

# PROPOSAL FOR

Albany Pool Communities Green Infrastructure Stormwater In-Lieu Fees and Stormwater Retention Credit Banking Feasibility Study  
Combined Sewer Overflow Long Term Control Plan

November 20, 2015



*Privileged and Confidential*

Mr. Martin Daly  
Project Director  
Capital District Regional Planning Commission  
One Park Place, Suite 102  
Albany, NY 12205

Subject:

**Proposal for Albany Pool Communities Green Infrastructure Stormwater In-Lieu Fees and Stormwater Retention Credit Banking Feasibility Study RFP #2015-002**

Arcadis U.S., Inc.  
855 Route 146, Suite 210  
Clifton Park  
New York 12065  
TEL 518 250 7300  
FAX 518 250 7301  
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Dear Mr. Daley:

The Albany Pool Communities are faced with numerous challenges over the coming years – in particular, implementation of the CSO Long Term Control Plan (LTCP), which includes a significant Green Infrastructure component. As a part of this program, the Albany Pool Communities are required to complete a feasibility study for Stormwater In-Lieu Fees (“ILFs”) and Stormwater Retention Credit Banking.

Contact:

John Mastracchio, PE, CFA

Date:

November 20, 2015

Phone:

518.250.7353

Email:

[john.mastracchio@arcadis.com](mailto:john.mastracchio@arcadis.com)

The Arcadis Team stands alone among our competitors when it comes to stormwater program planning and knowledge of the Albany Pool Community’s LTCP. We are the only consulting team that brings unmatched expertise in developing stormwater programs, including mitigation credit banks, stormwater credits, stormwater fees, billing systems, and support organizations, and combines this experience with the in-depth knowledge of the Albany Pool Community’s LTCP.

Our ref:

66000942.0013

The Albany Pool communities will benefit from our relevant stormwater industry experience and expertise. We have helped several of our clients implement similar stormwater programs, such as City of Philadelphia (Green City, Clean Water’s Program), and the Georgia DOT (Wetlands Mitigation Credit Banking Program), and have authored several recent industry publications on relevant stormwater and green infrastructure topics. By leveraging this experience, the Albany Pool Communities will receive a sound and realistic feasibility study that is based on relevant, successful approaches, and lessons learned that exist in the industry regarding Stormwater ILFs and credit banking.

Furthermore, our team brings extensive experience in working with the Capital District Regional Planning Commission (CDRPC) and the Albany Pool Communities, have intimate knowledge of the LTCP goals and requirements

Martin Daly  
November 20, 2015

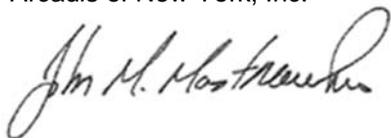
through our development on the LTCP, and have extensive knowledge of potential development areas throughout the Capital District where a stormwater credit banking and ILF program may be most suitable. This will ensure that the Albany Pool communities receive a feasibility study that is sufficiently focused on meeting the goals of the community's overall program, and will allow us to prepare the Feasibility Assessment for Stormwater ILFs and Credit Banking that targets and achieves the greatest CSO benefit.

Our unique approach to this project entails providing a collaborative forum with which the CDRPC and the Albany Pool communities can access experts in the industry that are also practitioners regarding Stormwater Banking and ILFs to collectively assess stormwater banking and ILFs and their suitability to the Albany Pool communities. These experts include Fernando Pasquel (Arcadis' Stormwater Practice Leader), Brenna Mannion (Director of Regulatory Affairs at the National Association of Clean Water Agencies), Seth Brown, a nationally recognized researcher regarding Stormwater Credit Banks, and other practitioners who have led the implementation of Stormwater Credit Bank programs.

Thank you for the opportunity to present our qualifications. If you have any questions or need any additional information, please do not hesitate to contact me.

Sincerely,

Arcadis of New York, Inc.



John M. Mastracchio, PE, CFA  
Project Manager

Copies:

Four (4) Copies / One (1) Electronic

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# PART I: PROPOSAL FORM



**PROPOSAL FORM COVER SHEET**

**PROPSOAL IDENTIFICATION:**

Title: **ALBANY POOL COMMUNITIES GREEN INFRASTRUCTURE STORMWATER IN-LIEU FEES AND STORMWATER RETENTION CREDIT BANKING FEASIBILITY STUDY COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN**

RFP Number: **2015-002**

Communication concerning this Proposal shall be addressed to:

John Mastracchio, CFA

Arcadis of New York, Inc.

855 Route 146, Suite 210

Clifton Park, NY 12065

Phone: (518) 250-7300 Email: John.Mastracchio@arcadis.com

**PROPOSAL SUBMITTED TO:**

Martin Daley  
Project Director  
Capital District Regional Planning Commission  
One Park Place, Suite 102  
Albany, NY 12205

1. The undersigned applicant proposes and agrees, if this Proposal is accepted, to enter into a contract with the Albany Water Board to complete all work as specified or indicated in the contract documents for the contract price and within the contract time indicated in this Proposal and in accordance with the contract documents.
2. Applicant accepts all of the terms and conditions of the Instructions to applicants. This Proposals may remain open for ninety (90) days after the day of Proposal opening. Applicant will sign the contract and submit any other documents required by the contract documents within fifteen (15) days after receipt of the contract.
3. The following documents are attached to and made a condition of this Proposals:
  - a) Cost Proposal
  - b) Acknowledgement by Applicant
  - c) MWBE Requirements

Applicant Name: John Mastracchio, CFA

Date: November 20, 2015

Applicant Signature: 

**ACKNOWLEDGMENT BY SUBMITTER**

If Individual or Individuals:

STATE OF \_\_\_\_\_ )  
COUNTY OF \_\_\_\_\_ ) SS.:

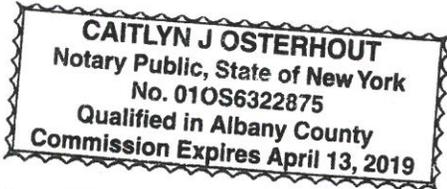
On this \_\_\_\_\_ day of \_\_\_\_\_, 2015, before me personally appeared \_\_\_\_\_ to me known and known to me to be the same person(s) described in and who executed the within instrument, and he (or they severally) acknowledged to me that he (or they) executed the same.

\_\_\_\_\_  
Notary Public, State of \_\_\_\_\_  
Qualified in \_\_\_\_\_  
Commission Expires \_\_\_\_\_

If Corporation:

STATE OF New York )  
COUNTY OF Saratoga ) SS.:

On this 20<sup>th</sup> day of November, 2015, before me personally appeared John M. Mastacchio to me known, who, being by me sworn, did say that he resides at (give address) 212 Britton Ave, Norcogen; that he is the (give title) Associate Vice President of the (name of corporation) ARCADIS of New York, Inc. the corporation described in and which executed the above instrument; that he knows the seal of the corporation, and that the seal affixed to the instrument is such corporate seal; that it was so affixed by order of the board of directors of the corporation, and that he signed his name thereto by like order.



Caitlyn J. Osterhout  
Notary Public, State of New York  
Qualified in Albany County  
Commission Expires April 13, 2019

If Partnership:

STATE OF \_\_\_\_\_ )  
COUNTY OF \_\_\_\_\_ ) SS.:

On this \_\_\_\_\_ day of \_\_\_\_\_, 2015, before me personally came \_\_\_\_\_, to me known to be the individual who executed the foregoing, and who, being duly sworn, did depose and say that he/she is a partner of the firm of \_\_\_\_\_ and that he/she has the authority to sign the same, and acknowledged that he/she executed the same as the act and deed of said partnership.

\_\_\_\_\_  
Notary Public, State of \_\_\_\_\_  
Qualified in \_\_\_\_\_  
Commission Expires \_\_\_\_\_

# PART II: QUALIFICATIONS / EXPERIENCE



## Part II: Qualifications / Experience

The Arcadis Team is best suited to complete the Green Infrastructure Stormwater In-Lieu Fees (“ILFs”) and Stormwater Retention Credit Banking Feasibility Study for the Capital District Regional Planning Commission (“CDRPC”) and the Albany Pool Communities due to our strong qualifications, experience, and leadership in stormwater management, and intimate knowledge of the Albany Pool LTCP, including the following:

- We have extensive experience in developing stormwater programs, including mitigation credit banks, stormwater credits, stormwater fees, stormwater authorities, billing systems, and support organizations. For example, we helped the Georgia DOT plan and implement mitigation credit bank that is effectively managing wetlands mitigation throughout Georgia.
- We are industry leaders in the planning and implementation of green infrastructure programs, so much so that members of our project team are authors of *Green Infrastructure Implementation, A Special Publication* by the Water Environment Federation (2014), *Navigating Litigation Floodwaters: Legal Considerations for Funding Municipal Stormwater Programs* (NACWA, 2014), *User Fee Funded Stormwater Programs* (WEF, 2013) and other industry publications on rates, fees, and charges.
- We bring CDRPC and the Albany Pool Communities access to experts in the industry regarding Stormwater Banking and ILFs, including Fernando Pasquel (Arcadis’ National Director for Stormwater Management), Brenna Mannion (Director of Regulatory Affairs at the National Association of Clean Water Agencies), Seth Brown, a nationally recognized researcher regarding Stormwater Credit Banks, and other practitioners who have led stormwater credit bank or ILF programs.
- We bring extensive experience in working with the CDRPC and the Albany Pool Communities, have intimate knowledge of the LTCP goals and requirements, as well as potential development areas throughout the Capital District where a stormwater credit banking and ILF program may be most suitable. This experience will allow us to prepare the Feasibility Assessment for Stormwater ILFs and Credit Banking that targets and achieves the greatest CSO benefit.

What this means is that the Arcadis Team is best able to leverage and apply the successful approaches, lessons learned and body of knowledge that exists in the industry regarding Stormwater ILFs and credit banking to developing a sound and realistic feasibility study for the CDRPC and the Albany Pool Communities.

## About Arcadis

### *Our History*

Arcadis is a large company with more than 28,000 employees worldwide, including 6,200 employees in the U.S., and more than 1,300 in the Northeast offices. This includes more than 900 personnel in New York State and New Jersey alone. Arcadis began operation 1888, when the organization was founded in the Netherlands as an association for wasteland redevelopment. Arcadis NV evolved throughout the 20th century, expanding its global reach and

range of service offerings through strategic initiatives and targeted acquisitions.

Arcadis was established in the United States in Delaware as Geraghty & Miller in 1967. The firm expanded in 1964 in response to water supply problems created by a major drought in the Northeast. The first public offering occurred in 1988. In 1993, Geraghty & Miller was acquired by Arcadis NV. In 1998, Geraghty & Miller was renamed Arcadis.

Arcadis has continued to grow through strategic mergers and acquisitions to enhance its service

offerings and expand its geographic coverage in the U.S. and worldwide. The firm is a leading international company providing consultancy,

design, engineering and management services in infrastructure, water, environment and buildings.

### ***Point-of-Contact / Contract Authorization***

For this contract, the Arcadis Point-of-Contact is:

John Mastracchio, CFA  
855 Route 146, Suite 210  
Clifton Park, New York 12065  
TEL (518) 250-7300  
FAX (518) 250-7301  
[John.Mastracchio@arcadis.com](mailto:John.Mastracchio@arcadis.com)

John is also authorized to execute this and any contract with the City of Albany and the Capital District Regional Planning Commission.

## **Subcontractors**

### **Boomi Environmental, LLC**

Boomi Environmental (Boomi), a certified MBE, is a progressive environmental consulting firm specializing in the development of sustainable, implementable, and cost-effective solutions to water and wastewater challenges faced by municipalities, industries, state/federal agencies and watershed organizations. The founding principle is to develop solutions that strive to preserve the environment for future generations - working locally with a global vision. **For this project, Boomi will provide their expertise for our Workshop Panel of Experts.**



John Clarkeson left the Federal Highway Administration and founded Clarkeson Engineering in Boston, Massachusetts, the firm that would become CHA Consulting. President Eisenhower four years later signed the Federal Aid Highway Act creating the interstate highway system. John Clarkeson, designed miles of highway and 36 bridges as part of Boston's Southeast Expressway. **In 1961, Interstate 95 in Maine was named America's Most Scenic Highway, an award the firm would receive again six years later for another highway (I-87 in New York).** By 1993, CHA had ten offices and more than 250 staff, and over the past two+ decades, the firm has acquired a number of other successful enterprises: Southern Engineering, Isbell Engineering Group, Olver, Inc., Gryphon International Engineering, RW Armstrong, Coler & Colantonio, and Huntley Partners. **For this project, CHA will provide Development and Topographic Assessment as well as ILF and Banking Program Assessment.**

### **Brenna Mannion**

Ms. Mannion is the Director of Regulatory Affairs and Outreach for the National Association of Clean Water Agencies (NACWA). A licensed professional engineer, she works with federal agencies and nationwide on behalf of communities implementing stormwater management programs and to garner national support for innovative management techniques like green infrastructure. Brenna holds a BS in Civil Engineering from the University of Notre Dame, and is based in DC. She participated in the development of the publication titled Navigating Litigation Floodwaters: Legal Considerations for Funding Municipal Stormwater Programs, NACWA 2014. **For this project, Ms. Mannion will provide her expertise for the Workshop Panel of Experts.**



Storm and Stream Solutions, LLC (S3) was created to provide various professional services in the water sector. Service areas range from technical review, design and analysis of water resources, stormwater management and stream restoration efforts to research in public-private partnership (P3) investments in stormwater and green infrastructure frameworks. S3 is led by Seth Brown, who has a career with 20 years in the water sector in areas ranging from fluvial geomorphology to technical training to policy / legal aspects of the water sector. While covering a wide array of areas and issues, my passion is in the stormwater sector. His 15 years in the private sector has focused on design, analysis and modeling of natural water systems – stream assessment / restoration, watershed management, GIS services, development and delivery of technical training focused on erosion and sediment control (E&S) as well as post-construction stormwater management. **For this project, S3 will provide expertise for the Workshop Panel of Experts.**



Founded in 2009, Towne, Ryan & Partners, PC (TRP) is the largest certified WBE law firm in Upstate New York, as well as in 57 of the 62 counties of New York. TRP is a general practice law firm that offers skilled legal counsel in a broad range of legal fields covering transactional and litigation matters. Although the Firm has only been in existence for six years, their experience and reputation in the community were long established prior thereto. Between the three principals alone, the Firm has nearly 100 years of experience collectively.

Over the course of the last several decades, TRP has worked with a variety of private and public agencies, including a number of towns, cities, villages, counties, school districts, community colleges, planning boards, public housing authorities and community action groups in an advisory role. They have also worked with various internal departments to assist in dealing with a host of issues in and out of state and federal courts and the Public Employment Relations Board (PERB). They have strategized to avoid grievances, litigation and PERB filings through negotiations and proper training and various types of preventative strategies. **For this project, TRP will provide services for Regulatory Authority and Governance.**

## Stormwater Consulting Qualifications

Managing stormwater is about both quantity and quality. Municipalities want to control the quantity of stormwater to minimize its impact on communities and ecosystems and manage the cost of meeting the water quality demands imposed by environmental regulations. Arcadis takes a more expansive view of stormwater management that emphasizes quality through the use of stormwater as an asset. We develops solutions that fit a client's particular needs by treating stormwater as a valuable resource that can be managed for reuse, irrigation, or environmental features such as wetlands. This is coordinated with the management of ground and surface water so that the entire water cycle factors into the planning process.

As a firm with more than a century's worth of consulting experience on water and environmental projects, Arcadis has founded its mission on helping its clients and their communities to create sustainable solutions that make our world cleaner and safer. Throughout our history we have helped state and local clients solve a wide range of stormwater problems. Our stormwater services include:

- Development of stormwater utilities, policies and ordinances.

- Development of equitable and defensible stormwater rate structures, fees, and credits, including expert testimony.
- NPDES MS4 permitting and SWPPP development.
- TMDL compliance support and action plan development.
- Modeling (hydrology, hydraulics, pollutant fate and transport).
- Floodplain management and eco-restoration (streams, wetlands, shoreline).
- In-stream biological impact assessment coordinated with conventional water quality assessment.
- Mitigation Credit Banks
- BMP evaluation, planning and design.
- Green infrastructure development.
- Stakeholder involvement and public education.

*Arcadis is currently undertaking Green Infrastructure and stormwater projects for:*

- New York City
- Philadelphia and Pittsburgh, PA;
- Wilmington, DE
- Washington, DC
- Chattanooga, TN
- Columbus and Cincinnati, OH
- Chicago, IL
- Buffalo, NY
- Fort Wayne, IN

### ***Knowledge of State and Federal Stormwater Management Statutes***

Our stormwater specialists have detailed knowledge of the USEPA Stormwater Rules and Regulations and the requirements of National Pollutant Discharge Elimination System (NPDES) permitting including New York MS-4 requirements. We have also assisted clients in developing action plans for compliance with local stream TMDLS.

We frequently assist clients in developing cost-effective plans for regulatory compliance. By understanding regulatory requirements and creating a balance between compliance and affordable, environmentally-effective actions that provide the maximum benefit for every public dollar invested, we help communities to promote sustainable development and logical, results-oriented spending decisions. We help communities become more proactive than reactive when it comes to managing their existing stormwater systems

### ***Mitigation Credit Banking***

Arcadis has extensive experience in the planning, implementing, and managing wetlands mitigation credit banking programs. While this experience was specifically for the management of wetlands mitigation, it is directly relevant to the stormwater ILFs and credit banking, and we will apply this experience to the CDRPC and Albany Pool feasibility study. This experience includes:

- Developing mitigation banking programs, including standard operating procedures
- Planning, designing, and construction oversight of mitigation banks
- Auditing all mitigation credits and debits for each mitigation bank
- Coordinating regulatory approval of new banks and closure of completed banks
- Developing a GIS-based database to house and track all documents pertaining to mitigation sites/banks
- Developing a mitigation bank credit web-based toolkit for managing banking credits

## ***Stormwater Program Implementation***

Arcadis recognizes that providing consulting services to support the management and sustainability of stormwater programs, including entire utility organizations, requires specialized and unique expertise, including:

- Experience in stormwater management and cost-recovery methods.
- Experience in implementing sustainable stormwater utilities.
- Experience in reviewing master plans in order to develop capital improvement programs and O&M costs to project revenue requirements.
- Strong financial analysis and financial modeling capabilities to establish rates and secure revenues.
- Experience in GIS and ability to leverage municipal expertise.
- Proven public education and outreach approaches.

Arcadis has extensive experience with stormwater utilities, including implementing stormwater utilities in a number of communities: Chattanooga, TN; El Paso, TX; McDonough, GA; Newark, OH; Isle of Wight, VA; and others as further described in this proposal, including studies for New Haven, CT and the Long Island Sound Watershed Municipal Council, NY.

## ***Experience with Operational Budgets***

Development of a financial assessment of the ILF and Credit Banking program requires financial and economic expertise and experience with cost estimating and operating budgets. Arcadis has extensive experience in this area. Using scenario planning, we work with client staff to help develop financial projections that support program requirements and clearly indicate the potential financial consequences of current management decisions. By focusing on operations and maintenance (O&M) and capital issues, we first clarify financial requirements — how much money the utility needs to meet its operational and capital needs — and then factor in financial performance measures to provide for sustainability of utility operations. This experience is relevant to the development of a process of evaluation of stormwater ILFs.

Arcadis has had success working on operational budgets and fiscal plans for various related client projects, e.g., Chattanooga's Economic Analysis of Stormwater Management Program; Isle of Wight County's Stormwater Management Plan; and the City of Norwalk, CT Wastewater & Stormwater Rate Study.

## ***Development of Stormwater Fees and Credits***

Development of a financial assessment of ILF fee calculations or off-site credits is an important component of the feasibility study. Arcadis routinely completes rate and fee studies to support municipal utilities as part of their ongoing financial planning and approval processes, including the development of stormwater fees, credits, and ILFs. Our process of utility rate structure selection is governed primarily by key pricing objectives, which typically are influenced by customer usage characteristics and utility financial considerations. For some utilities, choosing a rate structure may involve balancing multiple objectives that require public involvement across the community. Arcadis recognizes that by

*Arcadis' unparalleled experience in stormwater program planning and implementation, having completed more than 100 projects in over 30 states, will lead to a comprehensive Stormwater ILF and Credit Banking Feasibility Study.*

understanding the priorities of a community and utility, they will be able to translate these concerns into pricing objectives, thereby balancing clients' objectives with financial requirements and goals that are critical to establishing an optimal rate structure

### ***Analysis and Development of City Ordinances***

A successful stormwater program, such as a Stormwater Banking and ILF program, needs to be supported by a comprehensive ordinance to promote its effective implementation, the public health, safety and general welfare of its customers in compliance with the Federal Clean Water Act and State regulations. Arcadis has proven experience in assisting clients in evaluating policy issues and developing ordinances that specifically address the technical, legal (working with client legal counsel) and financial requirements of their stormwater program. This includes establishment of minimum requirements and procedures to control the adverse effects of stormwater and establishment of user fees for the privilege of discharging stormwater.

We assist clients in establishing sound policies in their ordinance to provide fair, equitable and nondiscriminatory rates and charges based on contribution of stormwater and use or benefit of services including credits for BMPs which will reduce the quantity or improve the quality of stormwater runoff. We also assist our clients in developing local performance-based zoning codes that will support and harmonize with green infrastructure, low-impact development and smart-growth policies.

### ***Utility Staffing Studies***

Analyzing the regional and local capacity to administer a Stormwater ILF and credit banking program requires experience in organizational effectiveness and design. Arcadis has helped forward-thinking utilities across the U.S. to thoroughly assess their performance and develop strategies for improvements in efficiency and cost-effectiveness. We do this by staffing our team with utility management specialists, organizational effectiveness leaders, local engineers and national financial consultants who work to establish a working relationship and understanding of our clients' communities and systems.

For the development and management of utilities, we assist with developing organizational structures, clarifying roles and responsibilities, evaluating technology and operational efficiency opportunities, preparing O&M programs, and monitoring performance. Our staff members have experience in increasing staff efficiency and determining preferred management options, such as in-house operations or outsourcing.

### ***GIS Mapping Capabilities***

GIS Mapping capabilities will be important to the completion of the Stormwater ILF and Credit Banking feasibility study, particularly for identifying areas under development pressure, and for providing a general assessment of soils and topography to determine areas of high and low GI value. Arcadis leads the way in developing and implementing GIS stormwater management solutions that are both innovative and practical. Using the latest GIS tools, we collaborate with our clients and design geodatabases to meet the needs of the project and serve as a repository of information, if needed, once the project is complete. This leaves our clients with a GIS they can rely on to meet permitting requirements and to update and review storm water improvements as they respond to community needs. We have extensive experience helping municipalities from the early stages of assessing current GIS system, building stormwater billing database, building the asset inventory through implementation and integrating with other systems, and developing spatial analysis routines to build and document knowledge. We are also experienced in

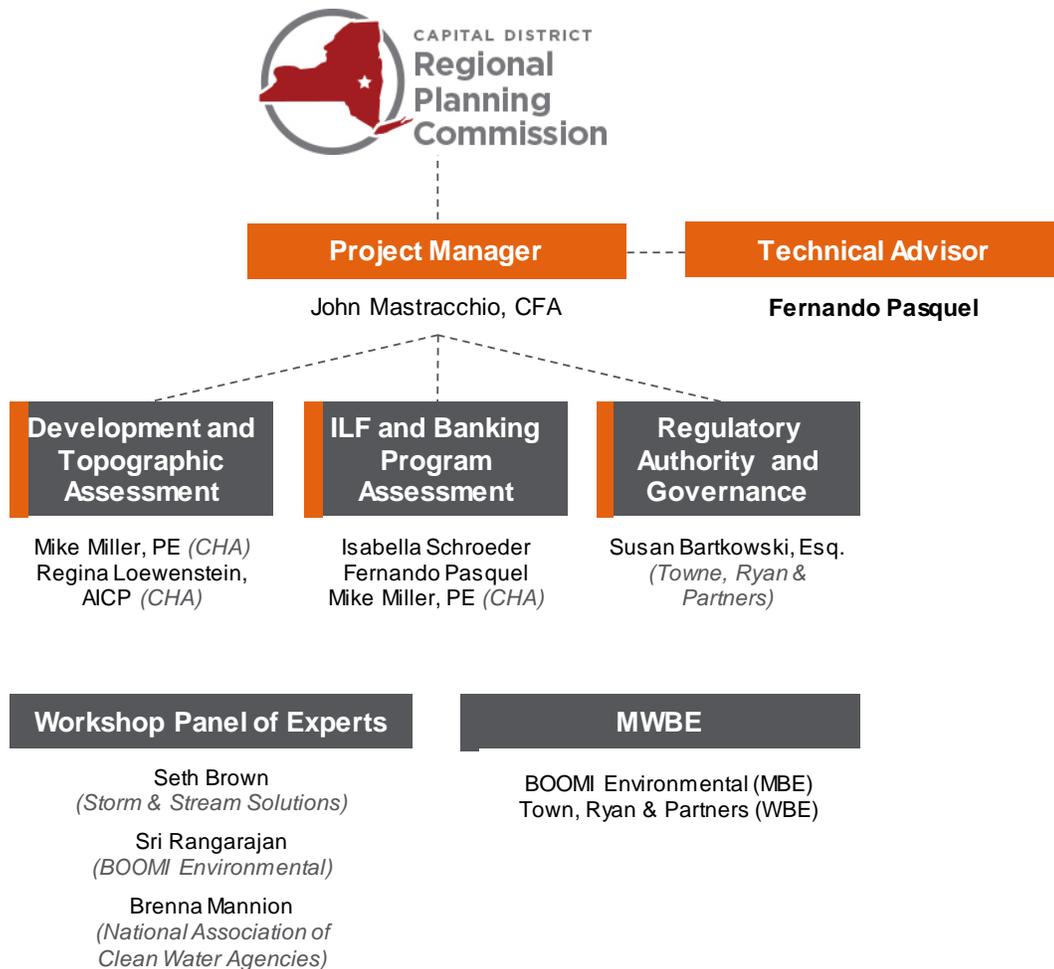
working with municipal staff that have developed GIS layers, and we support the analysis of the existing data to develop a fair and defensible rate structure.

### **Public Outreach & History with Public Education**

We understand that an effective stormwater utility program requires buy-in from the public. As part of our stormwater projects, we have routinely developed stormwater ordinances and policies — gaining acceptance through public outreach and education programs, making public presentations, conducting surveys, and providing support for the passing of legislation and ordinances. We understand that public outreach is a critical function for developing and implementing a new program. Arcadis will collaborate with the CDRPC and the Albany Pool Communities to make sure that there is appropriate outreach to the public and stakeholders included in the feasibility study and resulting implementation plan.

### **Team Organization**

Our organization is well thought out and finely tuned to provide the CDRPC and the Albany Pool Communities with a team of professionals to meet your needs. Our team organization is provided below, and the value and commitment for each of these roles is also presented, followed by brief biographies for key individuals.



- Our Project Manager, John Mastracchio, will set the direction and manage the execution of the project. John has over 21 years of experience managing and executing projects, is a subject matter expert regarding stormwater economics and funding, and was a member of the team that helped develop the LTCP for the Albany Pool Communities.
- Our Technical Advisor, Fernando Pasqual, is a nationally recognized expert in the stormwater management field and will provide assistance in an advisory capacity. Fernando has 30 years of experience in developing and implementing watershed and stormwater management programs that involve establishing funding alternatives; modeling; policy analysis; permitting; and designing stormwater management controls and best management practices (BMPs).
- Our Development and Topographic Assessment Team will be led by Mike Miller from CHA. Mike has over 25 years of experience in municipal engineering planning, design, and construction, including wastewater and stormwater experience throughout the Northeast.
- Our ILF and Banking Program Assessment Team will be led by Isabella Schroeder and supported by John Mastracchio, Fernando Pasquel, and Mike Miller. Isabella has over 30 years of engineering and economic consulting experience in the areas of stormwater and wastewater management.
- Our Regulatory Authority Review Team will be led by Susan Bartkowski, Esq from Towne, Ryan & Partners, a WBE firm. Susan is a general practice lawyer that has worked with a number of municipalities in New York State in advisory role, including compliance issues that dealt with a variety of environmental issues.

Our core project team will be supported by a deep bench of planners, communicators, problem solvers and engineers — with over 600 staff in the State of New York, we are fully committed to the success of this undertaking.

We have also assembled a team of workshop panel experts from around the country with practical experience in planning, implementing, and/or managing stormwater management programs, including Stormwater ILFs and Credit Banks. These experts will bring their knowledge and experience to help craft a tailored feasibility study for the Albany Pool Communities. These experts include:

- Fernando Pasquel, Arcadis' Stormwater Practice Leader, who is also an author of *Green Infrastructure Implementation, A Special Publication* by the Water Environment Federation (2014)
- Brenna Mannion, the Director of Regulatory Affairs at the National Association of Clean Water Agencies, who is also an author of *Navigating Litigation Floodwaters: Legal Considerations for Funding Municipal Stormwater Programs* (NACWA, 2014)
- Seth Brown, a nationally recognized researcher regarding Stormwater Credit Banks, who brings practical experience from programs implemented in Philadelphia and District of Columbia.
- Sri Rangarajan from Boomi Environmental, who was involved in the implementation of stormwater programs for New York City.
- Other potential practitioners that have led the implementation of Stormwater Credit Bank programs.

## Resumes

For ease of review, we have provided our team member resumes in **Appendix: Resumes** at the end of this proposal

## Project Experience

Arcadis has assisted many communities with stormwater management projects. Below is a representative listing of our recent nationwide stormwater experience, followed by representative project descriptions.

Representative Relevant Stormwater Project Experience	Stormwater Organizations	Stormwater Fees and Credits	Stormwater Program Management	GIS Support	Master Account Files/Billing System	Legal/Ordinances	Public Outreach/Education
<b>Client/Project Title</b>							
<b>City of Philadelphia, PA</b> Green City, Clean Waters Program			•	•			•
<b>City of New Haven, CT</b> Stormwater Management Plan	•	•	•	•	•		•
<b>City of Norwalk, CT</b> Stormwater Management Plan			•	•	•		
<b>City of Chattanooga, TN</b> Stormwater Utility Program	•	•	•	•	•	•	•
<b>City of McDonough, GA</b> Stormwater Management and Stormwater Utility	•		•	•	•	•	•
<b>El Paso Water Utilities Public Service Board, TX</b> Stormwater Utility Feasibility Analysis and Implementation	•	•		•		•	•
<b>City of Lancaster, OH</b> Creation of Stormwater Utility	•	•		•	•		•
<b>City of Stockbridge, GA</b> Annual Stormwater Utility Billing Analysis	•	•		•	•	•	
<b>City of Newark, OH</b> Stormwater Utility	•	•		•			•
<b>City of Scarsdale, NY (LISWIC)</b> Regional Stormwater Management District	•	•	•	•		•	•
<b>City of Newburyport, MA</b> Stormwater Master Plan/Green Infrastructure Planning			•	•			•
<b>Isle of Wight, VA</b> Stormwater Program Review and Resource Needs valuation	•	•	•			•	•
<b>City of Columbus, OH</b> Stormwater Master Plan and Green Infrastructure Program		•	•	•			•
<b>Fairfax County Maintenance and Stormwater Management Division, VA</b> Stormwater Management Program			•	•			•
<b>Buffalo Sewer Authority, NY</b> CSO LTCP and Green Infrastructure Master Plan				•			•
<b>New York State Thruway Authority and Canal Corp., NY</b> Compliance with Phase 2 Stormwater Rule – MS4 Program				•			
<b>New York City Department of Environmental Protection</b> Green Infrastructure Program	•		•	•	•	•	•

## GREEN CITY, CLEAN WATERS PROGRAM – GREEN STREETS PROGRAM S-50028-G

Philadelphia Water Company / Philadelphia, PA



The City of Philadelphia intends to address its environmental challenges to become the “greenest” city in the United States. Directly in support of this goal is PWD’s 20-year, \$1.6-billion implementation of its combined sewer overflow (CSO) Long- Term Control Plan, which has been titled the Green City, Clean Waters program.

ARCADIS has been awarded a number of “green” projects that encompass several of the green infrastructure techniques detailed in this aggressive and ground-breaking program. The most recently completed design project involves right-of-way runoff management from four areas in North Philadelphia. Each GSI systems collects runoff from an approximately 1-acre drainage area, captures between 1 and 2 inches of runoff, stores the water, then slowly releases the water either through infiltration or to the combined sewer system through a controlled slow-release orifice. A system of tree and storage trenches (i.e. stormwater tree trenches) was used due to physical constraints at the various areas and to match the character of the existing conditions. The facilities have been constructed at an estimated construction cost of approximately \$775,000.

We are currently working on another PWD Green Streets project for design of GSI facilities in five areas. The new facilities have an estimated construction cost of \$1.87 million and will include stormwater tree trenches and stormwater bumpouts.

### ***Challenges & Benefits***

- Implemented PWD design standards in local project conditions to maximize BMP efficiency and performance
- Maximized GSI coverage and CSO reduction by using different stormwater tree trench designs
- Met regulatory and design delivering assignments on-schedule and budget to maximize program cost-efficiency and assure regulatory compliance

## DESIGN SERVICES FOR GREEN INFRASTRUCTURE

New York City Department of  
Environmental Protection, NY



As part of the CSO control program focused on meeting water quality standards in New York City's waterways, DEP has rolled out an aggressive GI implementation program. As described in the NYC Green Infrastructure Plan, the GI projects are expected to manage one inch of rain on 1.5% of impervious areas within combined sewer tributary areas of the City by 2015 and an additional 2.5% by 2020.

Arcadis has been engaged on several meaningful projects. They include site evaluation, field investigation and design services for right-of-way bioswale (ROWB) and greenstreet projects and assisting in development and implementation of a state-of-the-art citywide GI project tracking system to track construction, performance and O&M requirements for all NYC GI projects.

Our services include the following:

- Analyzing DEP GIS sewer maps to delineate drainage areas for each catch basin within the project area
- Calculating impervious drainage areas tributary to each catch basin
- Estimating the number of potential ROWBs necessary to manage stormwater within each drainage area using the DEP spreadsheet tool
- Locating preliminary ROWBs within each drainage area
- Assembling a list of preliminary ROWB locations for subsequent field investigations and surveys
- Evaluating green street opportunities in the areas not suitable for ROWB construction
- Site walk-throughs with DEP and partnering City Agencies to review the potential ROWB locations for meeting the DOT and DPR requirements
- Final design and design services during construction

The objectives of the GI project tracking system include the following:

- Development of user friendly, secure, GIS/data management
- Report and management of GI asset data through the full GI lifecycle from planning, design, construction, operation and maintenance
- Use of mobile device access and entry with GIS interface
- Document management for storage, retrieval and categorization of GI documents
- Development of a dashboard to quickly view GI benefits and report GI asset status

## WETLAND AND STREAM MITIGATION BANKING PROGRAM

Georgia Department of Transportation /  
Statewide Georgia



Arcadis is currently functioning as the program managers for Georgia DOT's statewide wetland and stream mitigation program. Both project work and contract administration for this project are being completed by our Atlanta office. As part Phase 1 of this program management role, the Arcadis team was responsible for managing and implementing all aspects of the Georgia DOT mitigation program. During Phase 2 of the mitigation program, the Arcadis Team has worked closely with Georgia DOT staff on a task order basis to again implement the mitigation program at all levels. Throughout both Phases of this program management role, the Arcadis team is or has been responsible for the following:



- Auditing all mitigation credits and debits for each mitigation bank
- Coordinating right-of-way acquisition (including archeological and history surveys)
- Coordinating regulatory approval of new banks and closure of completed banks
- Planning, designing, and construction oversight of mitigation banks
- Monitoring vegetation, hydrology, and aquatic organisms for prospective and established banks
- Developing a GIS-based database to house and track all documents pertaining to each of the more than 190 Georgia DOT-owned mitigation sites/banks
- Developing a SOP for Georgia DOT's mitigation program
- Responding to USACE audit and performing site visits statewide to insure regulatory compliance of mitigation obligations
- Assessing, diagnosing and prescribing remedial actions for Department-owned sites in need of rehabilitation
- Developing statewide asset inventory and needs assessment using TPro and USACE resources.

## NUTRIENT CREDITS ECONOMIC EVALUATION, BNR UPGRADES AND CSO LTCP

Williamsport Sanitary Authority / Williamsport, PA



### REFERENCE

Douglas Keith  
Executive Director  
253 West 4<sup>th</sup> Street  
Williamsport, PA 17701  
(570) 323-6140

### KEY ARCADIS STAFF

John Mastracchio

The Williamsport Sanitary Authority (WSA) owns and operates two wastewater treatment plants (WWTPs) and the combined sewer system in the City of Williamsport, which encompasses more than 123 miles of sewer lines. The Central and West Plants serve approximately 56,500 residents in an 18-square-mile area that includes the City of Williamsport; the Boroughs of Duboistown and South Williamsport; and portions of the Townships of Loyalsock, Old Lycoming, Armstrong, Woodward, and Lycoming. The WSA contracted with Arcadis for the provision of services to assist with the planning, design, construction, startup and operation of a multi-phased program of Improvements to the two wastewater treatment plants, and the economic evaluation of WSA's nutrient credit trading program. Phase 1 of the program was focused on improvements required to comply with Pennsylvania's Chesapeake Bay Tributary Strategy for nutrient removal as well as federal and state regulations focused on reducing combined sewer overflows.

The design of improvements to the Central Plant included an economic assessment of merits of purchasing nutrient credits for nitrogen and phosphorous under the State of Pennsylvania fledgling nutrient credit trading program versus the design and construction of wastewater treatment plant improvements to remove the nutrients. The design considered provisions for maintaining plant operations throughout construction while managing numerous interconnections with existing piping and processes on a limited site. The design includes a new influent pump station and headworks facility (screening and grit removal); new 2-million-gallon CSO storage tank; retrofit of primary clarifiers and aeration tanks; new ferric chloride and polymer chemical systems; conversion of secondary clarifiers into anoxic/oxic nutrient treatment reactors; four new final clarifiers and a chlorine contact tank; four new denitrification filters and associated chemical systems; new effluent disinfection facilities; and new solids handling and dewatering facilities, including the addition of a gravity belt thickener for thickening of waste activated sludge and replacement of existing dewatered sludge cake conveyors with an enclosed piping and sludge cake pumping system.

Arcadis assisted the WSA in evaluating capital program and credit trading alternatives by constructing a credit trading financial model to evaluate the net present value of proceeding with various capital projects to meet its nutrient discharge limitations, and evaluate the purchase and/or sale of nutrient credits to meet its limitations. This effort also included "testing the market" by procuring credit trading prices from various credit generators. Arcadis also developed a nutrient surcharge pricing model to recover its nutrient-related costs from its high strength dischargers.

Arcadis is also working with the WSA to implement a stormwater management program, including developing a stormwater fee and credit program.

## STORMWATER PROGRAM REVIEW AND RESOURCE NEEDS EVALUATION

County of Isle of Wight, VA

### REFERENCE

Donald Jennings, PE  
Assistant Director of General Services  
Isle of Wight County  
P.O. Box 108  
Isle of Wight, VA 23397  
(757) 365-1655

### KEY ARCADIS STAFF

John Mastracchio  
Fernando Pasquel

Arcadis recently conducted a full review of all Isle of Wight County stormwater-related programs in an effort to help the County plan for and implement existing and future stormwater regulatory requirements. The evaluation included a review of policies and procedures, interviews with County staff, a gap analysis between current programs and the upcoming new stormwater regulations, and a funding needs and potential funding source assessment. Programs that were covered included:

- Erosion and sediment control (ESC)
- Stormwater management (SWM) component for new development and redevelopment
- Chesapeake Bay Preservation Act (CBPA) component
- Municipal Separate Storm Sewer System (MS4)
- Total Maximum Daily Load (TMDL) requirements
- Drainage maintenance and improvement

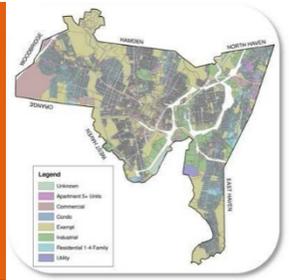
This evaluation has resulted in the development of a strategic stormwater program implementation strategy that has helped the County plan for future staffing needs. The evaluation also gives the County a basis for funding source options to meet upcoming regulatory requirements.

Arcadis supported the County with development of program revenue requirements and an evaluation of alternative rate structures for potential funding mechanisms. This effort included the development of impervious areas and analysis of residential and non-residential parcels to develop an equivalent residential unit (ERU) for the potential development of a stormwater utility.

As part of this effort, we also assisted the County in the development of a stormwater fee and stormwater fee credit program that could be used to provide incentives to developers and commercial customers to implement onsite stormwater retention to reduce stormwater runoff and lower the customer's overall stormwater bill.

## STORMWATER PILOT PROGRAM AND UTILITY CREATION

City of New Haven, CT



### REFERENCE

Larry Smith, PE  
Assistant City Engineer  
City of New Haven  
200 Orange Street  
New Haven, CT 06510  
(203) 946-8099

### KEY ARCADIS STAFF

Isabella Schroeder  
John Mastracchio

Arcadis assisted the City in developing a stormwater management plan and conducting a feasibility analysis of establishing a stormwater utility to implement and finance the stormwater plan. Key aspects of the project included proposed revisions to State stormwater legislation and submission of a Pilot Program Report to State for approval.

Upon State approval of the Pilot Report, Arcadis assisted the City in implementing the recommendations of the Report to develop an authority to manage and secure sufficient revenues to pay for the City's stormwater management program and Combined Sewer Overflow (CSO) cost share. Services included but were not limited to: program management and coordination, ordinance development, budget and staffing, billing system development, public relations, stakeholder negotiations, transaction document development and other Authority creation services.

A key component for creating a New Haven Stormwater Authority was establishment of the customer information and billing database based on each customer's measured impervious surface area. Services included field investigations to confirm GIS findings; conduct cost of service analysis; development of a rate structure that recovers both fixed and variable cost components; development of fees for permit review, credit application review, and inspections; development of a City rebate program for non-profits and economically disadvantaged customers; development of a stormwater credit program and coordination with a third party biller for billing services.

# PART III: REFERENCES



## Part III. References

### **BNR UPGRADES AND CSO LONG-TERM CONTROL PLAN IMPLEMENTATION**

Williamsport Sanitary Authority / Williamsport, PA

#### **REFERENCE**

Douglas Keith  
Executive Director  
Williamsport Sanitary Authority  
253 West 4<sup>th</sup> Street  
Williamsport, PA 17701  
(570) 323-6140

### **STORMWATER PROGRAM REVIEW AND RESOURCE NEEDS EVALUATION**

County of Isle of Wight, VA

#### **REFERENCE**

Donald N. Jennings, PE  
Assistant Director of General Services  
Isle of Wight County  
P.O. Box 108  
Isle of Wight, VA 23397  
(757) 365-1655

### **STORMWATER PILOT PROGRAM AND UTILITY CREATION**

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# PART IV: PLAN IMPLEMENTATION



## Part IV: Plan Implementation

This section provides Arcadis' approach to providing the scope of services requested in Section 4: Scope of Services of the CDRPC RFP. As requested in Section 4.1 this approach provides several suggestions and ideas for accomplishing the following two key tasks identified in the RFP:

### Stormwater In-Lieu Fees (ILFs) – Section 4.2

- a. Research ILFs employed by other communities
- b. Determine whether APCs have the regulatory authority to implement a fee and manage and ILF program.
- c. Determine the scope of the ILF and program and steps necessary to establish the program.
- d. Analyze regional and local capacity to administer the ILF program.
- e. Identify barriers to implementation and administration of the ILF program.
- f. Propose strategies to overcome barriers and constraints.
- g. Determine steps necessary for municipalities and counties to manage an ILF program.

### Stormwater Retention Credit Banking – Section 4.3

- a. Determine whether APCs have the regulatory authority to implement a fee and manage a Credit Program.
- b. Identify areas under development pressure and areas not likely to experience development.
- c. Provide a general assessment of soils and topography to determine areas with high green infrastructure (GI) value and low GI value.
- d. Compare development demand, and topographic data, determine where the “cap and trade” ILF program may work.
- e. Develop a financial assessment of ILF costs and fee calculation, or Off-site Credits.
- f. Identify barriers to implementation and administration of the Credit program.
- g. Propose strategies to overcome barriers and constraints.
- h. Determine steps necessary for municipalities and counties to manage a Credit Program.

More specifically, our approach is based on compiling the required information to **facilitate informed decision-making**, working with the six Albany Pool Communities (APCs) to establish a general concept for the two programs and conducting a preliminary feasibility assessment of this concept. The preliminary feasibility assessment will include, but will not be limited to all of the elements specified in the above RFP Scope of Services.

It is noted that the majority of the considerations for development and implementation of the two programs are the same, as these two program are often complimentary of each other vs. exclusionary. As such, our approach is based on conducting the preliminary feasibility assessment for both programs concurrently while at the same time identifying any differences specific to each program.

Arcadis staff have assisted numerous municipalities with the evaluation and implementation of many funding mechanisms for their stormwater and CSO programs. The table below illustrates examples of the funding mechanisms described in a recent Chapter on Financing Strategies of a recent (2014) WEF publication on Green Infrastructure Implementation. Arcadis' John Mastracchio and Fernando Pasquel led the development of that Chapter.

Table 1. Arcadis Experience with Traditional and Innovative Funding

Traditional Funding Sources	Innovative Funding Sources
Stormwater utilities and taxing districts General appropriation revenues Grant and loan programs Municipal bonds <b>In-lieu-fee programs</b> Developer funding Water/wastewater revenues	Cost sharing Capital markets Private and nonprofit sources PPPs <b>Mitigation banking and credit trading</b> Miscellaneous sources

The following provides a detailed description of the services to be provided. Where appropriate, a cross reference is provided within the below tasks to demonstrate compliance with the requirements of Sections 4.2 (a-g) and 4.3 (a-h) of the CDRPC’s RFP.

### Task 1: Data Collection and Review

The purpose of this task is to compile background information to facilitate an informed decision making process. Evaluation and development of a successful Stormwater ILF and/or Stormwater Retention Credit Banking Program requires careful consideration of each of the APCs local issues as well as the regional factors. This task focuses on compiling background information on each of the APCs and their stormwater systems including the following information:

- Current LTCP (Arcadis and CHA helped develop the LTCP and has this information) and stormwater management program and Master Plan, where available
- Organization and management of LTCP implementation and stormwater activities
- Current building codes and practices as it relates to stormwater management and green infrastructure, including coordination with the soon-to-be selected consultant developing the Green Infrastructure Code Audit.
- Current and proposed stormwater infrastructure including any long-term capital plans
- Service area and economic development projections
- Land-use maps and lot coverage information
- Watershed Plan (if available) including watershed boundaries, hydrology, topography and soils
- Operational conditions and MS4 compliance/annual reports, if available
- Current stormwater revenue and expense sources and uses

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**As part of the development of the Albany Pool LTCP, Arcadis and CHA have a good working knowledge of and access to much of the data required for this Task; providing a solid foundation to hit the ground running.**

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### ***Deliverables***

- ✓ Data Request Letter
- ✓ Tabular Summary of Data Received and Reviewed
- ✓ Memorandum summarizing findings including tabular comparison of APC local conditions.

## **Task 2: Regulatory Authority and Governance**

The purpose of this task is to review the current regulatory framework for stormwater management and options available to the APCs for implementation of Stormwater ILF and Stormwater Retention Credit Banking Programs. These options may include intermunicipal cooperation and agreements, regional authority, and/or new legislation. Our Project Manager, John Mastracchio, and several members of our team have conducted similar reviews as part of stormwater/CSO funding studies and will use that experience to provide templates to summarize the information for use in the ILF and Credit Banking Programs. This task will examine the institutional bounds of the APCs current governance structures, relevant ordinances and State and Federal regulations to:

- Identify alternative organization structures for development of local and regional ILF and Credit Programs,
- Identify legal and regulatory factors such as general powers, financing powers, revenue raising powers and regulatory and rate impacts that should be considered when establishing an organizational structure for an ILF and/or Credit Banking Program.
- Assess potential of alternatives to effectively support ILF and Credit Banking Programs given current and anticipated future operating environment.

### ***Deliverables***

- ✓ Memorandum summarizing findings including tabular comparison of potential alternatives and legal/regulatory authorities.
- ✓ Meeting to discuss findings and requirements of your program

## **Task 3: Research ILFs and Credit Banking Employed by Other Communities**

Stormwater ILFs have been used for many years while retention credit banking programs are relatively new. Both of these programs are significantly gaining in popularity as they provide means for meeting more stringent regulatory requirements while simultaneously encouraging vs. inhibiting development and redevelopment. Review of potential model programs, either already developed or in the process of being developed, can provide significant insight and lessons learned to help guide the development of this project.

Our team has compiled this type of information as part of previous projects and for recent publications and presentations. For example, the following table provides an example of selected barriers for the implementation of the identified funding sources based on interviews of municipalities that we conducted while preparing the Financial Strategies Chapter of WEF's Green Infrastructure Implementation publication.

Table 2. Barriers to Implementation of Funding Sources (Modified form WEF Green Infrastructure Implementation, 2014)

Funding Source	Selected Implementation Barriers	Green Infrastructure Components Most Suitable for Funding
Fee in-lieu-of programs	Difficult to build a long-term program based on unreliable and limited sources of funding	- Planning and design (most suitable given uncertainties of revenue stream to support long-term obligations) - Some construction
Mitigation banking and credit programs	- Lack of established markets and incentives to participation - Concerns with changing regulatory requirements and credits for green infrastructure	Planning, design and construction of green infrastructure based on program set up

Our staff is also experience in identifying ways of overcoming these barriers and we will work with the Albany Pool communities to summarize this information and develop strategies to overcome potential barriers. Examples of strategies to overcome barriers include:

- Revising the existing regulations and ordinances to incorporate green infrastructure a means to comply with LTCP/stormwater requirements. Your work in conducting the Green Infrastructure Code Audit will provide valuable insights for this activity
- Expanding the definitions of capital assets and utility system assets to include green infrastructure and its components
- Implementing incentives and education opportunities
- Gaining support form elected officials and community champions

Under this task we proposed compiling, in coordination with the APCs, ILF and credit banking information on up to a dozen communities across the region including at least three in the Northeast region. The following provides a preliminary list of potential model programs to be investigated:

Table 3. Potential Example ILF and Credit Banking Communities

Washington DC	Park Ridge, IL
Fredericksburg, VA	Tulsa, OK
Maryland Critical Area communities	Aspen, CO
Maine Sensitive Lakes	San Antonio, TX
Saint Paul, MN	Neuse River, NC
Fairfax County, VA	Chattanooga, TN

Research of these programs will focus on the following key program factors:

- Program Overview
- Local Motivation and Drivers
- Governance Structure and Stakeholders
- On-Site Compliance Requirements
- Program Eligibility Requirements
- Allowable Practices and Scale
- Rate Setting and BMP Unit Costs
- Private Sector Involvement

- Public Education and Participation
- Incentives to Participation
- Program Successes
- Leadership (internal and external) Support
- Lessons Learned

In addition to researching existing available documents, our plan is to contact each of these municipalities and agencies to review program and community specifics and provide real world public agency to public agency advice and information to the APCs to further supplement our experience with ILFs and mitigation banks. We have already reached out to our contacts at the District of Columbia Department of Environment, who have implemented similar ILF and Credit Banking Programs for stormwater, and they have committed to sharing their documentation and information to support the feasibility evaluation for the CDPRC and APCs.

In completing this task, Arcadis will develop a survey form to facilitate consistent data collection and comparison of ILF and Credit programs in the representative communities. We will contact each of these municipalities to further review program and community specifics and program development advice. Where feasible, Arcadis will facilitate a teleconference with selected representative agencies and invite the APCs to participate in these teleconferences. Prior to the teleconference, we will provide the selected agencies with some background regarding this study and a list of questions for discussion on the teleconference.

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**We will also bring our experience serving as Georgia DOTs program manager for their statewide wetland and stream mitigation banking program to bear on this project as well as our municipal experience with wetland mitigation banking. Services for the DOT included but are not limited to auditing all mitigation credits and debits, coordinating acquisitions and all regulatory approvals, planning, design and construction oversight of mitigation banks, development of GIS database to house and track mitigation sites/banks, development of SOPs, and development of statewide asset inventory and needs assessments.**

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### ***Deliverables***

- ✓ Survey form
- ✓ Teleconferences
- ✓ Memorandum summarizing findings including tabular comparison of programs
- ✓ Meeting to discuss findings and applications to your program.

### **Task 4: ILF and Credit Banking Programs Concept Workshop**

Under this task, we propose to conduct a half-day workshop with the APCs and other stakeholders as appropriate to review the findings to date and facilitate the development of a potential conceptual program for the region. Our approach is to assemble a panel of experts both from our consulting project team and external experts who have real, practical experience with the planning and implementation of ILF and Mitigation Banks to fully understand the merits, pitfalls, lessons learned, and to allow the APCs to fully understand how these programs work. It is anticipated that the panel of experts will include the following:

- Fernando Pasquel, Arcadis' Stormwater Practice Leader, who is also an author of Green Infrastructure Implementation, A Special Publication by the Water Environment Federation (2014)
- Brenna Mannion, the Director of Regulatory Affairs at the National Association of Clean Water Agencies, who is also an author of Navigating Litigation Floodwaters: Legal Considerations for Funding Municipal Stormwater Programs (NACWA, 2014)

- Seth Brown, a nationally recognized researcher regarding Stormwater Credit Banks, who brings practical experience from programs implemented in Philadelphia and District of Columbia.
- Sri Rangarajan from Boomi Environmental, who was involved in the implementation of stormwater programs for New York City.
- Other practitioners who have led stormwater credit bank or ILF programs.

We have also discussed potential participation in this workshop with municipal officials that have implemented ILF and credit banking programs. They have expressed interest in participating in this workshop and we will work with you to select the participants to maximize your benefits and input to your programs.

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**As part of our panel of experts, we propose to include Brenna Mannion’s in the workshop. Ms. Mannion, is the Director of NACWA. She works with federal agencies nationwide on behalf of communities implementing stormwater management programs, and works to garner national support for innovative management techniques like green infrastructure. She participated in the development of the publication titled “Navigating Litigation Floodwaters: Legal Considerations for Funding Municipal Stormwater Programs”, NACWA 2014.**

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The purpose of this task is not only to present preliminary findings and build consensus on potential program attributes; but to begin to establish a concept for a successful program and facilitate focused evaluation on the most promising alternatives. This information will be used to complete the feasibility study. For example, at this workshop, we will discuss with the Albany Pool communities the potential for municipalities to implement Green Infrastructure projects in public areas, such as the public right of way in order to create potential stormwater credits that could be used to encourage urban redevelopment projects. Alternatively, we will explore the possibility of utilizing the monies generated by the Stormwater Credit Bank to fund green infrastructure portions of municipal redevelopment/revitalization projects, such as the City of Albany’s Quail Street project and the City of Troy’s Monument Square Green Infrastructure Project. As such, this could result in the use of the credit bank as a tool to spur economic development in desirable areas.

This task will include the following activities:

- Preparation of Workshop Materials including PowerPoint Presentation to facilitate the workshop.
- Presentation and discussion of key findings including:
  - ILFs employed by other communities (4.2a)
  - APCs regulatory authority to implement fees and manage ILF and Credit Banking programs (4.2b and 4.3a)
  - Regional and local capacity to administer the ILF program (4.2d) and Credit Banking Programs.
  - Areas under development pressure and areas not likely to experience development (4.3b)
  - General assessment of soils and topography and areas with high GI value and low GI value (4.3c)
  - Potential areas where off-site projects would be most beneficial including Comparison of development demand, and topographic data, determine where the “cap and trade” ILF program may work (4.3d)

- Potential barriers to implementation and administration of the ILF and Credit Banking programs (4.2e and 4.3f).
- Key drivers and parameters of concern (infiltration, runoff, TMDLs, MS4 permit requirements, LTCP implementation, other) for each APC
- Discussion of ILF and Credit Banking Program Options and Requirements including:
  - Overarching program goals, objectives and drivers
  - Organizational structure, stakeholders and public/private/regional sector involvement
  - Developer driven vs. MS4 driven off-site mitigation
  - Eligibility - standards and protocol for plan review, inspections, and enforcement for on-site compliance and determination of sites which truly meet the “infeasibility” standard and can be authorized access to off-site options.
  - Allowable practices - inventory of appropriate mitigation practices and management systems to value, evaluate and track “trades” between on-site and off-site practices.
  - Scale of trading - mitigation should be within same sewershed/watershed but how will boundaries be defined?
  - Program administration logistics, coordination and costs
  - Availability of sites - potential “supply” for mitigation banking and needed capital projects for MS4 compliance as well as what the demand may be
  - Restrictions - any constraints that prohibit use of an off-site compliance option in a particular location or watershed
  - Currency of trade – is the currency a “cubic-foot to cubic foot” off-site trade or “dollar to dollar” where an average rate to “treat” a cubic foot of water is used, or based on trading ratios for off-site vs. on-site, etc.)
  - Rate setting and well-functioning market forces - rates established based on specific projects, average cost to treat runoff (\$/acre?), market demand (if rate too high that no one will take advantage of program? Rates too low may not cover planning, design, financing, construction, monitoring, etc. of ILF or enough sites to meet demand?)
  - Timing and sequencing factors.

The results of this workshop will be an enhanced understanding by stakeholders of the key issues, concerns and requirements associated with developing a Stormwater ILF and/or Stormwater Retention Credit Banking Program in their community and the region and a conceptual understanding of a preferred scope and approach for development of such programs.

### ***Deliverables***

- ✓ Workshop Materials
- ✓ Half-Day Workshop
- ✓ Memorandum summarizing workshop findings including preferred regulatory framework “rules of the program.”

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**The Arcadis Team’s involvement and in-depth knowledge of the Albany Pool’s LTCP will allow us to prepare the Feasibility Assessment for Stormwater ILFs and Credit Banking that targets and achieves the greatest CSO benefit.**

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## **Task 5: Preliminary Feasibility Assessment and Report**

Arcadis will conduct a preliminary feasibility assessment of implementing ILF Program and Credit Program in the region based on the proposed conceptual program developed from the previous Tasks. We will prepare a Preliminary Feasibility Assessment Report (the “Report”) to present the findings of the preliminary feasibility assessment. The Report will also serve to document the information and findings of each of the previous tasks; identify the key technical, financial and institutional requirements for program development, implementation barriers and how to overcome them, summarize the potential applicability and advantages and disadvantages of alternatives, document the basis for development of the proposed conceptual program, and identify recommended next steps.

---

**Arcadis is highly knowledgeable in assessing the requirements and feasibility of implementing Stormwater ILF and Retention Credit Banking programs in the region. This experience comes not only from our local presence and stormwater expertise, but also from having developed and managed all aspects of mitigation type programs including functioning as the program manager for Georgia DOT’s statewide wetland and stream mitigation program. We will specifically bring the lessons learned from developing and managing municipal funding programs and the mitigation program to bear in the feasibility assessment for CDRPC.**

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The work under this task will also incorporate the following scope of service activities identified in the CDRPC’s RFP:

- Determine the scope of the ILF and Credit Banking Programs and steps necessary to establish the programs (4.2c).
- Develop a financial assessment of ILF costs and fee calculation for off-site Credits (4.3e).
- Propose strategies to overcome barriers and constraints. (4.2f and 4.3g)
- Determine steps necessary for municipalities and counties to manage: ILF Program and Credit Program (4.2g and 4.3h).

### **Deliverables**

- ✓ Memorandum summarizing draft financial assessment of ILF costs and fee calculations for review and comment prior to incorporation into draft report
- ✓ Draft Report and meeting to present the report
- ✓ Final Report
- ✓ Powerpoint presentation of findings.

## Task 6: Project Management

Arcadis specializes in the management of high-quality programs for clients. We are recognized industry leaders, successfully delivering important projects and bringing a unique perspective. We successfully build consensus and deliver across a spectrum of expectations, providing results that add value to the project and to local and regional business plans and strategy.

Bringing complex projects to successful completion requires a level of leadership that only a team of experienced specialists can provide with the local experience of CHA. We will anticipate and respond to evolving expectations, actively collaborate with all stakeholders on management challenges, and use our deep technical expertise to form a strong safety net while delivering success.

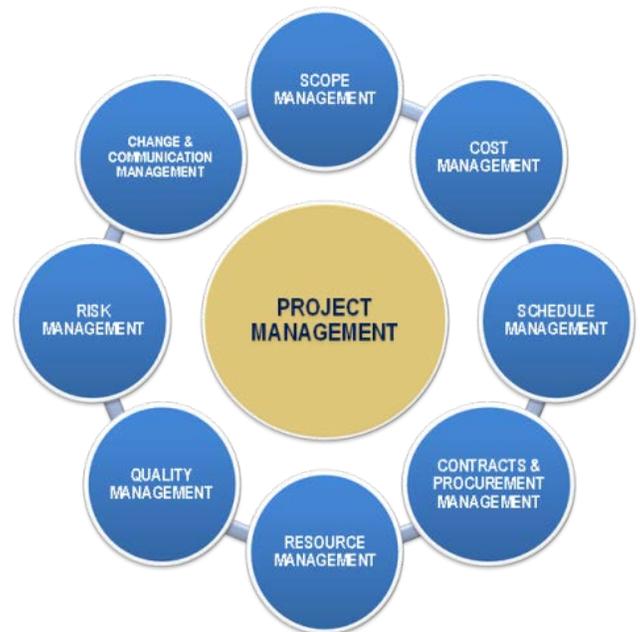
Arcadis' project manager will coordinate the efforts of our program staff by providing the following program monitoring, oversight, and quality control.

At a minimum, the following meetings will be held at various stages of the project. These meetings are in addition to the workshops and teleconferences proposed in the previous tasks.

- **Meeting 1 - Kick-off Meeting** – At the onset of the project, Arcadis will facilitate a kick-off meeting with the CDRPC and its key stakeholders to review the project intent and objectives, validate specific goals, scope of services, schedule, level of effort and communication protocols.
- **Meeting #2 – Final Acceptance Meeting** – We are proposing Meeting #2, to serve as the Final Acceptance meeting, to be conducted after the CDRPC and stakeholders have reviewed the final draft report. The purpose of this meeting is to present the final results and confirm acceptance of the report findings and recommendations. The Power Point presentation of findings prepared under Task 5 will be presented at this meeting.

### **Deliverables**

- ✓ Kick-off Meeting
- ✓ Final Acceptance Meeting
- ✓ Monthly Status Reports



# PART V: COST PROPOSAL



## Part V: Cost Proposal

Arcadis proposes to complete the project for a not-to-exceed price of \$75,000. A detailed breakdown of the Project labor and expenses is shown on the following Cost Proposal table. As shown, our cost proposal includes an in-kind contribution from Arcadis' innovation funds of \$5,000 due to the innovative nature of this assignment. Arcadis' Innovation Fund has been established to provide additional monetary contributions to projects where there is benefit to both our clients and Arcadis for industry innovation that can transfer to other projects and clients in the future. As such, by selecting Arcadis, the CDRPC and the Albany Pool communities receive a value of \$80,000 for a project cost of \$75,000.

Our cost proposal includes labor and other direct costs, including travel expenses associated with the workshop described in our project approach. This workshop will provide significant value by the knowledge transfer and networking that will be accomplished at this in person workshop. The \$5,000 Arcadis Innovation Fund will be utilized to offset a portion of the workshop costs to bring members of other communities and national organizations that are influential in ILF and GI Banking.

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**Capital District Regional Planning Commission  
GI Stormwater ILF and GI Banking Feasibility Study  
Cost Proposal**

DESCRIPTION	Grade Level						Sub Hrs	Sub Cost	Expenses	Total Cost per Task
	12	11	10	9	7	5				
<b>Rates</b>	<b>\$290</b>	<b>\$260</b>	<b>\$200</b>	<b>\$165</b>	<b>\$140</b>	<b>\$120</b>				
Task 1 -Data Collection and Review	0	4	0	0	0	12	0	\$0	\$50	\$2,530
Task 2 -Regulatory Authority and Governance	0	2	0	0	0	0	45	\$11,300	\$0	\$11,820
Task 3 - Research ILFs Employed by Other Communities	0	8	0	0	0	40	30	\$5,380	\$0	\$12,260
Task 4 - ILF and Credit Banking Program Concept Workshop	0	20	24	0	0	16	24	\$5,960	\$4,000	\$21,880
Task 5 - Preliminary Feasibility Assessment and Report	2	0	52	0	0	60	40	\$8,000	\$100	\$26,280
Task 6 - Project Management	0	16	0	0	0	8	0	\$0	\$110	\$5,230
<b>TOTAL LABOR HOURS</b>	<b>2</b>	<b>50</b>	<b>76</b>	<b>0</b>	<b>0</b>	<b>136</b>	<b>139</b>			
<b>TOTAL PROJECT COSTS</b>	<b>\$580</b>	<b>\$13,000</b>	<b>\$15,200</b>	<b>\$0</b>	<b>\$0</b>	<b>\$16,320</b>		<b>\$30,640</b>	<b>\$4,260</b>	<b>\$80,000</b>
Less: Use of Arcadis Innovation Funds										(\$5,000)
<b>TOTAL PROPOSED FEE</b>										<b>\$75,000</b>

# PART VI: MWBE POLICY



# New York State Department Of Environmental Conservation

Division of Management and Budget Services - Minority and Women's Business Program

625 Broadway, 10th Floor, Albany, New York 12233-5028

Phone: 518.402.9240 Fax: 518.402.9023

Website: [www.dec.ny.gov](http://www.dec.ny.gov) Email: [MWBE@dec.ny.gov](mailto:MWBE@dec.ny.gov)



Version 5.0

## Consultant / Contractor Detailed M/WBE-EEO Utilization Plan

Contractor Name:	ARCADIS OF NEW YORK, INC.		
NYSDEC Contract No:	2015002	Contractor Federal ID:	570373224
Contract Start Date:	01/01/2016	Contract End Date:	07/31/2016
		Date Submitted:	11/20/2015
Contractor Address:	855 ROUTE 146, SUITE 210		
City:	CLIFTON PARK	State:	New York
		Zip Code	12065
Contractor E-mail:	john.mastracchio@arcadis.com	Contractor Phone Number:	(518) 250-7300

Contract Type:	Services / Technologies	
Project Goals Based on:	Upstate New York	<u>Downstate Counties</u> Nassau, Suffolk, Dutchess, Orange, Putnam, Rockland Sullivan, Ulster, Westchester, Bronx, Kings, New York Queens, Richmond
Project County:	Albany	
Authorized Representative Name:	JOHN MASTRACCHIO, CFA	
Authorized Representative Title:	ASSOCIATE VICE PRESIDENT	

M/WBE Contract Summary	%	Amount	EEO Contract Summary	%	No of Employees
1. NYSDEC Contract Amount	( A )	\$75,000.00	7. Total Employees in this project	100 %	9
2. Recipient Share (If Applicable)	( B )		8. Total Goal -Minority Employees %	15	1.35
3. Total Project Amount ( A + B ) *	100 %	\$75,000.00	9. Total Goal - Female Employees %	15	1.35
4. MBE Project Goal %	15.12	\$11,340.00	10. EEO Combined Totals %	30	2.7
5. WBE Project Goal %	15.07	\$11,302.50			
6. M/WBE Total %	30.19	\$22,642.50			

\* - Goals apply to Total Project Amount

Please note: The overall goal for MWBE Participation is 30%. 15% MBE and 15% WBE is a suggested starting point, however, the actual participation between MBE and WBE may vary depending on statewide availability.

Section II - EEO Information: In order to achieve the EEO Goals, Minorities and Females are expected to be employed in the following job categories. Please provide breakdown of **Minority and Female Employees assigned to this project only**. If the EEO goals are not met, please provide an explanation in the comments area.

Job Categories	Total Count of Minority Employees	Breakdown of Total Count of Minority Employees by Gender		Breakdown of Total Count of Minority Employees by Ethnicity				
		Male	Female	African American	Asian	Native American	Hispanic	White
Officials/Managers								
Professionals	5	2	3		1		1	3
Technicians								
Sales Workers								
Office/Clerical								
Craftsman								
Laborers								
Service / Workers								
<b>Totals</b>	5	2	3		1		1	3

Comments:

Please don't remove previous comments

Additional personnel will be utilized upon commencement of the project based upon assignments. This count includes key staff only.

Section III - M/WBE Information: In order to achieve the M/WBE Goals, New York State Certified Minority/Women-owned firms are expected to participate in the following manner:

**Important: If there is no M/WBE Vendor participation, please provide brief summary of Good Faith Efforts in the comments section on page 2. Do not enter NA or NONE in Vendor Name.**

M/WBE Vendor Name	Federal ID	Vendor Status	Subcontract Amount	Start Date	End Date	Payment Date	Work Description
TOWNE, RYAN & PARTNERS, PC	271342894	WBE	\$11,300.00	01/01/2016	07/31/2016		Regulatory Authority Review
BOOMI ENVIRONMENTAL	260319489	MBE	\$11,340.00	01/01/2016	07/31/2016		Workshop Panel of Experts
	Total Subcontract Amount		\$22,640.00				

By printing name below, Contractor: 1.Certifies that the above information is true and complete as of this date. 2. If required, will provide Good Faith Effort documentation to NYSDEC.

**Important: Please don't attach this form manually to E-Mail, instead Click "Submit by E-mail" button to send form via E-Mail.**

Authorized Representative Signature (Print Name) JOHN M. MASTRACCHIO

**FOR NYSDEC MWBE UNIT USE ONLY**

Approved By:

Approved Date:

# APPENDIX: RESUMES



## JOHN MASTRACCHIO, CFA

Project Manager



### QUALIFICATIONS

- **MBA Finance Cornell University 2001**
- **MS Civil and Environmental Engineering Clarkson University 1994**
- **BA State University of New York at Geneseo 1993**

### PROFESSIONAL REGISTRATIONS

- **Chartered Financial Analyst**

### PROFESSIONAL AFFILIATIONS

- **American Water Works Association**
- **Finance, Accounting & Management Controls Committee**
- **Rates & Charges Committee**
- **Chartered Financial Analyst Society of Rochester**
- **Government Financial Officers Association**
- **Water Environment Federation**

Mr. Mastracchio leads Arcadis' financial services practice. As a published author, active national technical committee member, and frequent presenter with a strong industry presence, he is a thought leader and a recognized subject matter expert. He has experience in stormwater financial planning, revenue and cost studies, rate setting, capital financing, customer affordability, utility valuations and regionalization. He is a contributing author of several publications, including the textbook *The Effective Water Professional: Leadership, Communication, Management, Finance, and Governance* (WEF), *Financial Management for Water Utilities: Principles of Finance, Accounting, and Management Controls* (AWWA), and the *Water Capital Financing Manual of Practice* (AWWA M29), and the *Principles of Water Rates, Fees, and Charges Manual of Practice M1* (AWWA). Mr. Mastracchio has earned the Chartered Financial Analyst (CFA) designation, and is also a professional engineer. He is a member of several industry committees including the AWWA Rates & Charges committee, the Finance, Accounting & Management Controls Committee, the CFA Institute, and the Water Environment Federation (WEF) Utility Management Committee.

### Project Experience

#### **Nutrient Credit Bank Economic Evaluation Williamsport Sanitary Authority / Williamsport, PA**

Completed an economic feasibility study to assess the purchase of nutrient credits from a nutrient credit bank versus designing and constructing various capital planning options for nutrient. Developed an economic model to evaluate alternatives and assist in decision making. Prepared procurement documents for the pricing of nutrient credits from various sources. Analyzed nutrient credit purchase costs versus capital construction costs as part of completing the economic feasibility study.

#### **Stormwater Feasibility Study Isle of Wight County, VA**

Completed a stormwater feasibility study to assess the cost of the County's stormwater program and develop funding alternatives to recover the program costs. The funding alternatives considered the recovery of costs through Ad Valorem taxes and stormwater fees.

## Project Experience Continued

### **New and Emerging Capital Providers for Infrastructure Funding Water Research Foundation / Denver, CO**

Principal investigator for a research project aimed at identifying and evaluating various new and emerging capital infrastructure alternatives, including public-private and public-to-public partnerships, green bonds, social impact investing, private placements, qualified public infrastructure bonds, and government programs such as WIFIA. The results of the research will be documented in an industry research report and a decision toolkit will be developed for industry use.

### **Affordability Study Capital District Regional Planning Commission / Albany, NY**

Managed the completion of an affordability study as part of a long-term control plan for six communities in the Capital District Region of New York, including the Cities of Albany, Rensselaer, Troy, Cohoes, Watervliet, and the Village of Green Island. The affordability study assessed the cost as a percentage of median household income for each community, as well as the financial capability of each community to pay for capital projects associated with the plan. Developed a year-by-year rate impact analysis for each community to assess the rate increases that would be necessary under several different CSO control scenarios.

### **Stormwater Management City of Norwalk, CT**

Led various tasks associated with the completion of a stormwater utility feasibility study, including the evaluation of stormwater fee alternatives and the development of stormwater fees based on impervious surface area and property assessed value.

### **Economic Expert Witness Metropolitan Water Reclamation District of Greater Chicago / Chicago, IL**

The District serves a population of 10.35 million people, and owns and operates one of the world's largest water reclamation plants. Served as the lead financial analyst in completing a comprehensive financial, economic, and environmental analyses of potential effluent disinfection at the District's three largest wastewater reclamation plants. Developed an economic model and completed an analysis of the impact of funding projects needed to meet the effluent disinfection requirements. Assessed the ability to fund and finance the District's entire capital program, assessed the impact on customer's cost of service, and assessed customers' ability to pay for the proposed improvements. Presented written and oral testimony of evaluation results before the Illinois Pollution Control Board.

## FERNANDO PASQUEL

Technical Advisor / ILF and Banking  
Program Assessment



### QUALIFICATIONS

- MS, Civil Engineering/Water Resources, Virginia Polytechnic Institute & State University, 1985
- BS, Civil Engineering, Virginia Polytechnic Institute & State University, 1981
- Master's Certificate in Project Management, University of Pittsburgh, Katz Graduate School of Business, 2006
- Serves as Arcadis' National Director for Stormwater and Watershed Management

### PROFESSIONAL AFFILIATIONS

- Member of WEF Watershed Management Committee (Chair 2013 - 2016)
- Member of the Board of Directors, Center for Watershed Protection (2003 – 2012)
- American Society of Civil Engineers
- Virginia Governor's Appointment: Joint Subcommittee to Study the Efficiency and Consistency of the Storm Water Management and Permitting Policies of the Commonwealth
- Invited Member of several State Technical Advisory Committees supporting the development of new Virginia stormwater regulations

Mr. Mastracchio leads ARCADIS' financial services practice. As a published author, active national technical committee member, and frequent presenter with a strong industry presence, he is a thought leader and a recognized subject matter expert. He has experience in stormwater financial planning, revenue and cost studies, rate setting, capital financing, customer affordability, utility valuations and regionalization. He is a contributing author of several publications, including the textbook *The Effective Water Professional: Leadership, Communication, Management, Finance, and Governance* (WEF), *Financial Management for Water Utilities: Principles of Finance, Accounting, and Management Controls* (AWWA), and the *Water Capital Financing Manual of Practice* (AWWA M29), and the *Principles of Water Rates, Fees, and Charges Manual of Practice M1* (AWWA). Mr. Mastracchio has earned the Chartered Financial Analyst (CFA) designation, and is also a professional engineer. He is a member of several industry committees including the AWWA Rates & Charges committee, the Finance, Accounting & Management Controls Committee, the CFA Institute, and the Water Environment Federation (WEF) Utility Management Committee.

### Project Experience

#### Stormwater Funding Various Locations

Project manager or task leader for stormwater funding studies in **Virginia**: Alexandria, Portsmouth, Manassas, Prince William County, Roanoke Valley (4 municipalities), Henrico County, and Chesterfield County; **Pennsylvania**: Pittsburgh, Williamsport and Hampden Townships; and **Maryland**: Takoma Park and Montgomery County. Fernando has also supported stormwater funding studies in North Carolina, Georgia, and Colorado. Authored a stormwater utility case study for a 2013 Water Environment Federation (WEF) publication entitled *User-Fee Funded Stormwater Programs* and is co-author of a chapter on Financing Strategies for the 2014 WEF publication titled *Green Infrastructure Implementation*. He has conducted several workshops on stormwater funding, including a 2015 Lorman Webinar on Green Infrastructure Funding Strategies.

## Project Experience Continued

### **Stormwater Utility Study and Stormwater Program Costs Henrico County, VA**

Project director for a feasibility study that included the development of revenue requirements, including projections of cost for compliance with Chesapeake Bay TMDLs, new stormwater regulations, and NPDES MS4 permit compliance costs. Supported the development of alternative rate structures based on impervious area, total area and pollutant loads. Led the development of an organizational assessment and a public outreach plan (Also served as project manager for the first two years of the study).

### **Stormwater Program Assessment and Funding Analysis Isle of Wight County, VA**

Technical advisor for a comprehensive review of the County's stormwater-related programs to align services and facilitate compliance with existing and future regulatory requirements and customer needs, gaps and program needs. Supported the development of funding requirements, ordinance preparation, ERU calculations.

### **Watershed Management Professional Engineering Services Chesterfield County, VA**

Project manager for a 5-year contract to assist with the development of a compliance plan for the stormwater MS4 permit and Chesapeake Bay TMDL requirements. The project also involves program assessment and evaluation of program costs, development stormwater / watershed management plans, monitoring, and identification of stormwater control measures to achieve compliance. Supported the County in the evaluation of funding mechanisms (pro-rata share/in-lieu fee and stormwater utility) and MS4/TMDL compliance costs.

### **Stormwater Engineering Services Loudoun County, VA**

Project director and task leader for a team that completed a variety of stormwater engineering tasks for the County. Developed a comprehensive public information and outreach program for the County's municipal separate stormwater (MS4) program; conducted an organizational analysis of the County's Public Works and Facilities Maintenance departments; prepared the annual report for the MS4 and stormwater control program; and conducted a study to investigate potential sources of sedimentation accumulating in a best management practice (BMP) stormwater facility. Also supported the development of cost estimates and evaluation of policies for compliance with the Chesapeake Bay TMDL.

## MICHAEL F. MILLER, PE

### PROJECT MANAGER - GREEN INFRASTRUCTURE



#### EDUCATION

Stony Brook University, NY, B.S. in Engineering, 1989

#### REGISTRATIONS | ACTIVITIES

Licensed PE in NY  
NYWEA Member  
WEF Member  
NYWEA Collection System Committee  
NYSDEC, Subcommittee  
Member to the Wastewater Management Advisory Committee

#### OFFICE LOCATION

CHA  
III Winners Circle  
Albany, NY 12205

Mr. Miller is a vice president with over 25 years of diversified experience in municipal engineering planning, design and construction, including extensive experience with sanitary and combined sewer studies throughout the Northeast. Mr. Miller is currently assisting municipalities across New York State in regards to compliance requirements under the Clean Water Act. He is presently working on the implementation of the Albany Pool CSO Long-term Control Plan, as well as CSO/SSO compliance activities in several New York State municipalities.

**Onondaga County, New York, Green Infrastructure “Save the Rain” Program.** Through its “Save the Rain” initiative, Onondaga County has targeted to reduce 250 million gallons of stormwater to the City of Syracuse’s combined sewer system on an annual basis. To achieve this objective, the county has ambitious plans to construct green roofs and parking lots/roadways/sidewalks with porous pavement and other infiltration practices. In addition, the county will plant 8,500 trees and build rain gardens to further intercept rain water from the combined sewers.

**Capital District Regional Planning Commission, Albany, NY. Albany Pool Phase I CSO Long Term Control Plan.** The Albany Pool involves the cities of Albany, Troy, Cohoes, Watervliet, Rensselaer, and the Village of Green Island. The long-term control plan will minimize combined sewer overflows to the Hudson River and ensure compliance with EPA’s regulations. The project includes a comprehensive flow monitoring and sampling program, evaluation of the treatment plants, detailed system modeling, and identification and evaluation of green and gray infrastructure alternatives.

**Albany Water Board/City of Albany, New York, Quail Street Green Innovation Project.** The City has designed the Quail Street project adapting standard GI practices for northeast, cold-weather climates to maximize the benefits of the practices within an urban, CSO environment. As part of the “Quail Street Green Infrastructure Project”, the City plans to construct green infrastructure practices to promote and maximize infiltration practices to reduce the runoff and flow rates conveyed to the existing CSS. Options evaluated included large diameter pipes, StormTech® chambers and subsurface Raintank® systems. Ultimately, a 10-ft wide stone section was selected which works in conjunction with an overflow system to provide storage for approximately 2.5-inches of rainfall along the corridor. The Quail Street project is presently under construction, with an anticipated completion date for the project in 2016.

**Albany Water Board, New York, Hansen and Ryckman Alley CSO Abatement and Flood Mitigation.** To provide for abatement of system surcharging and flooding, green infrastructure elements are planned within an urban park in the City of Albany. In order to mitigate conditions in Hansen Alley, the preferred alternative diverts stormwater flows to an underground infiltration gallery located beneath the two (2) basketball courts in Woodlawn Park. The existing underground detention system in the alley and proposed underground infiltration gallery will work in unison to capture, detain, and infiltrate flows from the Hansen Alley watershed area.

To provide for abatement of system surcharging and flooding in Ryckman Alley, the preferred alternative is to construct a wetland system to the south of the Ryckman Alley. The constructed wetlands would consist of a wet pond, a plunge pool, a micro-pool and an assortment of aquatic plant life located in low marsh and high marsh areas within the wetland system. Once again, the existing underground detention system and proposed wetland system will work in unison to capture, detain, and mitigate flows from the Ryckman Alley watershed area. Collectively, these practices will promote infiltration practices while providing for the storage of over a million gallons of wet-weather stormwater flows.

## REGINA M. LOEWENSTEIN, AICP

### SENIOR LAND USE PLANNER



#### EDUCATION

SUNY College of Environmental Science & Forestry, NY, B.S. in Forestry/Resource Management, 1980

#### REGISTRATIONS | ACTIVITIES

American Institute of Certified Planners  
American Planning Association  
Member of the Town of Malta Planning Board

#### OFFICE LOCATION

CHA  
III Winners Circle  
Albany, NY 12205

Ms. Loewenstein is a senior planner with over 27 years' experience in CHA's planning and ecology group. Her experience includes comprehensive planning and zoning, environmental impact statements, and grant writing for public and private sector clients. These plans have involved zoning, subdivision, and other regulations required for implementation. She is responsible for the full coordination of documents and permits for multi-service clients. Ms. Loewenstein has also prepared studies in advance of design and construction for solid waste management, utilities, open space, traffic, and parking projects.

**Capital District Regional Planning Commission, Albany, NY. Albany Pool Phase I CSO Long Term Control Plan.** The Albany Pool involves the cities of Albany, Troy, Cohoes, Watervliet, Rensselaer, and the Village of Green Island. The long term control plan will minimize combined sewer overflows to the Hudson River and ensure compliance with EPA's regulations. The project includes a comprehensive flow monitoring and sampling program, evaluation of the treatment plants, detailed system modeling, and identification and evaluation of green and gray infrastructure alternatives.

**Onondaga County, New York, Green Infrastructure "Save the Rain" Program.** CHA worked with CH2M Hill and the City of Syracuse and Onondaga County officials to improve the city's stormwater management regulations and tree ordinance amendments. The project was part of the process to reduce adverse effects of the city's combined sewer system on the Onondaga Lake's water quality as part of the EPA's federal consent order for lake clean-up.

**City of Albany Dept. of General Services, NY, Consultant Services, Capital Region Sustainability Plan.** CHA worked with a multi-consultant project team to prepare the Capital Region Sustainability Plan as part of the Cleaner Greener Communities Program. Ms. Loewenstein provided technical assistance to the Water Resources Technical Committee to assess existing conditions, set goals, identify and prioritize strategies, develop implementation plans, and identify priority sustainability indicators and targets for water resources within the eight county capital region. The project involved extensive research to assess existing conditions and presentation of this material in easily understood written and map forms that enabled committee members to prioritize issues.

**City of Albany Dept. of General Services, New Yprk, City of Albany, CFA Application Wastewater Collection System Planning Study.** CHA prepared a grant application under the New York State Consolidated Funding Application procedure to fund the development of a Sustainable Infrastructure Plan for the City of Albany to address long term needs for water, wastewater, and stormwater management in the fast growing Upper Washington Avenue Academic and Nanoscience Corridor. Document preparation required coordination with several city departments and data collection to ensure the funding request provided a comprehensive overview of the opportunity and met all application requirements.

## ISABELLA SCHROEDER

ILF and Banking Program Assessment



### QUALIFICATIONS

- **MS Chemical Engineering**  
Manhattan College 1988
- **BS Chemical Engineering**  
Manhattan College 1996
- **Stormwater Utility/Funding  
Discipline Leader for  
Arcadis**

Ms. Schroeder serves as Stormwater Utility/Funding Discipline Leader for Arcadis. She has 29 years of management consulting experience helping clients navigate changing business environments. She specializes in municipal and utility planning including integrated utility management strategies, regionalization, utility creation, outsourcing, public-private partnerships, financial modeling, feasibility assessments, consensus building, and securing bond funding for water, wastewater, and stormwater utilities. She uses her strategic planning expertise and program management skills to develop technically and financially viable programs and has prepared feasibility reports in support of more than \$2 billion in system financings.

### Project Experience

#### **Stormwater Pilot Program and Utility Creation City of New Haven, CT**

Project manager for the development of a stormwater management plan and detailed evaluation of establishing a stormwater utility to implement and finance the stormwater management plan. Key aspects of the project include public outreach, opportunities for regionalization, review of organizational structures, rate structures, and legal, technical and financial requirements with the provision of recommendations to the State legislature to assist in implementing requirements. Subsequently, assisting the City in implementing the recommendations of the Pilot Program Report including development of a new stormwater authority to manage, operate, and maintain the stormwater utility on behalf of the City. Services include but are not limit to: program management and coordination, legislative ordinance development, billing system development, public relations, stakeholder negotiations, transaction document development and Authority creation.

## Project Experience Continued

### **Stormwater Pilot Program**

#### **City of Norwalk CT**

Technical advisor for the assessment of stormwater management needs, developing a program to correct serious flooding issues in the community and developing and evaluating alternatives for establishing a stormwater utility to implement and finance the City's stormwater program.

### **Stormwater District Development**

#### **Long Island Sound Watershed Intermunicipal Council / Long Island, NY**

Technical advisor for the conduct of financial analysis and review of funding alternatives available for the organizational structures under consideration for creation of the new regional stormwater district.

### **New Stormwater Authority**

#### **Hampden Township, PA**

Technical advisor for the implementation of a new Stormwater Authority for the Township pursuant to Senate Bill 251 which passed in April 2013 and amends Title 53 (Municipalities Generally) to expressly allow for the creation of municipal stormwater authorities. The Hampden Stormwater Authority is one of the first such authorities in the State of Pennsylvania.

### **Proposed Public Partnership Feasibility Analysis**

#### **Metro-Iloilo Water District / Iloilo City, Philippines**

Providing technical assistance for the conduct of feasibility analysis for a proposed public private partnership between Metro-Iloilo Water District and MetroPac Water Investment Company to expand water supply and customers serviced by a factor of four by 2040.

### **Wastewater Regionalization Study**

#### **City of Bridgeport, CT**

Managed a study to quantify and qualify the potential benefits/deterrents to regionalizing wastewater and stormwater services for the City and the Towns of Trumbull and Monroe.

### **Billing Methodology Study**

#### **Green Bay Metropolitan Sewer District Commission / Green Bay, WI**

Principle-in-charge and project manager for the conduct of a billing methodology study to establish an equitable and defensible billing system for the District's wholesale customers and for the design and development of the new software system for implementation of the selected methodology.



**Susan F. Bartkowski**  
**Principal**  
137 Maple Avenue  
Saratoga Springs, New York 12866

**Telephone:** (518) 587-7300  
**Direct Dial:** (518) 608-8524  
**Fax:** (518) 587-2734  
**Email:** susan.bartkowski@townelaw.com

#### **Practice Areas**

- Municipal Law
- Labor and Employment Law
- Litigation
- Alternative Dispute Resolution
- Real Estate Law
- Environmental Law

**Susan F. Bartkowski**, one of the founding partners, has been representing businesses, municipalities and related entities for over two decades in wide ranging areas of law. Ms. Bartkowski has over 23 years of experience advising municipalities across wide ranging areas of law including construction law, real estate, zoning and planning, labor and employment law, and complex business law and litigation. Ms. Bartkowski counsels clients with regard to business contracts and insurance policies, including assisting with negotiations and disputes. She regularly engages in alternative dispute resolution, including arbitration and mediation.

#### **Education**

- Albany Law School of Union University, J.D., 1990
- Wells College, B.A., 1987

#### **Bar Admissions**

- New York, 1991
- U.S. District Court, Northern District of New York, 1991
- U.S. District Court, Eastern District of New York, 1997
- U.S. District Court, Southern District of New York, 1997
- U.S. Court of Appeals, Second Circuit, 1998

#### **Mediation**

- Designated Mediator and Early Neutral Evaluator (ENE), U.S. District Court, Northern District of New York's Alternative Dispute Resolution Program
- Mediator, U.S. District Court, Northern District of New York, Pilot Program, 2013
- Trained as Advanced Mediator for Multi-Party Cases by American Arbitration Association

#### **Honors and Awards**

- Named to the Upstate New York Super Lawyers list (top 5% of attorneys based upon peer reviews and other criteria) as one of the top attorneys in Upstate New York, 2010-2015
- Recipient, Pro Bono Award for service as an Early Neutral Evaluator, U.S. District Court for the Northern District of NY, 2010
- Graduate, Leadership Saratoga, Class of 2007
- People to People Ambassador, South African Labour Law Delegation, October 2006

## **Presentations**

- Presenter, *Legal Updates Impacting Dealerships*, National Association of Dealer Counsel Member Conference, 2015
- Speaker, *Are You Certifiable (As a NYS Women Business Enterprise)?*, One Woman. One World., Critical Needs Now, 2015

## **Memberships and Affiliations**

- Member, New York State Bar Association
- Member, Albany County Bar Association
- Member, Saratoga County Bar Association
- Member, Saratoga County Chamber of Commerce
- Member, Association of Trial Lawyers of America
- Member, New York State Academy of Trial Lawyers
- Member, National Association of Dealer Counsel (NADC)
- Member, National Association of Women in Construction
- Board Member, National Association of Women in Construction, Capital District NY Chapter #0261
- Member, Saratoga Builders Association, Inc.
- Member, Associated General Contractors New York State
- Trustee, Loisaba Community Conservation Foundation, Inc., and sponsor of on-going pen-pal program since 2007 between middle school students in Saratoga Springs, NY and students at the Ewaso Primary School
- Founding Member, The Foal Project
- Member, Soroptimist International of Saratoga County, Inc., 2011 - present
- Member, Women TIES
- Board Member, National Multiple Sclerosis Society of Upstate New York, 2007-2011
- Board Member, Saratoga Film Forum, 2007-2011

## Sri Rangarajan

Principal Consultant



### Professional Profile

Dr. Rangarajan is a civil and environmental engineer with over 26 years of public and private sector experience. His projects have focused on hydrologic, hydraulic, and water quality evaluations to assist municipalities, regional agencies, state regulators, watershed organizations and private developers in making informed decisions through sound scientific assessments and in meeting regulatory requirements, in a sustainable and cost-effective manner.

### Selected Project Highlights and Clients

Recently provided strategic directions and backbone technical support to the following programs in New York City:

- Long-term control planning to mitigate the impacts of CSOs and calibration/application of watershed models to support facility planning, that has an implication of over \$3 Billion on the City's capital improvement program.
- Green infrastructure (GI) planning and implementation, with a planned budget of \$2.4 Billion, including research and development pertinent to new or modified designs to achieve multiple stormwater quantity/quality control goals and use of monitoring data and watershed models to evaluate the GI benefits at site, neighborhood and watershed scales.
- Superfund efforts for Gowanus Canal and Newtown Creek, with a potential implication of several billion dollars on capital program.
- Advisories for public recreational activities based on integrated watershed/waterbody evaluations, including forecasting of water quality near beaches and in waterways.

Also served as Project Director, Project Manager, Task Manager or Technical Lead in projects for over 20 municipalities and state/regional and private agencies, with budgets ranging from \$30,000 to \$15 Million. Projects included CSO/SSO mitigation studies involving the design and implementation of field monitoring programs, asset management, risk-based failure analysis, urban hydrology and sewer system modeling, GI feasibility analysis and implementation, evaluation of conventional and innovative technologies for impact mitigation through comprehensive facility planning and design, and review and support of relevant regulatory requirements. **Clients:** *Washington DC, Baltimore MD, New Castle County DE, PVSC NJ, Rockland County Sewer District NY, Harrison NJ, Paterson NJ, Fort Lee NJ, East Newark NJ, Guttenberg NJ, North Bergen NJ, Elizabeth NJ, Richmond VA, and Cities of Edmonton and Winnipeg (Canada).*

### Selected Publications

Chapter on Analytical tools for simulation of stormwater controls in Design of Urban Stormwater Controls, Manual of Practice 23 by WEF and ASCE, May 2012.

Performance evaluation of blue roofs to mitigate CSO impacts, WEF Collection Systems 2012.

Recalibration of the New York City drainage models to support GI planning and implementation, National Low Impact Development Symposium 2011.

A phased approach to SSO mitigation planning, NJ WEA 2011.

### Education

Ph.D. (Hydrology/Water Resources),  
University of Manitoba, Canada, 1995.  
M.Eng.(Hydraulics/Water Resources),  
Indian Institute of Science, India, 1990.  
B.Eng. (Civil Engineering), Madurai  
Kamaraj University, India, 1988.

### Employment

Now - President, Boomi Environmental.  
2012-February 2014 - New York City  
Environmental Protection.  
Various consulting firms - October  
1995-2011.

### Registration and Awards

Professional Engineer, Canada  
Diplomate of American Academy of  
Water Resources Engineers.  
Member of Climate Ready Water  
Utilities Workgroup of USEPA.  
Chair of WEF Watershed Management  
Committee.  
US Asia Environment Partnership's  
Leadership Award.  
ASCE Edmund Friedman Young  
Engineer Award.

**Arcadis U.S., Inc.**

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