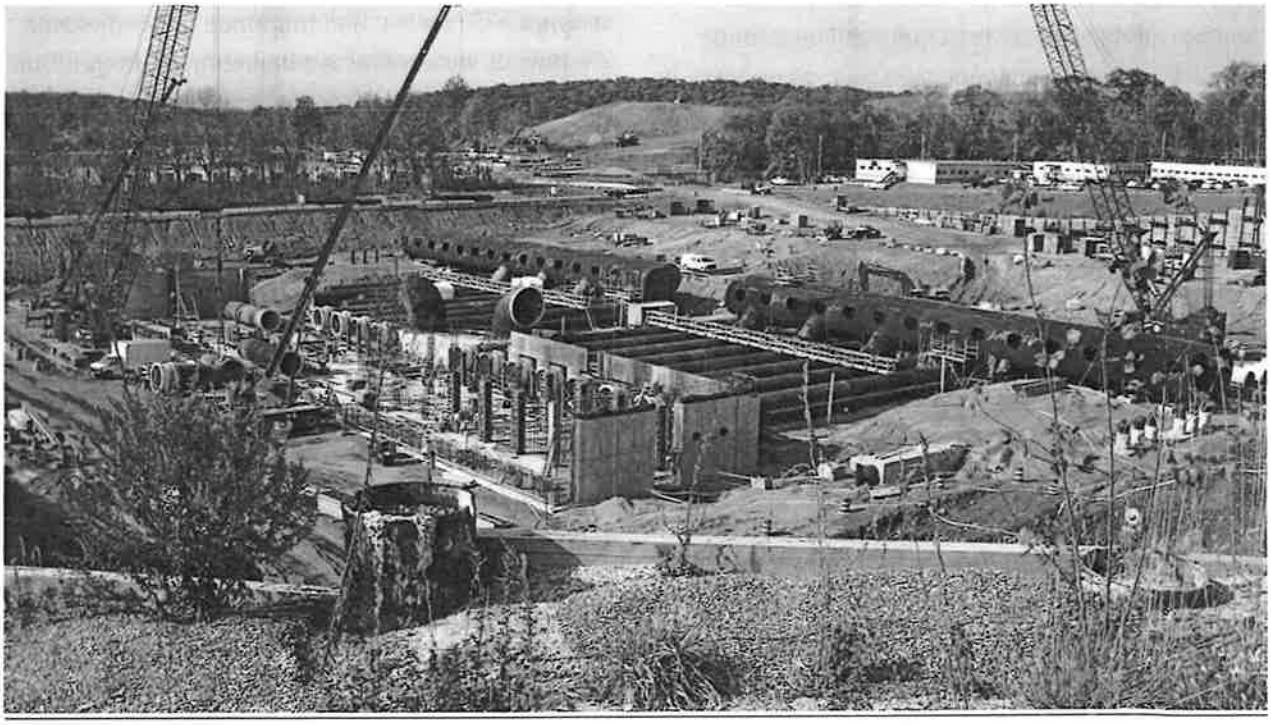
We do, however, anticipate that NJDEP will issue a comment letter for any items not included in the two previous studies, such as public involvement, end user cost analysis, disturbance area, and permit status. We have assumed and budgeted for one round of comments from the NJDEP. Since the planning document is an environmental review, NJDEP comments will be addressed under Task

will track the submittal utilizing Orion, a web based document management system, which will allow electronic submission, review, mark-up and return of shop drawings. It is Arcadis' intention to review and return shop drawings to the contractor, on average, in 14 days or less. Once the shop drawings have been reviewed, the submittal coordinator will review each shop drawing, prior to its return to the contractor, to verify that comments provided are appropriate and no constructive changes have been made. We will assign the shop drawings an appropriate status, based on the comments, log the submittal out and forward it back to the contractor. In addition, Arcadis will develop and maintain a shop drawing log which will track progress on all shop drawings and to identify any concerns related to shop drawing review and approvals that may negatively affect the timely completion of the project. The shop drawing log will additionally be utilized during the monthly progress meetings to facilitate the discussion of shop drawings and track performance of Arcadis and the contractor.

Progress Meetings

In addition to regularly scheduled construction progress meetings, we will also hold periodic monthly meetings with PVWC staff. The purpose of the meeting is to update PVWC staff on the status of the project, progress of the construction, status of existing and new construction and contract issues, status of pay requests, status of change orders and potential change orders, and status of Requests for Information (RFI) and submittals. This meeting will be attended by the Resident Project Representative and the Project Manager and is expected to occur prior to the regularly scheduled monthly construction progress meetings on the same day as the regular construction progress meetings.

Conduct regular progress meetings and distribute minutes to attendees, PVWC and the NJDEP.



Arcadis has experience providing construction management and resident engineering for major water projects such as the $1.4 billion Catskill Delaware Ultraviolet Light Disinfection Facility in Valhalla, NY (pictured above).

presented and discussed at monthly progress meetings. All information gathered in the P-files will be used to discuss the issues with the PVWC, determine the need and/or applicability of a change order, and prepare and negotiate the change order, if one is written. The main purpose of identifying issues and potential change orders is to be ahead of the contractor and have already identified the potential change order, discussed it with the PVWC and the project team, analyzed the issue to determine the appropriateness of developing a change order and have already identified a change order scope, justification and engineer's estimate prior to the Contractor requesting a change order.

Information that will be gathered will include, but not be limited to, daily reports, disposal tickets, T&M tickets, vendor/supplier information, photos, and any other information necessary to capture and define the issue.

Based upon the information gathered and the discussions held with PVWC staff regarding the need and applicability of preparing a change order for a particular issue identified, Arcadis will prepare the appropriate change order documents.

Conduct reviews of Contractor's Schedule, staffing level and progress.

- Review Contractor's Initial Project Schedule.
- Review monthly updates and monthly 30-day Look-Ahead Reports.
- On one day each month, at least one week prior to the monthly progress meeting, meet with the contractor to tour the site and discuss construction progress and updates to the schedule.
- Review recovery schedules, should an updated progress schedule indicate that the Contractor is behind schedule for meeting project or milestone completion dates.
- Update PVWC staff on the status of the project schedule, delays and impacts during the monthly meetings with PVWC.

Arcadis is very familiar with reviewing and evaluating progress schedules, the acceptability of the initial schedule, and subsequent updates and the impacts of change orders and project issues on the schedule.

As part of performing the schedule services, Arcadis' Resident Project Representative will meet with the contractor to review and discuss progress of the work, issues that have developed, changes that have been identified, and their impacts to the schedule. Additionally, it is expected that the Resident Project Representative will tour the site with the contractor to help facilitate schedule reviews.

Review and approve Contractor's periodic payment requests

Prepare monthly progress reports and payment applications and submit all supporting documentation to the NJDEP along with requests for reimbursement.

Arcadis will review all monthly payment requests submitted by the contractors and compare them against the construction progress of the project, to assure that the progress payment request reflects the monetary value of the Contractor's work completed.

In addition, Arcadis shall certify to the PVWC that the Contractor's payment requests are verified and mathematically correct, and make a written recommendation to the PVWC regarding payment to the Contractors. The Contractor's pay request, Arcadis' written recommendation and all supporting documentation necessary to satisfy the NJEIT loan requirements for reimbursement will be submitted to the PVWC. The information will subsequently be provided to the NJEIT as required.

The pricing information contained within the progress payment request will be in accordance with the approved schedule of values for the work,

- Collect all specified guarantees and warranties.
- Recommend dates of substantial completion and warranty commencement.
- Upon notification from the contractor that the work is complete, typically around the 85% to 90% level, Arcadis, in conjunction with PVWC and the NJDEP will perform an inspection/walk through of the work. Out of this inspection/walk through, a punch list will be developed, and a determination of substantial completion will be made.
- Once all punch list items have been completed and property and adequately addressed by the contractor, Arcadis along with PVWC and the contractors will perform a final inspection for the purpose of verifying that all work is complete and that all punch list items have been completed.
- Review the Contractor's record drawings.

Arcadis' Resident Project Representative will periodically review the contractor's marked up "Red Lined" set of record drawings to verify that the documents are being sufficiently maintained to capture any and all changes and modifications made during the course of the work. Arcadis typically perform this on all projects, and it is usually performed by the Resident Project Representative prior to the monthly progress meetings or when the monthly request for payments are submitted. In order to supplement the contractor's record drawings, Arcadis will also maintain and prepare set of "Red Lined" record drawings that will capture any field and design changes made during the course of the project.

Review and recommend the processing of final payments and the release of any retained monies.

Final technical inspection and certification. Provide final inspection and certification of facilities. Arcadis will provide to PVWC and the NJDEP the Engineer's certification required by the NJDEP EIT program. The certification will state that based on the observation made, inspections performed and records developed during the course of the project, the work has been constructed according to the intent of the Contract Documents.

Provide office specialty personnel to assist the field personnel at the appropriate time during construction.

Arcadis understands that during construction there are times that issues will arise that will require the direct involvement of the specialty design personnel, who were specifically responsible for the project's design. The design of the projects will be performed by Arcadis personnel in our White Plains, NY and Fair Lawn, NJ offices. Accordingly, because of the close proximity of these offices, field issues and problems requiring site visits can be directly handled by the designers responsible and can be resolved in a matter of hours. This will effectively act to limit contractor downtime and potential delays that might be experienced because of downtime or a delay in resolving construction issues.

Task 15 – Start-up and Training

Participate and observe initial operation of the project (start-up) and operation and performance tests required by the specifications.

Arcadis has assumed that the initial project start-up will primarily be handled by our on-site Resident Project Representative, who will draw on the Arcadis resources locally situated in our White Plains, NY, Fair Lawn, NJ, and Edison, NJ offices. We will be able to bring resources to the site as needed to observe various start-up and performance testing activities. We have assumed that for on-site start-up and resolution of initial operating problems we will provide the appropriate design personnel for 10 full day site visits.

As part of the start-up and performance testing participation and observation, Arcadis will review Contractor's start-up plan, training plans and training materials. Observe and document results of startup and testing activities.

ARCADIS Design & Consultancy for natural and built assets

PASSAIC VALLEY WATER COMMISSION

NEW STREET RESERVOIR WATER STORAGE AND PUMPING FACILITIES DESIGN, PERMITTING AND CONSTRUCTION ADMINISTRATION SERVICES

PROJECT NO. 16-P-64

4. PROJECT BUDGET AND SCHEDULE

4. PROJECT BUDGET AND SCHEDULE

This section illustrates how our knowledgeable staff will be able to deliver this project on schedule and budget. Included in this section are a detailed budget breakdown, hourly rate schedule, and project schedule for successfully delivering the project. In addition, we have included a list of assumptions made during development of the cost and schedule.

Order of this section:

- Cost Table
- Hourly Rate Schedule
- Project Schedule
- List of Assumptions

Cost Table

		Total	Subs	ODC	ARCADIS	ARCADIS	Director	Principal II	Principal I	Sr. Eng II	Sr. Eng I	Proj. Eng	Engineer	CADD Tech	Res 1 (30 mos.)	Res 2 (18 mos.)
		$	$	$	Labor $	Labor (hrs)	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs
Total Hrs / Grade		14,669					151	196	398	1,786	332	630	2,274	862	5,030	3,010
Hourly Rates		$ 108.18					$ 230	$ 220	$ 200	$ 185	$ 155	$ 145	$ 125	$ 80	Full Time Resident Engineers $ 75	$ 75
Task 1	Information Review and Value Engineering	$ 48,430	$ -	$ 500	$ 47,930	280	16	30	24	100	0	30	80	0	0	0
Task 2	Site Mapping	$ 22,800	$ 16,500	$ 250	$ 6,050	44	2	0	0	12	0	8	10	12	0	0
Task 3	Coordination with Public Relations Consultant	$ 52,180	$ 9,900	$ 500	$ 41,780	266	6	20	0	100	60	0	40	40	0	0
Task 4	Stormwater Run-off and Flood Hazard Area Analysis	$ 26,930	$ -	$ 1,000	$ 25,930	148	2	12	8	70	16	40	0	0	0	0
Task 5	Geotechnical Investigation and Evaluation	$ 92,840	$ 88,000	$ 250	$ 4,590	25	1	8	0	10	0	0	6	0	0	0
Task 6	Progress Meetings	$ 34,240	$ -	$ 400	$ 33,840	192	16	0	0	136	0	0	40	0	0	0
Task 7	Basis of Design	$ 47,600	$ -	$ 500	$ 47,100	284	20	16	24	90	10	24	100	0	0	0
Task 8	Design	$ 432,650	$ -	$ 2,000	$ 430,650	3040	70	90	80	900	150	200	800	750	0	0
Task 9	Permitting	$ 67,090	$ -	$ 1,000	$ 66,090	476	2	0	56	58	0	70	230	60	0	0
Task 10	Cost Estimates	$ 63,980	$ 53,020	$ 250	$ 10,710	62	2	10	0	30	0	0	20	0	0	0
Task 11	Financing Assistance	$ 21,680	$ -	$ 500	$ 21,180	126	6	0	0	60	0	60	0	0	0	0
Task 12	Bidding Assistance	$ 15,140	$ -	$ 500	$ 14,640	96	3	0	15	20	0	0	58	0	0	0
Task 13	Construction Administration, Office Coordination	$ 187,190	$ -	$ 3,000	$ 184,190	1248	2	0	180	200	16	100	750	0	0	0
Task 14	Resident Observation	$ 650,000	$ -	$ 50,000	$ 600,000	8000	0	0	0	0	0	0	0	0	5000	3000
Task 15	Start-Up and Training	$ 17,710	$ -	$ 1,000	$ 16,710	131	0	10	3	0	0	58	20	0	30	10
Task 16	Operations & Maintenance	$ 23,560	$ -	$ 700	$ 22,860	170	2	0	8	0	0	40	120	0	0	0
Task 17	Record Drawings	$ 13,380	$ -	$ 750	$ 12,630	81	1	0	0	0	80	0	0	0	0	0
	Totals Without Allowances	$ 1,817,400	$ 167,420	$ 63,100	$ 1,586,880	14669	151	196	398	1786	332	630	2274	862	5030	3010
Task 18	Allowance for Additional Meetings	$ 80,000	$ -	$ 80,000	$ -	0	0	0	0	0	0	0	0	0	0	0
Task 19	Allowances for Additional Services and VE	$ 100,000	$ -	$ 100,000	$ -	0	0	0	0	0	0	0	0	0	0	0
	Totals With Allowances	$ 1,997,400	$ 167,420	$ 243,100	$ 1,586,880	14669	151	196	398	1786	332	630	2274	862	5030	3010

Hourly Rate Schedule

Charges for services provided will be in accordance with the following schedule. All rates presented apply to services rendered as per the schedule provided.

Classification	Hourly Rate ($)
Design Tech II/Resident Project Rep II	71
CADD Technician	80
Drafter I/Resident Project Rep III and IV	85
Drafter II/Resident Project Rep V	96
Project Assistant I and II	135
Engineer/Scientist	125
Staff Engineer/Scientist/Architect	135
Project Engineer/ Scientist/Architect	145
Senior Engineer/ Scientist/Architect I	155
Senior Engineer/Scientist/Architect II	185
Principal Engineer/Scientist/Architect I	200
Principal Engineer/Scientist/Architect II	220
Engineer/Scientist Director	230

Other Direct Costs. All expenses incurred for a project, except in-house services specified below, from outside vendors will be invoiced at cost plus 10% to cover administrative expenses. These items may include, but are not limited to: shipping charges; printing; supplies; equipment; traveling expenses; special insurance; licenses; permits; or subcontractors.

In-house services consist of:

- Transportation: $0.64 per mile for vehicles.
- Equipment: A schedule of usage rates for specialty equipment is available for field assignments.
- Web Hosting: A schedule of monthly web hosting rates is available for client access web sites.

List of Assumptions

Task 1- Information Review and Value Engineering

Costs for additional design & construction administration work if the VE analysis results in a design different from the one presented in the RFP are not included in the base scope. Assuming one or two of these VE Alternatives are pursued, the additional design effort would appear to be covered by the amount currently included in Task 19, Allowances.

One site visit by three people is included.

The meeting with the Commission to discuss the white paper and value engineering analysis will be a 6 hour meeting, including travel time, attended by three people.

The public meeting/workshop will be 8 hours, including travel time, attended by two people.

One draft and one final Project Sequencing Plan memorandum are included.

Task 2 - Site Mapping

Existing Survey Mapping for the New Street Reservoir will be provided by PVWC in electronic CAD format.

Subsurface utilities will be shown based on existing mapping, markouts by others, and surface features. No subsurface mapping, GPR, etc., is included.

The drawings in the Conceptual Design Report note a discrepancy between the survey and the bathymetry. Since the nature of this discrepancy is unknown, reconciling it has not been included. Also, an update to PVWC's bathymetric survey is not planned.

Task 3 – Coordination with Public Relations Consultant

Three alternate site layouts and three elevation drawings/renderings are included.

For the 8 public meetings, 4 hours has been budgeted and attendance by two people for each meeting.

Task 4 – Stormwater Run-off and Flood Hazard Area Analysis

The meeting with the NJDEP to confirm that the New Street Reservoir is indeed within the 100-year floodplain will be 8 hours, including travel time, attended by two people.

Task 5 - Geotechnical Investigation and Evaluation

It is assumed that the bottom of the reservoir is bedrock.

Bedrock outcroppings are visible and relatively accessible around the reservoir.

Task 6 - Progress Meetings

Pricing assumes 17 Progress Meetings (includes two meetings beyond the monthly progress meetings) at 8 hours, including travel time, attended by the Project Manager, along with one other key team member, depending on the focus of the meeting.

Task 7 - Basis of Design

Pricing assumes one draft and one final version of the BODR.

Task 8 - Design

Assumed 1 million gallons of temporary equalization storage is needed.

Due to the advantages of a prefabricated building for a project such as this, Arcadis has based its

Task 12 - Bidding Assistance

Provide Finished Drawings to PVWC

- Assume that documents will be supplied to PVWC for sale to bidders.

Provide Contract Documents for Bidding

- Assume that documents will be sent to PVWC.

Respond to Bidders Questions and Issue Addenda

- Assume that there will only be one addendum issued.
- Addenda will be faxed and fed-ex in order to confirm delivery.
- Assume that 15 questions will be received, reviewed and answered.
- Assume that each question will require 3 hrs to review, respond and finalize answer.
- Assume that contract will require one (1) addendum
- Addendum will consist of 20 pages, including pre-bid minutes, questions and up to two (2) sketches.

Pre-Bid Meeting

- Assume one meeting will be 6 hrs, including travel time.
- Assume Arcadis will prepare agenda - 30 copies at 1 page each.
- Assume Arcadis will prepare Pre-Bid Meeting Minutes - 30 copies at 5 pages each.

Review Bids / Make Recommendations

- Assume that bids will be reviewed and recommendation letter will be written to PVWC
- Assume recommendation letter will consist of 2-3 pages and two (2) attachments

Task 13 – Construction Administration, Office Coordination

Review and Approve Shop Drawings

- Assume that we will use Arcadis Shop Drawings software - Orion web based document management system.
- Assume that review of shop drawings will be performed by design engineers.
- Assume that scope will be to accept Shop Drawing, Log-in, Distribute for review, accept from reviewer and transfer comments, copy, log-out and distribute Shop Drawings.
- Assume total number of shop drawings will be 100

Attend Monthly Meetings, Resolve Construction Problems and answer RFIs

- Monthly meetings will be held during the active construction period.
- Meetings will be 4 hrs, including travel time.
- Assume that issues/problems will be handled primarily by RE and field staff.
- Assume effort to resolve issues will require 16 hrs per month for office staff in addition to RE and field staff.
- Assume that we will use Arcadis Orion Software - Orion web based document management system to accept, log-in, distribute for review, accept from reviewer, log-out and distribute RFIs
- Assume that review of RFIs will take 4 hrs per RFI.
- Assume total number of RFIs will be 25

Change Orders

- Assume total number of change orders will be 5
- Assume that time to prepare and issue changes in advance of executing change orders will be 12 hrs per change order.

Monitor Construction Progress/Potential Delays

- Assume this will be performed by on-site staff and resident project representative.

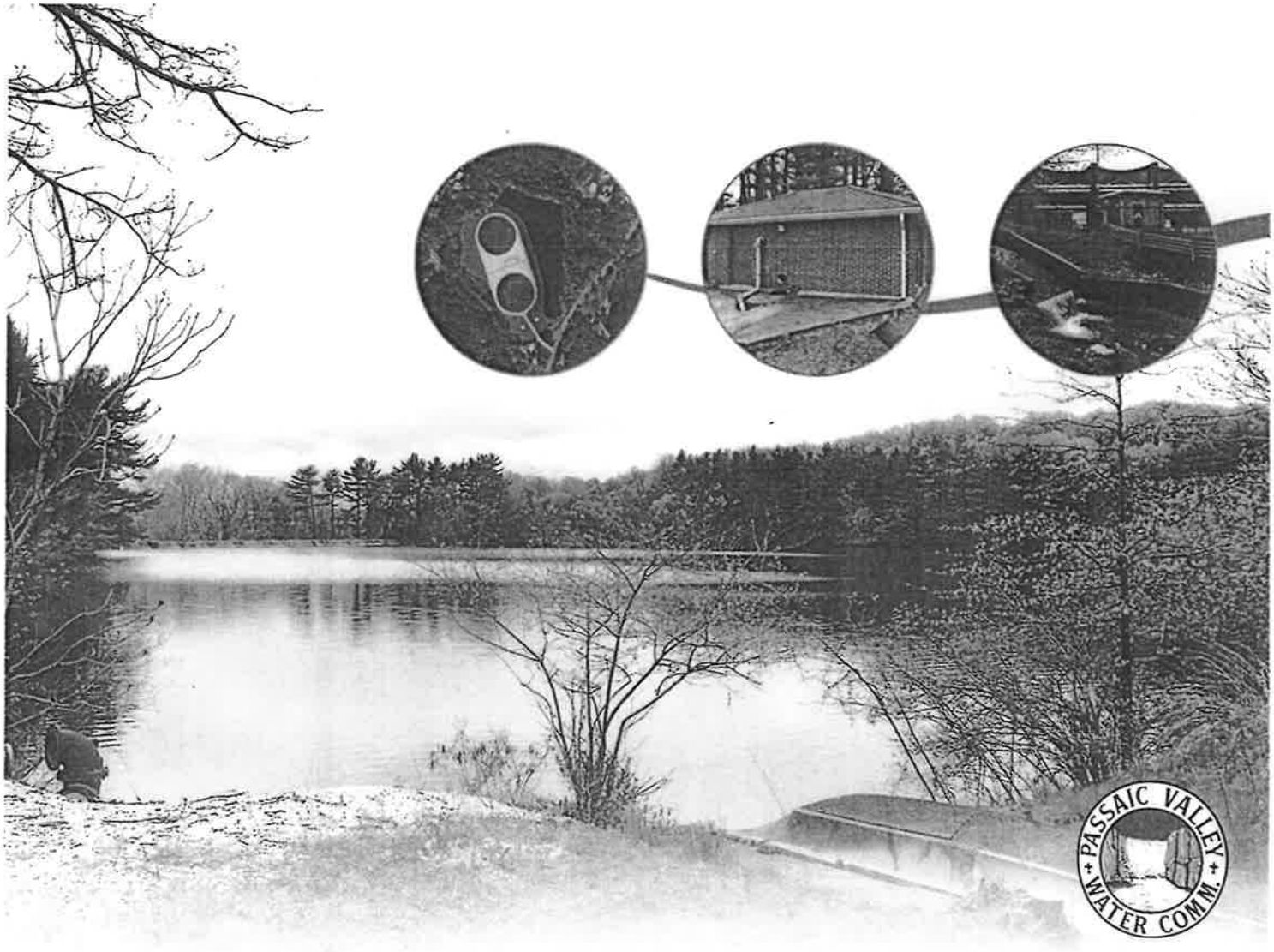
ARCADIS Design & Consultancy for natural and built assets

PASSAIC VALLEY WATER COMMISSION

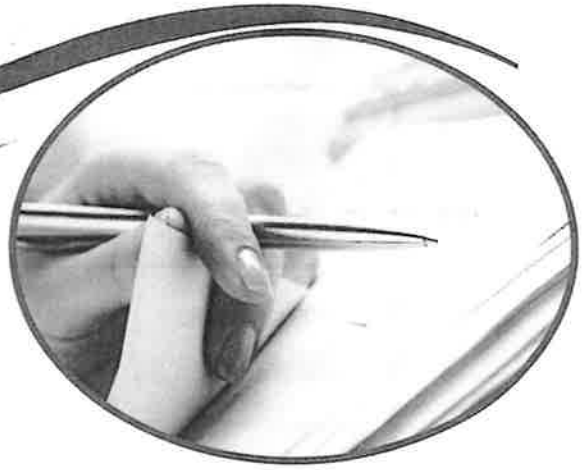
NEW STREET RESERVOIR WATER STORAGE AND PUMPING FACILITIES DESIGN, PERMITTING AND CONSTRUCTION ADMINISTRATION SERVICES

PROJECT NO. 16-P-64

5. REQUIRED FORMS



5. REQUIRED FORMS



Required Forms

In accordance with the RFP requirements, we present the following forms and attachments within this section:

- Identification Page
- Experience / Reputation
- Knowledge of Subject Matter
- Availability to Accommodate All Required Meetings
- Availability of Personnel & Resources
- Qualifications and Experience
- Disclosure of Ownership Statement
- Insurance Requirements and Acknowledgement Form
- Insurance Certificates
- Affirmative Action Compliance Notice
- Certificate of Employee Information Report
- Acknowledgement of Receipt of PVWC's Changes to the Request for Responses for the Project
- Conflict of Interest Certification
- Non-Collusion Affidavit
- Equal Employment Opportunity Notice
- Certification of Investment Activities in Iran
- Schedule of Political Contributions / Donations

*Please note that we have included a copy of **Arcadis' Business Registration Certificate** issued by the State of New Jersey Department of Treasury, Division of Revenue on the following page.*

PASSAIC VALLEY WATER COMMISSION

REQUEST FOR PROPOSALS FOR PROFESSIONAL SERVICES (OR EXTRAORDINARY UNSPECIFIABLE SERVICES)

IDENTIFICATION PAGE

A. Name of Firm[1] Arcadis U.S., Inc.

B. Mailing Address of Firm: 17-17 Route 208 North

Fair Lawn, NJ 07410

C. Firm's Primary Contact Person for this Project:

1. Name: Michael L. Mondello, PE
2. Telephone Number: 201-398-4354
3. Facsimile Number: 201-797-4399
4. E-mail Address: Michael.Mondello@arcadis.com

D. Firm's Alternate Contact Person for this Project:

1. Name: Gerard M. Spiesbach
2. Telephone Number: 201-398-4379
3. Facsimile Number: 201-797-4399
4. E-mail Address: Gerry.Spiesbach@arcadis.com

E. Contact Information for Firm's Proposed Subcontractor, if any:

1. Name of Subcontractor's Firm: Borbas Surveying & Mapping, Inc.
2. Address of Subcontractor's Firm: 402 Main Street, Boonton, NJ 07005
3. Subcontractor's Contact Person: J. Peter Borbas, PLS, PP
4. Telephone Number : 973-316-8743
5. Facsimile Number:
6. E-mail Address: www.borbas.com

F. Contact Information for Firm's Additional Proposed Subcontractor(s), if any:

(Attach Additional Sheets as Required) (See attached sheet)

NOTE: (1) Firm as used herein refers to Professional/Professional's firm, as applicable.

PASSAIC VALLEY WATER COMMISSION

REQUEST FOR PROPOSALS FOR PROFESSIONAL SERVICES (OR EXTRAORDINARY UNSPECIFIABLE SERVICES)

EXPERIENCE/REPUTATION

Responders to the Request for Proposals shall include a narrative to address this Section

(Additional detail may be provided in the Proposal)

Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 27,000 people active in over 70 countries that generate more than $3.8 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world.

Please refer to Section 1 - Firm Experience for a more comprehensive description of our experience and reputation.

PASSAIC VALLEY WATER COMMISSION

REQUEST FOR PROPOSALS FOR PROFESSIONAL SERVICES (OR EXTRAORDINARY UNSPECIFIABLE SERVICES)

AVAILABILITY TO ACCOMMODATE ALL REQUIRED MEETINGS

Responders to the Request for Proposals shall include a narrative response to address this Section.

(Additional detail may be provided in the Proposal)

Arcadis' office in Fair Lawn is 15 minutes from PVWC's office and with a staff of approximately 60 professionals in Fair Lawn and over 300 in the NY/NJ area we can easily accommodate all meetings. Technical experts where required for meetings can easily be brought to New Jersey as we have in the past.