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September 3, 2015

Ms. Catherine Douglass
State of New Jersey, Department of the Treasury
Division of Property Management & Construction Contracts & Procurement Unit
33 West State Street, P.O. Box 034
Trenton, New Jersey 08625-0034

Re: Rebuild by Design - New Meadowlands Project
Feasibility Study, Environmental Impact Statement, Design and Construction Administration Services

Dear Ms. Douglass:

Just as Rebuild by Design gathered "the talent of the world to work with the talent of the Sandy-affected region," so AECOM has created a team to deliver locally our global expertise in rethinking resiliency to help to protect people, homes, businesses and infrastructure for a more sustainable future.

AECOM Technical Services, Inc. (**AECOM**), and our team of subconsultants, are grateful for the opportunity to work with the New Jersey Department of the Treasury, Division of Property Management and Construction and the New Jersey Department of Environmental Protection, Office of Flood Hazard Risk Reduction Measures (DPMC/DEP), on this important project - Rebuild by Design – New Meadowlands Project "**Protect**, **Connect**, **Grow**"

AECOM assembled a Team with experience cooperatively achieving the objectives of project. Joining AECOM to prepare the necessary studies, NEPA planning, design and bid documents for DPMC/DEP, and providing permit applications, permit coordination, bidding support and construction administration services are:

- **URS Corporation** – A wholly owned subsidiary of AECOM
- **URS Architects & Engineers** – A wholly owned subsidiary of AECOM
- **HDR, Inc.** – Environmental Engineering firm in NJ/NY, completing flood risk reduction and ecosystem restoration throughout the Metropolitan region; architecture, environmental and construction services delivering resilient facilities and infrastructure
- **Dewberry Engineers Inc.** – Significant Rebuild by Design, feasibility study, and Environmental Impact Statement experience in New Jersey
- **Matrix New World Engineering, Inc.** – A woman-owned, New Jersey based, certified SBE/WBE company with extensive experience in the New Jersey Meadowlands
- **HR&A Advisors, Inc.** – A solid background in complicated real estate and economic development projects
- **Robinson Aerial Surveys, Inc.** – A certified DBE/MBE/SBE in New Jersey with significant expertise in aerial survey and mapping
- **Remora Consulting, LLC** – Assists HUD grant recipients in delivery services to their communities while complying with HUD's requirements
- **Reichman Frankle Inc.** – A WBE/SBE/DBE firm, RFI is particularly skilled in organizing multi-faceted outreach programs, cost-effectively while maintaining quality control
- **Stevens Institute of Technology, Davidson Laboratory** – Local governments are rebuilding and establishing guidelines for future development based on the studies and models they develop

AECOM

The AECOM Team knows that successful project execution depends on strong working relationships to achieve project implementation milestones and goals. Accordingly, our design teams and technical resources will be focused on providing maximum flexibility to DPMC/DEP in seeking to advance this key project. Our professionals have the relationships, in-depth managerial capability and technical knowledge to easily span across all project phases including **Feasibility** (flood risk management, levee design, interior drainage design, ecosystem restoration) **NEPA/EIS Documentation** (reviews and approvals, public outreach and community engagement), **Design** (detailing the project components/elements) and **Construction Administration**.

These are the advantages we believe makes the AECOM Team the best choice for this important projects:

Global Expertise, Local Delivery - The AECOM Team brings nearly unlimited resources to bear on the project with more than 4,500 staff in the NJ area and over 100,000 staff globally. This will enable the team to bring lessons learned from similar projects to the New Meadowlands project without a steep learning curve which will save time and money.

Currently manage a number of successful NJDPMC/NJDEP Term Contracts – This experience working under state guidelines minimizes start-up time and expenses and enables our team to work with your team to engage community stakeholders immediately in the process.

We have been, and continue to be, one of the primary FEMA contractors in your region – We developed all of the FEMA floodplain models and mapping for the New Meadowlands project area which gives us an intimate knowledge of the dynamics of the project area flooding.

The AECOM Team knows that successful project execution depends on strong working relationships to achieve project implementation milestones and goals.

HUD Community Development Experience – the AECOM Team has worked on other HUD Rebuild by Design projects and is active in supporting a number of Community Development Block Grants for Disaster Recovery (CDBG-DR). AECOM helps cities around the world become more resilient as a contractor working for the 100 Resilient Cities—pioneered by the Rockefeller Foundation. AECOM is the global resilient cities partner under the R!SE Initiative of The United Nations Office for Disaster Risk Reduction (UNISDR).

World-Class Placemaking – Our Team has been involved in some of the highest profile public realm projects around the globe and locally here in the NY/NJ Metropolitan area; including the transformation of the World Trade Center into a vibrant campus and the creation of a new public realm in the form of an esplanade along and over the East River.

US Army Corps of Engineers (USACE) New York District and Nationwide A/E contractor – The Team has been involved with, and responsible for, the feasibility studies, designs, permitting, and construction of some of the largest Flood Risk Management and Ecosystem Restoration projects in the region over the past few decades.

Experience working with project stakeholders – in addition to the USACE, the State of New Jersey, and HUD, the AECOM team has extensive experience working with the Environmental Protection Agency, the Port Authority of New York and New Jersey (including Teterboro Airport), Public Service Electric and Gas Company (PSEG), the NY/NJ Baykeepers, the Hackensack Riverkeepers, the New Jersey Meadowlands Commission, now the NJ Sports and Exposition Authority (NJSEA), Rutgers University, Jersey City, the boroughs of Little Ferry and Moonachie, and the towns of Kearny and Secaucus.

An established track record in the design and construction of ecosystems and infrastructure in the State and in the project area – Our team knows how to work with your team to design, permit, and get things constructed in New Jersey – on-time and on-budget.

AECOM

Unparalleled staff expertise and experience:

- **Christopher Benosky, PE, CFM (AECOM)**, our proposed Project Manager, has more than 25 years of experience in managing flood protection and risk management, coastal engineering, ecosystem restoration design, dam and levee engineering, hydrologic, hydraulic, and hydrodynamic modeling and analysis, stormwater management system design, geotechnical engineering, construction cost estimation, and construction administration and management.
- **John Bianco (AECOM)** former USACE North Atlantic Division Chief of the Sandy Coastal Management Branch and Director of the Dam and Levee Safety Program
- **Col. John Boulé (Dewberry)** former USACE Commander of the New York District
- **Dr. Alan Blumberg (Davidson Laboratory at Stevens Institute of Technology)** a world renowned oceanographer and innovator of predictive modeling of natural and man-made disasters to coasts
- **Duane Gapisnski, PE (HDR)** former USACE Rock Island District Commander, HDR Program Manager for the $14.6 billion program management support for the reconstruction of the New Orleans Area Hurricane and Storm Damage Risk Reduction System

These are just a few of the world-class professionals on our team who will work out of our New Jersey offices to deliver cost effective ways to implement the winning proposal based on the $150 million HUD award.

Working with DPMC/DEP, the AECOM Team will "marshal the talent of the world to answer a region's greatest needs;" just as the visionaries who founded Rebuild by Design intended, and just as the *New Meadowlands Project*: "***Protect, Connect, Grow***" will exemplify.

Respectfully submitted,

Thomas C. Mac Allen

Tom Mac Allen, PE, PP
Vice President

Christopher Benosky, PE, CFM
Associate Vice President

AECOM

HDR

Dewberry

MATRIXNEWORLD

STEVENS

HR&A

ROBINSON

RFI

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1 Organization Chart /Staffing Plan

The AECOM Team — AECOM, Legacy URS, HDR, DEI, and Matrix (SBE), bring the depth and breadth of local expertise and experience working together to meet the diverse requirements of the Project, leading to an implementation plan.

INTRODUCTION

AECOM Technical Services, Inc. (AECOM), and our team of subconsultants, are grateful for the opportunity to work with the New Jersey Department of the Treasury, Division of Property Management and Construction and the New Jersey Department of Environmental Protection, Office of Flood Hazard Risk Reduction Measures (DPMC/DEP), on this important project: *Rebuild by Design – New Meadowlands Project* ***"Protect, Connect, Grow".***

Just as Rebuild by Design gathered "the talent of the world to work with the talent of the Sandy-affected region," so AECOM has created a team to deliver locally our global expertise in rethinking resiliency to help to protect people, homes, businesses and infrastructure for a more sustainable future.

The AECOM Team

The combined experience of our team is reflected by our organizational leadership, policy and procedure development at the programmatic level, utilization of a production focused management process, including time-saving techniques, procedures and significant construction oversight experience honed over 40 years. Our Team spans across the development of feasibility studies, NEPA EIS preparation, design and construction administration support for flood risk management projects, Ecosystem Restoration and Urban Planning projects. Our experience provides us with all the tools to work in the new paradigm of resiliency that make our society more environmentally and economically resilient. AECOM and all it's primary sub-consultants have worked together extensively on previous projects similar in nature and scope. Our past success working together to achieve client goals is why we have joined together again for this unique and exciting project. We believe you'll find our team provides outstanding experience and an exceptional level of capability in professional consulting services to support this contract.

The AECOM team, is comprised of **AECOM** as the prime consultant, and is supported by **HDR Engineering, Inc. (HDR)** and **Dewberry Engineers Inc. (DEI)**; as well as two Minority-Owned Businesses, **Matrix New World Engineering, Inc. (Matrix)**, an **SBE**, and **Reichman Frankle, Inc. (RFI)**, as **SBE**,

Robinson Aerial Surveys, Inc. (Robinson), an **SBE**, to meet our HUD Statement of Assurance obligations; and specialty subconsultants **Remora Consultants, LLC (Kevin Hamby, JD)** - (HUD Compliance Specialists), **HR&A Advisors, Inc. (HR&A)** - (Real Estate Economic Analysts), and **Stevens Institute of Technology (Stevens)** - (Coastal Modeling and Engineering ITR / Technical Advisors). In addition, to further our small business participation, we will seek out and solicit bids from pre-approved, as applicable, **Small Business Enterprises** to obtain **soil borings, laboratory testing** (Hampton-Clarke, Inc., WBE and Veritech laboratory, SBE), and **reproduction services**.

AECOM is comprised of three pre-qualified entities, **AECOM Technical Services (ATS)**, and the pre-qualified subconsultants of **URS Architects/Engineers, Inc.**, and **URS Corporation**, herein after referred to simply as AECOM or AECOM(URS) when referring to legacy URS firms. The team was assembled specifically to provide the most qualified professionals and most relevant experience to meet the varied needs of this solicitation, and to **provide a fresh independent perspective to the conceptual plans developed by the Rebuild by Design team, free of any preconceived prejudices, to assure a truly independent formulation of constructible project alternatives during the feasibility stage of the project development.**

AECOM(URS) provided full-service program management to the Mississippi Development Authority for the implementation of the $5.4 billion Hurricane Katrina HUD CDBG Recovery Program.

Experience with Term Contracts and as a Team

AECOM, Legacy URS (AECOM(URS)), and DEI all hold Term contracts with DPMC for floodplain mapping throughout the state, and AECOM(URS) and DEI also hold two of the DPMC Demolition Consultant Contracts. By involvement with two of DPMC's Term Contracts, the Team has demonstrated their familiarity with the use of contract vehicles similar to that proposed for this project. The Team is accustomed to working with NJDEP and DPMC requirements and staff. In addition, the DPMC Demolition Contract, as well as DEI's Rebuild by Design Hudson River (Hoboken) Contract, are funded through CBDG-DR grant funds and the team is fully familiar and has been compliant with HUD requirements.

Working under the DPMC floodplain contract, AECOM(URS) has just completed the flood risk mapping for all of Bergen County, including a large portion of this project area, and have intimate knowledge of the flooding problems in the area. AECOM(URS) in a joint venture with DEI known as RAMPP, working for FEMA, performed the coastal modeling and mapping associated with the Bergen County mapping project. **This hands on experience with the area's flood risk studies will minimize modeling time and accelerate the feasibility analysis.**

Local staff capacity of more than 4,500 professionals, supported by a global expertise of more than 100,000.

Additionally, AECOM has teamed with HDR and DEI on several large Term Contracts relevant to this project. The teams working relationships and management structure on similar large scale task order type contracts are well established. AECOM and HDR are presently working as a team on a post Sandy resiliency project for the Passaic Valley Sewage Commission's wastewater treatment plant in Newark NJ, the nation's fifth largest treatment plant. Comprised of a powerplant, floodwalls, levees, interior drainage components and pumping stations, this project mimics many of the features that will be called for as part of the New Meadowlands Project. Furthermore, AECOM(URS) and HDR have worked as a team on several large Term Contracts with the USACE New York and Philadelphia Districts, including recent feasibility studies for flood risk management projects for the New Jersey side of the Delaware River, the ongoing update study for the Passaic River, NJ, and the Mamaroneck and Sheldrake Rivers in New York State. HDR, through its legacy firm LMS, and DEI have also worked together as a Joint Venture on a $10 million environmental contract for the MTA New York City Transit.

Members of this team have a long history of successfully working together on some of the area's largest and most visible projects; we will perform for you and make you proud to be associated with the New Meadowlands Project

Together the AECOM team brings to the State national expertise delivered through the personal service of our local offices. Based in the AECOM office in Piscataway, NJ and supported by our AECOM(URS) Clifton, NJ office as well as the local NJ offices of HDR, DEI, and Matrix, the team is geographically well positioned to access the site, provide public outreach assistance, and to meet with NJDEP staff in Trenton. The AECOM team brings a local **NY/NJ Metropolitan Area staff of over 4,500 professionals** supported by a global network exceeding 100,000 in strength, assuring that the team has more than sufficient capacity to meet the needs of this project while still meeting ongoing obligations.

While having the majority of disciplines and experience necessary to complete the assignments anticipated under this solicitation in-house, AECOM has assembled a team specifically to provide the DPMC/DEP with recognized experts in their technical fields that have a long term track record of working on NJ projects. These individuals know and understand the political and regulatory environment in the state. In addition to our primary sub-consultants HDR, DEI, and legacy URS, we have added several specialty firms to meet foreseeable niche requirements and to assist us meeting our HUD Statement of Assurance obligations. **Exhibit 1.1** introduces the AECOM team members their roles and responsibilities and our rational for selecting them to be on our team. A brief summary of each firm follows the summarizing tables beginning on the next page.

TEAM MEMBERS BACKGROUND AND OVERVIEW

Lead Firm

AECOM

WHO WE ARE: AECOM is a global provider of engineering, architecture, design, and construction services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 100,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation and technical excellence in delivering solutions that create, enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 150 countries.

AECOM was founded upon a commitment to socially and environmentally responsible places and infrastructure. Today, we incorporate a broad definition of sustainability into our mission of creating exemplary environments. The resiliency of the public realm environment depends upon cooperation between all of its elements, from the economic, to the social, to the structural. We address each of these elements, and the relationships between them, through environmental, economic, planning and design services, aided by the latest information technology tools, to ensure the vitality of the total system. Our project protocols ingrain these considerations in projects at every phase. In keeping with the goals of our practice, we are committed to operating our business in a sustainable manner.

WHAT WE DO: AECOM has extensive experience in a range of complex urban infrastructure and resiliency projects. Our sophisticated analysis and design techniques, combined with innovative engineering, are tailored for projects that require a robust integration of communities and coastal infrastructure. Our planners, engineers and architects address diverse aspects of the urban environment—from structures and buildings, to natural environments, and the infrastructure that provides for life in cities.

Examples include:

- Passaic River Flood Control Program
- Green Brook Flood Control Program
- Hudson-Raritan Estuary Feasibility Study
- Passaic Valley Sewage Commission (PVSC) Resiliency Project
- Atlantic Coast of New Jersey, Sea Bright to Manasquan Beach Erosion Project
- Access to the Region's Core (ARC) Project
- World Trade Center Public Realm Project
- Second Avenue Subway Project
- NJ Turnpike Authority (NJTA), Turnpike Interchange 6 to 9 Widening Program
- New Tappan Zee Bridge Project
- PSEG Estuary Enhancement Program

Exhibit 1.1 - The AECOM Team and Firm Roles

Firm	Role	Size	Rationale for Selection
AECOM Technical Services, Inc.	• Prime Consultant • Overall Program Responsibility • Program Management Lead • Delivery Order Management • Financial / Administrative Management Lead • Feasibility Study Lead • NEPA EIS Lead • Design - Flood Risk Mitigation Lead • Ecosystem Restoration Support • State and USACE Permitting Lead • Urban Planning and Design Lead • Coastal Engineering Lead • Coastal Modeling Support • Site Investigation and Remediation Investigations Lead • Report Preparation Lead • Cost Estimating Lead • Public Realm Design Lead	Large Business	• Large Term Contract Management Expertise • In-house multi-disciplinary capabilities in design of flood risk mitigation and ecosystem restoration to increase economic and environmental resilience • In-house globally renowned Urban Planning and Design Team • Large New Jersey / New York metropolitan area presence • Acknowledged experts in the preparation of EA / EIS / NEPA documents • Pre-qualified by DPMC for Unlimited Civil Engineering, Hydrology, Environmental Engineering, Estimating / Cost Analysis as well as majority of remaining disciplines required for this project • In-house expertise in Construction Administration led by our Project Manager and supported by staff from the former Tishman Construction and Hunt Construction Group operations, now AECOM, should our role evolve into a greater CM role • Presently working with teaming partner HDR on Flood Resiliency Project for Passaic Valley Sewage Commission at their Newark Plant
URS Corporation	• Delivery Order Management Feasibility Formulation Lead • Public Outreach Lead • State and USACE permitting support • Engineering / Design / Levee / Berm support • Flood Wall Design Lead • Closure Gate Design Lead • Interior Drainage / Urban Flooding Lead • Ecosystem Restoration support • Wetland Delineation support • Hazardous, Toxic, Radioactive Waste Investigations • Site Remediation Investigations support • Report Preparation Support • Cost Estimating support	Large Business	• Part of the AECOM family of firms • In-house multi-disciplinary capabilities in design of flood risk mitigation and ecosystem restoration to increase economic and environmental resilience • Experience in feasibility / planning stage efforts for USACE on majority of major local Coastal and Riverine flood relief projects • 30 years experience on USACE Green Brook Flood Control project, from feasibility to construction on State of New Jersey's largest ongoing flood control project • Separately qualified (before AECOM acquisition)
URS Architects / Engineers, Inc.	• Pump Station Facility Design • Building facilities • Cost Estimating support	Large Business	• Local Architectural practice in NJ • Part of the AECOM family of firms • Separately qualified (before AECOM acquisition)

Exhibit 1.1 - The AECOM Team and Firms' Roles (continued)

Firm	Role	Size	Rationale for Selection
PRIMARY SUBCONSULTANTS			
HDR Engineering, Inc. (HDR) [Formerly Lawler, Matursky & Skelly Engineers (LMS) and Hydroqual]	• Delivery Order Management Mitigation / Ecosystem Restoration Lead • Habitat Evaluation Lead • Water Quality Sampling and Monitoring Lead • Sediment Transport Modeling Lead • NEPA / EIS support • Public Involvement support • Environmental Mapping • Permit Assistance support • Levee and Flood Wall design support	Large Business	• Ongoing Wetland Banking Experience in the Meadowlands • Recognized Experts in Ecosystem Restoration Design • In-house staff with strong habitat assessment experience • Experienced in Green Infrastructure Design • Experienced in bio-engineering design and construction • Acknowledged experts in the preparation of EA / EIS / NEPA documents • Provides depth to design staff for Levees and Flood walls • In-house Flood Warning Experience • Ongoing sampling and monitoring in NY / NJ Harbor • Past working relationships with AECOM and AECOM(URS) including Hudson Raritan Estuary Enhancement program, NY / NJ Harbor Deepening Feasibility Study, Green Brook Flood Control, Passaic River Flood Control, Mamaroneck River Flood Control, and Passaic Valley Sewage Treatment Plant Resiliency Project
Dewberry Engineers Inc. (DEI)	• Delivery Order Management • Coastal Modeling Lead • Cultural Resources Lead • Land Surveying Lead • Socioeconomic and Environmental Justice Lead • Air Quality Lead • Transit Planning support • Technical and Regulatory Advisor to the NEPA EIS	Large Business	• Lessons Learned from Rebuild by Design Hudson River (Hoboken) Contract • Depth of experience with FEMA Region II, including RAMPP JV / AECOM(URS) • Coastal Modeling Expertise, including the Danish Hydraulic Institute's (DHI's) MIKE System • Use of LiDAR data and creation of detailed Terrain Models • Local Land Surveying Expertise • DPMC Pre-approved in Archaeology, as well as, all required disciplines, Archaeological / Cultural Resources Staff • Section 106 experience • Teamed with AECOM(URS) on all three of FEMA's major contracts, Mapping Provider Contract ($150 million), Hazard Mitigation Technical Assistance Contract (HMTAP) ($100 million) and the Technical Assistance Contract (TAC) ($50 million) • Together AECOM(URS) / DEI / Performed all Coastal Modeling for NJ for FEMA

Exhibit 1.1 - The AECOM Team and Firm Roles (continued)

Firm	Role	Size	Rationale for Selection
Small Business Subconsultants			
Matrix New World Engineering, Inc. (Matrix)	• Hydrographic and Land Surveying • Geotechnical Engineering • Environmental Permitting support • Wetland restoration design • EIS assistance • Treatment groundwater contamination • Site Remediation	WBE SBE	• Woman-owned small business • Pre-approved Hydrographic Surveying and Land Surveying • Permitting experience in New Jersey • Engineering experience in Ecosystem Restoration • Geotechnical Engineering experience • Teamed with HDR and AECOM on several USACE contracts for ecosystem restoration
Robinson Aerial Surveys, Inc. (Robinson)	• Aerial Surveying / Mapping Lead • Land Surveying support	MBE SBE	• Minority-owned small business • Pre-approved Aerial Surveying and Land Surveying • Performed similar role on the Floodplain Mapping Contract TX-007 for AECOM
Reichman Frankle Inc.	• Public Outreach and Community Involvement	WBE, SBE, DBE	• Woman-owned Business Enterprise and Small Business • Local to the Project Area • Working with AECOM on other projects • Experience working in Spanish speaking areas
Specialty Subconsultants			
HR&A Advisors, Inc. (HR&A)	• Real Estate Economics	N/A	• Experts in Real Estate Market Forecasting • Real Estate Development Economics • Experts in Tax Revenue Forecasting
Remora Consulting, LLC (Kevin Hamby, JD)	• HUD Grant Compliance Lead	N/A	• Experts in HUD Procedures • Performed similar role with AECOM(URS) following Hurricanes Ike and Dolly
Stevens Institute of Technology	• Technical Advisor - Coastal Modeling and Engineering / Independent Technical Review	N/A	• Provides Recognized Academic Expertise to the Team • Largest and most widely renowned Hydrodynamic and Ocean Engineering Facilities in the nation

We are a New Jersey firm with extensive Federal state and local agency experience. AECOM engineers, designers, environmental planners, and scientists have proven experience working with New Jersey agencies, including DPMC, NJDEP, NJDOT, NJTA, Port Authority of NY and NJ, and NJ Transit, among others, bringing a deep understanding of the best practices essential to the success of any New Jersey project. In addition, AECOM experts are working closely with agencies of the Federal government, including FEMA, HUD, and the USACE, to develop best practices and strategies for implementing long term solutions to climate change impacts and resiliency best practices.

HISTORY: AECOM was founded on a commitment to deliver socially and environmentally responsible places and infrastructure. While our official founding was in 1990, some of our predecessor firms have distinguished histories dating back to the early 1900s. Over the past 25 years, more than 40 companies have joined AECOM, with URS Corporation being

the most recent to join the AECOM family of companies in 2014.

Our Subconsultants

HDR has partnered with clients to shape communities and push the boundaries of what's possible since 1917. They specialize in engineering, architecture, environmental and construction services. With nearly 10,000 employees in more than 200 locations around the world, they combine local knowledge and delivery capabilities – understanding local regulations, policies, operating environment and geography – with the resources and reliability of a global firm. The collaboration of HDR's local staff has led to creating and delivering resilient facilities and infrastructure with the best value for our clients and to be ranked No. 9 in the top 500 Design Firms by *Engineering News Record*, as well as being ranked No. 2 in the top 10 Environmental Sciences Firms.

HDR has a significant technical NJ in-state practice and in addition to their Mahwah NJ Office, they have offices in Newark, Lawrenceville, and Pompton Lakes. Their NJ office locations house over 225 HDR employees and are linked under regional leadership with additional office locations in Manhattan, White Plains and Nanuet, NY as well as their office in Plymouth Meeting, PA. All told, HDR has 11 offices in NY/NJ/PA metropolitan areas with more than 700 technical staff.

Some of their most significant projects are located in the State of New Jersey and include the raising and rehabilitation of the Bayonne Bridge, the re-design and reactivation of the Greenville Yard Barge-Train facility, remediation of the Port Imperial Superfund Site, and numerous other projects in the areas of flood risk mitigation, environmental restoration, and transportation infrastructure. They have also worked on many large scale regional projects to mitigate flood hazards and build resilient environmental infrastructure in the Hudson-Raritan Estuary focusing on the full range of environmental challenges and opportunities for restoration and protection of natural resources relating to water quality, sediment, and habitat degradation – issues of both technical and public interest. Their solutions help clients integrate flood risk mitigation with other watershed improvements such as recreational facilities, ecosystems, habitats, community connectivity, and water distribution and quality. Each system reflects the unique characteristics of both the community and associated flooding threat.

HDR is also engaged in some of the most high profile projects in the region where they partner with their clients to develop compelling solutions. Examples include being the lead designer for the New Tappan Zee Bridge as well as being the lead for ensuring environmental compliance during construction, lead designer for the new Pennsylvania Rapid Bridge Replacement Program P3 which is addressing 500 bridges throughout the state, restoration of NYC Transit's Rockaway Line over Jamaica Bay after Hurricane Sandy damages, and the development of a Floodwall around the Veterans Administration Hospital on the Manhattan East Side to protect it from the type of damages they experienced during Sandy.

HDR supports the communities that we work and live in. Both as individuals and as a company, they strive to make our communities better. HDR has over 265 employees that live in the State of New Jersey and we are engaged as citizens of the state and participate in many important associations that help understand the State's needs and help shape a promising future including NJ Alliance for Action, NJ Association of Counties, Commerce and Industry Association of NJ, NJ Association of Floodplain Managers, as well as many others.

Their highly skilled interdisciplinary team of planners, economists, engineers, ecologists, biologists and other related specialists represent the broad spectrum of disciplines necessary to formulate, design, mitigate, estimate and evaluate the various alternatives to provide flood risk management and environmental resiliency. Many of their staff come from, or have worked for national organizations such as the Federal Emergency Management Agency (FEMA), the Environmental Protection Agency (EPA), and the USACE. This depth of experience and diversity provides a solid foundation for flood risk and resiliency planning that reflects a systematic and comprehensive approach. This process not only recognizes the direct

physical and financial losses to those directly impacted by flooding, but it also considers the dynamic nature of the economy, the environment and variability of other social effects over time.

Dewberry

Dewberry is a leading professional services firm focused on improving land and water, infrastructure, and buildings—from sensitive, protected environments to dense urban cores. While the firm maintains 40+ office locations and 2,000 personnel nationwide, it offers a community-based approach. Community offices offer strong knowledge of local conditions including physical, political, regulatory, economic, and demographic factors.

Dewberry provides program management, planning, engineering, environmental services, and surveying and mapping services, along with a myriad of technical support. As one of the nation's leading water resources firms, Dewberry's 200+ water resources specialists work with public agencies to recreate natural ecosystems, reverse the degradation of waterways, and restore our watersheds. The firm is a long-standing (FEMA) contractor with disaster recovery and hazard mitigation work spanning 30 years and more than 400 disaster declarations. Dewberry's dedicated climate resiliency group leverages this experience to implement programs that address flooding and help local governments overcome the uncertainties associated with climate change and sea level rise.

Operating in New Jersey for more than 55 years, Dewberry has three offices in Bloomfield, Parsippany, and Mount Laurel. The New Jersey and Manhattan offices have more than 325 personnel. A significant percentage of the firm's local work is performed for state agencies. The firm brings a proven track record of delivering for DPMC; term contracts include:

- Floodplain Mapping Multiple Award Term Contract TC-007 (held along with AECOM and URS)
- Demolition Consultant Multiple Award Term Contract TC-008 (held along with URS)
- NJ Department of Human Services (DHS) Civil Engineering Agency Consulting Program Project #R0204-00
- DPMC Professional Environmental Consulting/Licensed Site Remediation Professional Services Agency Consulting Program Project #J0328-00

Dewberry shares the NJDEP's mission to protect the air, waters, land, and natural and historic resources of the state. Noteworthy collaborations include:

- As prime consultant on the NJDEP's Rebuild By Design Hudson River project, Dewberry is partnering with the NJDEP to deliver a Feasibility Study and Environmental Impact Statement for a comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City.
- Under the Demolition Consultant contract, the firm's professionals supported the state in developing the program to use federal funding wisely while transforming repetitive flood-loss properties to open space that can buffer and protect our communities.
- Principal Ileana Ivanciu, PhD, PG, is the long-standing chair of the American Council of Engineering Companies' NJDEP Liaision Committee which is dedicated to partnering the consulting community with the NJDEP to improve the state's built environment while maintaining environmental protection.
- As Program Manager for the state's Superstorm Sandy Waterway Debris Removal, Dewberry professionals partnered with the NJDEP to execute the largest wet debris removal program in U.S. history, safely returning our waterways to industry and recreation within federally mandated reimbursement deadlines.
- Dewberry is supporting the NJDEP along with URS as Environmental Field Assessment Contractor, having completed nearly 400 Post-Superstorm Sandy environmental and historic preservation reviews to date, pursuant to the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant-Disaster Recovery (CDBG-DR) regulations.

The firm also brings valuable experience working in and nearby the New Meadowlands Pilot Project Area. Highlights of relevant projects include:

- Teterboro Airport Storm Drainage System – Dewberry is currently preparing engineering design to minimize flooding at the Airport. This work is based on the firm's portfolio of projects in the Borough, for both the Port Authority of New York & New Jersey and the Borough of Teterboro, providing planning, design, permitting, and construction administration of flood control projects.
- Route 7 Wittpenn Bridge Replacement and Associated Roadways – This $730-million project is currently under construction. Dewberry, as a subconsultant, prepared Technical Environmental Studies for the NEPA Environmental Assessment and provided multi-disciplinary engineering and site remediation services for the replacement of Route 7 over the Hackensack River, the realignment of Fish House Road on the west side of the river, and related approach interchange improvements.
- Improvements along the 2.5-mile corridor of Route 3 near Pilot Area #1 in Rutherford, Lyndhurst, and Clifton – Dewberry led the NEPA Environmental Assessment, final scope development, and preliminary and final design services for the $159-million project that replaced the Route 3 Bridge over the Passaic River, improved the corridor, and created a series of environmental enhancements including riverfront access. Completed in 2014, this project recently received the American Road & Transportation Builders Association Transportation Development Foundation Globe Award. The award recognized Dewberry's design and stakeholder outreach on this infrastructure project that seized the opportunity to enhance the community, restore ecologies, honor history, and promote public awareness to improve the health of the Passaic River.

MATRIXNEWORLD
Enabling Progress

Matrix New World Engineering, Inc. (Matrix), is a woman-owned, New Jersey based, certified SBE/WBE company with extensive experience in the New Jersey Meadowlands. Highlights of their relevance to the success of the New Meadowlands Project are presented below.

- In business for 25 years, Matrix was founded upon providing engineering and environmental services for large infrastructure projects in the NJ/NY metro region (including the Meadowlands region) and continues to work on the region's most important projects.
- DPMC experience, including pre-qualification in 17 disciplines, and active project at Liberty State Park.
- Strong relationships with the Meadowlands community, political entities and business interests.
- A history of work assignments for Hudson, Bergen and Essex counties and their local municipal governments.
- Strong marine ecology and wetlands experience, including work on the Meadowland's largest privately funded mitigation bank (Kane Mitigation Bank).
- Over twenty years experience working with AECOM and HDR.
- Extensive experience with HUD-funded projects and reporting requirements, including the CDBG and RREM Programs.
- Regulatory strength in the urban core of New Jersey, with particular expertise in the marine environment and relationships with NJDEP Land Use Regulation Program, Meadowlands Commission, FEMA and USACE.
- A complete Marine Services Division, including marine engineering, hydrographic surveying, diving, marine ecology, and sediment sampling capabilities.
- A focus on climate change resiliency design, with dozens of active projects for the State of New Jersey, NJ Transit, Port Authority of New York and New Jersey, the City of New York, and private institutions.
- Proximate staffing, with approximately 100 staff located in the nearby Florham Park, headquarters.
- A commitment to New Jersey's resiliency, as evidenced by the charitable endeavors, including a pro-bono "living shoreline" demonstration project on Barnegat Bay that was designed, permitted, constructed and financed by Matrix.

In summary, Matrix provides a well-qualified, local technical resource for the New Meadowlands Project. Their expertise and experience are complementary to the Project, and their

senior staff are dedicated to the management and delivery of the work.

Stevens Institute of Technology, a premier technological university, is home to the Davidson Laboratory, headed by Dr. Alan Blumberg, a world renowned oceanographer and innovator of predictive modeling. The laboratory focuses on assessing, predicting and mitigating the damage of natural and man-made disasters to coasts as a result of storm events and climate change modeling.

Stevens has been involved with their forecasting work during Hurricane Sandy and has been well recognized by their peers, the National Weather Service and the press. Local governments are rebuilding and establishing guidelines for future development and infrastructure improvements based on the studies and models developed by Stevens under the direction of Dr. Blumberg.

Some of the projects currently underway at the institute include:

- The New York - New Jersey Harbor NAvigation and Vessel SAFEty Support System (NAVSAFE), funded by the New Jersey Department of Transportation. This is a five year research project, that has led to an integrated system of oceanographic, and meteorological sensors and hydrodynamic forecasting models to allow for the real-time assessment of ocean, weather, environmental, and marine transportation conditions throughout the waters of New York and New Jersey, and the forecast of conditions in the near and long-term. This integrated system, called The New York Harbor Observation and Prediction System (NYHOPS), will be significantly enhanced to create an operational NAvigation and Vessel SAFEty Support System (NAVSAFE) for the New York – New Jersey Harbor.
- A new, high-resolution, hydrodynamic model that encompasses the waterfront cites of Hoboken, Jersey City, Weehawken and Bayonne. The robust wetting and drying of land in the model physics provides for the dynamic prediction of flood elevations and velocities across land features during inundation events.
- A project for the Port Authority of New York and New Jersey to forecast warnings of storm surge heights with high spatial and temporal resolution. The warnings are targeted directly to the operators of critical Port Authority infrastructure, in terms they can understand and act upon. This storm surge warning system creates dynamic informational materials that relate real-time and forecasted flood levels to local flood benchmarks that are disseminated via the web and email alerts.

The Stevens team has also used the various climate data products produced by the scientific team to study the interactions between Sea Level Rise and Storm Surge in the New York Metropolitan Region and for the New Jersey to Massachusetts coasts. The long-term sea level rise projections from the climate team are being integrated into Stevens' storm surge model, ultimately providing ecosystem and infrastructure impacts. This effort is delivering valued storm surge relevant data and information products based on user priorities, guaranteeing data quality and adherence to ocean modeling standards. The information and products being developed will leverage and substantially augment the New York Harbor Observing and Prediction System (NYHOPS).

HR&A

HR&A Advisors, Inc. (HR&A) is an industry leader in economic development, real estate and public policy consulting. Equipped with a unique understanding of the intersection of the public and private sectors, HR&A has served a diversity of clients since 1976. HR&A has extensive experience advising on some of the most complicated real estate and economic development projects in communities across the country. They approach each assignment by focusing on how to achieve the client's goals in the context of the public sector's priorities and the private sector's motivations. Their approach has allowed hundreds of public and private clients

to transform public infrastructure, real estate and economic development concepts first into actionable plans, then into job-producing, community strengthening assets.

Since Superstorm Sandy, HR&A has led critical resilience planning initiatives, including partner Jamie Torres Springer's leadership in creating the Special Initiative for Rebuilding and Resiliency (SIRR) with the Mayor's Office in New York City managing community planning for the most impacted portions of New York City; as well as the firm's substantial role within the Rebuild by Design process; and our management of multiple community plans for the Governor's Office of Storm Recovery in the New York Rising Program. On behalf of the Rockefeller Foundation's 100 Resilient Cities Centennial Challenge (100RC), HR&A is working with cities across the United States to support the launch of the 100RC program. They have a strong shared understanding of the importance of urban resilience over the next century.

HR&A has over three decades of experience in developing visionary solutions to revitalize downtowns, neighborhoods, districts, cities and regions into job-producing, community strengthening assets. They are leaders developing an economic framework to inform strategic decisions. They examine, separately and together all the components of public investment for infrastructure such as pump stations, CSO improvements or even coastal defense systems. They consider the implications of proposed actions on transportation infrastructure, (including transit hubs and transit corridors) historic buildings, public open space, disused industrial centers, highway and railway infrastructure; and shifting public policy and provide a financial framework to assist the decision makers in making the right choices. They quantify the potential benefits, both one time and recurring from public investment and public policy changes which helps lead to successful project implementation. Their role will be to assist the team in financial implications and public outreach.

Urban Planning Experience with Large-Scale Public and Private Developments. HR&A has over three decades of experience leading successful large-scale development projects. They are able to navigate complex regulatory environments in order to achieve project implementation. They have managed multidisciplinary teams through the pre-master planning and master planning phases, from identifying and soliciting additional team members, to leading rezoning proposals, to engaging public sector officials and community leaders to attain development approvals. They have worked in cities across North America, and around the world to create strategies that leverage unique opportunities and assets in order to create new economic vitality. HR&A served as a strategic advisor to the Brooklyn Bridge Park Development Corporation (BBPDC), and is working with the BBPDC to translate its vision for one of the nation's great waterfronts into critical policy and strategic decisions for the 85-acre park.

In the wake of Superstorm Sandy, HR&A led a multidisciplinary team to develop community-led strategies to support long-term resiliency and economic growth for 7 of the 10 New York City storm-affected areas under the New York State Office of Storm Recovery's New York Rising Community Reconstruction Program (NYRCR). On behalf of the New York City Economic Development Corporation, HR&A is leading the economic, planning, and regulatory components of a multidisciplinary feasibility study for the Lower Manhattan Multipurpose Levee, a proposal to build a multipurpose levee along the eastern shoreline of Lower Manhattan. HR&A partners with urban designers, planners and architects to produce imaginative plans for unique places.

ROBINSON

Established in 1936, Robinson was founded by C.S. Robinson in Ithaca, NY, a civil engineer who worked for the New York State Park Commission. What started with a contract awarded by the U.S. Department of Agriculture to photograph 16,000 square miles in New York State, evolved into other two companies, Robinson Airlines (later merged with Allegheny Airlines and now known as USAir) which provided airline services between Ithaca and New York City, and in 1946 the acquisition of Standard Aerial Surveys of Newark, NJ.

The next expansion for the Company was in topographic mapping. A field operation was established which utilized the Tellurometer system. During 1960, Robinson moved to Newton, New Jersey to be near the new airport being built by the Aeroflex Corporation at Andover, New Jersey. Today, Robinson has its own photographic laboratory, digital and analytical mapping systems and CADD platforms, making it a fully integrated mapping facility.

In 2011 Robinson developed an Engineering division. Their Engineering team has vast experience in MEP Design and Construction Management / Administration gained through participation in numerous, diverse projects throughout New Jersey, New York and Pennsylvania. Additionally, Robinson is certified DBE / MBE / SBE in New Jersey, New York, and Pennsylvania. Over the years, Robinson has worked on over 10,000 projects for major clients.

Remora Consulting

Kevin Hamby, President of Remora Consulting, LLC, has taken his experience in working with the challenges in operating federal programs and created a boutique firm dedicated to providing focused expertise to assist grant recipients in delivering services to their communities, while still meeting HUD's requirements.

Having worked with CDBG-DR since October of 2005, Kevin has a firm background in starting up programs. Also important to many programs is the ability to reinvigorate existing programs. Kevin was instrumental in developing a plan in Texas for Hurricane Ike to eliminate barriers to moving forward. The effort increased the number of homes being started and continued through Round 1 of the funding. His efforts were recognized by program sub-recipients and civil-rights experts.

Kevin also has first-hand experience in working to increase the inclusion of low-income populations in DR programs by developing affirmatively furthering fair housing plans. Kevin was the state agency liaison to the private law-firm hired by the State of Texas to defend a legal action filed over discriminatory practices. The U.S. Supreme Court upheld HUD's legal authority to use the Disparate Impact rule, currently one of the major determinants in enforcement of the Fair Housing Act. This decision will be used extensively to determine if funds are being used to affirmatively further fair housing.

With his legal background work in private practice as a litigator and as an assistant attorney general, Kevin's value in resolving conflicts that arise as a routine part of any disaster recovery program helps the client be more productive in expediting the more routine applicants. Kevin has experience in helping to address out-of-the-norm issues that arise and finding ways to make them work within the rules or, when necessary, limiting the exposure to the program by preventing further action.

RFI

Reichman Frankle Inc. (RFI), a WBE/SBE/DBE formed in 1990, is a full service marketing and public relations firm based in Englewood Cliffs, NJ. For over 25 years, the firm has provided strategy, writing, design, media, and public outreach services to a diverse group of private and public sector clients in New Jersey and the greater New York metropolitan area. Their creative and cost-effective approach has led to long standing partnerships with clients who count on them for fresh ideas, memorable deliverables and quality service with a personal touch.

Their team includes experts in marketing communications planning, promotional and technical writing, website design and online marketing, graphic design, public relations, advertising, community outreach and information programs, and event planning.

Infrastructure projects disrupt communities, but a good communications program that informs, communicates the need, benefits and process goes a long way toward building goodwill and consensus among stakeholders. RFI is particularly skilled in organizing multifaceted outreach programs; obtaining community input; communicating complex technical information to the public; and producing brochures, newsletters, websites and presentation materials cost-effectively while maintaining quality control.

Some of the relevant public outreach projects that RFI has been involved in include:

NJ TRANSIT—Portal Bridge Replacement - A key component in Accessing the Region's Core (ARC): In support of planning, environmental and engineering assistance for a replacement for this key rail transit bridge, RFI developed project branding and an independent website. Other elements in this multifaceted program included newsletters, displays, presentations, advertising and support for public meetings.

NJDOT - Rehabilitation of the Pulaski Skyway - Travel smarter: In partnership with NJDOT RFI developed a multifaceted communications plan to alert commuters and travelers in advance of the closure of the northbound lanes of the iconic Pulaski Skyway on April 12, 2014. Plan components included branding, TV, radio advertising, and collateral materials which RFI developed and produced. A combination of effective materials, well-planned and early community outreach and continuous monitoring effectively mitigated traffic and resulted in a very successful project for NJDOT to date.

Monmouth Economic Revitalization Planning Authority—Fort Monmouth Revitalization and Reuse Study - The public weighs in: Adapting the Fort Monmouth military base in Monmouth County, New Jersey to civilian use required a time-sensitive media and community outreach program. RFI's media and branding services included public information strategy, press releases and public notices, press conferences, logo development and informational tools, and planning and support for community charrettes and major public meetings.

MTACC—East Side Access - A multifaceted long-term program: RFI and AECOM are working together on this $8.2 billion mega project that will bring the Long Island Rail Road into Grand Central Terminal, RFI has provided a broad range of public outreach and marketing communications services since 2001. These comprise branding, brochures, Q & A documents, orientation programs for new employees and support for public meetings. The project is expected to open in 2019.

NJDOT—Route 139 - Upgrading a key route in the metropolitan area: For both the design and construction phases of the replacement/rehabilitation of this heavily travelled roadway between the Holland Tunnel and the Tonnelle traffic circle in Jersey City, RFI provided comprehensive public outreach services. These comprised a community involvement plan; participation in partnering sessions' formation of a community outreach technical advisory groups; coordination of meetings with community groups, committees and city and country political leaders; an extensive mailing list; writing and design of brochures (English and Spanish), fact sheets, and newsletters; arrangements, staffing and support for public information centers.

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Program Management / Engineering Office

Located in Piscataway, NJ, this office currently has more than 200 professionals comprised of civil, geotechnical, water resources, structural, mechanical, and electrical engineers, and house our proposed Project Manager, Design Lead, and contract administrative support staff.

Production Offices

Planning, Engineering and NEPA support will be conducted by our Piscataway office supported as needed primarily by over 4,300 additional staff from our nearby NY/NJ Metropolitan area business unit offices, and in particular our Clifton NJ office with nearly 200 people, including a dedicated full-time water resources engineering staff of over 15 people, as well as staff specializing in permitting, NEPA and geotechnical engineering. In addition significant portions of the work will be performed by our primary sub-consultants mainly in their Mahwah, Parsippany and Bloomfield NJ offices.

Team Capacity

As demonstrated by the Organization Chart, the attached resumes and the "Key Team Member Project Experience Data Sheets" provided in Section 2, and the understanding of the needs of the project, we have assembled a project team to provide DPMC/DEP, with more than sufficient qualified staffing to meet the anticipated demands of the TC-001 Contract.

Sufficient qualified staffing is a function of the ability to foresee the end product and understand how to best apply staff resources to reach that goal. The AECOM Team has the experience to make that happen.

More importantly, **Exhibit 1.2** compares the number of team staff available from the responding offices to the number of staff required to perform a project of this nature. This demonstrates that the team has sufficient capacity to meet even unanticipated contractual demands in all discipline areas.

Current Work Load

One of the advantages of being such a robust firm supported by two significant sub-consultants is the great depth of resources which assures the ability to accept new projects while honoring our existing commitments.

AECOM's projected workload anticipates the absorption of work presented by this assignment without difficulty, even with the expedited schedule driven by the NEPA process, or if there are significant increase in the project's scope. In addition, the AECOM team has the resources available to commence work immediately, seamlessly and with no learning curve. The key personnel we introduce are available upon notice to proceed to perform the services associated with this project. Our key staff members have repeatedly achieved their project's scheduling goals and have responded to our clients' needs.

In addition to the local resources of our team we have the availability of other staff as necessary, from the team's various offices outside our immediate region. Our Team prides itself on the quality of our professional staff and the ability to meet every challenge that our profession demands. AECOM also maintains a state-of-the-art technology infrastructure, allowing its project managers to work with remote project team members on a real-time basis.

Exhibit 1.2 - Comparison of Team Personnel to Anticipated Requirements

Discipline	Team Member	Anticipated Staff Required	Capacity of Responding Team		Responsibility
			Local	Nationally	
Surveyor	Robinson and DEI	9 - 12	13	179	Hydrographic, Land and Aerial GPS / Traditional Survey Data
Aerial Survey / LiDAR	Robinson	5 - 7	10	10	Photogrammetric Mapping / LiDAR Terrain Data
Remote Sensing / LiDAR Analyst	DEI, HDR, and Matrix	2	7	24	LiDAR QA / QC
GIS Database Analyst	AECOM, DEI, HDR, and Matrix	4	20	185	GIS Project Database and Terrain Model Creation
H&H Engineers	AECOM, DEI, HDR, and Matrix	7 - 9	41	253	H&H Analysis, Drainage Design Interior Drainage Analysis
Coastal Engineers	AECOM, DEI, HDR, and Matrix	2	5	74	Wave Runup Analysis
Geologists / Geotechnical Engineers	AECOM, DEI, HDR, and Matrix	6 - 8	99	374	Boring Inspection, Seepage, Settlement, and Stability Analysis; Foundation Designs
Structural Engineers	AECOM, DEI, and HDR	4 - 8	173	764	Floodwall Design, Closure Gate Designs, Bridge / Culvert Designs, Pump Station Designs
NEPA Specialists (Biologists, Cultural Resources Specialists, Planners, etc.)	AECOM, DEI, HDR, and Matrix	6-10	301	1,721	Perform Environmental Studies, Evaluate Impacts, Public Outreach; Author Documents
Real Estate Development Analysis	HR&A	2-3	44	62	Real Estate expertise and Market Forecasting; Development Economics; Tax Revenue Forecasting
Construction Administration	AECOM, DEI, HDR, and Matrix	2 - 4	151	780	Assist with Bid Openings, Review Specialty Shop Drawings, Respond to RFIs
Project Executive (Program Manager), Project Manager, and Deputy Project Managers	AECOM - Lead DEI, HDR, and Matrix	1 - Project Executive 2 - Executive Committee 1 - Project Manager 3 - Deputy Project Managers	320	2,561	Program Management

As demonstrated above, the AECOM Team has more than sufficient qualified staff to meet the varied needs of the T-001 Contract, but staffing is more than just numbers. Our proposed project team understands the work flow and we have the right management structure to keep the project moving forward with sufficient staff conducting as many parallel work tasks as possible, to limit the critical path throughout the contract duration.

KEY MANAGEMENT AND SUPPORT STAFF

Exhibit 1.3 - Organization Chart, provides a summary of the depth of staff that the AECOM Team brings to this project.

We have broken down the Organization Chart in two highlighting in the first chart our Project Management and Leadership; Quality Assurance Staff; and Technical Management Leads, and in the second chart illustrating the multi-disciplined Technical Support Group.

Key to the success of any project is the Project Manager as he will serve as the Day-to-Day point of contact with the DPMC/DEP project manager and be responsible to the State for the oversight of all the services performed. For that reason we have selected Mr. Christopher Benosky, PE, CFM to serve in this role and we are proud to present a brief synopsis of his career and qualifications below.

Project Manager - Christopher Benosky, PE, CFM

SUCCESS HIGHLIGHT

25 years of diverse management experience directing multi-million dollar Term Contracts.

Mr. Christopher Benosky is an Associate Vice President of the firm, the AECOM NY/NJ Metro Area Water Resource Market Sector Leader, and one of the global Technical Practice Leaders for the firm's Ecosystem Restoration Services. He has over 25 years of experience in managing flood protection and risk management, coastal engineering, ecosystem restoration design, dam and levee engineering, hydrologic, hydraulic, and hydrodynamic modeling and analyses, stormwater management system design, geotechnical engineering, construction cost estimation, and construction management. He serves as AECOM's Project Manager on DPMC/DEP's floodplain mapping contract, which is currently winding down, as well as directing AECOM's role on several USACE Indefinite Delivery (Term) Contracts with upset values of over $10 million. Many of these contracts entail task orders dealing with ecosystem restoration and flood risk management. In his current role, Mr. Benosky focuses on developing the firm's water resource practice to provide our clients with comprehensive design approaches and innovative solutions.

Mr. Benosky started his career as a Surveyor working for Donald H. Stires Associates and Johnson Engineering, Inc. in Somerville, New Jersey in 1985. After graduating the Ohio State University with his masters degree in Civil Engineering he joined Woodward-Clyde Consultants (which later became URS and eventually AECOM) as a geotechnical engineer in 1992. During his tenure at URS he had the opportunity to work on a number of small and large dam projects throughout the State of New Jersey, but the majority of his time at URS was devoted to the PSEG Estuary Enhancement Project (EEP). The PSEG EEP is, to this day, the largest privately funded wetland restoration program in the country. Mr. Benosky, working alongside Mr. Ray Hinkle, our Ecosystem Restoration Quality Control/Technical Advisor on this project, saw the project through from the data collection and feasibility stages, to design and permitting, and eventually through construction where he served as the projects Resident Engineer for four years. Post construction monitoring and reporting services are still being provided by AECOM on this unprecedented project. In its entirety, the project restored and preserved more than 20,000 acres of tidal estuaries along the Delaware Bay and constructed more than 20 miles of upland protection flood control dikes and levees.

Exhibit 1.3 - Project Organization Chart

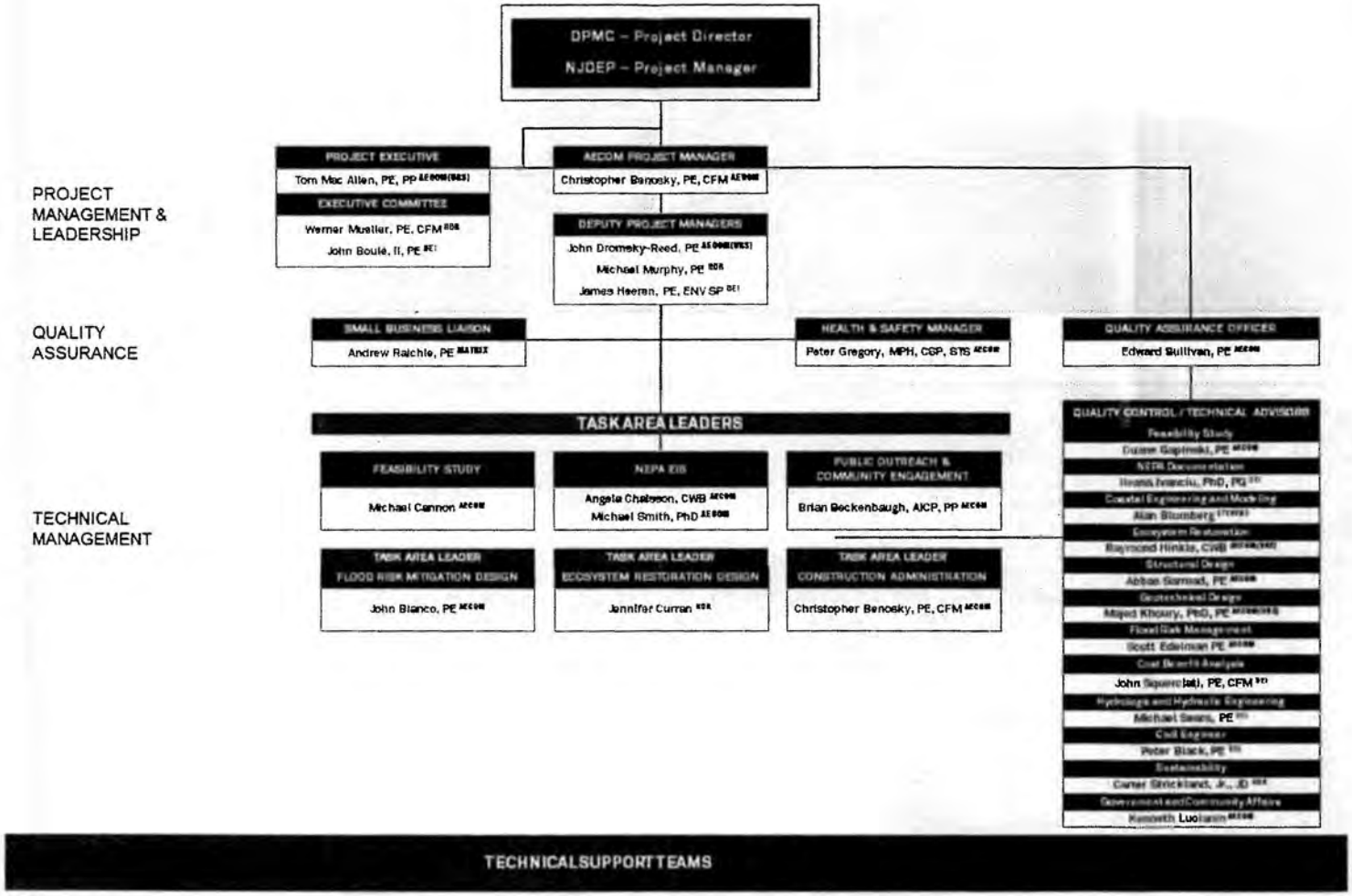
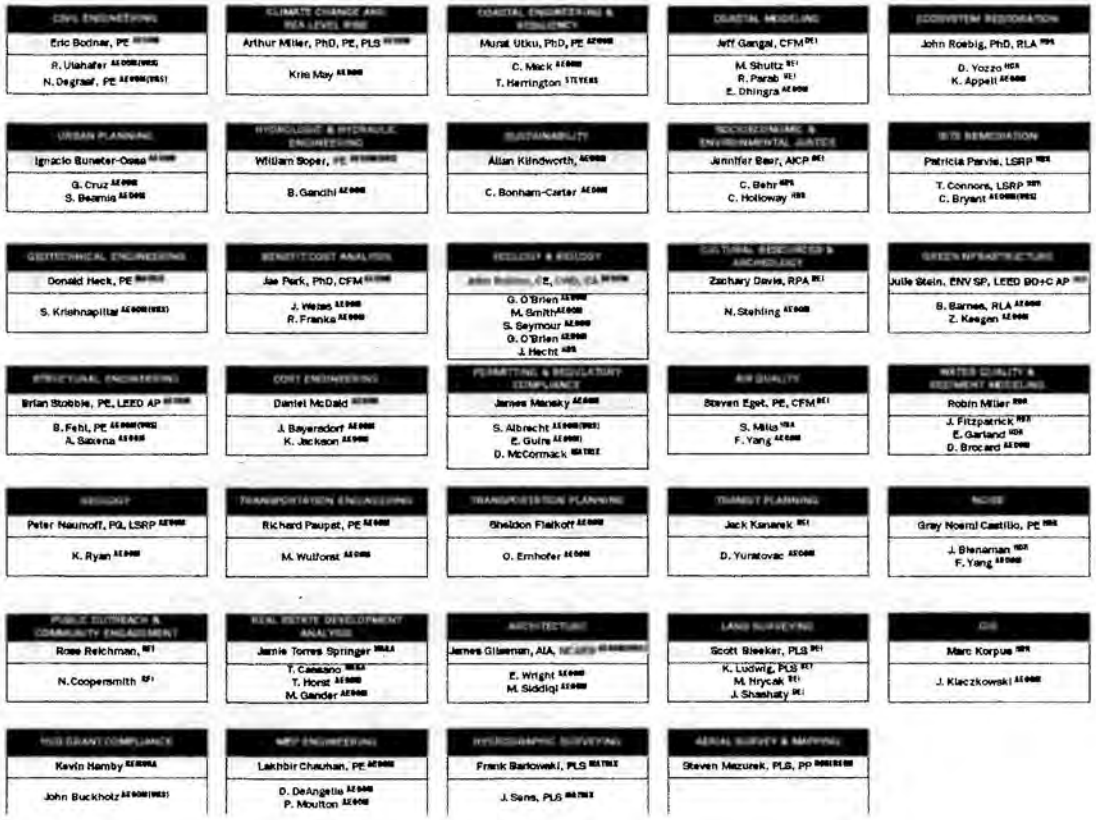


Exhibit 1.3 - Project Organization Chart

Project Management and Leadership

Quality Assurance

Technical Management



Meadowlands Restoration Experience

In 2001, Mr. Benosky became the Director of Ecological Restoration Services at a previous firm in Florham Park, New Jersey. In his time with Louis Berger he worked on a number of projects in and around the Meadowlands with the then New Jersey Meadowlands Commission (NJMC) and with the New York District of the USACE. In fact, Mr. Benosky, along with Ms. Karen Appell, PE, one of our ecosystem restoration experts on this project, were **heavily involved in the development of the USACE Hackensack Meadowlands Ecosystem Restoration Study (HMERS)** and the **Initial Phase of the Meadowlands Comprehensive Restoration Implementation Plan (MCRIP)**. The HMERS addresses the degradation while the Federal plan addressed restoration of the Hackensack Meadowlands. The MCRIP, a key document developed under the HMERS effort, addresses the engineering, environmental, and economic aspects to determine the feasibility of restoration in the Meadowlands. The report clearly delineates degradation problems and restoration needs and analyzes programmatic Meadowlands-wide restoration opportunities.

Regulatory Permitting Experience

Starting in 2004 Mr. Benosky gained considerable regulatory and permitting experience while he served as the Regulatory and Hydrologic Engineering Department Manager at a previous firm in Manalapan, NJ. In this position he regularly interfaced with NJDEP Land Use Regulation Program (LURP) staff working with developers, municipalities, and Federal and state agencies. He held these positions during the initial inception of the new Stormwater Management and Flood Hazard Area Rules, and he spent time working with the NJDEP LURP on development of the rules while serving on the BMP committee.

Flood Risk Experience

In his current tenure with AECOM, which started in 2008, Mr. Benosky has served as the Project Manager and/ or Principal-in-Charge of a number of large scale study, design, and construction projects. In fact, for the past four years he has served as the Project Manager for the DPMC/DEP Term Contract for FEMA Floodplain Mapping for Portions of the Hackensack-Passaic Watershed, in Morris, Passaic, and Bergen Counties, New Jersey. Working with our Deputy Project Manager Mr. Dromsky-Reed, AECOM along with AECOM(URS), developed and supported a Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report, for portions of the Hackensack-Passaic Watershed and prepared the County-Wide map update for Bergen County. All of the processes and deliverables were completed in accordance to the FEMA Guidelines and Standards (G&S). Mr. Benosky oversaw, over 32 miles of detailed studies, 21 miles of limited detail studies, and the production of a number of Risk Map products for the watersheds.

Public Outreach Experience

Under this DPMC/DEP Term Contract, Mr. Benosky working with Dr. Arthur Miller, our proposed climate change and sea level rise lead for this project, directed an analysis for the Pompton Lake Dam Floodgate Facility, a very controversial project. The analysis included the development of an unsteady HEC-RAS hydraulic model to simulate the downstream effects resulting from the operation of the dam's floodgate facility. This analysis / model allowed for post-contract modifications/analyses by the USACE and NJDEP to evaluate the impacts of potential modifications /changes to the floodgate operational regime, such as: Changes to the Pompton Lake Dam Floodgate Operating Rule Curve and/or Lowering Pompton Lake in anticipation of flood events. Mr. Benosky and Dr. Art Miller, presented the results of this study to the local stakeholders at a public meeting alongside Commissioner Martin on April 12, 2012. As a result of the study that AECOM performed, Mr. Benosky and Dr. Miller co-authored a paper with John Moyle, Russel Ray, and Joseph Ruggeri of NJDEP for the September 2012 issue of *International Water Power & Dam Construction*.

Construction Experience

Mr. Benosky has recently been part of the Program and Construction Management team for the New Jersey Turnpike Authority (NJTA) Interchange 6 to 9 Widening Program, led by AECOM as part of a Joint Venture. The program is one

of the largest infrastructure initiatives in New Jersey with a construction cost of just under $2.7 Billion. Mr. Benosky was the design and permitting lead for the 411-acre Brookland Wetland Mitigation Site and served as Resident Engineer overseeing the construction of all the Wetland Mitigation sites for the widening project.

The design of the NJTA Brookland Mitigation Site, for which Mr. Benosky was the Engineer of Record, involved the creation, restoration, enhancement, and preservation of wetlands, streams, vernal pools and other wildlife species habitat. The work included analyzing data collected during the conceptual design phase, and collection of supplemental data, including geotechnical and physical soil sampling, and analysis, soil remediation design, groundwater and stream gage data analysis, delineation of drainage areas, and existing onsite wetlands and hydric soils. Hydrologic and hydraulic modeling was performed to map existing and proposed flood hazard areas and water budgets were performed to support the proposed wetland design, which included 14 interconnected wetland systems. A variety of ecosystem habitats were integrated into the design, including vernal pool complexes, forested freshwater wetlands, and reforested upland areas. Mr. Benosky presented the results of this restoration project at last year's Conference on Ecological and Ecosystem Restoration (CEER2014) in New Orleans, Louisiana.

Large Scale Term Contract Management Experience

Mr. Benosky is currently the FEMA Region II - Regional Technical Coordinator for Compass (an AECOM led Joint Venture with CDM) under a nationwide $600 million contract and AECOM's Client Account Manager for the USACE New York District where he oversees a number of Indefinite Delivery (Term) Contracts and is currently involved in, and providing, technical oversight for the Overall Hudson Raritan Estuary (HRE) Feasibility Study (see project description in Section 2) being performed by AECOM.

Published Author

Throughout his career, Mr. Benosky has authored or co-authored a number of relevant publications (in addition to those already mentioned with NJDEP), including:

- Benosky, Christopher and O'Rourke, Shaun, "*Sustainable Practice in Infrastructure Systems: Ecological Infrastructure.*" Infrastructure Sustainability and Design. Routlege, Taylor and Francis, 2012.
- Appell, Karen and Benosky, Christopher and Gallacher, David, "*Changing Climates and the World's Rivers and Wetlands.*" Climate Design: Design and Planning for the Age of Climate Change, ORO Editions, 2010.
- Adams, Christopher and Benosky Christopher, "2,400 Hectares of Salt Marsh Wetland Restoration", ASCE, March 1998.

Mr. Benosky is a Licensed Professional Engineer in the states of New Jersey, New York, Pennsylvania, Connecticut, Virginia, Delaware, Florida, and Louisiana, and is a nationally Certified Floodplain Manager.

It is the culmination of all these experiences and his relationships with our team members and the State that makes Mr. Benosky uniquely qualified to serve as the Project Manager for the New Meadowlands Project. If selected, Mr. Benosky will be available to serve on a full-time, as needed basis to provide the services necessary to successfully execute this important project for the State of New Jersey.

NJPE, Certified Floodplain Manager, Diverse Experience, Great Facilitator.

Project Executive - Thomas Mac Allen, PE, PP

Mr. Mac Allen has 40+ years of experience primarily dealing with the feasibility, design and construction administration of flood risk reduction projects in the New York Metropolitan area. Throughout his career he has worked extensively with NJDEP, FEMA and the USACE as his principal clients. He worked extensively on the feasibility study (1973-1981), the General Reevaluation Study (1994-1997) and design and construction administration (1999-2015) of the Green Brook Flood Risk Management Project, **New Jersey's largest and most comprehensive ongoing flood control project presently under construction**. Mr. Mac Allen has directed several other reconnaissance and feasibility phase flood relief projects including the Passaic River Flood Risk Management Project, northern NJ; Peckman Creek 905b Study Passaic-Essex County, NJ; Poplar Brook Study, Deal, NJ; South River Flood Risk Management Study, South River, NJ and the South Shore of Staten Island Feasibility Study to name a few.

For NJDEP and FEMA he has been responsible for the flood risk mapping for many of the northern NJ communities and most recently has been the project executive responsible for the updated mapping for Bergen County, encompassing most of the project study area. His knowledge of the team's resources and history with mitigating flooding issues in New Jersey over his entire career makes him the ideal candidate for this position. Additionally, he has worked previously with both the HDR representative to the executive committee Mr. Werner Muller and DEI representative Mr. John Boule`, II. He and Mr. Mueller have a long history of successfully working together on many major projects similar in nature to this project. They worked together on the Green Brook Flood Mitigation Project and the FEMA Disaster Response contract, when Mr. Mueller was previously employed for 17+ years at URS; and continued that relationship ever since teaming together on such projects as the Hudson-Raritan Estuary, the Mamaroneck and Sheldrake Flood Risk Management Project, and the Passaic River Flood Risk Management Project. Mr. Boulé II was the District Commander for the New York District and oversaw many of Mr. Mac Allen's projects. This past history with the executive committee members of the two primary sub-consultants assures a cohesive team able to work seamlessly on this assignment.

Executive Committee - Werner Mueller, PE, CFM

Mr. Mueller is a Senior Vice President with HDR with over 35 years of experience in the fields of flood risk mitigation, floodplain management, environmental science, environmental planning and ecosystem restoration. Mr. Mueller is currently responsible for the development of HDR's Water Resource Management and Environmental Science and Planning in the Northeast with a primary focus on holistic systems that create resilient solutions within a changing climate.

Mr. Mueller is a graduate of the New Jersey (NJ) Institute of Technology twice over and received a bachelors degree in Civil Engineering in 1979 and then obtained a masters degree in Environmental Policy 20 years later in 1999. Through experience and education, he has developed a deep involvement in the key areas that will be required for the success of the New Meadowlands project including the reduction of flood risk, the enhancement of the surrounding ecosystem, as well as dealing with legacy environmental contamination issues. Prior to joining HDR, Mr. Mueller spent over 17 years of his career with URS (now AECOM) and focused heavily on multiple NJ flood risk mitigation projects. His involvement included over 12 years as the project manager for USACE $610 Million Green Brook Flood Risk Management Project, as well as project engineer to project manager roles for joint USACE / State initiatives on the Passaic River, Saddle River, Peckman River, the Hudson-Raritan Estuary, and many more NJ waterbodies. Mr. Mueller was also involved in FEMA Public Assistance contracts and has dealt first hand with the impacts that flood disasters have on NJ communities and their infrastructure.

Upon joining HDR in 2003, Mr. Mueller became more heavily involved in environmental cleanup, ecosystem restoration, and environmental planning, at times leading up to 160 staff engaged in these endeavors. Mr. Mueller currently leads staff in study and design efforts for restoring and enhancing

ecosystems and is the Principal Engineer in charge of projects such as the development of mitigation bank sites within the Hackensack Meadowlands, development of a comprehensive restoration plan for the Hudson Raritan Estuary Ecosystem, as well as design of the proposed freshwater wetland project at Liberty State Park. Mr. Mueller is also HDR's contract manager for a NYSDEC Superfund contract and has led staff involved in remedial investigations, feasibility studies, remedial designs, and remedial actions. Taken together, this combined experience provides a basis for understanding the broad spectrum of issues and challenges that need to be addressed to realize a "New Meadowlands."

Mr. Mueller is a licensed Professional Engineer in New Jersey and New York and is a Certified Floodplain Manager. He has participated in multiple organizations and initiatives including time as a Director in the NJ Post of the Society of American Military Engineers, State Chair of the NY State Floodplain and Stormwater Managers Association, Member on NYS DEC Hudson River Sustainable Shorelines Advisory Committee and recently as a subject matter expert at the HUD / Rockefeller Foundation led regional academies for the National Disaster Resilience Competition.

Executive Committee - John Boulé, II, PE

Mr. Boulé serves as the senior Point of Contact for Dewberry Engineers Inc. (DEI). He is DEI's Senior Advisor on the feasibility study and NEPA Environmental Impact Statement (EIS) for the $230 million comprehensive water strategy to protect the Hoboken waterfront as well as portions of Weehawken and Jersey City. He served as the Commander of the New York District of the USACE from 2009 to 2012, where he managed the planning, design, construction and operations and maintenance of over 100 water resource development projects including ecosystem restoration, flood and coastal flood risk reduction and navigation projects. Mr. Boule` comes to this assignment with nearly 30 years of experience in the engineering industry, specializing in water resources, resilience, environmental restoration, risk mitigation, and infrastructure planning, design, and construction. Mr. Boule` served in the US Army from 1986 to 2012, attaining the rank of colonel. As Commander of the New York District of the USACE, he was responsible for the USACE water resource development, and regulatory activities and the award and management of hundreds of contracts with an average annual value of over $1 billion. The contracts were for engineering, construction, and technical services in support of water resource development as well as the design and construction of military installations. Accomplishments included:

- Managing the planning, design, construction, operations and maintenance of over 100 water resource development projects (ecosystem restoration, flood and coastal storm risk reduction, navigation channels and structures) in New York and New Jersey, Vermont, Massachusetts, and Connecticut.
- Overseeing the improvement of the Comprehensive Restoration Plan for the Hudson Raritan Estuary. The plan developed by the District with assistance from AECOM(URS) and HDR was adopted by EPA Region 2 (covering New York City, New York State, and New Jersey) as the region's restoration blueprint and incorporated into NYC's and NYS's strategic plans (discussed further in experience section).
- Partnering with the Port Authority of New York and New Jersey to direct the largest civil works project in the northeastern U.S.—the $1.6 billion New York/New Jersey Harbor Deepening Program developed by the New York District with assistance from AECOM(URS) and HDR (discussed further in experience section).
- Overseeing the design and construction of major segments of the Green Brook Flood Risk Management Project including the fast track design, and bidding of the Segment B1 reach performed under contract by AECOM(URS) to meet American Recovery and Reinvestment Act of 2009 (ARRA) "Shovel Ready" requirement deadlines (discussed further in the experience section)

Since Superstorm Sandy, Mr. Boulé has supported the professional engineering consultant community's response, rebuilding, and resilience efforts in New Jersey and New York. As part of that work he was responsible for development of the Coastal Protection Plan in New York City's Special Initiative for Rebuilding and Resiliency (SIRR)

report, A Stronger, More Resilient New York, addressing performance of hard and soft coastal protection measures under multiple storm and sea level rise scenarios. As mentioned above, currently, he is providing executive oversight on Dewberry's contract to prepare a the Feasibility Study and Environmental Impact Statement for the Rebuild by Design Hudson River project in Hoboken, NJ.

Mr. Boulé holds four master's degrees including those for Environmental Fluid Dynamics and Structural Engineering from Stanford University, as well as a bachelor's degree in Civil Engineering from the U.S. Military Academy at West Point.

Deputy Project Manager - John Dromsky-Reed, PE

Mr. Dromsky-Reed joined AECOM(URS) in 1998 after serving 11 years in the U.S. Coast Guard. He received his Bachelor of Science degree in Marine Science from the U.S. Coast Guard Academy in 1986 and his master's degree in Environmental Engineering from NJIT in 1999. Since joining AECOM(URS) he has served as the Deputy Project Manager or Project Manager for AECOM(URS) on several of the USACE largest programs including the feasibility study to deepen the NY/NJ Harbor to 50 feet, the Hudson Raritan Estuary Enhancement Program, the South River Coastal Storm Risk Management Project, and the Green Brook Flood Risk Management Project. In his most recent role on the South River Project he has coordinated the reanalysis of the project following significant changes in economics, floodwall designs, and major project features' costs. In his role on the Green Brook Flood Risk Management Project, he has managed hydraulic studies to establish the height of the line of protection, evaluated project performance after Tropical Storm Floyd (1999) and conducted the evaluation of residual flood risk due to drainage on the protected side of the project. He also conducted a reanalysis of the project's Upper Basin proposed project features, including developing new alternatives to replace features legislatively removed from the project.

Mr. Dromsky-Reeed, developed the Project Management Plan for the USACE for the next phases of the project design and construction for the NY/NJ Harbor study, and the South River and Green Brook projects, as well as several other USACE projects. Additionally, he has managed reconnaissance or feasibility studies for Poplar Brook in Deal NJ; the Peckman River in Little Falls, NJ; Goffle Brook in Hawthorne, NJ; and the South Shore of Staten Island Storm Damage Reduction Project. He also serves as the project manager for the DPMC/DEP floodplain mapping contract where he directed H&H studies in the Hackensack-Passaic watershed and mapping of the flood risk for Bergen County NJ.

Deputy Project Manager - Michael Murphy, PE

Mr. Murphy is a Vice President and Professional Associate with HDR. He plays a key role in working with Federal and municipal client sectors. As a professional civil engineer with more than 30 years of experience, Mr. Murphy's professional career started in 1982 with two years of experience as a land surveyor, then ten years of experience in land development planning and infrastructure design, followed by six years of experience as a study manager for flood risk reduction planning projects with the USACE New York District where he worked closely with URS and Mr. Mac Allen and Mr. Mueller in evaluating alternatives and optimizing plans for the General Reevaluation Report for the Green Brook Flood Risk Management Project.

Upon joining HDR, Mr. Murphy worked for ten years as a lead municipal engineer and municipal engineering section director. As lead municipal engineer, his primary role was to assist Town and Village boards with the review of land development projects, provide guidance on the environmental review process, and the planning and design of municipal infrastructure improvement/repair projects including parks, roadways, water distribution systems, sanitary sewer collection systems, stormwater drainage and MS4 compliance. Most recently, Mr. Murphy has been engaged in working with Federal clients including, USACE, National Park Service (NPS) and Naval Facilities

Engineering Command (NAVFAC). Much of this work involves the planning, design and construction implementation of recovery efforts related to the damages caused by Hurricane Sandy. Mr. Murphy has served as the Project Manager for the HDR/URS Joint Venture where he and Mr. Cannon, our proposed lead for the feasibility study phase of this project, Mr. Dromsky- Reed the AECOM(URS) proposed Deputy Project Manager and Mr. MacAllen have all worked together closely on 30 Task Orders, for services that relate closely to the objectives of the New Meadowlands project.

Deputy Project Manager - James Heeren, PE, ENV SP

Mr. Heeren is a senior project manager and environmental engineer responsible for managing multi-disciplinary teams. As Deputy Project Manager, will support the Project Manager as Dewberry's main contact on the New Meadowlands project; he has been successful in this role for a series of contracts notably the NJDEP Remedial Design Services Term Contract and Route 17 Corridor Improvements for Bergen County. Raised in Hasbrouck Heights, Mr. Heeren served on the Borough's Zoning Board and brings an understanding of how Bergen County's small municipalities work, and how to manage positive change within these frameworks.

Mr. Heeren brings particular experience with projects that require heavy involvement from regulatory agencies, including environmental restoration programs. He leverages his understanding of both infrastructure engineering and environmental impact analysis to facilitate the environmental analysis process under the National Environmental Policy Act (NEPA) and other governing regulations. Accomplishments include:

- As Environmental Lead for the $900-million Direct Connection project, Mr. Heeren played a critical role in the NEPA Environmental Impact Statement, public involvement, agency coordination, and permitting processes for this project that literally weaves through sensitive natural, cultural, and community resources. The EIS process led to a Record of Decision in 2009, accolades from regulatory agencies and stakeholders, and national awards; construction is underway.
- Mr. Heeren played a critical role in preparing the NEPA Environmental Assessment (EA) for improvements along a 2.5-mile corridor near New Meadowlands Pilot Area #1. Located in Rutherford, Lyndhurst, and Clifton, the $159-million project replaced the Route 3 Bridge over the Passaic River, improved the corridor, and created a series of environmental enhancements including riverfront access. Completed in 2014, the project received the American Road & Transportation Builders Association Transportation Development Foundation Globe Award recognizing its far-reaching impact in enhancing the community, restoring ecologies, honoring history, and promoting public awareness to improve the health of the Passaic River.
- Today Mr. Heeren supports the Rebuild By Design: Hudson River project as a technical advisor and regulatory expert, providing quality reviews of the EIS deliverables, including the Purpose & Need Statement and Scoping Document

In addition to Rebuild By Design: Hudson River, Mr. Heeren has been involved with a series of response, recovery, and resiliency projects following Superstorm Sandy, requiring delivery within federally mandated timeframes. Supporting New York City's Build It Back program, he directed environmental review (under NEPA and HUD CDBG-DR requirements); the program includes more than 12,000 properties. Mr. Heeren also served as Environmental and Historic Preservation Lead for the NJDEP's Waterway Debris Removal Program and continues that work as Project Manager for Dewberry's contract to support the New Jersey Department of Transportation's State Dredging Program. The Dredging Program includes both coastal marsh enhancement and design of resilient disposal facilities.

Mr. Heeren holds a master's degree in Environmental Engineering and a bachelor's degree in Civil Engineering, both from The New Jersey Institute of Technology. In addition to being a licensed Professional Engineer, he is a certified Envision® professional with the Institute for Sustainable Infrastructure.

Feasibility Study Task Area Leader - Michael Cannon

Mr. Cannon led the post-Sandy NACCS Team for AECOM(URS) and is a member of the USACE Project Delivery Team selected as the nation's 2015 PDT Team of the Year.

Mr. Cannon is Director of Civil Works Planning at AECOM(URS). He has played a key role in managing feasibility studies for many of the USACE projects in New Jersey and New York. He specializes in working with diverse interest groups and integrating engineering, environmental and economic assessments into the development of alternative plans. He joined AECOM(URS) shortly after completing his B.S. in Hydrology. Mr. Cannon recently served as the Deputy Project Manager for the North Atlantic Coast Comprehensive Study (NACCS) where he was responsible for preparation of the Project Performance Evaluation and the NACCS Main Text and development of updated depth-damage relationships. He has been lead author or provided significant input to multiple USACE Procedure Manuals on such relevant topics as Structural Failure for use in Benefit Cost Analysis and Coastal Storm Risk Analysis, and has participated in several expert panels for the Institute of Water Resources.

Mr. Cannon has over 35 years of experience in conducting Feasibility Studies for flood and coastal storm risk management, ecosystem restoration and transportation/ navigation projects with a focus on plan formulation and hydrologic/ economic risk analysis He has prepared the benefit cost studies for numerous USACE projects including the beach nourishment projects constructed from Sandy Hook to Manasquan and the Green Brook Flood Risk Management Project. His recent projects include the Blanchard River Ohio Flood Risk Management Feasibility Study, preparation of the USACE Feasibility Study of storm damage protection for the South Shore of Long Island, the South Shore of Staten Island and Rockaway Beach in NY, Plan Formulation lead for the Delaware River Comprehensive Study and Project Director for the economics and benefits analysis for the Passaic River Main-Stem and Tidal Area Studies.

AECOM sees the NEPA process as a significant driver in the overall feasibility process, requiring diverse skill sets and an in-depth undestanding of the Federal requirements. As a result of this understanding, we have selected two of our senior NEPA specialists to direct this aspect of the project.

NEPA EIS Task Area Leader - Angela Chaisson, CWB

Ms. Chaisson joined AECOM (URS) in 1996, and is a Certified Wildlife Biologist and senior NEPA specialist with extensive experience preparing EISs and EAs for FEMA and other Federal and State agencies. As a subcontractor to Booz Allen Hamilton, she is currently preparing a nationwide Programmatic EIS and Biological Evaluation for the proposed modifications to FEMA's National Flood Insurance Program (NFIP), which also includes Dewberry as a subconsultant. Recently, she managed fast-track simultaneous EAs to rebuild three U.S. Coast Guard (USCG) shore facilities damaged by Hurricane Sandy, as well as related regulatory compliance documentation under several other Federal regulations including Memorandums of Agreement, HABS/HAER documentation, and archaeological surveys under the National Historic Preservation Act (NHPA); a Biological Assessment under the Endangered Species Act (ESA); Essential Fish Habitat Assessments under the Magnuson-Stevens Fishery Conservation and Management Act; and Coastal Zone Consistency Determinations under the Coastal Zone Management Act (CZMA). The USCG was extremely satisfied with the rapid response to project design changes, requests for review agency coordination and meetings, and preparation of high-quality deliverables. She coordinated with New Jersey review agencies to help facilitate coordination on environmental and cultural issues.

For example, a URS Architectural Historian accompanied the USCG to a meeting with the NJ SHPO to discuss the MOAs being prepared for the projects and helped establish a good working relationship between all parties – this will facilitate SHPO reviews in time to meet the project schedule.

For FERC, she prepared a Third-Party EIS for the construction of an approximately 33-mile, 24-inch, natural gas pipeline from the existing terminus in Northport, New York, underneath Long Island Sound, to a new terminus in the Bronx, New York City. The project included 3 miles of pipeline on land and 30 miles in New York State waters and the EIS addressed impacts from onshore and marine construction.

Ms. Chaisson brings significant NEPA experience for FEMA, including overseeing numerous NEPA documents for rebuilding Mississippi's communities following Katrina, as part of AECOM(URS) and Dewberry's NISTAC Joint Venture.

For FEMA Region IV, she helped prepare an EIS for flood recovery activities in Albany. That highly controversial project included the acquisition/demolition of nearly 500 private residential and commercial properties within the floodplain or floodway of the Flint River and replacement of 140 public housing units and four public schools. Principal issues of concern addressed in the EIS were environmental justice, social and economic impacts of moving public schools from their present neighborhoods, cultural resources, safety from future flooding, and Karst topography in the project area. As senior NEPA reviewer, she provided oversight for preparation of a PEIS for a Shoreline Restoration and Infrastructure Protection Project at NASA Wallops Flight Facility in Virginia. Federal assets at the NASA Wallops Flight Facility on Wallops Island are valued at over $800 million and are at risk from severe beach erosion. The purpose of the project was to reduce the potential for damage to, or loss of, NASA and tenant assets while avoiding adverse impacts to nearby coastal resources. The PEIS described the potential impacts from replenishing the beach with approximately 3 million cubic yards of sand from an offshore borrow site located in Federal waters, construction of a groin, and extension of an existing rock seawall. Specific tasks included an offshore cultural resources survey of two potential offshore borrow sites, offshore and onshore biological characterizations, a commercial and recreational fisheries study, public involvement, agency consultation including coordination with BOEM (then the Minerals Management Service), preparation of the PEIS, and permitting.

For the Federal Communication Commission (FCC), she prepared a PEA for the FCC's Antenna Structure Registration (ASR) Program to assess the impacts of FCC's ASR Program on migratory birds and threatened and endangered (T&E) species, as required by a 2008 court case (American Bird Conservancy, Inc. v. FCC). She worked with FCC to develop a range of alternatives; conducted extensive literature review on this highly controversial subject; arranged and facilitated three public scoping meetings (one each in Washington DC, San Diego CA, and Tampa FL), an agency workshop meeting in Washington DC, and a public comment meeting following issuance of the Draft PEA; and assisted in coordination meetings with USFWS and the Council on Environmental Quality. Project issues successfully navigated included public controversy due to issues voiced by conservation groups, tower companies, and natural resource agencies; economic impacts on ASR Program applicants due to potential increases in cost and time associated with changes to the ASR program; analysis of potential impacts to migratory birds and threatened and endangered species from the ASR Program and project alternatives; and extensive public and agency comments submitted on the project.

NEPA EIS Task Area Leader - Michael Smith, PhD

Dr. Michael Smith is a nationally-recognized leader in National Environmental Policy Act (NEPA) and associated environmental law compliance with over 20 years of experience in project and program management, technical analysis, policy development, and training/education for a wide range of public and private sector clients.

He has managed and provided compliance review for some of the nation's largest, most complex, and highly controversial projects in a wide variety of sectors, including water infrastructure and flood control, energy siting and development, major rail and other transportation infrastructure initiatives, regulatory approval of genetically engineered plants, and commercial space transportation operations.

For the U.S. Department of Transportation – National Highway Traffic Safety Administration (NHTSA), he served as the overall Project Manager for the agency's EIS on the rulemaking for new fuel economy standards for all cars and light trucks sold and operated in the U.S. The EIS was the first ever prepared under NEPA to model the incremental climate change consequences of the proposed action, including the incremental effect of the proposed action on climate change-related factors including global mean temperature increase, changes in precipitation patterns, and sea level rise. Under White House direction, the EIS was prepared under an extremely aggressive schedule that required the Final EIS to be completed in less than five months. The EIS won the NHTSA Administrator's Superior Accomplishment Award for 2008. For the U.S. State Department, he served as the NEPA Compliance Lead for the climate change analysis for the Keystone XL Pipeline Supplemental EIS, and he is currently serving as the NEPA Compliance Lead for the Sacramento Area Flood Control Agency and USACE North Sacramento Streams, Sacramento River East Levee, Lower American River, and Related Flood Improvements Project. This project will implement flood system improvements to reduce flood risk in the Sacramento and American River systems in the Sacramento, CA metropolitan area as part of an ongoing federal-State-local effort to improve the flood system in the Sacramento area that was initiated in the aftermath of the record flood of 1986. Dr. Smith is also currently serving as the Cumulative Impacts Team Leader for two Tennessee Gas Federal Energy Regulatory Commission (FERC) resource report filings (for the Northeast Energy Direct and Connecticut Expansion natural gas pipeline projects) that cross numerous northeastern U.S. states, including New York State.

Dr. Smith frequently provides training and strategic advice for NEPA and related environmental compliance requirements for public and private sector clients as a faculty member at the Duke Environmental Leadership Program at Duke University's Nicholas School of the Environment, and the NEPA Certificate Program at the Department of Environment and Society, Quinney College of Natural Resources at Utah State University, with the University of California Extension, and as a Senior Consultant at The Shipley Group. He is a past recipient of a Science & Technology Policy Fellowship with the American Association for the Advancement of Science (AAAS) at the Environmental Protection Agency (EPA) headquarters Office of Water and Office of Federal Activities in Washington, DC. From 1998 to 2007, he was an Associate Professor of Environmental and Natural Resources Sciences at Humboldt State University, where he taught courses and conducted research in environmental impact assessment, environmental planning, land use planning, and community development. He has published extensively on environmental assessment and policy in numerous peer-reviewed journals, and served as an Associate Editor of the professional journal Society and Natural Resources.

Public Outreach Task Area Leader - Brian Beckenbaugh, PP, AICP

Mr. Beckenbaugh joined AECOM(URS) in 1998. A Professional Planner with a Master of Science Degree in City and Regional Planning, Mr. Beckenbaugh has functioned as planning/outreach lead in numerous high-visibility projects. As a Lead Planner in the New York Rising Community Reconstruction (NYRCR) program, he was responsible for facilitating the local planning committee,

organizing public outreach efforts and events, reviewing needs and opportunities with multiple agencies from the City of New York, preparing a reconstruction plan and identifying priority infrastructure and community investment projects for the communities of Gerritsen Beach and Sheepshead Bay, Brooklyn. As Project Manager for the Delaware River Interim Feasibility Study, Mr. Beckenbaugh worked with sixteen repetitively-flooded New Jersey communities on the Delaware River, conducting site visits, and preparing public outreach materials including brochures, posters, and articles for public meetings as well as well as managing the project website. As lead planner for the USACE 83-mile Fire Island to Montauk Point (FIMP) Storm Damage Reduction Reformulation Study he was responsible for planning a major conference on non-structural flood risk mitigation in the project area with over 100 attendees, including county and local officials, and Congressional representatives. Also as part of FIMP he prepared case studies of non-structural methods for four study area communities and participated in public outreach meetings to discuss project alternatives. He also worked with a sub-consultant in the preparation of various newsletters, poster boards, and videos for public education. As a GIS-expert, Mr. Beckbaugh has blended his knowledge of GIS and planning to develop state of the art presentation materials including posters for public meetings.

Mr. Beckenbaugh has also worked extensively with FEMA's Public Assistance Policy Group, first as a Hazard Mitigation grant specialist conducting damage assessments and preparing grant applications for disaster-affected communities in California and Louisiana. His thorough knowledge of the program and successful interaction with affected communities led FEMA to request his assistance as a lead trainer in the program, training hundreds of specialists prior to deployment to later post-disaster areas. He later became a Policy Adviser advising senior FEMA management on Public Assistance policy in response to Hurricane Irene, in Albany, NY, as well as preparing policy briefs, responding to Congressional inquiries, and working with State of New York emergency management staff to resolve eligibility matters in a "pre-appeal" setting.

Design-Flood Risk Management Task Area Leader - John Bianco, PE

Mr. Bianco is a Senior Manager for Major Projects within AECOM. He has been playing a key role in working with Federal, State and Municipal client sectors working on Dam, Levee and FEMA related Emergency Action Response/Recovery projects. Mr. Bianco has an Undergraduate Civil Engineering degree from Rutgers University, New Brunswick, NJ; a master's degree in Engineering from Johns Hopkins University, Baltimore, MD; and a Professional Engineering License with New Jersey.

Prior to joining AECOM, Mr. Bianco served with the USACE for over 36 years (1977-2013) where he was widely recognized as a dedicated technical/strategic leader. During his last 10 years with USACE, he performed a variety of key leadership roles for the North Atlantic Division (CENAD) as the Chief of the Engineering and Construction Division and the Sandy Coastal Management Division. He executed duties as the Technical Director for CENAD's Regional Production Center (RPC) and was the regional Levee Safety Officer (LSO) and Dam Safety Officer (DSO) for the Northeast Region of the United States. In this capacity, Mr. Bianco was technically responsible for the structural integrity and the key life safety aspects of over 50 dams (all USACE owned) and more than 200 levee segments/systems (either federally owned and operated by USACE or were federally designed and turned over to local sponsors for operations and maintenance (O&M) activities). He has over 36 years of experience with civil works that includes dams, levees, floodwalls, seawalls, bulkheads, beach-fill/dune coastal projects, large size diversion tunnels, channels, bridges and various types of interior drainage facilities for levee/floodwall systems. He is very familiar with the planning, design, construction, rehabilitation, major modifications and emergency repairs/ actions associated with civil works infrastructure (including dams and levees) within the Northeastern United States. During his career with USACE, Mr. Bianco worked closely with Tom MacAllen, Mike Cannon and John Dromsky-Reed of AECOM; John Boulé of Dewberry; and Werner Mueller of HDR, on critical levee/floodwall projects located within Northeastern US including the Passaic River Main-Stem

Flood Damage Reduction project, Northern, NJ; Green Brook Flood Damage Mitigation Project, NJ; Fire Island to Montauk Point, NY; Lower Passaic Flood Damage Reduction in Newark Bay and Vicinity; NJ and others.

Since joining AECOM in 2013, Mr. Bianco has continued with this type of large scale life safety projects including performing inspections, review and leading design efforts associated with the Northampton Levee/Floodwall Project, in MA; the Port Alleghany Levee/Floodwall System in PA; and, the Passaic Valley Sewage Commission Floodwall design, in Newark, NJ. Recently, Mr. Bianco served as AECOM's senior technical advisor to the Colorado Recovery Officer (CRO) and Governor's staff. During this assignment, he provided hands-on technical support to the State's response and recovery efforts associated with the devastating September 11-14, 2013 flooding along the Front Range. He developed processes to provide the CRO with real-time situational awareness facilitating the assignment of limited resources to target areas suffering major impacts from the flood.

Design-Ecological Task Area Leader - Jennifer Curran

Ms. Curran is the manager of the Ecosystem Restoration Sciences Section at HDR. She earned her master's of science degree in Marine Environmental Science from the State University of New York at Stony Brook's Marine Science Research Center. She has more than 15 years experience leading multi-disciplinary teams in large-scale mitigation and restoration planning studies, as well as design and development of construction documents for site-specific restoration projects. She has extensive experience in planning for, permitting, and leading the design and preparation of construction documents for ecosystem restoration projects in the Hackensack Meadowlands.

For the past 11 years, working with AECOM(URS)'s Tom Mac Allen and John Dromsky, Ms. Curran has served as HDR's project manager for the USACE Hudson-Raritan Estuary Ecosystem Restoration Study, and was tasked with drafting and updating the Comprehensive Restoration Plan for the Estuary. During this process there was extensive public and stakeholder involvement within the Meadowlands. Over the past decade Ms. Curran has also assisted private and public sector clients to study, design, construct and monitor small- and large-scale wetlands restoration projects in the Hackensack Meadowlands. Through these experiences she has developed a thorough understanding of the ecology, existing degraded conditions, stakeholders, and constraints and opportunities for ecosystem restoration in the region.

Since 2008, Ms. Curran has served as the Project Manager to assist Evergreen Environmental to plan for, permit, design and monitor wetland mitigation banks in the region, including the recently constructed 67 acre tidal marsh complex that encompasses the Evergreen MRI3 Wetland Mitigation Bank and mitigation project in Carlstadt, New Jersey. Constructed in 2012, the wetlands are already in compliance with the Year 5 permit conditions of 85% coverage of native vegetation and less than 10% coverage of invasive species. The saltmarsh communities are thriving and are providing habitat to a wide variety of long-legged wading birds, shorebirds and fish. The Evergreen MRI3 project showcases what can be achieved in the Meadowlands with enhanced tidal flushing, proper design and invasive species removal.

Ms. Curran is also assisting the Port Authority of New York and New Jersey with a pilot-scale freshwater forested wetland restoration project in the Hackensack Meadowlands. Mitigation projects are needed for FAA-mandated safety improvements to the Teterboro Airport that will result in forested wetlands impacts. The New Jersey Meadowlands Commission (now the Sports Exhibition Authority) suggested restoring forested wetlands on a 79-acre parcel in Carlstadt that is separated from the tidal influence of the Hackensack River by the flood berm for the Kane Mitigation Bank and a tide gate on Moonachie Creek. Because the site appears to be only marginally suitable for the development of a forested wetland due to high concentrations of salinity in the soil and groundwater, and a high water table, HDR has developed a one-acre pilot restoration plan for the site that was planted this spring. The pilot project includes two separate plots with a variety of tree and shrub species that have different habitat requirements and tolerances. One half of the area was subject to micro-grading to create a pool and mound

topography typical of a palustrine forested wetland and to bring the plantings higher from the water table.

During the planning phase for the projects Ms. Curran worked on, she developed an understanding of the unique benefits and constraints associated with conducting ecosystem restoration projects within the Hackensack Meadowlands and she will be able to transfer these lessons learned to the New Meadowlands project.

Construction Administration Task Area Leader - Christopher Benosky, PE, CFM

Mr. Benosky has been designated in the dual role of Project Manager for the overall contract, and the Task Area Leader for the Construction Administration role. As indicated by his biographical information provided above, Mr. Benosky is experienced in this role. We have identified him in this second role since the position as defined in the Request for Proposal will be to assist the State with the bidding process; periodically coordinate with the CM/PM contractor should there be questions; respond to contractor RFIs; possibly review shop drawings; and periodically meet in the field if a design question requires clarification. As a result of being the Project Manager Mr. Benosky is in the best overall position to serve as the Construction Administration Lead as well. He will have been directly involved with all design decisions as they took place; he will know who performed the design and will know to best direct specific RFIs to; and clearly has the management skills to ensure the responses are provided in a timely manner. Should the position expand and evolve into more of a CM role than anticipated at this time, Mr. Benosky would be supported by AECOM's Construction Management Business line with staff available through Legacy firms Tishman Construction and Hunt Construction Group, brand names in the industry.

QUALITY ASSURANCE / QUALITY CONTROL

Quality Assurance Officer - Edward Sullivan, PE

Mr. Sullivan has more than 40 years of experience with AECOM(URS) and his full time role is as Quality Assurance Officer. Mr. Sullivan directs the Quality Control Program for the New York Metropolitan Area offices. As QA Officer, he verifies that the quality of the product meets the requirements of the contract and the client. He regularly performs quality project audits to verify that quality control is being performed in accordance with the company's Quality Control Program and project specific Project Execution Plan. The audits also address adherence to schedule and budget. He is responsible for conducting quality control training of staff and conducts client satisfaction surveys. He monitors that the services we provide are in accordance with our standard of practice and a quality deliverable is achieved.

Mr. Sullivan has conducted detailed project reviews of countless projects. Relevant programs and projects he has reviewed include: the Green Brook Flood Risk Management Project, including planning, engineering, and designing task orders; the South River Coastal Risk Management Project; the New Jersey Floodplain Mapping contract; and the Lake Lenapa Dam project.

As a project Quality Officer, Mr. Sullivan was responsible for QA / QC reviews for such significant projects as the Comprehensive Inspection and Design of the Queens Midtown Tunnel; the St. George Ferry Terminal Reconstruction in Staten Island, NY; AMTRAK System-wide Program Management Services; PANYNJ Rehabilitation and Security Projects; and the Gowanus Expressway Design.

QUALITY CONTROL / TECHNICAL ADVISOR GROUP

The Quality Control / Technical Advisor (QC/TA) team is comprised of Senior Staff with over 25 years of experience in their respective fields. The staff selected for this role are independent of the project production team and in many cases have been specifically selected from a firm not performing the work to further assure and independent review of the work product.

Our proposed QC/TA review team is comprised of the staff as illustrated in **Exhibit 1.4 - Quality Control / Technical Advisors Staff**, on the following page.

Exhibit 1.4 - Quality Control / Technical Advisors Staff

Name Firm	QC / ITR Responsibility Role	Years of Experience	Highest Degree	Area of Specialty
Duane Gapinski, PE **HDR**	Feasibility Study	33	MS	Water Systems; Hydraulic Structures (dams, levees, reservoirs, tunnels, etc.); USACE
Ileana Ivanciu, PhD, PG **DEI**	NEPA Documentation	33	PhD	NEPA Agency Coordination; Permitting; Environmental Compliance
Alan Blumberg, PhD **Stevens Institute of Technology**	Coastal Engineering and Modeling	40 +	PhD	Estuarine and Coastal Ocean Circulation Engineering; Storm Impacts and Mitigation; Hydrodynamic Modeling
Raymond Hinkle, CWB **AECOM(URS)**	Ecosystem Restoration	40 +	MS	Ecological Restoration; NEPA Compliance; Fish and Wildlife Habitat Assessments
Abbas Sarmad, PE **AECOM**	Structural Design	37	MS	Structural / Geotechnical Marine Engineering
Majed Khoury, PhD, PE **AECOM(URS)**	Geotechnical Design	40 +	PhD	Civil and Geotechnical Engineering; Dams and Reservoirs Engineering; Levees
Scott Edelman, PE **AECOM**	Flood Risk Management	34	BS	Water Resources; Flood Risk Management; Floodplain Mapping and Mitigation; FEMA
Michael Sears, PE **DEI**	Hydrologic and Hydraulic Engineering	26	BS	Water Resources; Hydrologic and Hydraulic Engineering; Flood Management and Mitigation; Wetlands and Coastal Regions
John Squerciati, PE, CFM **DEI**	Cost / Benefit Analysis	25	ME	Hazard Identification and Risk Assessment; Structural Engineering; Analysis of Hazard Vulnerabilities and Mitigation;
Peter Black, PE, CME **DEI**	Civil Engineering	40 +	BS	Civil Engineering; Stormwater Management and Flood Control; Feasibility Studies; Site Plan Preparation; Permit Application
Carter Strickland, Jr., JD **HDR**	Sustainability	20	JD	Sustainability and Environmental Policy; Green Infrastructure; Climate Change Mitigation; Environmental Review; Air and Water Quality
Kenneth Lucianin **Matrix**	Government and Community Affairs	20	BS	Government and Community Affairs; State and Municipal Level Legislation

Health and Safety Manager - Peter Gregory, MPH, CSP, STS

Mr. Gregory serves as the Clifton, New Jersey Office Health and Safety Representative. Ms. Gregory has extensive experience in environmental and health and safety compliance. His areas of expertise include: health and safety audits, employee training; incident investigations; job hazard analysis; field safety monitoring; exposure assessments; waste management and radiation safety awareness.

KEY SUPPORTING STAFF

In addition to the key staff identified above as part of the Management and Quality Assurance / Quality Control team, due to the diversity of disciplines required to meet the needs of this project, the team has assigned varied technical staff to lead the various disciplines. Copies of their resumes are attached at the end of this Section. To provide a summary of their education and years of experience and their roles at a glance we have included **Exhibit 1.5. Key Supporting Staff.**

Exhibit 1.5 - Key Supporting Staff

Name	Firm	Years of Experience	Degree	Role
TASK AREA LEADERS				
Eric Bodnar, PE	AECOM	24	BS	Civil Engineering
Arthur Miller, PhD, PE, PLS	AECOM	40+	PhD	Climate Change and Sea Level Rise
Murat Utku, PhD, PE	AECOM	21	PhD	Coastal Engineering and Resiliency
Jeff Gangai, CFM	DEI	20	BS	Coastal Modeling
John Roebig, PhD, RLA	HDR	40+	PhD	Ecosystem Restoration
Ignacio Bunster-Ossa	AECOM	36	MS	Urban Planning
William Soper, PE	AECOM	26	BASc	Hydrologic and Hydraulic Engineering
Allan Klindworth	AECOM	13	MS	Sustainability
Jennifer Baer, AICP	DEI	28	MA	Economics / Environmental Justice
Patricia Parvis, LSRP	HDR	29	MS	Site Remediation
Donald Heck, PE	MATRIX	22	MBA	Geotechnical Engineering
Jae Park, PhD, CFM	AECOM	23	PhD	Cost / Benefit Analysis
John Rollino, CE, CWD, CA	AECOM	21	MS	Ecology and Biology
Zachary Davis, RPA	DEI	22	PhD	Cultural Resources / Archaeology
Julie Stein, ENV SP, LEED BD+C AP	HDR	16	MS	Green Infrastructure
Brian Stobbie, PE, LEED AP	AECOM	30	MBA	Structural Engineering
Daniel McDaid	AECOM	9	BS	Cost Engineering
James Mansky	AECOM	37	MS	Permitting and Regulatory Compliance
Steven Eget, PE, CFM	DEI	23	MS	Air Quality
Robin Miller	HDR	25	MS	Water Quality / Sediment Modeling

Exhibit 1.5 - Key Supporting Staff (continued)

Name	Firm	Years of Experience	Degree	Role
Peter Naumoff, PG, LSRP	AECOM	32	MA	Geology
Richard Paupst, PE	AECOM	36	MS	Transportation Engineering
Sheldon Fialkoff	AECOM	40+	MS	Transportation Planning
Jack Kanarek	DEI	40+	MS	Transit Planning
Gray Noemi Castillo, PE	HDR	14	MS	Noise
Rose Reichman	RFI	30	MS	Public Outreach and Community Engagement
Jamie Torres Springer	HR&A	16	MA	Real Estate Development Analysis
James Gilsenan, AIA, NCARB	AECOM	38	BS	Architecture
Lakhbir Chauhan, PE	AECOM	36	MS	MEP Engineering
Marc Korpus	HDR	12	BA/JD-Law	GIS
Kevin Hamby	REMORA	20	BA/JD-Law	HUD Grant Compliance
Frank Barlowski, PLS	MATRIX	35	BS	Hydrographic Surveying
Scott Bleeker, PLS	DEI	24	BS	Land Surveying
Steven Mazurek, PLS, PP	ROBINSON	40+	---	Aerial Surveying / Mapping

CONCEPT OF OPERATIONS

The AECOM Team is a performance-based organization with sufficient capacity in New Jersey to meet the States' goals and objectives. Because of our capacity we are able be a flexible partner to the State to adapt to mid-course corrections that will take place over the life of the contract and to successfully produce work on multiple phases of the project simultaneously.

This section discusses the AECOM Team's concept of operations for contract management that will achieve the goal of taking the New Meadowlands Project from Feasibility through design and construction. Our approach relies on product driven processes at reasonable cost. We know and understand DPMC/DEP's need to meet key milestones in order to meet the Disaster Relief Appropriation Act (Pub. L. 113-2) funding deadlines and we have the capacity and management structure in place to achieve those objectives. We understand the need to maximize the leverage of local stakeholder involvement and the need to build and maintain mutually beneficial partnerships to achieve this performance goal. We developed our Concept of Operations with the goal of maximizing public involvement to gain stakeholder support and to meet NEPA requirements while balancing the State's fiscal need to stay on schedule.

External Communication / Coordination

As identified in individual delivery order management plans, external communication will be limited to the Project Executive and Project Manager under strict quality standards. Verbal communication specifically requesting data and coordinating with partners/stakeholders will be delegated to the appropriate team staff member. All e-mail correspondence is limited to the Project Executive and Program Manager. All written correspondence including memorandums, records of communication and letters are reviewed for content and format prior to submission.

Subconsultant Management

The AECOM Team is comprised of AECOM as prime contractor, working in concert with AECOM(URS) and two additional primary sub-consultants , two minority business and three specialty sub-consultants. AECOM has a long history of managing sub-consultants using Term Type Contracts and will follow the procedures discussed in Section 3B of this proposal.

Internal Quality Controls

As discussed in Section 3D AECOM employs a quality control and quality assurance plan for all work assignments. The Quality Assurance Plan provides full details of the quality program including the internal quality review tools. In summary quality is controlled at every stage starting with the preparation of contract documents and pricing and ending with delivery of the final deliverables. By controlling quality from the beginning, the correct scope and lowest price will be assigned to each task; and the quality delivery of services throughout the project will minimize costs and delays associated with reviews by the State.

We have assigned Mr. Ed Sullivan, PE as our Quality Assurance lead. In that capacity he will be responsible to perform periodic audits of the Quality Control files and processes being employed on the project to assure that the procedures established at the onset of the project in the Project Management/Execution Plan are being adhered to and that they achieving the desired level of controls. Each of our sub-consultants will have to adopt a similar process and be subject to similar audits. If deficiencies are found, the Project Manager will have 30 days to take corrective action and in the case of sub-consultants should such corrective action not be taken they could risk having their role on the project being reduced or even in extreme cases terminated.

As a performance-based organization, quality is tracked throughout the project and reported as a performance metric. AECOM utilizes a continual process of improvement to identify areas where process improvements are required or new technologies can be used to improve quality or reduce study costs.

Conflict of Interest Avoidance

While at this stage in the process it is not possible to foresee possible Conflict of Interests (COIs), with any large high profile team as is required to complete this project and the magnitude of this project combined with the known potential for encountering contamination issues, the potential always exists for a COI or the perception of a COI to occur. The key is how to manage the issue should it arise. Once a COI or the perception of a COI with any team member is identified, we will immediately notify the State of the potential problem. For example, should the line of protection run through a contaminated site and it is determined that the property is owned by a present or past client of one of the team members, we would notify to State and propose a course of action to mitigate the COI. Our first solution would normally be to create a fire wall between the team member and that portion of the project where a COI may be perceived to be of concern. In most cases this can be easily achieved because of the depth of our team across three major firms. Historically this type of fire wall approach to conflict resolution has been met by approval from all parties. Should the State take exception to such a solution, at the State's discretion, consideration could be given to deploying the "Alternate Consultant" to address the plans in the specific area of concern.

STAFFING PLAN OVERVIEW

As demonstrated by their accomplishments in performing on DPMC's Floodplain Mapping Contract (TC-007) and the Demolition Consultant Contract (TC-008), AECOM has developed a comprehensive management approach with a proven track record in accomplishing the efficient and cost effective services to assist DPMC/DEP in completing this multidiscipline Term Contract for the Feasibility Study, EIS, Design, and Construction Administration for the New Meadowlands. Additionally over the last 20 years all our USACE Contracts have been Task Order Indefinite Delivery (Term Type) contracts. The key to cost effectively staffing Term Contracts is the ability rapidly assemble a team of experts when a Task Order is issued and to disassemble the team equally as fast when the Task Order is complete. Due to the robust size of AECOM and our two primary

subconsultants, HDR and DEI, combined with the long term nature of the types of projects all three firms normally undertake, the team has the depth and breadth of staff to divert staff from other projects and to reassign staff so that all projects are fully staffed to meet the goals of our clients. This has been repeatedly demonstrated when AECOM(URS) and DEI in joint venture held all three of FEMA's major contracts, Mapping Provider Contract, RiskMap ($600 million), Hazard Mitigation Technical Assistance Contract (HMTAP) ($150 million) and the Public Assistance Technical Assistance Contract(TAC) ($500 million). All three of these contracts had an emergency rapid response component requiring AECOM to build a technical response team in short notice while still maintaining routine production on all our remaining contracts. In a similar vein AECOM(URS) and HDR have performed as a team utilizing several multimillion dollar Indefinite Delivery Contract vehicles to successfully complete many of the USACE's largest programs, including the Hudson- Raritan Estuary Enhancement Project, the Deep Draft Navigation Feasibility Study and elements of the Green Brook Flood Risk Management Project.

From the lessons learned over the years of managing similar projects and teams, the key to success is to be able to mobilize the best talents from the entire team and to work seamlessly to meet the clients goals. We have established our team in a manner to achieve this goal. By purposely establishing Deputy Project Managers representing each of the three major firms, combined with having representation of the two major sub-consultants in the Executive management of the team we are able to identify the full resources of the team and have the most senior level commitment of all three firms. To further facilitate the seamless operation, as AECOM(URS) and DEI have done in the past on FEMA contracts, depending on the type of Task Order issued, the team can easily cohabitate in a single office as AECOM(URS)'s office in Clifton, HDR's Mahwah, office and DEI's Bloomfield and Parsippany Offices are all less than a ½ hour drive from each other.

MANAGEMENT STAFFING PLAN

Project Management Structure

Successful delivery order execution will be the responsibility of the Project Manager and his three Deputy Project Managers, one from AECOM and the two primary subconsultants as well as their Discipline Leads. Our AECOM Project Executive, **Mr. Thomas Mac Allen, PE, PP**, a Vice President with AECOM(URS), has the authority to make immediate decisions on behalf of AECOM and to commit corporate staffing resources, will be the primary point of contact for contractual matters. He will be responsible for the overall financial administration of the contract, and periodic "How are we Doing" audits with DPMC/DEP. For the two primary sub-consultants, HDR and DEI we have identified **Mr. Werner Mueller, PE, CFM** and **Mr. John Boulé, II, PE**, respectively representing each of their firms as members of an executive committee to assure the corporate resources of their organizations to this project.

Mr. Christopher Benosky, PE, CFM, our Project Manager will be the primary point of contact on all technical matters and the primary liaison to the State throughout the execution of all task orders. Supported by Deputy Project Managers **Mr. John Dromsky-Reed, PE** [AECOM(URS)], **Mr. Michael Murphy, PE** (HDR), and **Mr. James Heeren, PE, ENV SP** (DEI), they comprise the primary management team.

Independent of the management team but a key element of our success is the QC/TA team under the oversight of our Quality Assurance Officer **Mr. Edward Sullivan, PE**. Each of the staff members assigned to the QC/TA team bring in excess of 25 years of experience in their respective areas of expertise and are registered professionals where appropriate. Technical resource personnel from AECOM will support the management team in the production and management of each delivery order including the technical oversight of our team's sub-consultants. Supporting the Deputy Project Managers we have defined Task Area Leaders that will head up the five main task areas, Feasibility Study; NEPA EIS; Public Outreach; Design, broken down to Flood Risk Mitigation elements and Ecosystem Restoration elements; and Construction Administration. Their roles will be to pull the technical work efforts together into

deliverable work products in each of these project areas and to draw upon the various technical support resources as necessary to create a team to address task order deliverable requirements. A key element to our team is the health and safety manager who will be responsible for the Health and Safety Program for the project and the Small Business Liaison who will be consulted at the initiation of each task order to assure that our small business objectives are considered as each task order team is defined. The specific roles and responsibilities of the entire dedicated team and a summary of their individual qualifications are detailed in Section 3B of this proposal; the attached resumes; and the "Key Team Member Project Experience Data Sheets" in *Section 2 - Similar and Relevant Experience*.

When a delivery order is active the Project Executive, Project Manager, and Deputy Project Managers will engage in weekly, or more often as needed, coordination telephone calls to address staffing assignments, schedule compliance, and cost issues.

As Project Executive on this Term Contract assignment, Mr. Mac Allen will be responsible for coordinating the following related activities:

- Communication with DPMC/DEP on all contract related issues
- Coordination with the Project Manager, and Deputy Project Managers on the assignment of appropriate technical personnel to each delivery order
- Administrative and contractual management of the overall contract and individual delivery orders

As Project Manager, Mr. Benosky will be responsible for:

- Day to day management of all task orders and liaison to DPMC/DEP
- Review of specific delivery orders and, if required, further discussion with DPMC/DEP for clarification of technical direction
- Quality control of deliverables in collaboration with designated QC/TA specialists and under the direction of the designated QA Officer, Mr. Ed Sullivan, PE.
- Tracking Schedule, Delivery Deadlines and Costs
- Ongoing coordination to identify workload and staffing requirements and to review the status and performance of ongoing and prior work assignments in the spirit of partnering with DPMC/DEP
- Quality control of deliverables in collaboration with designated QC specialists and under the direction of the designated QA Officer, Mr. Ed Sullivan, PE.
- Tracking Schedule, Delivery Deadlines and Costs
- Ongoing coordination to identify workload and staffing requirements and to review the status and performance of ongoing and prior work assignments in the spirit of partnering with DPMC/DEP.

PROJECT KEY PERSONNEL LIST

Beginning on the following page, we have included the completed Project Key Personnel List form, illustrating the percentage of time assigned to the project for all key staff; personnel with an Hourly Wage Level of 5 and above.

RESUMES

Following the Project Key Personnel List, we have included resumes of all key staff comprising of proposed personnel with a Level 5 and above.

Proposed Staff

Team Member	Company	Project Role
Christopher Benosky, PE, CFM	Project Manager	AECOM
John Dromsky-Reed, PE	Deputy Project Manager	AECOM (URS)
Michael Murphy, PE	Deputy Project Manager	HDR, Inc.
James Heeren, PE, ENV SP	Deputy Project Manager	Dewberry Engineers, Inc.
Thomas Mac Allen, PE, PP	Project Executive	AECOM (URS)
Werner Mueller, PE, CFM	Executive Committee	HDR, Inc.
John Boulé II , PE	Executive Committee	Dewberry Engineers, Inc.
Andrew W. Raichle, PE	Small Business Liason	Matrix New World Engineering, Inc.
Peter Gregory, MPH, CSP, STS	Health and Safety Manager	AECOM
Edward Sullivan, PE	Quality Assurance	AECOM (URS)
Michael Cannon	Feasibility Study	AECOM (URS)
Angela Chaisson, CWB®	NEPA EIS	AECOM
Michael D. Smith, PhD	NEPA EIS	AECOM
Brian W. Beckenbaugh, AICP, PP	Public Outreach & Community Engagement	AECOM (URS)
John P. Bianco	Flood Risk Mitigation	AECOM
Jennifer Curran	Ecosystem Restoration	HDR, Inc.
Duane Gapinski, PE	Feasibility Study	HDR, Inc.
Ileana Ivanciu, PhD, PG	NEPA Documentation	Dewberry Engineers, Inc.
Alan F. Blumberg, Ph.D.	Coastal Engineering & Modeling	AECOM
Raymond L. Hinkle	Ecosystem Restoration	AECOM (URS)
Abbas Sarmad, PE	Structural Design	AECOM
Majed A. Khoury, PhD, PE	Geotechnical Design	AECOM (URS)
Scott Edelman, PE	Flood Risk Management	AECOM
John Squerciati, PE, CFM	Cost / Benefit Analysis	Dewberry Engineers, Inc
Michael Sears, PE	Hydrologic & Hydraulic Engineering	Dewberry Engineers, Inc.
Peter Black, PE, CME	Civil Engineering	Dewberry Engineers, Inc.
Carter Strickland, Jr.	Sustainability	HDR, Inc.
Kenneth J. Lucianin	Government & Community Affairs	Matrix New World Engineering, Inc.
Eric Bodnar, PE	Civil Engineering	AECOM (URS)
Arthur C. Miller, PhD	Climate Change & Sea Level Rise - Discipline Lead	AECOM
Murat Utku, PhD, PE	Coastal Engineering & Resiliency - Discipline Lead	AECOM
Jeff Gangai, CFM	Coastal Modeling - Discipline Lead	Dewberry Engineers, Inc.
John Roebig, PhD, RLA	Ecosystem Restoration - Discipline Lead	HDR, Inc.
Ignacio Bunster-Ossa, FASLA, LEED AP	Urban Planning - Discipline Lead	AECOM

Team Member	Company	Project Role
William Soper, PE	Hydrologic & Hydraulic Engineering - Discipline Lead	AECOM (URS)
Allan Klindworth	Sustainability - Discipline Lead	AECOM (URS)
Jennifer Baer, AICP	Socioeconomics & Environmental Justice - Discipline Lead	Dewberry Engineers, Inc.
Patricia Parvis, LSRP	Site Remediation - Discipline Lead	HDR, Inc.
Donald T.M. Heck, PE	Geotechnical Engineering - Discipline Lead	Matrix New World Engineering, Inc.
Jae G. Park, PhD, CFM	Benefit Cost Analysis - Discipline Lead	AECOM
John A. Rollino	Ecology & Biology - Discipline Lead	AECOM
Zachary Davis, RPA	Cultural Resources & Archeology - Discipline Lead	Dewberry Engineers, Inc.
Julie Stein, ENV SP, LEED BD+C AP	Green Infrastructure - Discipline Lead	HDR, Inc.
Brian C. Stobbie, P.E., LEED® AP	Structural Engineering - Discipline Lead	AECOM
Daniel McDaid	Cost Engineering - Discipline Lead	AECOM
James Mansky	Permitting & Regulatory Compliance - Discipline Lead	AECOM
Steven Eget, PE, CEM	Air Quality - Discipline Lead	Dewberry Engineers, Inc.
Robin Miller	Water Quality & Sediment Modeling - Discipline Lead	HDR, Inc.
Peter G. Naumoff, PG, LSRP	Geology - Discipline Lead	AECOM (URS)
Richard Paupst	Transportation Engineering - Discipline Lead	AECOM
Sheldon L. Fialkoff	Transportation Planning - Discipline Lead	AECOM
Jack Kanarek, PE	Transit Planning - Discipline Lead	Dewberry Engineers, Inc.
G. Noemi Castillo, PE	Noise - Discipline Lead	HDR, Inc.
Rose E. Reichman	Public Outreach & Community Engagement - Discipline Lead	Reichman Frankle Inc.
Jamie Torres Springer	Real Estate Development Analysis - Discipline Lead	HR&A Advisors, Inc.
James M. Gilsenan, AIA, NCARB	Architecture - Discipline Lead	AECOM (URS)
Scott Bleeker, PLS	Land Surveying - Discipline Lead	Dewberry Engineers, Inc.
Marc Korpus	GIS - Discipline Lead	HDR, Inc.
Kevin Hamby, JD	HUD Grant Compliance - Discipline Lead	Remora
Lakhbir Chauhan, PE	MEP Engineering - Discipline Lead	AECOM (URS)
Frank J. Barlowski, PLS	Hydrographic Surveying - Discipline Lead	Matrix New World Engineering, Inc.
Steven H. Mazurek, P.L.S., P.P.	Aerial Survey & Mapping - Discipline Lead	Robinson Aerial Survey, Inc.

Christopher Benosky, PE, CFM

Project Manager

Firm
AECOM

Personnel Level
Level 7

Education
Master of Civil Engineering, Ohio State University, 1992
Bachelor of Science, Civil Engineering, Ohio State University, 1991

Licenses/Registrations

- Professional Engineer (NY, #077763; NJ, #24GE03991600; PA, #PE056594E; DE, #13005; FL, #70879, LA, #35707, VA#0402046412)
- OSHA 40hr.HAZWOPER Health & Safety
- OSHA 8hr. HAZWOPER Health & Safety Annual Refresher
- ASFPM Certified Floodplain Manager (US-06-02282)
- Rosgen Level I - Applied Fluvial Geomorphology Certification, 2003
- Rosgen Level II - River Morphology and Application Certification, 2003
- Rosgen Level III - River Assessment and Monitoring Certification, 2003
- Rosgen Level IV – Natural Channel Design and River Restoration Certification, 2003
- Rutgers Stream Restoration Certification, 2002

Mr. Christopher Benosky is an Associate Vice President of the firm, the NY Metro Area Water Resource Market Sector Leader, and one of the global Technical Practice Leaders for the firms Ecosystem Restoration Services. He has over 25 years of experience in flood protection and risk management, coastal engineering, ecosystem restoration design, dam and levee engineering, hydrologic, hydraulic, and hydrodynamic modeling and analyses, stormwater management system design, geotechnical engineering, construction cost estimation, and construction management. Throughout his career, Mr. Benosky has been responsible for the planning, design, and construction of more than 10,000 acres of wetlands and more than 20 miles of upland protection flood control dikes and levees throughout North America and abroad. Mr Benosky is a Licensed Professional Engineer in New Jersey, New York, Pennsylvania, Connecticut, Virginia, Delaware, Florida, and Louisiana, and he is a nationally Certified Floodplain Manager.

Experience

New Jersey Department of Environmental Protection (NJDEP) Federal Emergency Management Agency (FEMA) Flood Risk MAP Project for Portions of the Hackensack-Passaic Watershed, Morris, Passaic, and Bergen Counties, NJ. Project Manager for the NJDEP/DPMC FEMA Flood Risk MAP Project for Portions of the Hackensack-Passaic Watershed The objective of this Flood Risk MAP Project was to develop and support a Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) Report, for portions of the Hackensack-Passaic Watershed. In all this project consisted of over 32 miles of detailed studies, 21 miles of limited detail studies, and the production of a number of Risk Map products for the watersheds. [05/2011 – Present]

U.S. Army Corps of Engineers, New York District (USACE-NYD), Hudson River Estuary (HRE) and HRE-Lower Passaic River Ecosystem Restoration Feasibility Studies, Various Locations, NY & NJ. The overall program involves the Feasibility study for ecosystem restoration within the Hudson Raritan Estuary, including eight separate planning regions. AECOM is leading the effort, along with e4sciences, to prepare a Feasibility Report/Environmental Assessment (FR/EA) to recommend construction of the various recommended site plans for a subset of the overall HRE restoration opportunities. The FR/EA will include evaluations of alternatives evaluation, NEPA, Essential Fish Habitat, Section 404(b)(1), Section 7 of the Endangered Species Act, and Coastal Zone Consistency. Various stand-alone appendices are required for the FR/EA, including an Engineering Appendix, Cost Appendix, Real Estate Plan, and HTRW/Geotechnical Reports. Mr. Benosky is serving as the Principal in Charge for AECOM. [6/2014-present]

Christopher Benosky, PE, CFM Continued

USACE New York District, Green Brook Channel Improvements Flood Damage Reduction Project, Somerset County, NJ. AECOM was contracted to develop and implement post-construction monitoring and adaptive management design and feasibility services for the project's wetland mitigation site, the Finderne Wetland Mitigation Site, a 180-acre parcel of undeveloped land in Somerset County, New Jersey. Mr. Benosky served as the Principal Engineer for the project. [4/2014-present]

U.S. Army Corps of Engineers New York District, South Shore of Staten Island, New York, Beach Erosion Control and Storm Damage Protection, Phase 2. The USACE-NYD is conducting a reconnaissance level study to evaluate beach erosion control and coastal storm damage reduction plans for the South Shore of Staten Island. Working with e4sciences, AECOM evaluated existing and proposed structural and non-structural alternatives for storm damage reduction from Great Kills Harbor to Tottenville Beach and determined whether post Sandy plans are economically feasible. Using HEC-FDA, preparing benefit calclatiuons, a preliminary cost analysis, and Quantitative Preliminary Benefit To Cost Ratios. Preparing the economic analyses portion of the Preliminary Alternative Analysis Report. Mr. Benosky is serving as the Principal Engineer. [2013- present]

US Army Corps of Engineers, New York District, Project Management Plan, Ecosystem Restoration Study, Hackensack, NJ. As Project Engineer, Mr. Benosky was responsible for the preparation of the feasibility study cost estimate for the Hackensack Meadowlands Project Management Plan for the US Army Corps of Engineers. The purpose of the management plan was to determine the feasibility of environmental restoration and protection projects relating to water resources, wildlife habitat, and sediment quality within the Hackensack Meadowlands. [10/2003 – 07/2004]

US Army Corps of Engineers, New York District, Meadowlands Environmental Site Investigation Compilation (MESIC), Hackensack, Bergen County, NJ. The Meadowlands Environmental Site Investigation Compilation (MESIC) Report inventoried existing data and reports for the Hackensack Meadowlands. Mr. Benosky served as project engineer. [10/2003 – 07/2004]

U.S. Army Corps of Engineers – New York District, Hackensack Meadowlands Ecosystem Restoration Study (HMERS), Hackensack Meadowlands, New Jersey. To address the degradation and plan for restoration of the Hackensack Meadowlands, the USACE has undertaken the Hackensack Meadowlands Ecological Restoration Study (HMERS). Mr. Benosky served as Project Engineer. [09/2002 - 07/2004]

US Army Corps of Engineers – New York District, Initial Phase of the Meadowlands Comprehensive Restoration Implementation Plan (MCRIP), Hackensack, NJ. A key document developed under the HMERS effort, the Meadowlands Comprehensive Restoration Implementation Plan (MCRIP), addresses the engineering, environmental, and economic aspects to determine the feasibility of restoration in the Meadowlands. Mr. Benosky served as project engineer. [10/2003 – 07/2004]

New Jersey Turnpike, New Jersey Turnpike Widening Construction Management Services, Sections 6 – 9, NJ. AECOM provided full time Resident Engineering and inspection services for Contract 001 and Contract 003 of the NJ Turnpike 6 to 9 widening project. This portion of the contract consisted of five freshwater mitigation sites that required construction oversight and field inspection to ensure that the work is in compliance to the approved plans and specifications, as well as NJDEP regulatory permit requirements. The four sites total over 300 acres of wetland restoration and reforestation, construction of vernal pools, upland and wetland planting, invasive species removal, and the creation of new ecological habitat. Mr. Benosky is the Resident Engineer

John Dromsky-Reed, PE

Deputy Project Manager

Firm
AECOM (URS)

Personnel Level
Level 5

Education
MS / 1999 / Environmental Engineering
BS / 1986 / Marine Science

Licenses/Registrations
- Professional Engineer: NJ, 2004
- Professional Engineer: NY, 2009

Mr. Dromsky-Reed has 26 years of experience in flood mitigation, hydraulic modeling, and flood mapping. He recently managed several multi-million dollar task orders for flood data analysis and floodplain mapping for multiple counties in New York and New Jersey. He is also the Project Manager for several flood risk management projects with the New York District of USACE.

Experience

Green Brook Flood Control Project for NY District of USACE, New Jersey. Project Manager for this $610M project. Responsible for the reformulation of flood control alternatives for the Upper Portion of the Green Brook Sub-basin, conducting the Raritan River Split Flow analysis to analyze the impact of Tropical Storm Floyd, evaluating potential induced flooding from the partially constructed levee system, analyzing railroad bridge and dam removals, conducting an analysis of impacts of the first upstream constructed segment, overseeing the hydraulic model and cost estimate updates for the remaining construction elements, and preparing the proposal for reevaluation of the tidal portion of the basin.

Floodplain Mapping, including County-Wide DFIRM for Bergen County, NJ for NJDEP, in Partnership with FEMA, Region II, NY. Project Manager for this $1.3 million project for NJDEP. Responsible for survey, hydrologic and hydraulic (H&H) analyses, final FIS and creation of DFIRMs for Bergen County. Coordinated survey, H&H analyses between several contractors, and mapping, and oversaw development of the FIS and DFIRM.

Flood Hazard Area Permit Application, Teterboro Air Traffic Control Tower, Teterboro, NJ for Federal Aviation Administration. Task Manager for the hydrologic and hydraulic analyses for the siting of the new Air Traffic Control Tower (ATCT) at Teterboro Airport. Analyses included updated hydraulic analysis of East Riser Ditch which incorporated lateral weirs, and the design of the ditch crossing to eliminate any induced flooding. Siting of the tower site within a wetland area presented unique modeling and permitting challenges. Coordinated the stream survey, and hydrologic and hydraulic analyses of the proposed wetland mitigation site at Losen Slote. Responsible for the hydraulic surveys, hydrologic and hydraulic analyses, and Engineering Report for the NJFHA Permit.

South River Coastal Storm Risk Management Project for NY District of USACE. Project Manager for this $800,000 effort. Over the life of the project from Feasibility Study to the current Limited Reevaluation (LRR), conducted the interior drainage analysis and update using HEC-IFH, Lotus123 and HEC-HMS. Coordinated detailed design of the floodwall and levee system. Assembled the cost estimate and draft LRR. Coordinated the ITR of the Feasibility Study H&H and Design, and Cost Appendices developed by the USACE.

John Dromsky-Reed, PE Continued

Indefinite Delivery Contract 189a for Flood Control/Mapping for NY District of USACE, New York State. Project Manager for this $3 million contract for the New York District of USACE. Responsibilities include task order coordination, including cost proposals, subcontract coordination, and scheduling. Scope of work for Task Orders includes: Technical review of engineering drawings for navigation improvements and flood protection projects; engineering support during construction of the $20 million dam remediation project in Waterbury, VT; dam inspections; storm damage reduction projects in Long Island, including economic analyses of proposed protection and plans and specifications.

New York and New Jersey Harbor studies for NY District of USACE, NY State Navigation. Project Engineer assisting in the development of the NY/NJ Harbor Navigation Study's Plan Formulation. Responsible for consolidating project team input and drafting the Feasibility Study's Main Report, and several Appendices, as well as the Corps Alternative Formulation Briefing (AFB) package. Responsible for developing the project's Project Management Plan. In response to environmental concerns the Hudson Raritan Estuary Ecosystem Restoration (HRE) Project resulted- Served as Project Engineer responsible for coordinating development of the 8 Study Area Reports (SARs) outlining each area's existing ecological conditions, history of degradation, and restoration needs, which formed the basis of the project's Comprehensive Restoration Plan (CRP). Assisted in formulating the District's CRP. Project Manager coordinating the development of the HTRW and Cultural Resources Appendices for the forthcoming HRE Programmatic EIS. Post-Sandy Reconstruction-Subject Matter Expert (SME) for flood mitigation and coastal protection assisting six Community Reconstruction Zone (CRZ) planning committees in New York City and Nassau County, NY for NY State's NY Rising Program. As SME, assisted the planning committees with developing plans to improve community resiliency to storm damage, in identifying, screening, and refining potential flood and storm risk management measures.

County-wide DFIRM for Onondaga County, Rockland County, and Chemung County, NY for NYSDEC and FEMA, Region II, NY. Project Manager for the $2.8 million project which included the Onondaga County, NY, and Rockland County, NY county-wide FIS and DFIRM. Responsible for survey, H&H analyses, final FIS and DFIRM. Coordinated subcontracting for survey, H&H analyses, and mapping. Project Manager for the $502,000 Chemung County, NY county-wide FIS and DFIRM. Coordinated and oversaw the preliminary levee analysis and development of H&H models, reports, and maps. This project included numerous issues related to levee certification and associated outreach. Project was revised to include new detailed studies.

Flood Data Analysis for FEMA Region II, HMTAP Project in NY, PR, USVI. Project Manager for survey, H&H analyses, and creation of work maps for the detailed study of 540-miles of streams, including the Delaware River, Susquehanna River, and Mohawk River in New York. Coordinated subcontracting for stream survey of 1,600 cross-sections and 300 bridges, H&H analyses. Coordinated and oversaw detailed review of survey deliverables, hydrologic and hydraulic models, reports, and the creation of over 150 work maps. Project Manager for similar efforts for two flood data analysis projects on the East Branch of the Delaware River and Neversink River in New York, which include LiDAR collection, survey, and H&H analyses. Also, Project Manager for survey, H&H analyses, and work map creation for three rivers in Puerto Rico and two rivers in St. Thomas (USVI).

Michael Murphy, PE

Deputy Project Manager

Firm
HDR, Inc.

Personnel Level
Level 6

Years of Experience
32

Education
B.E., Civil Engineering; City College of New York, 1986
A.A.S, Civil Engineering; Westchester Community College, 1983

Training and Certifications

- Orange County Citizens Foundation, Member, Land Use Committee
- Orange County Municipal Planning Federation, Education Committee
- National Society of Professional Engineers, Member

Mr. Murphy is a Vice President and Professional Associate with HDR. He provides project management and engineering support services for a variety of major water resource, civil infrastructure, and land development projects. Mr. Murphy is responsible for the budget management, adherence to product delivery schedule, assigns tasks to project design team members, and provides guidance on preparing engineering reports, plans and specifications. His professional career includes six years of experience as a project/ study manager for water resource planning projects working for the US Army Corps of Engineers (USACE) New York District. Upon joining HDR, he worked as lead municipal engineer and engineering section director. Mr. Murphy has been engaged in working with Federal clients including the USACE, National Park Service (NPS) and Naval Facilities Engineering Command (NAVFAC) providing planning, design and construction implementation services related to the storm damage recovery from Hurricane Sandy.

Experience

NPS Capital Region Levee Improvement and Flood Plan Strategy Assessment, Washington DC. Lead Author of the Levee Improvement and Flood Plan Strategy report for the NPS, Anacostia Park. Prepared a report documenting existing flood risk management features at the 102-arce park facility, evaluated existing prior reports, assessed current levels of flood risks and formulated a series of plans to optimize the current flood protection afforded the site by existing features and developed strategies for increased levels of protection. All plans considered were in keeping with the National Capital Region Flood Plan, the Washington DC Flood Manual, and developed flood plan improvements needed to be compliant with National Incident Management System (NIMS) and Incident Command System (ICS), detection, notification, decision making, flood fighting, interagency communication and coordination. Incorporate strategies from Emergency Preparedness Guidelines for Levees, DHS, January 2012, and the tenets of November 1, 2013 Presidential Executive Order - Preparing the U.S. for the Impacts of Climate Change.

Sandy Hook Dispatch Center at Fort Wadsworth, Park Wide Telecommunications, Radio and Data Systems, NPS, Staten Island, NY. As the Project Manager for the Sandy Hook park-wide telecommunications project, Mr. Murphy led a multidiscipline team including telecommunications, electrical, mechanical and civil engineers, cost estimators and architects to prepare a Design-Build Request for Proposal (DB-RFP) package, which included project design requirements, schematic design drawings, and performance technical specifications. The project entailed developing DB-RFP package with plans for sustainable solutions

Michael Murphy, PE Continued

for the repair/replacement of park-wide telecommunications equipment and supporting architectural, electrical and mechanical systems which were damaged by Hurricane Sandy in October of 2012. HDR developed solutions in coordination with NPS to achieve designs that were cost efficient, sustainable, in accordance with Flood-resiliency requirements of NPS Director's Order 77.2, and historic preservation requirements.

Fort Hancock Sandy Hook, Jersey City, NPS. Mr. Murphy lead a multidiscipline team that consisted of electrical, mechanical and civil engineers, cost estimators and architects to conduct a schematic design analysis lead to the completion of a Design-Build Request for Proposal. The project entailed developing plans for sustainable solutions for the repair and/or replacement of electrical and mechanical systems damaged by Hurricane Sandy in October of 2012. The project included repairs to four historic buildings and the replacement of a vehicle fueling station.

Walter Reed National Navy Medical Center Alterations/Additions, Bethesda, MD. Mr. Murphy led the civil engineering team for the utilities infrastructure analysis and site plan redesign for the medical campus. Upon determining the baseline conditions for the facility, Mr. Murphy worked with a multi-disciplined engineering and architecture team to redesign the site utilities to reroute lines to clear the way for the future demolition of existing buildings and reconstruction of the new state of the art hospital structure. The key features of the utility system redesign was to provide continued service to the existing hospital facility during the reconstruction, create a new pathway for the utilities to avoid conflict with the future building location, and to upgrade the system capacities to support the future needs. The project designs were prepared in accordance with the Unified Facilities Code (UFC) and applicable local regulatory requirements.

USACE Term Flood Damage Reduction Contract IDIQ, New York District, NY. Contract Manger for IDIQ ($6M) with USACE New York District for Mamaroneck, Sheldrake General Reevaluation Report for flood damage reduction studies. Task Orders have included plan formulation studies, economic justification analyses, environmental impact assessments and hydrology and hydraulics studies for a variety of flood damage reduction studies, environmental monitoring programs in the New York Harbor and costal erosion studies.

New York City Department of Sanitation, Knapp Street Garage Facility Stormwater Management System, NY. Conducted stormwater system feasibility study for urban land redevelopment project, evaluated system performance, cost, constructability and long term O&M for six project alternatives. Assisted the client in identifying optimal solution, then proceeded with detailed design and environmental permitting for site located adjacent to NYC waterfront containing critical environmental habitat. Coordinated permits with NYSDEC and USACE.

Kingston Waterfront Planning, NY. Mr. Murphy lead the study team, was the USACE client manager and made public presentations for a Harbor Management Plan for Rondout Creek. Mr. Murphy conducted reviews of existing planning documents and engineering reports and conducted waterway field inspections to evaluate existing conditions of the bulkheads and shorelines to identify areas in need of repairs and critical environmental conditions. HDR helped the USACE develop plan formulation report by providing mapping of alternative navigation channel alignments, engineering an array of shoreline stabilization measures, and providing cost estimates for the various alternatives.

New York/New Jersey Harbor Navigation Study. As a Member of the NY/NJ Harbor Partnership, HDR assisted in preparing the EIS for the USACE New York District harbor-wide navigation feasibility studies. Mr. Murphy was in responsible charge of reviewing the entire harbor deepening plan and delineating the extent of disturbance to shallow water habitats. After reviewing the proposed channel alignments, cross sections and existing bathymetric maps.

James Heeren, PE, ENV SP

Deputy Project Manager

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 7

Years of Experience
25

Education
MS, Environmental Engineering, New Jersey Institute of Technology, 1995
BS, Civil Engineering, New Jersey Institute of Technology, 1990

Licenses/Registrations
Professional Engineer: NJ, GA
Envision Sustainability Professional, Institute for Sustainable Infrastructure: US

Training and Certifications
Certified UST Subsurface Evaluator/ Closure, NJDEP
ANSI/RAB Environmental Management Systems Auditor
Hazardous Waste Site Safety Training, 40-Hour; Annual Refreshers, OSHA

Mr. Heeren is a Senior Project Manager and Environmental Engineer responsible for managing multi-disciplinary teams. Jim brings particular experience with projects that require heavy involvement from regulatory agencies, including environmental restoration programs. He leverages his understanding of both infrastructure engineering and environmental impact analysis to facilitate the environmental analysis process under the National Environmental Policy Act (NEPA) and other governing regulations. Jim has managed a series of disaster response, recovery, and resiliency projects following Superstorm Sandy, including delivery within federally mandated timeframes. As a former member of the Hasbrouck Heights Zoning Board, Jim brings an understanding of the political and stakeholder issues in Bergen County communities.

Experience

Hudson River Project: Resist, Delay, Store, Discharge NEPA Environmental Impact Statement (EIS), NJ TRANSIT and New Jersey Department of Environmental Protection (NJDEP), Hudson County, NJ. Quality Reviewer for EIS deliverables including Purpose & Need Statement and Scoping Document for a $230-million comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City. Known as Resist, Delay, Store, Discharge, the project incorporates hard and nature-based infrastructure measures to address surge protection, coastal defense, and systemic drainage issues. This EIS is being prepared pursuant to US Department of Housing and Urban Development (HUD) requirements.

I-295/I-76/Route 42 Direct Connection NEPA EIS, New Jersey Department of Transportation (NJDOT), Camden County, NJ. Environmental Lead responsible for a NEPA EIS, ecology, socioeconomic, land use, cultural resources, hazardous waste services, permitting, regulatory coordination, and public outreach program. Involved permitting and regulatory approvals from agencies including NJDEP, US Army Corp of Engineers (USACE), US Environmental Protection Agency, US Coast Guard, and US Fish & Wildlife Service, including USACE Section 404 and NJDEP Individual Freshwater and Coastal Wetlands Permits, Waterfront Development, and mitigation. This $900-million project is under construction.

Ellis Island South Island Redevelopment Project NEPA EIS, National Park Service, Ellis Island, NJ. Senior Environmental Engineer, as a subconsultant, for preparation of the Wetlands/ Ecology, Hazardous Materials, and Transportation and Mechanical/ Electrical Plant Sections of the EIS in support of Adaptive Reuse of South Island. Redevelopment alternatives were evaluated and advanced through the EIS process.

James Heeren, PE, ENV SP Continued

Routes 3/21 over the Passaic River NEPA Environmental Assessment (EA), NJDOT, Passaic and Bergen Counties, NJ. Senior Environmental Engineer for the NEPA EA for the $159-million Route 3 bridge replacement and associated improvements.

Route 7/Wittpenn Bridge Replacement NEPA EA, NJDOT, Kearny and Jersey City, NJ. Senior Environmental Engineer, as a subconsultant, for hazardous waste services and socioeconomics analysis including Technical Environmental Studies for the NEPA EA, for the $730-million bridge replacement and associated roadwork in a highly contaminated corridor which is subject to flooding.

Pre-Construction Services Related to Hurricane Sandy Relief Programs, New York City Mayor's Office of Housing Recovery, New York, NY. Senior Environmental Engineer for Dewberry's contract to support the City's permanent housing recovery program post Superstorm Sandy by conducting detailed assessments of approximately 12,000 damaged homes and performing site assessments and environmental review to qualify properties for HUD Community Development Block Grant (CDBG-DR) funding. Environmental review is pursuant to NEPA, Section 106 of the National Historic Preservation Act, other governing regulations, and Programmatic Agreements.

Route 17 Bottleneck NEPA Documentation, Bergen County Department of Planning and Economic Development, Bergen County, NJ. Environmental Project Manager, as a subconsultant, responsible for environmental services related to corridor improvements in Maywood, Rochelle Park and Paramus. Oversaw Technical Environmental Studies in anticipation of a NEPA EA.

Project Management Contract for Superstorm Sandy Waterway Debris Removal, NJDEP, Statewide. Environmental and Historic Preservation Lead responsible for oversight and technical direction of biologists, hazardous waste specialists, GIS mapping specialists, maritime archaeologists, terrestrial archaeologists, and architectural historians.

Maritime Transportation System Planning and Project Management Services, NJDOT, Statewide, NJ. Project Manager for contract to support the NJDOT's Office of Maritime Resources with the State Dredging Program. Responsible for personnel resources, budgets, schedules, and overall quality on multiple task orders for engineering, FEMA compliance documentation and reporting, and environmental and historic preservation compliance.

Springfield Gardens Flood Control Project, NYC Economic Development Corporation, Queens, NY. Senior Environmental Engineer for environmental analysis, ecological studies, permitting, and design for a $53M flood control project where infrastructure improvements were constructed in tandem with coastal habitat restoration and coastal ecological enhancements to waterways.

Thomas MacAllen, PE, PP

Project Executive

Firm
AECOM (URS)

Personnel Level
Level 7

Education
MS / 1977 / Civil Engineering
BS / 1972 / Civil Engineering

Licenses/Registrations
- Professional Engineer: NJ, 1979; VT, 1982
- Professional Planner: NJ, 1981

Mr. MacAllen has 43 years of experience and serves as Vice President of Water Resources projects, including flood control, flood insurance studies, flood plain management, stormwater management, and water supply. He has performed hydrologic and hydraulic investigation for public and private clients. Mr. MacAllen is, past Treasurer for the Bergen County Professional Engineering Society, and is the Past Region II Director of the Association of State Flood Plain Managers.

Experience

Green Brook Sub-Basin Raritan River, New Jersey, for the New York District Corps of Engineers (USACENY). Project Principal/ Executive for preconstruction, engineering and design of the this 65 square mile watershed wide project that encompasses three counties and 13 municipalities involving 44 river miles of hydraulic study. Authored the Feasibility Report and General Reevaluation Report and directed the design for $57 million in construction to date. Duties included formulation and preliminary design of flood control measures (floodwalls, levees, dams, channel improvements, closure structures and pump stations), cost estimates, and complete economic analysis utilizing EAD &HECFDA for this $610,000,000 flood control project. Optimized over 30 interior drainage sites using a combination of HEC1 and INTDRA integrated with EAD and verified results with HECIFH and unsteady state HECRAS. Supervised P.E.D. effort including: HTRW assessment (development of Limited Health & Safety plan, site inspections, title & deed search, report preparation), intrusive investigations, preparation of geotechnical boring plan and development of response plan, preliminary structural design, coordination with railroads, detailed analysis of non-structural plans in FDM area, collection of utility and bridge as-built data and incorporation into Intergraph CADD file, and aerial flight and ground control survey for mapping in all but the FDM are. Prepared cost estimates, benefit analysis, and preparation of the final General Reevaluation Report. As part of the Plans and Specifications Stage of the project directed the permitting of several elements of the project, the design of a three (3) bridge replacements; 2000 LF floodwall; 2700 LF of levee; three (3) closure gates, two across rail lines and one roadway underpass; two (2) stormwater pump stations, including back up emergency power; and ring wall system around an apartment complex.

USACE - Storm Damage Reduction Feasibility Study - Union Beach, NJ. Project Principal for plan formulation and preparation of the Feasibility Report. Responsible for formulating flood protection plans. The recommended plan included a levee system tieing off to high ground and dunes along Raritan Bay.

Thomas MacAllen, PE, PP Continued

Floodplain Mapping, including county-wide DFIRM for Bergen County, NJ for NJDEP, in Partnership with FEMA, Region II, NY. Project Principal/Executive for this $1.3 million project for NJDEP. Directed the survey, hydrologic and hydraulic (H&H) analyses, final FIS and creation of DFIRMs for Bergen County. Directed coordination of survey, H&H analyses between several contractors, and mapping, and oversaw development of the FIS and DFIRM.

South Shore of Staten Island Feasibility Study, USACE NY District. Project Principal/Executive for the South Shore of Staten Island Coastal Storm Risk Management Feasibility Study. Oversaw the overall formulation and analysis of alternatives. In response to Hurricane Sandy the Project was split into two Phases. For Phase 1 of the Project, which includes a seawall/levee/floodwall system and 10 excavated stormwater storage ponds with an estimated cost of $580M for the 5+ mile reach from Fort Wadsworth to Oakwood Beach, AECOM managed the preparation of the Feasibility Main Text, Interior Drainage Appendix, Geotechnical Appendix, Benefits Appendix and Cost Appendix, coordinated inputs for the Real Estate Plan and Engineering Design Appendix, and provided technical support for the DEIS.

New York and New Jersey Harbor Navigation Feasibility Study for the New York District Corps of Engineers (USACE-NY). Project Principal/Executive for the Plan Formulation efforts associated with the first comprehensive investigation of Harbor in its entirety. Plans investigated revolved around the potential for providing 50 foot deep MLW channels to various ports with in the Harbor. Responsible for consolidating project team input and drafting the Feasibility Study Main Report, and several Appendices, including Plan Formulation, as well as the Corps' Alternative Formulation Briefing (AFB) package. Responsible for developing the Project Management Plan and lead role in developing and assembling a comprehensive Mitigation Report to address project impacts.

New Bedford Flood Hurricane Barrier and Tide Gate, Levee Certification Technical Report, New Bedford MA. Project Principal for technical evaluation of Hurricane Barrier to determine compliance with the requirements of 44CFR 65.10 so it can be accredited for the updated Flood Insurance Study under Map Mod. The main dike and navigation gate are owned and maintained/ operated by the New England Corps of Engineers. Two adjacent dikes that are integral to the system and include several closure gates are maintained and operated by the City of New Bedford and town of Fairhaven. A 500 cfs pump station conveys flow though the line of protection to the bay. URS performed a detailed inspection of the system, performed 10 borings and evaluated the stability of the dike and developed a HEC-HMS model to evaluate the residual flooding behind the Dike and mapped the 1% flood. Authored the Levee Evaluation Report.

Werner Mueller, PE, CFM

Executive Committee

Firm
HDR, Inc.

Personnel Level
Level 7

Years of Experience
36

Education
Master of Science, Environmental Policy & Management; New Jersey Institute of Tech, 1999
Bachelor of Science, Civil Engineering; New Jersey Institute of Tech, 1979

Licenses/Registrations
- Professional Engineer, New Jersey, USA, No. 24GE03036000
- Professional Engineer, New York, USA, No. 065874-1
- Certified Floodplain Manager (CFM), United States National Registration
- FEMA IS-00700.a, National Incident Management System (NIMS)

Mr. Mueller is HDR's practice leader for water resources and environmental science in the northeastern US. He has more than 34 years experience working in diverse projects including flood control, stormwater and floodplain management, ecosystem restoration, waterfront development, transportation, disaster recovery, hazard mitigation and environmental assessments.

Mr. Mueller has integrated specialists in technical disciplines, regulatory requirements, and stakeholder coordination to achieve successful outcomes for a variety of projects ranging from the development of flood control projects, port facilities and large civil works, to disaster recovery efforts. In the role of Principal-in-Charge, Mr. Mueller has guided HDR staff to the successfully undertake projects in the followng areas:

Experience

- PANYNJ Ecological Services On-Call Contract to assist with permit applications and associated natural resources assessments and ecosystem design for compensatory mitigation projects and for Phase I and II assessments, remediation designs and construction permits and best practices
- USACE Ecosystem Restoration IDIQ to support projects throughout the North Atlantic Division including assignments for ecosystem restoration, wetlands assessments/permits, assessment of essential fish habitat, benthic and fish population monitoring, water quality analysis monitoring and modeling, air quality modeling and attainment strategies, and flood risk management.
- NYC EDC Bronx River Greenway assignments for ecological assessments, design and permitting of shoreline ecosystem rehabilitation projects including the recently completed Hunts Point Landing
- Metro-North Hydrologic On-Call for two successive contracts to assess drainage issues, perform drainage designs, and provide climate change assessments and emergency response services
- NYCDEP, Alley Park Salt Marsh Restoration construction plans and specifications for the development of an 8-acre salt marsh and complementary upland habitats.
- New York State DEC Division of Environmental Remediation – contract management of a $50 million state superfund contract for remedial investigations, feasibility studies, remediation designs, and technical review.

Werner Mueller, PE, CFM Continued

Evergreen Environmental, LLC – Hackensack Meadowlands Mitigation Banks, NY. Mr. Mueller is the principal engineer assisting Evergreen Environmental, LLC to develop mitigation banks in the Hackensack Meadowlands in accordance with the U.S. Environmental Protection Agency (USEPA) and USACE Compensatory Mitigation for Losses of Aquatic Resources. To date, three sites totaling about 135 acres have been studied to determine the feasibility of developing economically-viable mitigation banks, and one 51-acre bank and

Evergeen 16-acre Project were constructed in 2012. HDR assisted Evergreen in all aspects of the mitigation bank development including baseline site characterization, hydrological field studies, design and development of construction documents, obtaining regulatory approvals and coordination with the Meadowlands Interagency Mitigation Committee, assisting with the preparation of the Prospectus and Mitigation Banking Instruments, as well as monitoring the site after construction.

USACE NY&NJ Harbor Deepening Project, Hudson-Raritan Estuary Ecosystem Restoration. Mr. Mueller was the Principal-in-Charge for the efforts to assist USACE and PANYNJ in their plan to deepen the navigation channels of the NY/NJ harbor. His oversight of staff efforts included the develoment of a NEPA EA to assess the impacts of channel deepeining on the EPA investigation of the Newark Bay superfund site. Mr. Mueller's staff was also responsible for assessing the potential biological impacts associated with dredging and monitoring dredge plumes to ensure environmental compliance. The harbor deepening effort also resulted in a new look at the ecology of the Hudson Raritan Estuary (HRE). Mr. Mueller's staff collaborated with stakeholders to develop the Comprehensive Restoration Plan that outlines target ecosystem characteristics as a uniform means to measure restoration benefits and identify potential restoration sites throughout the estuary. The effort also included Quality Control review of the design to create a freshwater wetland system within Liberty State Park in Jersey City which was to be the first project undertaken under the HRE Plan.

NYC Economic Development Corporation - Coney Island Creek Tidal Barrier, NY. Principal-in Charge for the ecological approach in a Feasibility Study for the development of a tidal barrier and ecosystem enhancements to reduce the potential for storm surge damages. This project is an identified initiative under the Superstorm Sandy PlaNYC Special Initiative for Resiliency and Recovery.

Veterans Administration VAMC Manhattan, Flood Preparedness Study, NY. QA/QC on the development of a multi□pronged defense strategy including the design and development of construction documents for a perimeter flood wall, assessment of potential flood damage hazards to critical hospital functions, interior drainage and the development of an Environmental Assessment to comply with state and city environmental review requirements.

USACE New York District, Green Brook Flood Control, NJ. With a previous employer, Mr. Mueller was Project Manager for over ten years on this large flood control project incorporating both structural and non-structural flood control techniques. His responsibilities included leading and supervising a multi-disciplinary project team in design and optimization of over 16 miles of levees and floodwalls, six miles of channel improvements, 5,000 feet of supercritical flume, seven closure structures, two earthen dams, over 32 bridge reconstructions or replacements and initial design of four pump stations ranging from 60 CFS to 450 CFS in capacity.

John Boulé II , PE

Executive Committee

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 7

Years of Experience
29

Education
MS, Resourcing National Strategy, National Defense University at Fort McNair, 2009
MA, National Security and Strategic Studies, Naval War College, 2001
MS, Environmental Fluid Mechanics and Hydrology, Stanford University, 1996
MS, Structural Engineering, Stanford University, 1995
BS, Civil Engineering, United States Military Academy, 1986

Licenses/Registrations
Professional Engineer: VA

Affiliations
- Society of American Military Engineers (SAME): Director and Past President, New York Post
- Metropolitan Waterfront Alliance: Vice Chairman, Board of Trustees
- The Nature Conservancy, Eastern New York Chapter, Board of Directors
- Governor's Island Alliance, Special Advisor to the Board of Trustees
- American Council of Engineering Companies of New York, Member
- Association of United States Army, Member

Mr. Boulé has more than 29 years of experience in the engineering industry, specializing in water resources, resilience, environmental restoration, risk mitigation, and infrastructure and facility services.

He served in the US Army from 1986 to 2012, attaining the rank of colonel before retiring. From 2009 to 2012, he was Commander of the New York District of the US Army Corps of Engineers. In this role, he was responsible for the Corps' water resource development, and regulatory activities in much of New York State and New Jersey, as well as parts of Vermont, Massachusetts, and Connecticut. As commander, he was responsible for the award and management of hundreds of contracts with an average annual value of over $1 billion. The contracts were for engineering, construction and technical services in support of water resource development as well as the design and construction of military installations in the northeastern US and Greenland. Responsibilities and accomplishments included:

Managed the planning, design, construction, operations and maintenance of over 100 water resource development projects (ecosystem restoration, flood and coastal storm risk reduction, navigation channels and structures) in New York State and New Jersey, Vermont, Massachusetts, and Connecticut.

Oversaw the improvement of the Comprehensive Restoration Plan for the Hudson Raritan Estuary. The plan was adopted by EPA Region 2 (covering NYC, NYS, and New Jersey) as the region's restoration blueprint and incorporated into NYC's and NYS's strategic plans.

Partnered with the Port Authority of New York and New Jersey to direct the largest civil works project in the northeastern U.S.—the $1.6 billion New York/New Jersey Harbor Deepening Program.

Experience

Rebuild By Design Hudson River: Resist-Delay-Store-Discharge, NJ TRANSIT and New Jersey Department of Environmental Protection (NJDEP), Hudson County, NJ. Senior Advisor for the Feasibility Study and National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) for a $230-million comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City. The project incorporates hard and nature-based infrastructure measures to address surge protection, coastal defense, and systemic drainage issues.

Special Initiative for Rebuilding and Resiliency (SIRR), New York City Office of Long-Term Planning and Sustainability, New York, NY. Project Director for preparation of a coastal protection plan which entailed planning and coordinating a citywide strategy and community-level interventions to significantly reduce damage from severe Sandy-like future storms and climate change, which was published in

John Boulé II , PE Continued

the City's SIRR report, A Stronger, More Resilient New York. The team designed, sited, modeled and analyzed the performance of hard and soft coastal protection measures under multiple storm and sea level rise scenarios.

Green Infrastructure Design and Construction Management Services for Bowery Bay Outfall Sewershed BB-005 Task Order Phase 5, New York City Department of Environmental Protection Office of Green Infrastructure, Queens, NY. Principal-in-Charge of engineering and design services to implement green infrastructure throughout a 684-acre tributary area with a target of 684 green infrastructure sites.

Ocean Parkway/Robert Moses Causeway Emergency Repairs, New York State Department of Transportation, Long Island, NY. Project Manager for fast-track engineering and design services for repairs to a section of Ocean Parkway and the Robert Moses Causeway traffic circle that were severely damaged during Superstorm Sandy as well as restoration of sand dunes and shoreline areas that were washed away by the storm surge. Led the team that provided civil, highway, geotechnical and coastal engineering and produced designs in just three weeks and prepared permit applications to NYS Department of Environmental Conservation and the US Army Corps of Engineers.

Superstorm Sandy Recovery Task Orders, MTA New York City Transit (NYCT), New York, NY. Senior Project Manager for over a dozen Sandy restoration and mitigation feasibility studies and design projects at NYCT subway stations, rail yards, and subway tunnels to increase transit system's resiliency. Representative projects include East River Tubes, Brooklyn; St. George and Clifton Rail Yards, Staten Island; and South Ferry Station, Manhattan.

Hurricane Sandy Recovery FEMA Category B – Emergency Protective Measures (Location of Debris and Shoaling in State Channels), New Jersey Department of Transportation (NJDOT), Various Locations, NJ. Senior Project Manager for the resiliency portion of this project which supported the NJDOT, Office of Maritime Resources to investigate, map, and prioritize the condition of all State navigation channels in the Raritan Bayshore, Monmouth, Ocean, Burlington, Atlantic and Cape May shore areas.

Design for Repair Work for Flood Mitigation/Resiliency of Montague Tunnel, MTA NYCT, New York, NY, Senior Project Manager. The Montague Tunnel was one of several New York City Transit under-river subway tunnels that flooded during Superstorm Sandy. In less than 12 hours after Notice to Proceed, the team immediately mobilized to support the assessment and design efforts. The team designed the repair and replacement of damaged subway equipment to restore the tubes and associated facilities to pre-hurricane performance under an accelerated schedule and designed resiliency improvements to harden the tubes and associated facilities against Category 2 Hurricane storm surges.

Andrew W. Raichle, PE

Small Business Liason

Firm
Matrix New World Engineering, Inc.

Personnel Level
Level 7

Education
ME, Ocean Engineering, Davis Fellow, University of Delaware, 1992
BE, Civil Engineering, University of Delaware, 1990

Licenses/Registrations

- Professional Engineer – New Jersey, #24GE04188900, 1990; Professional Engineer – New York, #077338-1, 2003
- Transportation Worker Identification Credential (TWIC) – Exp. 9/2014

Mr. Raichle is a Civil & Marine Engineer with nationwide experience in a broad range of waterfront development and maritime projects. His project experience includes planning and design of coastal and port structures, sub-aqueous utilities, navigational dredging, and shore protection projects. He is well versed in the technical, political, and regulatory specialties that are unique to the process of waterfront development/redevelopment, and has applied these skills throughout the U.S. and the Caribbean. Most recently, Mr. Raichle has been a key participant in the response and recovery effort for Superstorm Sandy in the metro New York region. In the days following the storm he led emergency response teams throughout the region. In the months since, He has led teams responsible for rebuilding marinas, boardwalks, and other infrastructure of the Jersey Shore and New York Harbor regions.

Experience

Trader's Cove Municipal Marina, Township of Brick, NJ. Mr. Raichle is the Engineer of Record for design and permitting of a modern, 110 slip floating dock marina to replace the circa-1950's marina destroyed by Superstorm Sandy. Work efforts included post-storm evaluation, FEMA coordination for funding, permitting and design. The entire project was funded, permitted and designed within three months of Superstorm Sandy landfall and scheduled for Summer 2013 completion.

Coastal Dune and Rock Revetment, Boroughs of Bay Head and Mantoloking, NJ. Mr. Raichle is the engineer of record for the largest privately funded shore protection project constructed after Superstorm Sandy. The project involved 20+ private landowners that pooled resources to construct a rock revetment and dune to protect their oceanfront properties. Work included coastal engineering design, NJDEP emergency permitting, contract procurement, and construction management. All work was initiated within several weeks of the storm landfall, and was complete prior to the Summer season.

Post-Sandy FEMA Map Modification Challenges, Multiple Properties and Jurisdictions, NY and NJ. Mr. Raichle represents multiple commercial, industrial, municipal, and high-rise residential property owners in matters concerning FEMA's modification of flood zones throughout New Jersey and New York. His work includes coastal modeling, FEMA map modifications (LOMRs), formal/informal FEMA challenges, and representation of local governments for FEMA matters.

Post-Sandy Rapid Infrastructure Assessment, Township of Brick, NJ . Mr. Raichle led a team of 10+ engineers to evaluate the impact of Superstorm Sandy in the days and weeks following the storm's impact. His work included life/safety evaluation of structures and infrastructure, coordination with FEMA, and recommendations/cost-estimates for repairs. Mr. Raichle's

Andrew W. Raichle, PE Continued

work culminated in the preparation of a master infrastructure repair phasing plan, and served as the basis for FEMA funding of the Township's infrastructure responses.

Redevelopment of Military Ocean Terminal, Bayonne (MOTBY), Bayonne, NJ. Engineer of Record for the Bayonne Local Redevelopment Authority's redevelopment of this 700+ acre former military base. Redevelopment included extensive site remediation of contaminated soils and groundwater. Coordinated remediation design and construction activities, including applicable regulatory requirements (NJDEP waterfront development permits, deed notices, CEA's, etc.). Produced remediation record documents, including record surveys and engineering certifications. Permitting and negotiated the filling and associated mitigation of 2.9 acres of contaminated freshwater wetlands on the site. Oversaw the closing and maintenance of a former C&D landfill on the site. Responsible for the design, procurement and execution of $5M square feet of building demolition, including asbestos abatment. Planned and executed modification of contamination engineering controls for new buildings, infrastructure, and utilities. Secured and executed $30M+ of New Jersey Environmental Infrastructure Trust (NJEIT) funding for site remediation and water quality improvements.

Lister Avenue / Sherwin Williams Portfield Redevelopment, Newark, NJ. Engineer of Record for the permitting, design and execution of a portfield redevelopment of a former waterfront paint factory. Redevelopment included extensive site remediation of contaminated soils and groundwater, and building demolition. Coordinated design and execution of remediation construction activities, including soil caps and a groundwater cutoff wall extending through the shallow water aquifer (~50 feet). Secured and executed $19M+ of New Jersey Environmental Infrastructure Trust (NJEIT) funding for site remediation and water quality improvements.

Submarine Cable Crossing, New York Harbor. Provided engineering and regulatory support for a high voltage submarine cable crossing from Bayonne, New Jersey to Brooklyn, New York.

Submarine Cable Crossing, Hudson River. Provided engineering and regulatory support for a high voltage submarine cable crossing from Edgewater, New Jersey to Manhattan, New York.

Rockaway Shoreline Stabilization, Queens, NY. Management of permitting, surveying, inspection, alternatives analysis, and design of a rock revetment to replace an existing, failed bulkhead along Beach Channel Drive in Rockaway, New York City.

Bulk Liquid Terminal Redevelopment, Perth Amboy, NJ. Engineer of Record for the redevelopment of a highly contaminated bulk liquid oil terminal. Redevelopment planning and execution under my authority included extensive permitting and remediation activities, including demolition, asbestos removal, local/State approvals, flood controls, free product removal, and overall site and marine redevelopment as a modern oil storage terminal.

Brooklyn Marine Terminal Pier Repair, Brooklyn, NY. Engineering and environmental consultant for bulhead repairs associated with circa-early 1900's relieving platform.

Port Liberte'/Liberty National Golf Course, Jersey City, NJ. Engineering consultant for the remediation and development of a golf course over a heavily contaminated former industrial facility. Redevelopment planning and execution under my authority included the placement of approximately 1 MCY of amended dredged material excavated from an adjoining industrial navigation channel.

Fairmount Chemical Portfield Redevelopment, Jersey City, New Jersey. Engineer of Record for the permitting, design and execution of a Portfield redevelopment of a former waterfront chemical factory. Redevelopment included extensive site remediation of contaminated soils and groundwater, and building demolition. Coordinated design and permitting of remediation construction activities, including soil caps and stormwater management.

Peter Gregory, MPH, CSP, STS

Health and Safety Manager

Firm
AECOM

Personnel Level
Level 5

Education
2004 / Master of Public Health / School of Public Health / University of Medicine and Dentistry of New Jersey / New Brunswick, NJ
2000 / Bachelor of Science / Biology / Boston College / Chestnut Hill, MA

Licenses/Registrations
- Certified Safety Professional (CSP)
- Safety Trained Supervisor (STS)
- OSHA 30-Hour Construction
- OSHA HAZWOPER
- OSHA Site Supervisor
- AHA First Aid-CPR-AED Trainer
- Fall Protection – Competent Person

Training and Certifications
- 40-hour OSHA HAZWOPER
- 8-hour OSHA Site Supervisor Training
- 30-Hour OSHA Construction
- AHA First Aid-CPR-AED Trainer
- Fall Protection – Competent Person
- Confined Space Awareness

Awards
- 2004/New Brian Sylvester Honorary Scholarship for the study of environmental health and safety/ New Jersey American Industrial Hygiene Association
- 2004/School of Public Health Student Community Service Award/ UMDNJ

Mr. Gregory is a Safety, Health and Environmental (SH&E) Professional with 15 years of overall experience in SH&E compliance including: managing risks; conducting comprehensive site inspections; developing new and improving upon existing procedures; providing various trainings; tracking both leading and lagging safety metric indicators; communicating with all levels of personnel and clientele; managing incident investigation and reporting; site investigation/ remediation strategies; exposure assessments; and due diligence environmental investigations.

Experience

NY Metro Area SH&E Manager (March 2015 – Present)

As the NY Metro Area SH&E Manager, responsibilities include:

- Protect AECOM employees and AECOM contractor employees.
- Protect AECOM from liabilities incurred from;
  - regulatory compliance shortfalls,
  - exposure due to a failure to meet expected levels of diligence appropriate for the applicable industry or activity, and
  - civil suits from the public, subcontractor, or other parties affected by AECOM activities.
- Assure compliance with the Safety and Environmental Management Standards at the Operating Units within the assigned NY Metro Area.
- Meet the expectations of, and provide services as directed by the Area Manager.
- Provide program support to the NY Metro Area including:
  - HAZWOPER and Field Safety training for employees on a continuing basis to meet the needs of the unit.
  - Technical support for management and staff as needed or requested.
  - Conducting audits and assessments related to the Safety, Health and Environment program at field sites and office locations at a frequency determined by the Regional Safety Manager. Report findings to the Area Manager and the Regional Safety Manager.
  - Serve as a conduit for communications between AECOM operations management and the SH&E Program Management. Advise of changing operational needs, program changes, and program performance.
  - Represent the Company when an Agency (OSHA, EPA, State Department of Labor) investigation or violation citation is initiated.

Peter Gregory, MPH, CSP, STS Continued

- Provide information to AECOM management concerning risks appropriate to the Safety, Health and Environment field as relates to operations, employee safety, and contractual or client derived obligations.

Superintendent of Operational Safety, Hudson Bergen Light Rail Transit System Operations and Maintenance (September 2012 – February 2014).

As the Superintendent of Operational Safety, my responsibilities included:

- Working closely with and reporting to top management at individual sites and within the corporation.
- Preparing and reviewing site-specific Construction Health and Safety Plans and other safety-related documents in compliance with OSHA and corporate standards.
- Reviewing contractor construction work plans to ensure safety and environmental compliance.
- Ensuring all field activities have a health and safety review.
- Providing safety training and field oversight to employees and contractors. Trainings and inspections conducted are in both a classroom setting and in the field. Specialty areas include: AHA First Aid-CPR-AED; Hazard Communication - Globally Harmonized System; Electrical Safe Work Practices; Confined Space Entry; Fall Protection; Bloodborne Pathogens; Forklift Operator Training; OSHA HAZWOPER; and MoveSMART – Strength and Control.
- Tracking leading indicators (or best practices) on a monthly basis in order to develop a positive safety culture and reduce incidents and injuries. Some examples of leading indicators developed and tracked include: an active STS certification program; employee wellness activities; an active safety committee with diverse involvement; a leading indicator safety incentive program (Hazard Recognition Program); an active safety awareness poster and banner program; an active Stretch & Flex program; a safety prequalification process required for subcontractors; and, documented table top drills and simulation exercises.
- Performing and handling accident investigations, root cause analyses, OSHA recordability determinations; injury management and workers compensation claims.

Health & Safety Manager (January 2011 – August 2012).

As the AECOM(URS) Local Health and Safety Manager, my responsibilities included:

- Assisting project managers, management, and staff with overall health and safety related issues;
- Identifying high-risk activities that require health and safety support;
- Preparing site-specific Health and Safety Plans, Safe Work Plans and Job Safety Analyses for various URS projects throughout the NY Metro Area.
- Ensuring that all projects initiated through the operating unit had a health and safety review. Some example activities requiring health and safety support include: power projects, environmental and geotechnical investigations; hazardous waste operations; facility inspections; dam inspections; on water/ over water work; excavation/ trenching; waste disposal; and, sample storage.
- Identifying, providing maintaining all health and safety training (i.e. OSHA HAZWOPER, Field Safety, CPR/First Aid, DOT, etc.) for the operating unit.

Edward Sullivan, PE

Quality Assurance

Firm
AECOM (URS)

Personnel Level
Level 7

Education
1967 / Business Administration / New York University
Graduate School of Business Administration
1962 / Master of Engineering / Administration / George Washington University
1952 / Bachelor of Science / Civil Engineering / University of Notre Dame

Licenses/Registrations
Professional Engineer
- 1965 / New Jersey
- 1966 / New York 058974-1

Professional Associations
American Society of Civil Engineers, Life Member

Mr. Sullivan is the Quality Assurance Officer for the AECOM(URS) Metro- New York Offices. Mr. Sullivan develops Quality Manuals and Plans; conducts training; performs and directs audits of projects; coordinates project reviews; facilitates client feedback; and reports to management on results and issues. As Quality Officer for AECOM(URS) Program Management/ Construction Management, he participated in drafting the Quality Management System Procedures, Instructions and Forms for AECOM(URS) Infrastructure & Environment. He has developed Quality training courses. Some of his relevant programs and projects: MTA Bridges & Tunnels Inspection, design and CM; Tappan Zee Bridge design; NYSDOT Gowanus Expressway; NYCDOT Brooklyn Bridges; PANYNJ Rehabilitation projects; NJ Turnpike Newark Bay Bridge; NYC Dept of Design and Construction design and CM; NYCDEP program management, design and CM; and security design and CM for MTA NYC Transit, NJDOT, PANYNJ and Tappan Zee Bridge.

Experience

New Jersey Department of Transportation – Pulaski Skyway Rehabilitation. Design - Quality Officer - Conducts audits and coordinates project reviews and client feedback.

USACE New York District - Green Brook Flood Risk Management Project- New Jersey. Quality Auditor - Conducted Quality Audits for multiple task orders on the project, including plan formulation, engineering analyses, and design services.

USACE New York District - South River Coastal Storm Risk Management Project – New Jersey. Conducted Quality Audits for the updated plan formulation and engineering analyses.

Lake Lenape Dam – Quality Auditor. Conducted Quality Audits of the project's engineering analyses.

USACE New York District - Mamaroneck and Sheldrake Basins – Flood Risk Management, New York, NY. Quality Auditor – Conducted Quality Audits for the plan formulation of the project, hydrologic and hydraulic analyses, and alternatives analysis.

MTA/TBTA – Henry Hudson Bridge– HH-88 Toll Plaza Renovations, New York, NY. Quality Auditor - Conducted Quality Audit for HH-88 Henry Hudson Bridge Toll Plazas. WSP/URS design of reconstruction of toll plazas for gateless tolling option, and rehab decks, structures and building.

MTA/TBTA – Queens Midtown Tunnel - Quality Officer - New York, NY. Prepared Quality Management System Manual for QM-40 – Comprehensive Inspection and Design; coordinates audits and project reviews.

Edward Sullivan, PE Continued

New York State Department of Transportation - Republic Airport, Improvement Projects, Farmingdale, NY. Quality Officer - Conducted audits of design and construction of taxiway construction, aircraft arresting barriers, and other improvement projects, and coordinates Project Reviews.

New York City Department of Transportation - St. George Ferry Terminal - Staten Island, NY - $170,000,000. Quality Assurance Manager - ARRA-funded design-build reconstruction of Staten Island Ferry terminal ramps, bus terminal, taxi/auto loading, parking and intersection.

National Railroad Passenger Corporation - AMTRAK Systemwide - Program Management Oversight Services - $65,000,000. JV Quality Manager - Supporting AMTRAK staff on AMTRAK Improvements Projects. Developed and updated Project Execution Plans, conducts Audits and coordinates Project Reviews and client feedback. Coordinating QA on Amtrak Stations Development Program for design of handicapped accessibility improvements.

Port Authority of NY & NJ – Rehabilitation and Security Projects - $74,000,000. Quality Officer - Conducts training and audits of rehabilitation and security projects for bridges, PATH, WTC and airports; and coordinates client feedback and Project Reviews.

New York State Department of Transportation - Bruckner-Sheridan Interchange and Access to Hunts Point EIS - Bronx, NY - $400,000,000. Project Design Quality Assurance Manager - Leading QA/QC for the $400 million reconstruction of the Sheridan/ Bruckner Expressway Interchange and to improve access to Hunts Point.

New York State Department of Transportation - Gowanus Expressway Project - Brooklyn, NY - $500,000,000. Project Design Quality Assurance Manager Leads quality assurance for this $500+ million project to reconstruct the Gowanus Expressway Section of I-278 from the Verrazano-Narrows Bridge to the Brooklyn Battery Tunnel. Mr. Sullivan performed quality audits of final designs, drawings, specifications, and estimates.

Michael Cannon

Feasibility Study

Firm
AECOM (URS)

Personnel Level
Level 5

Education
1979 / Bachelor of Science / Hydrology / University of New Hampshire
1984
SAS Institute, Statistical Analysis System, 1984
1986
Cook College, Storm Water Management Seminar, 1986

Mr. Cannon has over 31 years of experience in the management and performance of storm damage reduction, erosion and flood control projects. These projects have required a wide variety of engineering, economic and environmental investigations. This data has been incorporated into a range of products including engineering and economic Feasibility Reports, Design Memorandum, NEPA documents, and construction bid documents. He has demonstrated the ability to provide complete plan development including all documentation necessary to ensure full compliance with applicable planning guidance. He is experienced in incorporating risk criteria into project performance and economic assessments.

Experience

New York District COE, Green Brook Flood Control Project, Somerset, Middlesex, and Union Counties, - Project Economist - Somerset, Middlesex, & Union Counties, NJ. Project Economist for the analysis of interior drainage facilities associated with levees proposed for the lower reaches of the Green Brook Sub-Basin. Utilized the Interior Drainage Analysis Program (INTDRA) to perform flood routings against variable river tailwater conditions to evaluate alternative facilities. Supervised economic evaluations and optimization of line of protection elements and interior drainage systems including considerations for risk of coincidental flooding impacts on Expected Annual Damages. Directed the economic analysis of an array of detention dams and channel improvement alternatives for the upper reaches of the Green Brook Sub-Basin. Responsible for expected annual flood damage and benefit computations to evaluate the impacts of changes in discharge, rating curves, inter-basin diversions and mitigation of induced damages.

US Army Corps of Engineers - Reconnaissance Study, North Shore of Long Island - Project Manager - Long Island, NY. Project Manager for the formulation and economic assessment of Federal and local interest in alternatives to reduce storm damage along the Long Island Sound coastline. Responsible for the line of protection layout and cost estimates, as well as benefit assessments. Formulated interior drainage features and coordinated the preliminary HTRW assessment.

South Shore of Staten Island Reconnaissance Study for NY ACOE. Project Manager for the formulation and economic assessment of preliminary storm damage reduction alternatives along the South Shore of Staten Island from Fort Wadsworth to Tottenville. The analysis required preliminary assessment of how to prevent flooding from interior drainage trapped behind levees and floodwalls due to storm tides in Raritan Bay. A detailed Reconnaissance Report was prepared which included a preliminary HTRW assessment.

Michael Cannon Continued

US Army Corps of Engineers - South River Integrated Feasibility Study for Flood Control and Ecosystem Restoration Interior Drainage Analysis & QC Reviews. Mr. Cannon is served as the project manager responsible for developing and optimizing interior drainage facilities for the proposed levee and closure gate system across South River near its confluence with the Raritan River. The assessment of correlation indicated that the statistical flood correlation is weak, though there is potential for coincidence and dependence. The approach selected to analyze this uncertainty in tailwater conditions was to evaluate each interior event against a range of possible exterior events. This resulted in a series of stage vs. frequency and damage versus frequency curves, each of which was assigned a probability of occurrence. The curves were combined in the risk-based sampling program @RISK to calculate the annual damage and benefits for each interior alternative. Mr. Cannon supervised the hydraulic and hydrologic analysis of the interior drainage facilities. The analysis utilized HEC-IFH for drainage trapped behind levees and floodwalls. For the main sector gate closure at South River, it was necessary to evaluate how operating the gate in response to tidal cycles could maximize the storage in the estuary and reduce pump requirements. This was completed using a custom routing program allowing for complex gate operation rules.

US Army Corps of Engineers - Passaic River Basin Flood Damage Study - Engineering Economist - NY & NJ. As Engineering Economist, performed structure inventory and flood damage assessment. Assisted in the development of Structure Valuation and Flood Damage Assessment Guidelines, sample size requirements, and depth vs. damage relationships. Implemented data base management and statistical analysis procedures, which were linked to SID files. Supervised statistical update procedures for the General Reevaluation Report.

US Army Corps of Engineers - Reconnaissance Study - Project Economist - Raritan Bay and Sandy Hook Bay, NY. Project Economist to evaluate tidal flood control and erosion control for twenty miles of coast with numerous tidal creeks and inlets.

US Army Corps of Engineers - Reconnaissance and Feasibility Studies - Principal Economist - Long Beach, NY. Principal Economist for evaluation of storm protection for a nine-mile beach fill and dune system. Responsible for developing data collection and sampling standards, plan formulation, economic analysis and preparation of the main text and economic appendix.

US Army Corps of Engineers - Combined Flood Control and Shore Protection and Feasibility Study - Project Manager - Port Monmouth, NJ. Project Manager for plan formulation and preparation of the Feasibility Report. Responsible for formulating flood protection plans. The recommended plan included a levee system along Comptons Creek on the East, berms and dunes along Raritan Bay on the North, and a flood wall with storm closure gate extending across Pews Creek, meeting an existing Federal Project to the west. The analysis required maximizing NED outputs while avoiding or minimizing environmental impacts. The HECFDA computer program was used to assess benefits using risk and uncertainty procedures.

Upper Rockaway River Basin Flood Damage Reduction and Ecosystem Restoration Feasibility Study, NJ, USACE New York District. Project Manager for the economic assessments and the preparation of an integrated Feasibility Report/ NEPA document for the Upper Rockaway River Feasibility Study in Morris County and Sussex County NJ. The Report identifies five ecosystem restoration sites and construction of a diversion tunnel, dam modifications, channel improvements and building elevation as the NED and NER plan components. The Integrated Feasibility Report format was selected to help facilitate tradeoffs between the NED/NER Accounts.

Angela Chaisson, CWB®

NEPA EIS

Firm
AECOM

Personnel Level
Level 5

Education
BS, Wildlife Resources, West Virginia University, 1983

Licenses/Registrations
- license, #, location, Year

Years of Experience
30 Years

Professional Associations
The Wildlife Society

Training and Certifications
- 2005, URS Certified Project Manager
- 1998, Certified Wildlife Biologist (CWB®)/The Wildlife Society
- 1989, Certified in Wetland Evaluation Technique (WET) 2.0, Federal Highway Administration
- 1988, Certified in Habitat Evaluation Procedures (HEP), U.S. Fish and Wildlife Service

Ms. Chaisson has 30 years of experience in environmental sciences, with strong capabilities in NEPA compliance projects and terrestrial wildlife ecology. She provides senior technical expertise and oversight for projects involving NEPA and ESA compliance, including preparing EAs/EISs, and Biological Assessments (BAs) and conducting threatened/endangered species surveys, natural resources studies, wetland delineations, and wildlife habitat evaluations. She has worked with a wide range of clients, including the U.S. Coast Guard, FEMA, NASA, the U.S. Army, FHWA, the U.S. Army Corps of Engineers, the U.S. Navy, the Department of Veterans Affairs, the U.S. Fish and Wildlife Service, the Small Business Administration, the Federal Energy Regulatory Commission, state and local agencies and transportation departments, and private developers.

Experience

Programmatic Environmental Impact Statement (PEIS) and Nationwide Biological Evaluation (BE) for Modifications to the National Flood Insurance Program for FEMA, Washington DC, October 2014, $360,000. As a subcontractor to Booz Allen Hamilton, preparing biological resource sections of the PEIS and preparing the BE to address potential effects nationwide on listed and proposed threatened and endangered species, critical habitats, and Essential Fish Habitat from proposed modifications to the NFIP.

NEPA, Section 106, and Endangered Species Act Compliance for Hurricane Sandy Recapitalization Projects in NJ for the U.S. Coast Guard, 2013 – $703K. The U.S. Coast Guard (USCG) is proposing to rebuild three USCG Stations in New Jersey (Sandy Hook, Atlantic City, and Manasquan Inlet) under the 2013 Disaster Assistance Supplemental Act (P.L. 113-2), which appropriated funds to replace USCG shore facilities damaged by Hurricane Sandy in October 2005 with hurricane- and flood-resilient structures. The proposed projects would reduce future storm damage and down time for mission critical facilities by constructing new, hardened shore facilities above the 500-year flood elevation, where practicable, and to hurricane-resistant building codes.

URS is conducting regulatory compliance under several federal regulations which apply to these projects:

- National Environmental Policy Act (NEPA) - URS is preparing Environmental Assessments (EAs) to describe the existing conditions at each station and evaluate potential impacts of the proposed recapitalization actions and viable alternatives on socioeconomic, physical, natural, and cultural resources.

Angela Chaisson, CWB® Continued

- National Historic Preservation Act - URS is conducting consultation with the New Jersey State Historic Preservation Office (SHPO) under Section 106 of the NHPA, and preparing a Memorandum of Agreement (MOA) for historic structures at each station. URS is facilitating meetings with USCG and the NJ SHPO to address SHPO concerns and integrate the Secretary of the Interior's Standards for the Treatment of Historic Properties (35 CFR Part 68) into the final DB/RFP plans and specifications, per requirements of the draft MOAs now being negotiated with the NJ SHPO. At Station Sandy Hook, URS is conducting a Phase I Archaeological Survey within areas of high archaeological potential.
- Endangered Species Act (ESA) - URS prepared a Biological Assessment (BA) for Station Sandy Hook to determine whether the proposed improvements are likely to adversely affect listed species or critical habitat, jeopardize the continued existence of species proposed for listing, or adversely modify proposed critical habitat. The species addressed in the BA are piping plover, red knot, seabeach amaranth, and northeastern tiger beetle. The BA was prepared in accordance with federal agency consultation requirements associated with the Endangered Species Act, Marine Mammal Protection Act, Bald and Golden Eagle Protection Act, and Migratory Bird Treaty Act.
- Magnuson-Stevens Fishery Conservation and Management Act - URS is preparing Essential Fish Habitat Assessments for each of the three stations to evaluate potential project impacts on managed fish habitat.

Environmental Assessment for Proposed Air Mobility Warfare Center Contingency Operations Compound, Fort Dix, NJ, Project Manager, 2000. Under contract to the U.S. Army Corps of Engineers, Seattle District, managed preparation of an Environmental Assessment (EA) to assess the environmental impacts of the construction of the proposed Air Mobility Warfare Center (AMWC) Contingency Operations Compound (COC) at Fort Dix, New Jersey. The AMWC/COC would provide a 4-acre storage area for Air Force field training equipment and vehicles. Coordinated closely with the Army, Air Force, and New Jersey Pinelands Commission, as well as other Federal and state agencies. At the client's request, expedited preparation of the EA and submitted a draft for client review within 30 days.

EA and Section 7 Coordination for Group Sandy Hook Housing Project, U.S. Coast Guard, Monmouth County, NJ, Project Manager, 1991. Prepared an environmental assessment to address environmental impacts of a proposed housing project on Base Sandy Hook. Successfully coordinated with federal and state agencies to address potential impacts to the then Federally-threatened and State-endangered piping plover (Charadrius melodus), the State-endangered least tern (Sterna albifrons) and black skimmer (Rhynchops nigra), the State-threatened osprey (Pandion haliaetus), and a State specialty plant.

Environmental Assessment for the Rehabilitation of the Ellis Island, NY, Historic Seawall, National Park Service, 2006. Senior Technical Reviewer for this EA to address potential environmental impacts from the proposed $17 million rehabilitation of the historic stone seawall. This seawall protects Ellis Island as a historical resource of national significance, maintains the safety of the island's visitors and staff, and retains the landfill that composes almost 90 percent of the island's mass. The EA included a site reconnaissance and cultural resources evaluation.

A number of different masonry and structural repair techniques were proposed for the rehabilitation. depending on site-specific conditions. URS conducted the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) processes simultaneously.

Michael D. Smith, PhD

NEPA EIS

Firm
AECOM

Personnel Level
Level 5

Education
Ph.D., Sociology, Utah State University, 1998
M.A., Geography, University of Wyoming, 1994
B.A., Environmental Studies, University of California, Santa Cruz, 1991

Professional Associations
American Bar Association, Section on Environment, Energy and Resources
Association of Environmental Professionals
Environmental Law Institute
International Association for Impact Assessment
National Association of Environmental Professionals

Training and Certifications

- Frequent lead trainer for NEPA and CEQA courses offered through the
- University of California, Duke University, Utah State University,
- The Shipley Group, and with numerous state and federal agencies

Dr. Michael D. Smith is a nationally-recognized leader in National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), Canadian Environmental Assessment Act (CEAA) and associated environmental law compliance with over 20 years of experience in project and program management, technical analysis, policy development, and training/ education for a wide range of public and private sector clients.

He has managed and provided compliance review for some of the nation's largest, most complex, and highly controversial projects in a wide variety of sectors, including water infrastructure and flood control, energy siting and development project, major rail and other transportation infrastructure initiatives, regulatory approval of genetically engineered plants, commercial space transportation operations, and approval of new fuel economy standards for all vehicles operated in the U.S.

He frequently provides training and strategic advice for NEPA, CEQA and related environmental compliance requirements for public and private sector clients as a faculty member at the Duke Environmental Leadership Program at Duke University's Nicholas School of the Environment, and as a faculty member at the NEPA Certificate Program at the Department of Environment and Society, Quinney College of Natural Resources at Utah State University, with the University of California Extension, and as a Senior Consultant at The Shipley Group.

He is a past recipient of a Science & Technology Policy Fellowship with the American Association for the Advancement of Science (AAAS) at the Environmental Protection Agency (EPA) headquarters Office of Water and Office of Federal Activities in Washington, DC. From 1998 to 2007, he was an Associate Professor of Environmental and Natural Resources Sciences at Humboldt State University, where he taught courses and conducted research in environmental impact assessment, environmental planning, land use planning, and community development.

He has published extensively on environmental assessment and policy in numerous peer-reviewed journals, and served as an Associate Editor of the professional journal Society and Natural Resources.

Experience

National Environmental Policy Act (NEPA) Training, Duke Environmental Leadership Program, Nicholas School of Environment, Duke University (co-sponsored by the White House Council on Environmental Quality (CEQ), Durham, NC. Dr. Smith serves as a frequent trainer for courses focusing on implementation of NEPA, climate change, cumulative effects, socioeconomic issues, and environmental justice.

National Environmental Policy Act (NEPA) Training, NEPA Certificate Program, Department of Environment and Society, Quinney College of Natural Resources,

Michael D. Smith, PhD Continued

Utah State University. Dr. Smith serves as lead instructor for NEPA implementation and decision-making courses for representatives of government agencies, the private sector, and NGO groups.

National Environmental Policy Act (NEPA) Training, The Shipley Group, various locations nationwide. Dr. Smith serves as lead trainer for one to four-day NEPA workshops conducted for federal agencies and private-sector clients throughout the U.S. He has taught dozens of workshops on subjects including NEPA Process Overview, NEPA Climate Change Analysis, Reviewing NEPA Documents, NEPA Cumulative Effects Analysis, NEPA Project Management, and NEPA Clear Writing. In addition, he has served as lead or co-lead author for training manuals on NEPA Climate Change Analysis and NEPA Cumulative Effects Analysis. He also served as a co-lead author for a new NEPA Procedures Manual developed for the U.S. Air Force.

NEPA/CEQA/EIA Compliance for Water and Restoration Projects Sacramento Flood Control Agency and U.S. Army Corps of Engineers, North Sacramento Streams, Sacramento River East Levee, Lower American River, and Related Flood Improvements Project, Sacramento, CA. Dr. Smith is serving as the Lead for NEPA compliance for this project to implement flood system improvements to reduce flood risk along the Sacramento River, American River, Natomas East Main Drainage Canal, and Arcade Creek. The proposed project is part of an ongoing federal-State-local effort to improve the flood system in the Sacramento area that was initiated in the aftermath of the record flood of 1986. This effort has been characterized by three relatively distinct periods of flood risk management activity each triggered by a major flood event and each marked by a heightened post-flood awareness of flood risk and an increasingly aggressive response to this perceived risk. These recent flood events and resulting flood risk reduction efforts occurring over the past 25 years provide the context in which the key elements of the proposed project have been formulated including levee accreditation, system resiliency improvements, levee modernization, and implementation of a conservation strategy. [2014-Present]

Tennessee Gas Pipeline Company – Kinder Morgan Energy Partners, Construction and Operation of the Northeast Energy Direct Pipeline FERC Application Resource Reports, Pennsylvania, New York, Massachusetts, New Hampshire and Connecticut. Dr. Smith is leading the cumulative effects analysis for Tennessee's FERC resource reports examining the construction and operation of approximately 418 miles of natural gas pipeline and associated facilities in five Northeastern states. [2015 - Present]

NEPA/CEQ/EIA Compliance for Transportation Projects US Department of Transportation, Volpe National Transportation Systems Center, NEPA Compliance Support, Cambridge, MA and various locations nationwide. Dr. Smith served as the overall Program Manager for this five-year, $40 million multiple-award IDIQ contract. Work under the contract involved assisting primarily transportation-related federal agencies with NEPA, Endangered Species Act, National Historic Preservation Act, and Clean Air Act compliance for a variety of projects. [2011 – 2013, Prior to AECOM]

Federal Aviation Administration, Office of Commercial Space Transportation, NEPA-related Services, Washington, DC and various locations nationwide. Dr. Smith served as the Program Manager for this multi-year mission support contract to provide a range of NEPA-related services to the office, including EA and EIS preparation and review, policy direction, NEPA regulation oversight and development, and the development of NEPA process streamlining strategies. [2008-2013, Prior to AECOM]

Federal Housing Finance Agency, Rulemaking Concerning Mortgage Assets Affected by Property Assessed Clean Energy Programs EIS, various locations nationwide. Dr. Smith served on the management team for this EIS that analyzed impacts on energy efficiency program use in the residential housing sector, including analyses of greenhouse

Brian W. Beckenbaugh, AICP, PP

Public Outreach & Community Engagement

Firm
AECOM (URS)

Personnel Level
Level 5

Education
1994 / Bachelor of Arts / English / University of Illinois
1996 / Master of Science / City and Regional Planning / Rutgers University

Licenses/Registrations
- 2002 / Professional Planner, New Jersey 33LI00569100
- 2002 / American Institute of Certified Planners Professional Planner

Mr. Beckenbaugh has 19 years of experience in water resources planning, hazard mitigation, and land use/environmental planning. He is responsible for environmental, economic, and regulatory review of flood control, hurricane protection, navigation improvement, structural retrofit and floodproofing, hazard mitigation, disaster recovery and environmental restoration projects. Duties include project management, public outreach, NEPA review, technical writing, and GIS support and staff training.

Experience

Lead Planner, New York Rising Community Reconstruction (NYRCR) program, Community Reconstruction Plan for Gerritsen Beach and Sheepshead Bay, Brooklyn, 2013-2014. As part of a Superstorm Sandy recovery effort, managed a team of planners, civil engineers, and economic development and public outreach specialists to prepare a reconstruction plan and to identify priority infrastructure and community investment projects for the allocation of Community Development Block Grant-Disaster Recovery (CDBG-DR) funds. Over a 7-month period, coordinated with local planning committee, organized public outreach efforts and events, reviewed needs and opportunities with multiple agencies from the City of New York, and prepared detailed project profiles for the allocation of $13.3 million. Projects focused on building retrofit and floodproofing, enhancement of community capabilities for emergency response, and further evaluation of large-scale flood-risk reduction measures.

Planner, Green Brook Flood Control Project, Somerset, Middlesex, and Union Counties, NJ, New York District USACE, 1999. Planner for the design of non-structural elements of this major New York District USACE flood control project. Coordinated and evaluated alternative flood proofing solutions for 22 isolated commercial and residential structures not otherwise protected by levees and/or floodwalls. Work included on-site inspections, coordination with homeowners, preparation of preliminary plans and cost estimates, and presentation of alternatives to local public officials and residents.

Planner, South Shore of Staten Island (SSSI) Feasibility Study, Staten Island, NY, New York District USACE 2001 and 2013. Organized production of a Public Information Session as the first step in ongoing public outreach efforts. The effort involved extensive agency coordination and preparation of informational materials. In 2013, used GIS parcel data, potential project alignments, and City of New York Bluebelt land acquisition plans to identify areas for interior drainage plan, including ponding and retention areas.

Delaware River Interim Feasibility Study for New Jersey, Philadelphia District, US Army Corps of Engineers (USACE), 2009-2014. Project Manager
- Evaluated flood risks identified

Brian W. Beckenbaugh, AICP, PP Continued

opportunities for risk reduction in sixteen repetitively-flooded NJ communities on the Delaware River. Conducted site visits and developed concept-level structural and non-structural plans and costs for flood risk reduction. Primary author of feasibility study report. Prepared public outreach materials including brochures, posters, and articles for public meetings and project website.

Policy Adviser, FEMA Public Assistance Policy Group, Hurricane Irene, Federal Emergency Management Agency, 2012. Advised senior FEMA management on Public Assistance policy for response to Hurricane Irene, in Albany, NY. Prepared policy briefs, responded to Congressional inquiries, and worked with State of NY emergency management staff to resolve eligibility matters in a "pre-appeal" setting.

Project Planner, Fire Island to Montauk Point Storm Damage Reduction Reformulation Study. Nonstructural Plan Development, New York District USACE, 1999–2008. Oversaw development of and performed QA/QC of 38,000 building GIS database. Used database to prepare economic evaluations of storm damage impacts and benefits of potential project measures. Responsible for planning major conference on non-structural flood risk mitigation in project area, with over 100 attendees, including Congressional representatives. Prepared case studies of non-structural methods for four study area communities and participated in public outreach meetings to discuss project alternatives. Contributing author to Non-Structural Storm Damage Reduction Alternatives report, 2005.

Appeals/Policy Adviser, FEMA Public Assistance Policy and Correspondence Group, Hurricanes Katrina and Rita, Federal Emergency Management Agency, 2006. From December 2006 to mid-March 2007, completed first appeal responses and prepared official correspondence between FEMA Public Assistance and the State of Louisiana, internal FEMA requests for information, and Congressional and media inquiries. Identified eligible and ineligible items of work on Project Worksheets, evaluated labor costs, contractor invoices, and purchases of equipment and material. Subsequent backfill assignment in same role in 2008.

Public Assistance Coordinator, Winter Storm Damage Assessments, San Bernardino and Riverside Counties, CA, Federal Emergency Management Agency, 2005. Public Assistance Coordinator (PAC) for damage assessments for winter storms and flooding. Managed a team of Project Officers and coordinated with state and local governments to assess disaster-related damages and prepare applications for federal reimbursement of eligible costs. Conducted kick-off and exit meetings with local applicants, provided program guidance to staff, reviewed Project Worksheets, and maintained case management files.

John P. Bianco

Flood Risk Mitigation

Firm
AECOM

Personnel Level
Level 5

Education
MS, Civil Engineering, Johns Hopkins University, 1981
BS, Civil Engineering, Rutgers University, 1977

Licenses/Registrations
Professional Engineer, New Jersey

Professional Associations
Association of State Dam Safety Officials

Mr. Bianco has provided senior leadership as a lead technical designer in developing innovation solutions for civil work flood risk mitigation projects throughout all phases of study. Mr. Bianco has served in a number of key design positions within the dam/levee safety programs while working for the US Army Corps of Engineers (USACE). With over 36 years of USACE experience he is very knowledgeable with regard to planning, detailed design, construction (preparation of plans and specifications), and the rehabilitation of large civil works projects including levees, interior drainage system components channels, dams, bridges and related infrastructure facilities. Mr. Bianco was also responsible for the structural integrity and the technical readiness aspects for over 50 dams, 200 levee segments, and 120 bridges situated within the northeastern region of the United States. These projects were either federally owned and operated by USACE or were federally designed and/or constructed with the operational aspects of these projects turned over to State, Municipal or Local agencies/entities.

Experience

Passaic Valley Sewage Commission (PVSC) Ring Floodwalls, Newark, NJ. Working as the Floodwall Task Design Leader through an AECOM| HDR JV to PVSC. Performing duties as the technical design lead for 2 ring floodwalls protecting the Nation's 5th largest Water and Waste Water Treatment Plant (WWTP). Design includes coastal engineering analysis that includes wave dynamics, wave forces, MIKE21 modeling, vessel impact analysis and developing overtopping rates that accommodates Sea Level Change (SLC) and Freeboard determination. Floodwall design includes, structural, geotechnical, civil site layout and detailed cost estimating. CWE ~ $ 75 million. [with AECOM]

Engineering Assessments - 4 NYCDEP Class B Dams in New York State. Performing duties as the technical design manager for the development of 4 engineering assessments (per NYSDEC regulatory guidance) that includes assessing the geotechnical and structural stability of each dam, performing a hydraulic assessment of the hazard classification (dam break analysis) & performing technical assessments of the ability of each project to pass the required Spillway Design Flood (SDF) or meeting NYSDEC drawdown criteria timelines for the spillway and outlet works structures. [with AECOM]

Northampton Levee/Floodwall Systems, Periodic Inspections & Risk Assessments. Providing technical advisory management oversight of technical memorandum & risk analysis of pump station, preparation of supplemental data for the South Street drop structure, review of oxbow bridge alternatives and main stem technical freeboard reviews as related to Mill Creek & Connecticut River. [with AECOM]

John P. Bianco Continued

US Army Corps of Engineers - North Atlantic Division, Hurricane Sandy Recovery Efforts, New York. Led the Sandy Coastal Management Division. Responsible for rapidly establishing the organization following landfall of Super Strom Sandy; establishing technical roles and responsibility requirements for 22 special assigned team members; hiring of temporary and permanent staffs during the response and recovery phases; while providing technical managerial oversight for five major program areas (flood control and coastal emergencies (FCCE); operations and maintenance (O&M); general investigations (GI), authorized but unconstructed projects (ABU), and on-going project studies. [Prior to AECOM]

US Army Corps of Engineers - New York District, Passaic River Basin Levee/Floodwall - Flood Damage Reduction, New York. Final technical design authority as Chief Civil Design Branch. Project included as the centerpiece the multi-intake diversion tunnel. Fully responsible for planning, scheduling and the technical adequacy of all portions of the hydrology, hydraulic, civil site layout, cost engineering and structural elements of the $2 billion Passaic River Flood Damage Reduction Project (early 1990s). Performed hydrologic and hydraulic design on levee/floodwall systems while also exercising technical management oversight for teams assembled to design civil, hydrologic, hydraulic, coastal, structural, CADD specialist, and cost estimating personnel. Developed detailed scope of work and negotiated numerous task orders with seven Corps districts and 12 A-E firms. Planned and negotiated design contracts for levee designs, flood gates, hydraulic grade control weirs, CADD support contracts, tunnel elements and hydraulically complex inlet/outlet structures. Directed and performed risk and uncertainty studies for critical elements. Fully coordinated geographically dispersed design teams to minimize costs, reduce environmental impacts with the goal of gaining resource agency approvals, local sponsor acceptance and support for the recommended plan. Attended and presented at over 100 public meetings throughout northern New Jersey as the technical leader of the project. [Prior to AECOM]

US Army Corps of Engineers - New York District, Waterbury Dam, New York. Senior Technical Designer involved on numerous USACE-owned and operated facilities. Lead Hydrologist/ Hydraulic Technical Engineer worked closely with senior geotechnical, structural, mechanical, and electrical engineers to design complex modifications, rehabilitations, and/ or repairs to existing facilities. Issues to be corrected included deep foundation seepage or conduit pathways; inadequately sized or hydrologically deficient spillways or pertinent auxiliary structures; pool elevation frequency curves, intake tower modifications or water control manual revisions intended to optimize the congressionally authorized project purposes. [Prior to AECOM]

US Army Corps of Engineers - New England District, Westville and West Hill Dams, Worcester and Uxbridge, Massachusetts. Senior Technical Designer involved on numerous USACE-owned and operated facilities. Lead hydrologist/hydraulic technical engineer worked closely with senior geotechnical, structural, mechanical, and electrical engineers to design complex modifications, rehabilitations, and/ or repairs to existing facilities. Issues to be corrected included deep foundation seepage or conduit pathways; inadequately sized or hydrologically deficient spillways or pertinent auxiliary structures; pool elevation frequency curves, intake tower modifications or water control manual revisions intended to optimize the congressionally authorized project purposes. [Prior to AECOM]

US Army Corps of Engineers, Paxton Creek Levee/Floodwall Local Flood Protection, Harrisburg, Pennsylvania. Designed levee, floodwall, interior drainage facilities, pump stations and remote facilities located away from the line-of-protection. Detailed interior dam by performing required hydrologic and hydraulic design for Asylum Run Dam that reviewed top-of-dam elevation versus spillway width tradeoffs, spillway crest elevation and frequency, conduit

Jennifer Curran

Ecosystem Restoration

Firm
HDR, Inc.

Personnel Level
Level 6

Years of Experience
19

Education
M.S., Marine Environmental Science; State University of New York at Stony Brook, Marine Science Research Center, 2001
B.S., Environmental Science, Natural Resource; Johnson State College, Vermont, 1995

Memberships
American Fisheries Society
Atlantic Estuarine Research Society
Society of Environmental Toxicologists and Chemists – Board Member of the Hudson-Delaware Chapter (2004 – 2007)

Ms. Curran is the Manager of the Ecosystem Restoration Sciences Section at HDR. She specializes in leading multi-disciplinary teams conducting environmental assessments and ecological restoration projects. She focuses on identifying opportunities to minimize human influences on natural habitats, and to restore functionality to degraded ecosystems. Ms. Curran has more than 15 years of experience managing projects that generally relate to NEPA and regulatory compliance, habitat restoration, aquatic, estuarine and terrestrial ecology.

Experience

Evergreen MRI3 Wetland Mitigation Bank and Global Terminal Expansion Project Mitigation, Carlstadt, NJ. Evergreen Environmental developed of a 51-acre tidal wetland mitigation bank and a 17-acre wetland mitigation project along the Hackensack River. The projects required the removal of a tide gate, breaching a flood berm and grading the site to allow free tidal exchange with the river. Allowing tidal flooding to the site has potential implications to surrounding properties. Ms. Curran led the HDR team that conducted hydrologic analyses to determine the effects of increased tidal exchange on the surrounding properties, designed the restoration plan and prepared permit application materials for the NJDEP and the USACE. HDR also assisted Evergreen to coordinate with the USFWS, NOAA and to prepare a Prospectus and Mitigation Banking Instrument for the Meadowlands Interagency Mitigation Advisory Committee (MIMAC). The 17-acre portion of the project served as mitigation for the expansion of the Global Marine Terminal on the Port Jersey Peninsula in Bayonne and Jersey City, New Jersey. The project was constructed in 2012, and HDR is currently conducting the Year 3 post-construction monitoring program. The wetlands are already in compliance with NJDEP and USACE Year 5 permit conditions of 85% cover of native vegetation and less than 10% cover of invasive species.

Evergreen Mill Creek Point Mitigation Bank, Secaucus, NJ. Evergreen is developing a 22-acre mitigation bank in the Hackensack Meadowlands along Mill Creek in Secaucus, NJ. HDR is assisting Evergreen in all aspects of planning and ecosystem design, including baseline environmental sampling, wetland delineation, preparing a Prospectus and Mitigation Banking Instrument, 50% Design Documents. As the project continues to gain support from the MIMAC (the IRT for the bank), HDR will prepare permit application materials and finalize the construction documents. Ms. Curran is the client manager who provides oversight to ensure that the client's expectations and schedule are being met.

Hudson-Raritan Estuary Ecosystem Restoration Study – Comprehensive Restoration Plan, New York/New Jersey Port District. Ms. Curran led the HDR team that assisted the USACE

Jennifer Curran **Continued**

– New York District to develop the Comprehensive Restoration Plan to restore degraded habitats within the Hudson-Raritan Estuary (HRE). She worked closely with the USACE project team, the local partner the Port Authority of New York & New Jersey (PANYNJ) and the region's vast stakeholder community to assist in the development of an environmentally sound restoration plan. HDR was responsible for the development of the public involvement plan, the identification and cataloging of potential restoration measures for the degraded habitats, agency and stakeholder involvement, and drafting the Comprehensive Restoration Plan (CRP) for the Estuary. The Draft CRP was published in April of 2009, HDR further assisted the USACE to present the project at community outreach meetings in each of the eight Planning Regions between 2010 and 2012, and prepared an Executive Summary outlining proposed changes to the Draft CRP in June of 2014. HDR is currently updating the Draft CRP for release in late 2015.

Feasibility Investigation and Pilot Project for Forested Wetland Restoration in the New Jersey Meadowlands, Carlstadt, NJ. Ms. Curran is leading the HDR team currently assisting the PANYNJ to conduct a feasibility investigation to determine whether a 79-acre parcel could support a freshwater forested system. Establishing an on-site forested wetland could potentially mitigate future impacts to the forested wetlands at the Teterboro Airport facility. The groundwater table is closer to the surface than typical of a forested wetland, and groundwater salinity levels are also above the typical range for this type of habitat. For this reason, HDR recommended and designed a one-acre pilot restoration project that includes a variety of tree and shrub species subjected to different conditions (e.g. pool and mound topography, mulch). The concept was presented to the MIMAC, who agreed that it was a sound approach. HDR prepared the NJDEP and USACE and County Soil Conservation District permit applications for the pilot project, and the permits were issued in the spring of 2015. HDR prepared construction documents, and the site was constructed in the late spring of 2015. We are currently monitoring the site to determine whether there are species that can thrive at the site, and which treatments would be beneficial for their survival.

Coney Island Creek Tidal Barrier and Wetlands Feasibility Study, Brooklyn, NY. As a subconsultant to Arcadis, HDR is assisting the New York City Economic Development Corporation - with the preparation of a Feasibility Study for the provision of flood risk reduction to Coney Island and surrounding neighborhoods in Brooklyn, New York. Ms. Curran is leading the Ecology tasks, which include the identification and design of natural and nature based features such as wetlands and living shorelines that could be designed to both provide flood risk reduction, and serve to mitigate for wetland impacts associated with the construction of a tidal barrier. The tasks include extensive stakeholder coordination with the public and resource agencies.

Wreck Pond Feasibility Study, Spring Lake, NJ. HDR is assisting the USACE to prepare a Feasibility Study to determine the costs and benefits of developing flood risk reduction and ecosystem restoration measures along Wreck Pond, which is located in Spring Lake and Sea Girt, New Jersey. The coastal pond is cut off from tidal influence with the Atlantic Ocean by a weir. Hurricane Sandy's erosive forces cut an inlet to the pond, and the surrounding communities were subject to coastal flooding. Ms. Curran is leading the environmental tasks for this project. These include identifying alternate ecosystem restoration measures within the study area to maximize habitat in this highly modified system, and preparing a NEPA Environmental Assessment that evaluates the impacts of the different flood control and restoration alternatives.

Evergreen Hackensack River Mitigation Bank Development, Ridgefield, NJ. As Project Manager, Ms. Curran assisted Evergreen Environmental to determine the feasibility of developing a 45-acre tidal wetland mitigation bank on the Hackensack River in Bergen County, NJ.

Duane Gapinski, PE

Feasibility Study

Firm
HDR, Inc.

Personnel Level
Level 7

Years of Experience
33

Education
MS, National Resource Strategy; National Defense University, 2001
ME, Chemical Engineering; Rensselaer Polytechnic Institute, 1988
BS, Engineering; United States Military Academy, 1982

Licenses/Registrations
Professional Engineer, Virginia USA (No. 0402022477)

Mr. Gapinski brings 33 years of experience, the last 10 of which have focused on managing the delivery of complex projects and programs, including water systems. These programs have encompassed a multitude of issues such as hydraulic structures (dams, levees, reservoirs, tunnels, etc.), economic impacts, regional planning, and public outreach. He is a seasoned U.S. Army Corps of Engineers (USACE) Program Manager, overseeing the work done under more than 30 contracts with USACE over the last six years. Served more than 24 years in the military, including as District Commander of USACE Rock Island from July 2003 to July 2006. In the aftermath of Hurricane Katrina, Mr. Gapinski led the efforts to unwater the New Orleans area and, as a result, was recognized as National Society of Professional Engineers Top 10 Federal Engineer of the Year and an ENR Top 25 Newsmaker.

One of his most notable efforts was directing HDR's participation in the $14.6 billion program management support for the reconstruction of the New Orleans Area Hurricane and Storm Damage Risk Reduction System. This work was comprised of more than 350 construction projects such as water and transportation systems and infrastructure. Mr. Gapinski also led the HDR team for the Truckee River flood control project. He oversaw the team to perform value engineering, cost estimates, economics, Environmental Impact Statement and engineering report.

Experience

USACE New York District, NY/ NJ Ecosystem Restoration Program, Various Locations, NY/NJ. Program Executive. Mr. Gapinski is responsible for overseeing program and project execution. He supervises the Contract Manager and Project Managers by conducting project reviews to ensure proper scope, schedule, budget and resourcing of individual task orders and supervising contract and task order negotiations. The total contract value is $16M.

USACE St. Paul District Ecosystem Restoration, St. Paul, MN. Program Executive. Mr. Gapinski is responsible for overseeing program and project execution. He supervises the Contract Manager and Project Managers by conducting project reviews to ensure proper scope, schedule, budget and resourcing of individual task orders and supervising contract and task order negotiations. Total contract value is $3.5M.

USACE Jacksonville/SFWMD Comprehensive Everglades Restoration Plan and C-44 Dam and Reservoir Design, FL. Program Manager responsible for overseeing program and project execution. Supervises the project managers by performing quality controls on task order proposals and conducting project reviews to validate proper scope, schedule, budget and resourcing of individual task orders. Also supervises contract and task order negotiations. Additionally, performed quality control (QC)

Duane Gapinski, PE Continued

on the draft Lake Okeechobee Feasibility Report.

USACE Louisville A-E IDC for Great Lakes and Ohio River Division, Various Locations. Program Manager. Oversaw all aspects of this contract which involved development of design-build requests for proposals (RFPs), facilitation of design charrettes, planning studies, and full design services. Work performed under this contract includes dam safety, flood damage reduction, navigation, Flood Emergency Plans, Flood Evacuation Plans, Reconnaissance Reports, Feasibility Reports, Modification Studies, and Design Document Reports.

USACE Rock Island District A-E Services for Civil Works Projects, Various Locations. Program Manager responsible for all aspects of executing this contract as the District's single point of contact. Selected project managers for each task order, oversaw project team staffing and ensured adherence to HDR's and USACE's quality objectives. Projects have included engineering design, flood risk management, feasibility studies, H&H modeling, plans and specifications and cost estimates.

USACE, Kansas City – IDIQ for Planning & Engineering Support for Civil Works: Kansas River Modeling, MO. Program Manager. Supervises project managers for series of task orders for Kansas River Modeling effort, a mechanism for evaluating various Kansas River Basin lake operation procedures and assessing reservoir operation impacts on the lower Kansas River. This major water resources planning process is to be used to evaluate changes in physical outputs, system impacts, and economic characteristics across baseline condition and alternative operational scenarios.

City of West Sacramento, Problem Identification and Alternatives Analysis, CA. HDR is providing preliminary geotechnical services for evaluation of under seepage, slope stability and erosion assessment for a portion of the levee system surrounding West Sacramento.

Hurricane Protection System Program Management, New Orleans, LA. Program Manager responsible for the program management support to the USACE provided by 150 on-site consultants. Led the development of a 16,000 activity integrated master schedule used to manage the reconstruction of the New Orleans area Hurricane Protection System, a $14.6 billion program with over 350 construction projects and several studies. Supervised the market and risk analyses and development of the programmatic cost estimate which was used to justify and receive full funding by the US Congress. Developed the risk mitigation strategies used to deliver the program on schedule and under budget. Oversaw the development and use of performance metrics and the conduct of resource analyses. Our project managers supervised pump station damage assessments conducted for the development of the pump station repair portion of the program. Additionally, after Hurricane Gustav, several of our staff was recognized for their excellent work in tracking the progress of preliminary damage assessments.

Truckee River Flood Control Project General Reevaluation Report, Reno, NV. Project Manager responsible for managing the scope, schedule, budget and quality of support to the Truckee River Flood Management Agency. HDR developed a new Locally Preferred Plan and amended the USACE General Reevaluation Report and EIS for the Truckee River Flood Control Project. Supervised the risk assessment and value engineering efforts that resulted increasing the level of protection and more than doubling the benefit-cost ratio of the project. HDR also developed a $350M Flood Control project that would be built by the local sponsor without involvement of the Federal Government. The feasibility-level cost estimate developed by HDR is being used to develop a local fee to fund the project. Also, the hydraulic modeling of this complex watershed was extremely difficult due to its enormity and varied topography. Ultimately, we employed a team of flood risk management, hydraulic modeling and risk management professionals to determine when the uncertainty in modeling results was adequately reflected in the contingency as applied to the feasibility level cost estimate.

Ileana Ivanciu, PhD, PG

NEPA Documentation

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 57
Education
PhD, Geology, University of Bucharest, 2012
MS, Geology and Geophysics, University of Bucharest, 1981
BS, Geology and Geophysics, University of Bucharest, 1980

Licenses/Registrations
Professional Geologist: TN

Affiliations
ACEC NJDEP Liaison Committee, Chair
Transportation Research Board – Committee on Environmental Analysis in Transportation
American Society of Civil Engineers

Dr. Ivanciu is a recognized leader in the National Environmental Policy Act (NEPA) process and in expediting planning, design, and implementation of infrastructure improvements in environmentally sensitive areas. She received the 2011 National Environmental Excellence Award for Planning Integration for streamlining the NEPA Environmental Impact Statement (EIS) and permitting on New Jersey's $900-million Direct Connection Interchange. She has guided a series of Superstorm Sandy restoration and resiliency contracts in New York and New Jersey.

Experience

Hudson River Project: Resist, Delay, Store, Discharge NEPA EIS, NJ TRANSIT and New Jersey Department of Environmental Protection (NJDEP), Hudson County, NJ. Principal-in-Charge of the Feasibility Study and EIS for a $230-million comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City. Known as Resist, Delay, Store, Discharge, the project incorporates hard and nature-based infrastructure measures to address surge protection, coastal defense, and systemic drainage issues. This EIS is being prepared pursuant to US Department of Housing and Urban Development (HUD) requirements.

I-295/I-76/Route 42 Direct Connection NEPA EIS, New Jersey Department of Transportation (NJDOT), Camden County, NJ. Deputy Project Manager for feasibility assessment, preparation of an EIS, preliminary design, final design, permitting, and verifying compliance with commitments during construction for this project that weaves through sensitive natural, cultural, and community resources. Involved extensive permitting and regulatory approvals from agencies including NJDEP, US Army Corps of Engineers (USACE), US Environmental Protection Agency (USEPA), US Coast Guard (USCG), and US Fish & Wildlife Service, including USACE Section 404 and NJDEP Individual Freshwater and Coastal Wetlands Permits and mitigation.

Ellis Island South Island Redevelopment Project NEPA EIS, National Park Service, Ellis Island, NJ. Project Manager, as a subconsultant, responsible for coordinating all technical sections into the EIS; updating socioeconomic/land use/fiscal impacts and air/noise impact analyses based on readily available information for incorporation into Draft EIS; and quality assurance.

Post-Superstorm Sandy Environmental Assessment Contract, NJDEP, New Jersey. Principal-in-Charge of environmental compliance analyses and field studies in support of HUD Community Development Block Grant-Disaster Recovery (CDBG-DR) projects following Superstorm Sandy. Responded to 398 requests for Environmental Assessments and studies conducted pursuant to NEPA, Section 106 of the National Historic Preservation Act, and

Ileana Ivanciu, PhD, PG Continued

various federal acts and executive orders.

Management Support Services for EA, Governor's Office of Storm Recovery, Statewide, NY. Principal-in-Charge for environmental and program management services across a range of HUD CDBG-DR funded programs. Programs provide long-term recovery of communities impacted by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee.

Project Management Contract for Superstorm Sandy Waterway Debris Removal, NJDEP, New Jersey. Principal-in-Charge of Dewberry's contract to support the NJDEP in planning and managing a state-level, regionally organized contract to remove and monitor debris from waterways, while maximizing FEMA reimbursement.

Pre-Construction Services Related to Hurricane Sandy Relief Programs, New York City Economic Development Corporation and Mayor's Office of Housing Recovery, New York, NY. Executive Oversight for Dewberry's contract to support New York City's permanent housing recovery program post Superstorm Sandy by conducting detailed assessments of approximately 12,000 damaged homes and performing site assessments and environmental review to qualify properties for HUD CDBG-DR funding. Environmental review is pursuant to NEPA, Section 106 of the NHPA, other governing regulations, and Programmatic Agreements.

Post-Hurricane Katrina NEPA Environmental Assessments, Federal Emergency Management Agency (FEMA), Statewide, MS. Environmental Principal for multiple NEPA Environmental Assessments in Mississippi to support rebuilding of community facilities. Critical issues included floodway/ floodplain location, wetlands, hazardous waste, cultural resources, threatened and endangered species, air quality, noise, and traffic.

Route 29 Boulevard Feasibility Study and Environmental Analysis, NJDOT, Trenton, NJ. Deputy Project Manager for a study to convert a 1.8-mile-long freeway corridor into an urban boulevard to improve resiliency, access, and open space along the Delaware River waterfront; improve safety; and promote economic development. Included preparation of Technical Environmental Studies in support of an anticipated NEPA document.

Routes 3/21 over the Passaic River NEPA Environmental Assessment, NJDOT, Passaic and Bergen Counties, NJ. Deputy Project Manager for final scope development, NEPA Environmental Assessment, community outreach, permitting, final design, and construction administration for the $159-million Route 3 bridge replacement and associated improvements. Completed in 2014, this project, which is constructed in three municipalities, won the 2015 Globe Award for Environmental Protection and Mitigation.

Alan F. Blumberg, Ph.D.

Coastal Engineering & Modeling

Firm
AECOM

Personnel Level
Level 7

Education
Fairleigh Dickinson University, B.S. (Physics), 1970
The Johns Hopkins University, M.A. (Earth and Planetary Sciences), 1973
The Johns Hopkins University, Ph.D. (Earth and Planetary Sciences), 1976
Princeton University, Post Doctoral (Geophysical Fluid Dynamics), 1977 -1979
Stevens Institute of Technology, M.A. (Engineering, honoris causa), 2011

Employment
2007 to present Director, Davidson Laboratory, Stevens Institute of Technology, Hoboken, NJ
2002 to present George Meade Bond Professor of Ocean Engineering, Department of Civil, Environmental and Ocean Engineering, Stevens Institute of Technology, Hoboken, NJ
1985 to 2002
Principal Scientist and Executive Vice President, HydroQual, Inc., Mahwah, NJ
1979 to 1985
Senior Scientist/Vice President, Dynalysis of Princeton, Inc., Princeton, NJ

Honors
Fellow, American Society of Civil Engineers, 2006.
2007 Denny Medal, Institute of Marine Engineering, Science and Technology
2001 Karl Emil Hilgard Hydraulic Prize, American Society of Civil Engineers

The main focus of Dr. Blumberg's work is directed towards understanding and predicting the physical dynamics of estuarine and coastal ocean circulation and the creation of ocean observing and forecasting systems which are used for environmental studies, surface vessel operations, and for securing the future safety and sustainability of urban coastal regions. His research makes use of numerical models, laboratory experiments and field measurements. Long-term research interests address new perspectives on the evolution of urban-environment interactions to create sustainable and resilient 21st century coastal city regions.

Dr. Blumberg is presently leading several major studies to predict and assess storm flooding events in New York and New Jersey. He is working with the NY City Mayor's office on the effects of sea level rise on coastal flooding, with the NJ Governor's Office on state-wide storm surge reduction alternatives and with NASA and NOAA assessing impacts from storms of the future. He worked in every major estuary in the United States and many coastal environments around the world including the North West Approaches, and the coastal waters offshore of Norway and around the island of Oahu.

He is recognized as one of the pioneer and leading experts in modern estuarine and coastal ocean prediction and has contributed significantly to the creation of integrated modeling and observing systems. Presently, he leads the New York Harbor Observation and Prediction System (NYHOPS), which facilitates an assessment of ocean, weather, and environmental conditions throughout the New York Harbor region. He is at the forefront of hydrodynamic model development and application and has written over 130 peer-reviewed journal articles and conference proceedings.

Dr. Blumberg currently serves as a member UCAR's UCACN, a body of scientists, practitioners and stakeholders who provide advice to the National Weather Service thorough its National Centers for Environmental Prediction on all aspects of its operation and planning and is a member of the New York City Panel on Climate Change. He has served on the U.S. Environmental Protection Agency's (EPA) Science Advisory Board where an evaluation was conducted of the complex scientific and technical issues that affect the causes, location, magnitude and duration of the hypoxic zone in the Northern Gulf of Mexico. He was appointed in 2003 to the Ocean Modeling Review Panel that was commissioned by the NOAA Science Advisory Board to review the current ocean science and technology operational prediction capacity and capability that exist within NOAA's National Centers for Environmental Prediction. He serves periodically as a member of the California Bay/Delta Authority's Interagency Ecological Program Science Advisory Group.

Dr. Blumberg is the Recipient of the 2001 American Society of Civil Engineers (ASCE) Karl Emil Hilgard

Alan F. Blumberg, Ph.D. Continued

Hydraulic Prize and the 2007 Denny Medal from the Institute of Marine Engineering, Science and Technology. In 2013 he was elected a Fellow of the American Meteorological Society and in 2006 he was elected a Fellow of the ASCE. He serves as a member of the organizing committee of ASCE's prestigious biannual Estuarine and Coastal Modeling Conference and was an associate editor of their leading journal, the Journal of Hydraulic Engineering. Dr. Blumberg is also active with the Coastal and Estuarine Research Federation (CERF) as past Associate Editor of Estuaries and through frequent presentations at CERF conferences. He delivered the opening presentation at the CERF 2003 Conference. His work on hurricane intensity reduction was featured in a National Geographic Special in 2008. Dr. Blumberg is often called upon by the media to comment on current science related events and he has been featured in The New York Times, The Record, USAToday, on WCBS News Radio and television stations CNBC, WCBS, CN8 and NJN.

Relevant Publications

"Design Meets Science in a Changing Climate: A Case for Regional Thinking to Address Urban Coastal Resilience", Weisz, C. and A. F. Blumberg, Social Research: An International Quarterly, submitted, 2015.

"Street Scale Modeling of Storm Surge Inundation along the New Jersey Hudson River Waterfront", Blumberg, A., N. Georgas, L. Yin, T. Herrington and P. Orton, J. Atmos and Ocean Tech, in press, 2015.

"The impact of tidal phase on Hurricane Sandy's flooding around New York City and Long Island Sound." Georgas, N., Orton, P., Blumberg, A., Cohen, L., Zarrilli, D., and L. Yin. (Accepted). Journal of Extreme Events. 32pp.

"Detailed Modeling of Recent Severe Storm Tides in Estuaries of the New York City Region", P. Orton, N. Georgas, A. Blumberg, J. Pullen, J. Geophys. Res., . 117, C09030, 2012.

"Verification of a Multi-Model Storm Surge Ensemble Around New York City and Long Island During the Cool Season", T. DiLiberto, B. A. Colle, N. Georgas and Alan F. Blumberg, and A.A Taylor, Weather and Forecasting, 26, 922–939, 2011.

Raymond L. Hinkle

Ecosystem Restoration

Firm
AECOM (URS)

Personnel Level
Level 7

Education
MS/1972/Pennsylvania State University
BS/1969/Pennsylvania State University

Licenses/Registrations
- 1979/Certified Wildlife Biologist/ The Wildlife Society
- 1981/Habitat Evaluation Procedures/U. S. Fish & Wildlife Service

Mr. Hinkle has more than 40 years of experience that includes both conducting and managing aquatic, wetland and terrestrial ecology studies in a wide variety of habitats to both assess the impacts of developmental projects as well as restoring the functions and values of degraded natural ecosystems. These include coastal and freshwater wetlands, riverine and lacustrine systems, and a diversity of uplands. These studies have been collected to support a wide variety of proposed projects, including commercial developments and power generation facilities, pipelines and electric transmission lines, or as part of assessments associated with a hazardous waste site remedial or chemical/oil spills. Examples of Mr. Hinkle's natural ecosystem restoration experience are provided below:

Experience

For more than 15 years, Mr. Hinkle has served as the URS Project Manager for wetland restoration related services being provided to Public Service Enterprise Group (PSEG) as part of their Estuary Enhancement Program (EEP) on Delaware Bay. The EEP is part of a special condition of Salem Generating Station operating (NJDPDES) permit and is the largest privately funded wetlands restoration and improvement program in the US. The cornerstone of the EEP is the restoration, enhancement and/or preservation of more than 20,000 acres of degraded coastal wetlands and uplands along the Delaware Estuary in NJ and DE. Elements of the EEP that Mr. Hinkle has had responsibility for include:

- Pre-restoration Ecological Baseline Studies for Salt Hay Farm Sites and Phragmites Dominated Sites
- Contaminant Studies/ Assessments
- Tidal Hydrology Investigations
- Threatened/Endangered Species Surveys
- Wetland Restoration Site Management Plan Preparation
- Phragmites Dominated Site Wetland Restoration Services
- Phase 1 Assessments Related to Property Acquisitions
- Phragmites Control Treatment Evaluation
- Freshwater Wetland Mitigation Monitoring and Reporting
- Geomorphological Mapping and Data Analyses
- Detrital Production Monitoring and Annual Report Preparation (1996 – 2006)
- Preparation of Detrital Production, Wildlife Benefits, and Threatened/Endangered Species Exhibits for the of the NJPDES Permit No. NJ00005622 Renewal Application
- Continuing Support to PTS/EEP in Mapping, Data Analysis, and EEPAC Meeting Participation/ Presentation.

Raymond L. Hinkle Continued

- Project Manager for development of freshwater wetland restoration construction documents relating to the development of a new ecological element within Liberty State Park in Jersey City, NJ
- NEPA Environmental Assessment relating to the implementation of a wetland restoration demonstration project in Jamaica Bay utilizing "thin layer" disposal (prepared for the National Park Service)
- Tidal wetlands restoration related field data collection at four sites on Eastchester Bay/Hutchinson River and the Arthur Kill (Staten Island) for the New York State Department of Environmental Conservation (NYSDEC).
- Wetlands restoration plans and specifications for the NYSDEC sponsored Bridge Creek Wetland Complex on Staten Island, NY. Restoration was completed during 2005.
- Wetlands restoration plan development and state/ federal permitting for Delaware Branch Trail Project, Delaware City, DE – a pedestrian/bicycle trail crossing of tidal wetlands along the C&D Canal coupled with the restoration of adjacent freshwater wetlands. Construction was initiated in 2014.
- Wetland permitting and mitigation plan development for the New Jersey Water Supply Authority's Manasquan Reservoir System Project - a 760-acre project in central New Jersey requiring the creation of more than 150 acres of on-site and off-site wetlands.
- Wetland mitigation evaluation related to the remediation of asbestos disposal areas within the Great Swamp National Wildlife Refuge – New Jersey.
- Wetlands/habitat assessment studies and mitigation plan development for the Lone Pine Superfund Site in Monmouth County, NJ.
- Evaluation of wetland enhancement opportunities within the Barnegat Bay Estuary – New Jersey
- Development of wetland restoration plans related to mitigation for phosphate mining in coastal wetlands in eastern North Carolina (Pamlico River)
- Implementation of corrective measures at the PSEG Clarksville Wetland Mitigation site, the first site deemed as a successful freshwater wetland mitigation project under the New Jersey Freshwater Wetlands Protection Act requirements.
- Wetland permitting and mitigation planning related to the remediation of a solid waste management units at the DuPont Chambers works in Deepwater, NJ. The proposed remediation involves stabilization of the Delaware River shoreline and the restoration of state open waters at the site.
- Shoreline protection assessment and permitting associated with the breaching of dikes for mosquito control along Delaware Bay for the Cape May County Mosquito Control Commission
- Assessment of Phragmites control alternatives for the restoration of Georgica Pond, East Hampton, NY
- Wetland permitting, mitigation plan development and wetland construction specifications for the SouthPark Mall in Strongsville, Ohio - a 185 acre region shopping mall that resulted in the filling of 14 acres of freshwater wetlands. Both state and Corps of Engineers permits were acquired for the project and both onsite and offsite wetlands creation/enhancement was implemented as mitigation for the unavoidable loss.

Abbas Sarmad, PE

Structural Design

Firm
AECOM

Personnel Level
Level 7

Education
BS, Civil Engineering, University of Michigan, 1977
MS, Civil Engineering, University of Michigan, 1979

Licenses/Registrations
- Professional Engineer, New York

Professional Associations
Municipal Engineers of the City of New York
Society of American Military Engineers
American Society of Civil Engineers

Mr. Sarmad is a Senior Vice President and Structural/ Geotechnical Marine Engineer with extensive experience in the design, evaluation, analysis, construction rehabilitation, and installation of marine structures worldwide. He has applied his expertise in the industry on projects that include pile foundations, piers and waterfront structures, facilities, bulkhead, oil/gas drilling platforms, LNG facilities, and caissons, both nationally and internationally. Mr. Sarmad has been a participant on some large scale industry-wide research projects and is the author of a number of technical research papers addressing some of the current industry issues.

Experience

New York City Department of Transportation, Whitehall Ferry Terminal, New York. Project and resident engineer responsible for underwater and topside inspection, survey, geotechnical investigation, preparation of assessment reports, alternative design schemes, preliminary and final design plans and specifications, preparation of bid packages, and construction supervision for loading bridges. Also responsible for relevant electrical and mechanical systems, controls, and platforms for slips 1, 2, and 3 at the Whitehall Terminal.

Brooklyn Bridge Park Development Corporation, Brooklyn Bridge Park, New York. Project officer with overall responsibilities for the design of waterside and landside engineering, including marine, civil, geotechnical, electrical, and mechanical disciplines for this $130 million, 65-acre waterfront redevelopment program. Provided guidance and direction to the multidiscipline staff on the project for the initiation of the work and implementation of the site program and guidelines. Performed topographical and bathymetric surveys, geotechnical engineering, assessment of existing bulkhead and piers, and overall support of all technical aspects.

New York City Department of Sanitation, Conversion of Marine Transfer Stations, New York. Project officer responsible for marine engineering for conversion of a marine transfer station for handling municipal solid waste in the boroughs of Manhattan, Brooklyn, and Queens. Conversion enables stations to pack waste into standard intermodal transport containers to allow long distance shipping. Responsibilities included design of foundations over water for support of buildings and cranes, design of fender systems, bulkheads, and mooring racks. Efforts included preliminary analyses of all eight existing MTS facilities, with four selected facilities through final design and construction documents.

New York City Economic Development Corporation, West Harlem Waterfront Redevelopment, New York. Project Officer responsible for the initial planning, site investigations, engineering design, preconstruction, and construction management activities. The project redeveloped an underutilized

Abbas Sarmad, PE Continued

section of the West Harlem between 125th and 132nd streets, on the west Manhattan waterfront that was being used as a parking area with a multi-use waterfront park that included two new pier structures for excursion vessels and ferry boats, recreational piers, a kayak launch, and approximately 2.5 acres of landscaped upland areas. Responsibilities included marine, civil, and geotechnical engineering; and construction management services.

Hudson River Park Trust, Hudson River Park - Segments 3, 6, and 7, New York. Project Officer responsible for the inspection, evaluation, and design of over 3 miles of infrastructure improvements on the west side of Manhattan along the Hudson River, from Battery Park to 59th Street, for the future HRP. The construction cost is estimated at over $150 million, and the work includes seven piers of various sizes and configurations for passive and active recreation.

New York City Economic Development Corporation, New York Cruise Terminal Inspection, Design, and Construction Management Services, New York, New York. Project Officer responsible for inspections and preparation of repair and upgrade design, including construction management during the implementation of the work at NYCT, Piers 88, 90, and 92 located on the west side of Manhattan. The design and construction scope included a complete reevaluation and upgrade of the piers to accommodate 21st century cruise ship liners such as QM2. Responsibilities also included a geotechnical investigation and preliminary design of 30-foot aprons for the expansion of selected piers.

New York City Economic Development Corporation, Whitehall Terminal Slips 1, 2, and 3, New York. Project Manager and resident engineer responsible for the design and subsequent $12 million reconstruction of three slips at the Whitehall Ferry Terminal. The design included inspection, surveys, preparation of assessment reports, design alternatives, final design of slips platforms, rehabilitation of nine movable bridges (including all relevant electrical and mechanical equipment and controls), and design of repair to the deteriorated building foundations. Also responsible for construction inspection, permit acquisition, system start-up, and overall contract administration.

Port Authority of New York and New Jersey, Marine Terminal Condition Survey of Existing Piers, New York. Project Engineer responsible for underwater and topside inspection. The project involved structural evaluation of Brooklyn Piers 1, 2, 3, and 5, totaling 1 million square feet of piers. The inspection consisted of the top surface of the piers, the piles, the underside of the pier, and bulkheads. Responsible for updating the condition survey and drawings, making recommendations regarding repairs, and assessment of allowable loading for all piers.

Wall Street Esplanade and Pier 11, New York City Economic Development Corporation, New York. Construction Manager responsible for design modifications, pre-construction, and construction phase services related to the $18 million Pier 11 and Wall Street Esplanade. Responsibilities included provisions to temporarily relocate five existing ferry services, value engineering and constructibility analysis during the design stage, construction inspection, cost estimating, schedule control, and coordination of all field and office correspondence.

Dormitory Authority of the State of New York, South Street Seaport Museum Pier 15 Design, New York, New York. Project Manager responsible for design of Pier 15 located in downtown Manhattan adjacent to the South Street Seaport. The project included the design of a new pier capable of supporting a two-story structure with all necessary utilities and amenities to replace the original dilapidated Pier 15. The tasks included environmental data gathering, bathymetric surveys, geotechnical investigation, and permitting.

Majed A. Khoury, PhD, PE

Geotechnical Design

Firm
AECOM (URS)

Personnel Level
Level 7

Education
1978 / Ph.D. / Geotechnical Engineering / University of Illinois
1973 / Master of Science / Structural Engineering / Tufts University
1972 / Bachelor of Science / Civil Engineering / Damascus University / Syria

Licenses/Registrations
Professional Engineer
- 1982 / New Jersey 27850
- 1983 / New York 60629

Dr. Khoury has over 40 years of experience in civil, geotechnical and environmental engineering for infrastructure projects. Dr. Khoury has directed and/or managed staff and projects associated with waste facilities and landfills, dams and reservoirs, slurry cutoff walls, foundation systems, deep excavations, tunnels and highway embankments. Projects under his direction have included multidisciplinary services in civil engineering, geotechnical engineering and the geosciences for private and public clients. From 1995 to 2012 he also managed the operations of the Wayne, NJ URS/Woodward Clyde office with responsibilities including technical, financial, administrative and marketing in both NYC and NJ.

Experience

NYC Department of Sanitation - Fresh Kills Landfill - Principal in Charge/Project Director/ Senior Technical Reviewer - New York, NY. Principal in Charge/ Project Director/Senior Technical Reviewer static and seismic stability evaluations; design of automatic stability instrumentation monitoring system to control refuse placement rate; progressive closure design including the storm water drainage and final cover systems; technical reviews and consultation during the design and construction of a 6-mile long soil-bentonite and cement-bentonite cutoff wall for leachate containment; and technical reviews during the construction of the final cover of the Fresh Kills Landfill in Staten Island, New York

NYC Department of Sanitation - Fresh Kills Landfill - Project Director - Staten Island, NY. Supervised static and seismic stability evaluations; design of automatic stability instrumentation monitoring system to control refuse placement rate; and progressive closure design, including stormwater drainage system and final cover system, for the Fresh Kills Landfill in Staten Island, New York.

Various Municipalities/Counties/ Lake Associations - Remedial Construction Monitoring for Several Small Dams and Reservoirs New Jersey, NJ. Principal in Charge/Project Manager supervised/provided technical reviews for safety evaluations; design of dam rehabilitation measures; dam breach studies; emergency action planning, and remedial construction monitoring for several small dams and reservoirs in New Jersey.

NYS Office of Parks and Historic Preservation - Dam Inspection and Assessment, New York State. Principal-in-Charge/Senior Technical Reviewer dam inspection and assessment, emergency action planning and other rehabilitation considerations for over 10 dams located in central New York State

NYC Department of Environmental Protection - Ashokan Reservoir - New York. Principal in Charge/ Senior Technical Reviewer embankment inspection and assessment, instrumentation evaluations and design of rehabilitation measures for the Ashokan Reservoir in New York.

Majed A. Khoury, PhD, PE Continued

NYCDEP - Dam Inspection and Assessment - New York, NY. Principal-in-Charge/Senior Technical Reviewer dam inspection and assessment, emergency action planning and other rehabilitation considerations for over 20 major dams located East and West of Hudson in New York.

Burlington County - County Solid Waste Facility and Landfill - Burlington County, NJ. Project Manager/Principal-in-Charge hydrogeological and geotechnical site characterization; landfill stability evaluations; design and construction quality control of liner systems for the various phases of the County solid waste facility and landfill in Burlington County, New Jersey.

Various Architectural, Structural and Engineering Firms and Corporate Owners - Various Building Investigations and Recommentdations - New York, New Jersey and Other States. Principal-in-Charge/Project Manager/Technical Reviewer subsurface soil and rock investigations and development of foundation recommendations/ designs for corporate headquarters, high-rises and apartment complexes; investigation and design of support systems for deep excavations in soil and rock; recommendations to limit damage to historic structures from nearby excavations and pile driving in New York City; resident geotechnical engineering during construction. and senior technical reviews.

Exelon - Merrill Creek Reservoir System - Principal-in-Charge - New Jersey, NJ. Principal-in-Charge safety inspections and evaluations of dam and dikes, Emergency Action Planning, operations and maintenance, and instrumentation monitoring for the Merrill Creek Reservoir System in New Jersey.

NYCDEP - Kensico Water Tunnel - Senior Technical Reviewer - New York, NY. Senior Technical Reviewer geotechnical Investigations for the proposed Kensico Water Tunnel in New York.

NYS Department of Environmental Conservation - Gilboa Dam - New York. Principal-in-Charge expert technical reviews of the rehabilitation and rock anchoring design of the Gilboa Dam in New York

Modern Continental Co - Route 3 improvements - Massachusetts. Principal in charge geotechnical engineering for the design and construction of Route 3 improvements in Massachusetts (a design-build project).

Yonkers Construction Company - Brigantine Connector - Principal in Charge - Atlantic City, NJ. Principal in Charge geotechnical engineering for the design and construction of the Brigantine Connector in Atlantic City, New Jersey (a design-build project).

New Jersey Water Supply Authority - Manasquan Reservoir Dam - New Jersey. Project Manager/ Director supervised geotechnical and hydrogeological site characterization; reservoir leakage studies; dam design; design of automatic instrumentation system; dam breach studies and emergency action planning; and monitoring of earthwork construction and the installation of an innovative 75-ft deep soil-bentonite cutoff constructed in two stages for the Manasquan Reservoir System in New Jersey.

New Jersey Department of Environmental Protection - New Jersey. Technical Reviewer provided value engineering and reviews for the redesign of the containment system for the Lone Pine Superfund Landfill, New Jersey.

Scott Edelman, PE

Flood Risk Management

Firm
AECOM

Personnel Level
Level 7

Education
BS, Civil Engineering, Pennsylvania State University, 1981

Licenses/Registrations
- Professional Engineer, Maryland
- Professional Engineer, Virginia
- Professional Engineer, Mississippi
- Professional Engineer, North Carolina
- Professional Engineer, South Carolina

Professional Associations
Professional Engineers of North Carolina
National Society of Professional Engineers
American Society of Civil Engineers
Association of State Floodplain Managers

Mr. Edelman is the director of the AECOM Water Resources team within North America. He has 27 years of experience devoted to flood insurance studies and floodplain mapping. Mr. Edelman has been responsible for overseeing AECOM's floodplain mapping and mitigation work for the Federal Emergency Management Agency, as well as many state and local agency Cooperating Technical Partners, including agencies in Georgia, Alabama, North Carolina, South Carolina, Mississippi, Maryland, New Jersey, New York and California and local/regional CTPs in Florida, Texas, North Carolina, and Virginia. Mr. Edelman has directed the development of AECOM's WISE software tools, which were specifically created to streamline production of FEMA floodplain maps. He continues to oversee the company's development of geographic information system-based tools to make the DFIRM production process more efficient and incorporate automated quality tools while meeting FEMA standards. Mr. Edelman led the overall development of automated tools that have reduced project schedules as much as 75% and costs as much as 50%. He has extensive knowledge of AECOM's WISE software in addition to experience with HEC-1, HEC-HMS, HEC-2, HEC-RAS, XP-SWMM, TABS2D, FESWMS, and a variety of GIS tools.

Experience

Federal Emergency Management Agency, Flood Risk Mapping, Assessment and Planning, Nationwide. Principal-in-Charge overseeing the firm's role in providing production and technical services. Leading the development of a life-cycle cost model for the entire 5-year risk MAP program to support FEMA's planning and budgeting efforts. Also provides technical and policy support, and directs AECOM's role in updating riverine and coastal flood insurance studies in Regions IV, VIII, and IX.

Federal Emergency Management Agency, National Service Provider, Nationwide. Principal-in-Charge and task manager, worked closely with FEMA headquarters and regional staff on policy and technical tasks related to national floodplain management initiatives. Directed the startup and operations for offices that watershed concepts has established to provide direct support to Regions I, IV, and VII; these offices provide ongoing support for FEMA in flood study management, levee policy implementation, and community support. Also directed the efforts of consolidating FEMA's Life Cycle Model into one model.

Federal Emergency Management Agency, Flood Map Modernization, Nationwide. Directed support to estimate flood risk in the United States, calculated at the census block group level, that was highlighted in a FEMA 2006 report to congress. Involved in initial phases of planning and development of the mapping information platform and contributed to the data capture standards. Worked closely with FEMA headquarters and regional staff on policy and technical tasks

Scott Edelman, PE Continued

related to national floodplain management initiatives such as the initial MHIP and mid-course adjustment. Directed special projects including estimating the impact on the NFIP if certain legislation was passed for the Costello Amendment including the 500-year mandatory standard, wind coverage, primary frontal dune, dam inundation, and other issues.

Federal Emergency Management Agency, Flood Map Modernization, Nationwide. At the beginning of the program, was a contributing member of several FEMA Map Modernization committees that worked closely in the development of updated standards and processes. These committees include optimizing the flood insurance study process, DFIRM standards, approximate A Zones, and automated hydrologic and hydraulic Calculations. As a part of these committees, donated its database design, which was used as the baseline for the initial DFIRM standards. The donation represents $300,000 in development costs. [$30 million]

Federal Emergency Management Agency, Flood Recovery Maps, San Antonio, Texas. Under contract to FEMA, led a team that assisted in the rapid response to the July 2002 event in which more than 30 inches of rain fell in parts of central and south central area, causing significant flooding in the San Antonio and Guadalupe River basins. Directed geographic information systems support, high water mark surveys, and preparation of flood recovery maps to assist local communities and counties in the flood recovery process by providing updated flood elevation data quickly. Directed a team using the WISE software to assist in performing automated hydrologic and hydraulic analysis and mapping for 350 miles of stream. The data was prepared in several weeks and provided to local communities for review and adoption. After approval, the maps and engineering support data were made available on the watershed concepts web site for download.

State of North Carolina, Floodplain Mapping Program, North Carolina. Principal in charge that directed and initial project manager for the program, which was a model for FEMA's Cooperating Technical Partners Program. Oversaw supporting the state's basin-wide approach to floodplain mapping and DFIRM updates with topographic data development, hydrologic and hydraulic analysis, and floodplain mapping to FEMA standards. While the state initially assigned work equally to separate contractors, the company was eventually assigned 11 of the state's 17 river basins and has been responsible for production of more than 7,300 DFIRM panels and 78 countywide studies covering 35,000 square miles - over 70 percent of the state's area. Also directed the implementation of the North Carolina Floodplain Mapping Information System that allows internet access to all products and deliverables being prepared as part of the program. [$75 million]

Various Counties, Flood Map Modernization, Georgia. Directed production of 21 countywide Digital Flood Insurance Rate Maps in less than four months. Directed improvements to AECOM's in-house tools, which resulted in the ability to produce final DFIRMs more efficiently

City of Charlotte, Watershed Management System, Charlotte, North Carolina. Project Manager responsible for the development and implementation of a fully integrated watershed management system for the city, and for managing infrastructure and model data on a large scale. The city adopted watershed information system software for managing all of its water resources and base data needed for modeling and evaluation including terrain data (the city and county have obtained countywide light detection and ranging data); stormwater infrastructure data; hydrologic and hydraulic modeling; as well as water quality data and modeling.

Federal Emergency Management Agency, Tropical Storm Allison Recovery, Harris County, Texas. Project Manager for the completion of the county's DFIRM mapping project which required close and frequent coordination with FEMA, Harris County, and 30 firms responsible for completing the field survey, hydrologic analysis, hydraulic analysis, and DFIRM mapping. Also key participant in the DFIRM database standardization to be used among all firms.

John Squerciati, PE, CFM

Benefit Cost Analysis

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 7

Education
ME, Civil Engineering, The Cooper Union for the Advancement of Science and Art, 1991
BE, Civil Engineering, The Cooper Union for the Advancement of Science and Art, 1990

Licenses/Registrations
Professional Engineer: VA, LA
Certified Floodplain Manager: US

Professional Associations
National Council of Examiners for Engineering and Surveying

Mr. Squerciati is a Structural Engineer who has provided expert review for thousands of hazard mitigation grant program applications addressing flood, earthquake, tornado, coastal, and human-caused hazards. He was responsible for detailed analysis of hazard vulnerabilities and mitigation recommendations for various facilities following Superstorm Sandy in New York and New Jersey, Hurricane Katrina in Louisiana, and Hurricane Charley in Florida. He served as a Hazard Identification and Risk Assessment (HIRA) technical expert on more than 30 local, regional, state, and university hazard mitigation plans.

He served as lead technical developer for both the Hurricane Mitigation Handbook for Federal Emergency Management Agency (FEMA) Region IV following the 2004 Florida hurricanes and the Earthquake Hazard Mitigation Handbook for FEMA Region X following the Nisqually Earthquake (2001). He also provided QA/QC for both the Flood Mitigation Handbook for FEMA Region X and the Wildfire Hazard Mitigation Handbook for FEMA Region IX.

Experience

Hudson River Project: Resist, Delay, Store, Discharge NEPA EIS, NJ TRANSIT and New Jersey Department of Environmental Protection (NJDEP), Hudson County, NJ. Benefit-Cost Analysis Lead for the Feasibility Study and EIS for a $230-million comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City. Known as Resist, Delay, Store, Discharge, the project incorporates hard and nature-based infrastructure measures to address surge protection, coastal defense, and systemic drainage issues. This EIS is being prepared pursuant to US Department of Housing and Urban Development (HUD) requirements.

Technical Assistance and Research Contract, FEMA, Nationwide. Led several task orders for the FEMA's Building Science Branch. Led teams of experts to assess flood impacts on structures and building materials following a series of disasters including Hurricane Katrina (2005), Hurricane Charley (2004), and Hurricane Issac (2012). Led a team of experts to assess flood damages and service losses at critical facilities in New York and New Jersey following Superstorm Sandy (2012). Reviewed cost estimates used to develop residential breakdowns in the new Substantial Damage Estimator (SDE) software. Developed course materials and provided instruction for the Emergency Management Institute (EMI) and field workshops on retrofitting of flood-prone residential buildings (E279) and multi-hazard mitigation (E312).

Public Assistance Technical Assistance Contract, FEMA, Nationwide. Assisted with review of over 4,000 FEMA projects from 57 declared disasters nationwide.

John Squerciati, PE, CPM Continued

Audited, revised, and instructed a four-day training course at EMI for field personnel in FEMA's Public Assistance Program (E239). Course materials included instructor guides, student manuals, visuals, interactive exercises, and final exam.

Hazard Mitigation Technical Assistance Program (HMTAP) Contract, FEMA, Nationwide. Led instruction of 50 Benefit-Cost Analysis (BCA) training workshops in 29 states and ten FEMA regions. Was FEMA instructor of choice to conduct BCA training to the four HMTAP contractors for the FY2010 national technical reviews for Hazard Mitigation Assistance (HMA). Provided Residential Substantial Damage Estimator (RSDE) training and/or technical assistance in response to hurricane events in Texas, Nevada, Puerto Rico, New York and Louisiana. Senior BCA national technical reviewer for hundreds of flood, earthquake, wildfire, and other hazard mitigation project applications submitted under the Pre-Disaster Mitigation (PDM) and Hazard Mitigation Assistance (HMA) Programs. Provided technical support on a wide array of FEMA benefit-cost analysis tasks, and was the technical lead on the Damage Frequency Approach (DFA) module as well as an expert panel member on the wildfire module for the FEMA BCA Tool.

Federal Transit Administration - Hurricane Sandy Hazard Mitigation Cost Effectiveness (HMCE) Tool, Washington, DC. Technical Lead. Worked with the FTA as a subcontractor for PMO Partnership JV LLC in development of a hazard mitigation cost effectiveness (HMCE) tool to assess transit resilience projects submitted under a $3 billion post-Sandy Emergency Relief Program. Led HMCE tool development, coordinated alpha and beta testing, developed training materials, and instructed FTA applicants in the use of the tool. Additionally, provided follow-up training for a first-of-its-kind calculator developed by Dewberry to adjust recurrence intervals (RIs) of coastal flood events to incorporate Sea Level Rise (SLR) impacts on proposed resilience projects. Finally, trained and led a Dewberry team of technical reviewers of HMCE analyses and supporting documentation for the transit resilience project applications and assessed the potential cost-effectiveness of projects to FTA. Provided final review of HMCE review reports submitted to FTA for over 75 projects valued at over $11.5 billion in less than five weeks.

Massachusetts Water Resources Authority (MWRA) 7391 General Consulting Services, Various Locations, MA. Civil Engineer and BCA Expert. Conducted site visits and provided BCA support for critical infrastructure mitigation projects. Prepared preliminary BCAs to screen potential project benefits and costs, then researched and developed final BCAs for the final four HMGP project applications. The four project BCAs - included an innovative analysis of a lightning protection system for the Chelsea Operations Center were reviewed and approved by Massachusetts Emergency Management Agency; funding approved by FEMA Region I for one of the projects, and is under FEMA review for the other three.

Michael Sears, PE

Hydrologic & Hydraulic Engineering

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 7

Education
BS, Mechanical Engineering, University of Connecticut, 1992
BS, Metallurgy, University of Connecticut, 1992

Licenses/Registrations
Professional Engineer: NJ, CT, NY, PA
National Council or Examiners for Engineering and Surveying: US

Professional Associations
American Society of Civil Engineers
New Jersey Association of Floodplain Managers

Start typing introduction

Experience

Rebuild By Design Hudson River: Resist-Delay-Store-Discharge, New Jersey Transit, Hoboken, Weehawken & Jersey City, NJ. Deputy Project Manager for a Feasibility Study and Environmental Impact Statement (EIS) for the Rebuild By Design Hudson River project. The project is a comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City. Design factors such as utility impacts, subsurface soil conditions, right-of-way impacts, traffic/pedestrian flow, and construction cost will be evaluated for the concepts to narrow the focus on practical alternatives that can be discussed and evaluated in the context of an EIS.

Route 3 over Passaic River, New Jersey Department of Transportation, Rutherford, Lyndhurst and Clifton, NJ. Senior Water Resources Engineer responsible for the coordination of several environmental permits including a NJDEP Freshwater Wetlands General Permit, Flood Hazard Area Permit, Waterfront Development Permit, and Green Acres Diversion Permit. Also submitted application for a U.S. Army Corps of Engineers Nationwide Permit for this $159-million replacement of the existing moveable Route 3 Bridge over the Passaic River with several fixed bridges and associated roadway work. The project area is 2.5 miles and involves complex MPT, along with complex construction staging to permit each roadway to remain open during construction. The project included final scope development, Environmental Assessment resulting in FONSI, preliminary and final design, and construction support services.

Route 7 Wittpenn Bridge over the Hackensack River, New Jersey Department of Transportation, Jersey City/Kearny, NJ. Senior Water Resources Engineer. Responsible for the design of new drainage and stormwater management facilities for the proposed bridge, ramps, and approach roadways. An Extended Detention Basin was used to ensure the project complies with NJDEP stormwater management rules. Also coordinated submission of an NJDEP Flood Hazard Area Permit for this $730-million vertical lift replacement for the Route 7 Wittpenn Bridge over the Hackensack River and related approach interchange work.

New Jersey Turnpike Interchange 6 to 9 Widening Program - Final Design Section No. 6, Interchange 8, New Jersey Turnpike Authority, East Windsor, NJ. Senior Water Resources Engineer. Responsible for the design/development of hydrologic/hydraulic modeling, roadway drainage systems, stormwater management (consisting of seven wet ponds and one extended detention basin), and environmental permitting for the final design of this $230-million Section 6 (Interchange

Michael Sears, PE Continued

8) Turnpike widening project which included full relocation of the Interchange 8 toll plaza and ramps, reconstruction and widening of Routes 33 and 133, and the relocation of local roadways and intersections in five separate construction contracts.

Garden State Parkway Shoulder Widening/Reconstruction MP 83.6 to 99.5, Environmental Studies and Permitting, New Jersey Turnpike Authority, Ocean and Monmouth Counties, NJ. Senior Water Resources Engineer. Responsible for developing hydrologic and hydraulic models for streams crossing the project corridor. Also responsible for compliance with NJDEP Flood Hazard Area rules for this $300-million, 16-mile stretch of the Garden State Parkway which included shoulder widening between MP 83.6 to MP 99.5. Reviewed the designs for over 50 stormwater management basins throughout the program.

New Jersey Turnpike Interchange 14A Improvements, New Jersey Turnpike Authority, Bayonne and Jersey City, NJ. Senior Water Resources Engineer. Responsible for roadway drainage design, stormwater management, and environmental permitting. For the new toll plaza buildings, coordinated with the project architect to connect new roof drains to the subsurface drainage system. for this $160-million Interchange 14A improvement project. The project design includes: removing the signal at 53rd Street and Avenue E; widening the existing 11-lane plaza; replacing and expanding the Connector Bridge carrying Interchange 14A traffic over Route 440 onto Port Jersey Boulevard; providing a direct connection to the street network of the proposed BLRA redevelopment project known as The Peninsula; widening the entrance ramp; and improving the connection between Interchange 14A and Route 440.

Garden State Parkway Interchange 163 Improvements, New Jersey Turnpike Authority, Paramus, NJ. Senior Water Resources Engineer. Responsible for the design of new drainage facilities, modifications to existing drainage systems, stormwater management (including four extended detention basins), and permitting (including NJDEP Flood Hazard Area and Soil Erosion and Sediment Control Certification) for comprehensive engineering services for the development of preliminary and final design documents, and environmental permitting services necessary for $68-million improvements to the GSP Interchange 163 ramp network with NJ Route 17.

Peter Black, PE, CME

Civil Engineering

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 7

Years of Experience
40

Education
BSCE, Civil Engineering, Rutgers University, 1975

Licenses/Registrations
- Professional Engineer: NJ, NY
- Certified Municipal Engineer: NJ

Affiliations
- American Society of Civil Enigineers

Mr. Black is responsible for planning, designing, permitting, and providing construction administration phases for civil engineering projects. His projects include preparation of hydrologic studies; drainage studies; dam inspection, design and rehabilitation; design of stormwater management and flood control facilities; feasibility studies; design of water works facilities including mains, well houses and water storage tanks; site plan preparation; and preparation of permit applications for various agencies. He has managed several recent contracts with New Jersey's Department of Treasury, Division of Property Management and Construction (NJDPMC).

Experience

Post-Sandy Blue Acres Demolition Program Term Contract TC-008, NJDPMC, New Jersey. Project Manager for Dewberry's contract to support the State of New Jersey with demolition design and construction administration services. Includes preliminary surveys, assessments, site/civil design and permitting, utilities coordination, and administration services to support the state's program to acquire repetitive flood loss structures and return their properties to open space.

Floodplain Study Mapping Services, Term Contract TC 007, NJDPMC, Statewide, NJ. Deputy Project Manager for Dewberry's contract to provide floodplain delineation, mapping and information management services to support development of Digital Flood Insurance Rate Map and Flood Insurance Study Reports, as part of the New Jersey Department of Environmental Protection's (NJDEP's) partnership agreement with the Federal Emergency Management Agency (FEMA).

Route 46 Little Ferry Circle Improvements, New Jersey Department of Transportation (NJDOT), Little Ferry, NJ. Senior Civil Engineer for the design of the 106-cubic-feet/per second pump station including selection of pumps, wet well layout, mechanical bar screen, and pump discharge piping and outfalls for this 50-foot by 30-foot stormwater pumping station for Route 46 Little Ferry Circle roadway improvements. This western section approach to the Route 46 Bridge over the Hackensack River has a history of periodic flooding, with low-lying storm sewer systems discharging to the tidally influenced river. Included coordination with NJDOT and submission of permits to the NJDEP and Department of Community Affairs.

Hartz Mountain Industries Drainage Improvements Study, Secaucus, NJ. Engineer for a comprehensive drainage study with recommendations for proposed ditch and culvert sizes, stormwater management measures, and overall drainage plan for Hartz Mountain Industries. Engineer responsible for all hydraulic calculations, design, and study report preparation.

Vincent Place Stormwater Pumping Station, Borough of Teterboro, Teterboro, NJ. Project Manager

Peter Black, PE, CME Continued

for storm drainage improvements study and subsequent design, permitting, and construction phase administration. Included hydrologic and hydraulic investigations and development of drainage improvement alternatives. Recommended improvements with conceptual sketches, estimated construction costs, drainage benefits description, prioritization schedule for implementation, permitting requirements, and long-term maintenance recommendations. The ultimate project included a 175 cubic-feet/second stormwater pumping station involving 84-inch storm drains, detailed layout of the pump station facility including six 72-inch screw pumps, coordination of electrical, structural, and architectural work.

Drainage and Dam Studies Term Contract, NJDOT, Statewide, NJ. Project Manager. Provided engineering services under a 3-year statewide drainage/dam studies term agreement. Included establishment of Purpose & Need and development of Feasibility Assessment along with their pre-requisite tasks including identification/ verification of the problem, collecting relevant background data, (traffic, accident, flooding events etc.), mapping, developing cost estimates, assisting in providing support for Public Involvement, performing alternative analyses, providing engineering for further studies and supporting documentation.

Mckeel Brook Flood Control Project, Morris County and the US Army Corps of Engineers New York District, Morris County, NJ. Project Manager for planning, design, permitting and construction phase administration. Included preparation of a hydrologic model of the McKeel Brook drainage basin and a hydraulic model of the stream to recommend specific measures to reduce flooding impacts and manage stormwater runoff. Initial engineering included preparation of models to determine flood problem centers along McKeel Brook; preparation of floodplain maps and profiles showing existing conditions and recommended improvements. Constructed improvements include retrofit of existing stormwater management basin structures, and construction of a regional detention basin and construction bypass culvert.

Water Quality Management Study, NJDOT. Project Manager for Dewberry's assignment to: develop and analyze policies, procedures, and techniques to achieve water quality and quantity goals for the NJDOT; evaluate both structural and nonstructural source control methods for cost-effectiveness and effectiveness in reducing problem pollutants; formulate a Water Quality Best Management Practices Manual to combine and incorporate the current state-of-the-art technical criteria with day-to-day operational procedures of NJDOT; and conduct seminars to train NJDOT personnel in the design and implementation of water quality measures.

Sanitary Sewer Connection, New Jersey Training School for Boys, NJDPMC, Monroe Township, NJ. Project Manager for the construction of a force main sewer and pump station at the New Jersey Training School for Boys. The existing on-site wastewater treatment plant was decommissioned and replaced with a pump station and force main connecting to the Monroe Township Utilities Department (MTUD) sewer system. Services included survey; geotechnical investigation; preparation of construction documents for the pump station, force main, and appurtenances; and preparation and submittal of permit applications.

Carter Strickland, Jr.

Sustainability

Firm
HDR, Inc.

Personnel Level
Level 7

Years of Experience
20

Education
Juris Doctor; Columbia University School of Law, Harlan Fiske Stone Scholar, 1995
AB cum laude, with a major in History; Dartmouth College, 1990

Affiliations
- Board Member, New York Harbor Foundation
- Board Member, Natural Areas Conservancy
- Board Member, Brooklyn Greenway Initiative
- Member of the National Association of Clean Water Agencies, Former Board Member (2010-2013)
- Member of the Association of Metropolitan Water Agencies, Former Board Member (2010-2013)

Carter Strickland is recognized as a national leader in sustainability and environmental policy, with over 20 years of regulatory, financial, operational, stakeholder, and media experience. In a variety of leadership roles – including as Commissioner and Deputy Commissioner for Sustainability at the New York City Department of Environmental Protection (NYCDEP), New York City Office of Long Term Planning and Sustainability, Rutgers Environmental Law Clinic, and the New York Attorney General's Office - Carter has a track record of creating and executing long-term sustainability initiatives.

He is able to tap and mobilize extensive contacts in business, environmental, legal, and governmental communities and to develop and communicate durable data-driven solutions through technical, legal and economic analysis.

Experience

Sustainability, Strategic, Regulatory Initiatives, Various Locations, NJ and NY. Since joining HDR in April 2014, Mr. Strickland has provided strategic and regulatory advice to public and private clients in the Northeast and, with regard to strategic consulting and integrated planning, around the country.

Mr. Strickland's focus areas include integrated regulatory planning, green infrastructure, sustainability, ecological restoration, and utility management and performance benchmarking for water and wastewater utilities, cities, states, federal agencies, and corporations. Key initiatives and projects include the following.

New Jersey Future - Long Term Control Plan Best Practices White Paper. Developed a white paper on national best practices in developing LTCPs and presented findings to New Jersey communities with Combined Sewer Overflows in advance of state permits requiring the development of LTCPs.

Passaic Valley Sewerage Commission Resiliency Program Management. Leading Stakeholder engagement efforts for the program overseeing repairs following Hurricane Sandy and resiliency projects to harden the treatment plant, the 5th largest in the United States, against future coastal flooding. Resiliency projects will include a floodwall, power plant, and stormwater pump stations.

New York City Department of Environmental Protection (NYCDEP) Stormwater Management Plan. Part of leadership team for a joint venture that will be developing a stormwater management plan for NYC in response to the first-ever, comprehensive MS4 permit (finalized 7/31/2015).

United Water New York Management Audit. Leading a management review and benchmarking audit of a private utility serving approximately 75,000 households and business in

Carter Strickland, Jr. Continued

response to stakeholder concerns about alternative supply scenarios.

New York City Greenhouse Gas Reduction Strategy. Leading a study of how New York City can accomplish its ambitious goal of reducing greenhouse gases by 80% under 2005 levels by 2050, principally through improvements to the building sector, which is responsible for 75% of emissions in NYC.

New York Citywide Wastewater Resiliency Plan, NYCDEP, NY. Mr. Strickland conceived of and ultimately oversaw the detailed condition assessment of 14 wastewater treatment plants and 96 pump stations and related mitigation plan to protect against expected sea level rise and storm surges through 2050, including floodwalls where appropriate. The $325 million plan will protect $2 billion in assets in wastewater system that treats 1,300 MGD average flow and provided solid foundation for federal and state reimbursements. Efforts resulted in over $400 in FEMA HMGP and HUD CDBG-DR funding.

Hurricane Sandy Response, NYCDEP, NY. Mr. Strickland led preparation for, response during, and recovery after Hurricane Sandy for water and wastewater agency. NYCDEP's response limited storm damages to $95 million in FEMA Public Assistance Fund claims and kept releases of untreated waste to a fraction of an average day's treatment. Proactively monitored water quality and led media response to inquiries about pollution discharges through numerous on-camera and other interviews.

Hurricane Irene and Tropical Storm Lee Response, NYCDEP, NY. Led preparation for, response during, and recovery after Hurricane Irene and Tropical Storm Lee, which devastated the 2,000 square mile upstate watershed with up to 16 inches of rain in just a few hours and created widespread flooding. Mr. Strickland obtained on-the-ground situational awareness despite nearly complete telecommunications blackout, and led stakeholder and media response to numerous requests from the press, public, and elected officials, including members of Congress and County Executives. Guided water quality recovery from high turbidity in reservoirs and obtained funding from state and federal sources (FEMA) for stream restoration and storm response.

NYC Green Infrastructure Plan and CSO Consent Decree, NYCDEP, NY. Mr. Strickland promoted regulatory reforms to reduce cost impact of clean water mandates by developing a comprehensive, alternative plan, the NYC Green Infrastructure Plan, for entire 1,300 MGD wastewater system. The greener alternative reduced CSOs by billions of gallons more than the pre-existing plan, while saving over $2 billion in ratepayer funds and gaining widespread approval and endorsement from environmental justice and civic groups. Following a grassroots roll-out, led successful efforts to modify an existing CSO consent decree and incorporate the elements of the green infrastructure plan in an adaptive management framework with numerous protections for the utility.

New York City Department of Environmental Protection (NYCDEP). Mr. Strickland led several strategic initiatives as part of his role as Commissioner (2011-2014) and Deputy Commissioner for Sustainability (2010-2011) of the largest integrated municipal water utility in the United States, whose 5,700 employees deliver 1.1 billion gallons of clean drinking water every day to nine million customers, treat 1.3 billion gallons of wastewater every day, and regulate air, noise, asbestos and hazardous substances for New York City. Under his leadership the agency undertook external and internal reforms to become a Utility of the Future, including structural changes to create offices of organizational development, energy and green infrastructure, investments in energy efficiency and development and ecological measures to improve water quality, affordability and billing reforms, and regulatory reform. These strategic initiatives also shaped NYCDEP's $14 billion, 10-year capital plan, $3.5 operating budget, and rate and financial programs.

Kenneth J. Lucianin

Government & Community Affairs

Firm
Matrix New World Engineering, Inc.

Personnel Level
Level 7

Education
Rutgers University
Bergen Community College,
Concentration Public Administration

Licenses/Registrations

- Passaic Valley Sewer Commission, 2010 – Present, Appointed by Governor Jon Corzine, Reappointed by Governor Chris Christie
- License State of New Jersey Multiple Dwell Code Enforcement
- Passaic City Councilman, 2008 – 2011(Elected)
- Passaic Board of Education Commissioner, 1993 – 2002(Elected)
- NIMS Certification (National Incident Management Systems Department of Homeland Security)

Mr. Ken Lucianin is a government and community affairs professional with twenty years of diversified experience in community outreach programs, and municipal and state level legislation. He is a United States Navy veteran stationed at the Pentagon. Preceding his time in the military Lucianin attended Bergen Community College and Rutgers University and pursued a degree in Public Affairs. Mr. Lucianin brings government and infrastructure experience in both the private and public sectors to Matrix.

Formed in 1990, Matrix is a leading woman-owned full-service engineering and environmental services firm. Matrix is working on a wide range of infrastructure, building and environmental projects for public and private-sector clients throughout the United States. The Florham Park, NJ-based company has offices throughout New Jersey, New York, New Hampshire, Delaware, Alabama, Florida, Louisiana, California, and Arizona.

Experience

Gilbane Building Company, New Jersey Super-storm Sandy Rehabilitation, Reconstruction, Elevation and Mitigation (RREM) Program. Contract Executive responsible for execution of the contract that Matrix is implementing multiple task order asbestos inspections, lead-based paint (LBP) risk assessments, and radon measurement testing (as applicable) for an anticipated 2,000 (+) single and multi-family residential structures. The asbestos, LBP and radon investigations are conducted in preparation of the proposed structural, architectural, mechanical, plumbing, and electrical rehabilitation efforts for both the landlord and homeowner based State and Federally funded programs. Matrix is tasked with providing these services to program accepted Sandy impacted homes throughout northern New Jersey (north Monmouth to Bergen Counties).

Cattus Island County Park, Living Shoreline, Township of Toms River, Ocean County, NJ. Contract Executive responsible for the collaboration with the Ocean County Department of Parks and Recreation (OCDPR), Restore The Earth Foundation (REF), a not-for-profit, 501(c)(3), and HDR, Inc., along with local educational institutions (Montclair State University and Ocean County Vocational Technical School) to restore a 0.1 acre area of eroded saltmarsh at the Cattus Island County Park in Toms River, Ocean County, New Jersey. The project involved utilizing an innovative restorative technology, Bay-Saver Bags™, to stabilize/restore severely eroding sections of shoreline with native coastal marsh vegetation. This park contains over five hundred (500) acres of park lands bordering Barnegat and provides habitat for an array of migrating shorebirds and waterfowl along with numerous threatened and endangered species.

Kenneth J. Lucianin Continued

NJDEP Waterway Debris Removal and Management Services & Living Shoreline/Tidal Marsh Restoration, Debris Removal Zones 3, 4, 5, 6 and 7, Ocean and Monmouth Counties, NJ. Contract Executive responsible for Matrix working as a technical consultant/project partner with CrowderGulf, LLC. Matrix worked closely with CG to develop with more cost-effective sediment removal and reuse solutions. Matrix prepared conceptual design plans and obtaining local approvals for each of the sites. In accordance with GP-29, site selection for Living Shoreline restoration must be within an area formerly identified as wetlands, must avoid Special Areas (defined at N.J.A.C. 7:7E-3) and should have low fetch energy (i.e., low to moderate wave energy). Matrix and CG have presented the preliminary beneficial reuse plans and received endorsement from members of the Barnegat Bay Partnership, NJDEP, USACE, NOAA/NMFS, Ocean and Monmouth Counties, Ocean County Parks Department and some private land owners.

Environmental Remediation and Financial Services, LLC (ERFS). Environmental Consultant instrumental in introducing and building a successful ERFS services to his department. Extended ERFS services to engineers, and to private and public projects in Northeastern United States. The company provided unique soil and groundwater remediation services with in-situ (subsurface) technologies, developed since 1998. Provided daily guidance and direction on appropriate customer interactions and various Compliance/privacy matters directly to Mr. Mark Vigneri and Robert F. Kennedy, Jr., owners of the company. The Company is widely known for being a pioneer in Pay-for-Performance contracting. Led the implementation of ERFS services and assisted in the contracting review process for all contracts leading to reduction of policy violations by 92%. Managed the ERFS services program and assisted engineers in the process/ assessments and subsequent management action plans.

Gilbane Building Co. Manager of Government and External Affairs, duties included analyzing impact of transact/oil structures, creating product strategy; assisting in launching new products to clientele; designing internal and external promotional materials and researching/analyzing client markets.

Port Authority of New York and New Jersey. Government Affairs Representative responsible for providing support to the Port Authority Departments on Governmental and Community affairs by establishing and maintaining relations with slate and local entities.

Eric Bodnar, PE

Civil Engineering - Discipline Lead

Firm
AECOM (URS)

Personnel Level
Level 5

Education
1990 / Bachelor of Engineering / Civil Engineering / Stevens Institute of Technology

Licenses/Registrations
- 2000 / Professional Engineer New Jersey #42564

Mr. Bodnar is a Project Manager with URS Corporation based in Clifton, NJ. He is a civil engineer with more than 24 years of consulting experience, providing a broad range of consulting services to private and public sector clients. His area of expertise includes all aspects of commercial, industrial and residential site development, including grading, drainage and utility design, hydraulic modeling and storm water management, as well as extensive experience in municipal capital and infrastructure projects, including sanitary sewer pump station improvements, watermain and sewer extensions, and public open space improvements.

Experience

NYCDEP - Petroleum Bulk Storage/ Chemical Bulk Storage Tank Upgrade Project - Bowery Bay Wastewater Treatment Plan - Astoria, NY. Lead Designer for the design of new Sodium Hypochlorite and Ferric Chloride chemical storage and feed systems for the existing wastewater treatment facility. Work also included demolition and remediation of existing chemical bulk storage tanks and containment facilities.

City Center - Sawmill River Daylighting and Realignment - City of Yonkers, Westchester County, NY. Lead Designer for the daylighting and re-alignment of approximately 1,500 linear of the Sawmill River in the center of Yonkers, NY. This area is being re-developed by a public/private partnership as a mixed use project to re-vitalize the neighborhood. Goals of this portion of the project included uncovering portions of the Sawmill River that are currently culverted and returning them to a natural state within an urban park setting. Services included hydrologic and hydraulic modeling of the existing Sawmill River watershed, design of the re-alignment of the river and various natural and man-made features bordering the river, as well as all permitting involved with these tasks. He was also involved with the community out-reach portion of this project, participating in community and regional information meeting to insure public participation and acceptance of the project.

United Water, Hackensack Service Facility - Hackensack, NJ. Designer for upgrades to the facility's drainage system. United Water relocated to an existing building, which required significant architectural and site improvements to meet United Water's needs. Services included hydrologic modeling of local water shed area, hydraulic modeling of the existing and proposed storm water conveyance system, including a new underground storm water detention, preparation of construction documents and design services during construction.

Synthetic Turf Playing Fields – Various Locations. Designer for installation of synthetic turf athletic fields and tracks in various locations in the tri-state area, including St. Joseph Regional High School, Montvale, NJ, Fairleigh Dickenson University, River

Eric Bodnar, PE Continued

Edge, NJ, Kearny High School, Kearny, NJ, Waldwick High School, Waldwick, NJ, Bergen County Regional Sports Facility, Leonia/ Ridgefield Park, NJ, Butler Field, Scarsdale, NY, Tuckahoe High-Middle School, Eastchester, NY. Services included field subsurface drainage and retention design, field lighting design, track layout and design of various site amenities, as well as design services during construction.

Hackensack River Improvements - Town of Clarkstown, Rockland County, NY. Designer for a multi-phase engineering study of the Hackensack River between Lake DeForest and the Township's southern boundary. This reach of the Hackensack River is subject to flooding during large storm events. Services included hydrologic modeling of the watershed, hydraulic modeling of the existing river and associated culverts/ crossings, and design of flood control structures/remedies.

VETERAN AFFAIRS (VA) Hospitals - New York, NY. Senior Civil Enginer – Responsible for the civil engineering design, site improvement layout and utility design for the new generator building.

OHMSETT Building (R-25 Replacement, Naval Station), Leonardo, NJ. Responsible for the design of site layout, utilities and drainage for new material storage building. Prepared drainage and pump stations capacity calculations, project drawings, and specifications for client submission.

Bergen County Parks Department, Van Saun Park/Bergen County Zoological Park - Pump Station and Force Main Upgrades - Paramus, NJ. Lead Designer for repair and upgrades to the existing pumping station, which included installation of new force main and pump station controls. Services included design of forcemain, pumps and controls, preparation of bid documents and construction coordination.

Chubb Avenue Pump Station - Town of Lyndhurst, Bergen County, NJ. Lead Designer for replacement of the existing pumping station. Services included modeling of existing and future inflow to the station, design of new wet well, pumps and controls, preparation of bid documents and day-to-day construction oversight.

Chubb Avenue Sewer Repairs - Town of Lyndhurst, Bergen County, NJ. Lead Designer for the repair and lining of approximately 3,500 linear feet of sanitary sewer piping and associated structures. Due to the high ground water table associated with the New Jersey Meadowlands area, the sewers in this area were experiencing high levels of infiltration. Services included design of pipe lining system, preparation of bid documents and day-to-day construction oversight.

NYCDEP - Pine Hill Sewer Extension - Shandaken, NY. Lead Designer for the extension of the existing sanitary sewer. Services included design of sewer extension and laterals, preparation of SEQR documents, preparation of bid documents and coordination/ public out-reach to community stakeholders.

NYCDEP - Margaretville Sewer Extension - Shandaken, NY. Lead Designer for a multi-branch extension of the existing sanitary sewer system. Services included design of sewer extension and laterals, preparation of SEQR documents, preparation of bid documents and coordination/ public out-reach to community stakeholders

NYCDEP - Showers Road Sewer Extension - Hunter, NY. Lead Designer for the extension of the existing sanitary sewer. Services included design of sewer extension and laterals, preparation of SEQR documents, preparation of bid documents and coordination/ public out-reach to community stakeholders.

Polito Avenue Pump Station Upgrades - Town of Lyndhurst, Bergen County, NJ. Designer for repair and upgrades to the existing pumping station. Services included modeling of existing and future inflow to the station, design of new wet well, pumps and controls, preparation of bid documents and day-to-day construction oversight.

Roosevelt Avenue Watermain Improvements - Town of Lyndhurst, Bergen County, NJ. Served as project manager and lead designer for the replacement of

Arthur C. Miller, PhD

Climate Change & Sea Level Rise - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
BS, Civil Engineering, University of Massachusetts, Boston, 1965
MS, Hydraulics and Water Resources, Colorado State University, 1967
PhD, Hydraulics and Water Resources, Colorado State University, 1972

Licenses/Registrations
- Professional Hydrologist,
- Professional Engineer, Virginia
- Professional Land Surveyor, Pennsylvania
- Professional Engineer, Pennsylvania
- Professional Engineer, North Carolina
- Professional Engineer, Maryland
- Professional Engineer, Colorado

Professional Associations
American Society of Civil Engineers
Association of State Dam Safety Officials
American Water Resources Association
National Society of Professional Engineers
Transportation Research Board -- NCHRP Panel Member
American Geophysical Union
American Institute of Hydrology
Association of State Floodplain Managers
Energy Power Research Institute
American Society of Civil Engineers
Federal Energy Regulatory Commission

Training and Certifications
- Diplomate, Water Resources Engineer
- Certified Pennsylvania Department of Transportation Instructor

Dr. Miller is a nationally recognized expert in hydrology, hydraulic engineering, dam safety, and water resource management. His over 40 years of water resources experience includes research, consulting, and publishing in hydrology, hydraulics, floodplain delineation, dam safety, bridge scour, river mechanics, sediment transport, and impacts of climate change. Dr Miller is renowned for his expertise in numerical modeling of open channel flow; unsteady flow; hydraulic design techniques for dams, bridges and culverts; river mechanics; and sediment transport. His experience with hydrologic and hydraulic models includes XP-SWMM, HEC-1, HEC-2, HEC-6, HEC-RAS, HEC-HMS, TR-20, TR-55 FLDWV, GISHYDRO, WSPRO and RMA2, DAMBRK, FLDWV, and DWOPPER. He has received numerous awards from research, academic, and professional organizations for his achievements, especially in water resources and dam safety.Dr. Miller currently leads the Climate Change Initiative for AECOM.

Experience

Various Clients, Water Resources Course Instruction, Nationwide. Teaching courses throughout the country on topics ranging from fundamental hydraulics to open channel flow to hydrologic processes. Regularly teach courses for the National Highway Institute, Association of State Dam Safety Officials, Federal Energy Regulatory Commission, and Federal Emergency Management Agency. In 2008 developed and taught a 90-minute web seminar for ASDSO on Fundamentals of Hydrology. Instructional lectures were delivered via streaming video with 2-way audio conferencing.

State of California, Adapting to Rising Tides - San Francisco Bay Area Transportation Vulnerability and Risk Assessment Pilot, California. Hydraulics and water resources advisor for project to assist regional and local transportation and planning agencies, as well as communities in Alameda County, to better understand the risk of sea level rise on Bay Area transportation infrastructure. With predicted sea level scenarios of up to 55 inches by the end of the century, it is critical to begin acting now. To do so effectively, decision makers need to be informed about the assets at risk and the possible adaptation options and solutions that will be provided by this study.

New Jersey Department of Environmental Protection, Pompton Lake Dam Floodgates Operation Downstream Effects, New Jersey. Technical Advisor. The governor's Passaic River Basin Flood Advisory Commission charged New Jersey Department of Environmental Protection (NJDEP) to evaluate the operational impacts of the Pompton Lakes Dam floodgate facility. AECOM investigated and conducted a study on the impact of gate operations during flood events. The floodgate facility provides an unconventional approach to flood mitigation. Unlike most flood control projects involving dams, the project only

Arthur C. Miller, PhD Continued

provides flood reduction benefits to upstream residence. The USACE HEC-RAS Unsteady Flow model was used to determine downstream water surface elevations during various flood events. The HEC RAS model incorporated the existing rules for controlling the floodgate openings and operation. An existing HEC-HMS model was used to develop inflow hydrographs for input into the unsteady flow HEC-RAS model.

US Agency for International Development /Regional Development Mission for Asia, Asia Climate Change Adaptation Project Preparation Facility. RDMA's objective in climate change adaptation is to assist countries to increase adaptation and resilience to the negative impacts of climate change. The Asia-Pacific region is one of the most sensitive to climate change and related natural disasters, because of its topography and the high concentration of people living in vulnerable coastal areas and river basins. In addition, the region has a high reliance on economic sectors vulnerable to climate change. Sea level rise (SLR), storms, floods, landslides, and drought are all exacerbated by climate change.

Federal Emergency Management Agency and US Department of Homeland Security, Inflow Design Floods for Dams Selection and Accommodation: Beyond the Guidelines, Nationwide. The project is to develop and publish a guidance document for the evaluation of the risk-based hydrologic safety of dams, including guidelines for determining the inflow design flood (IDF) for new and existing dams. The guidance document will provide a tool to assist state dam safety programs in evaluating the adequacy of their current hydrologic guidelines.

Federal Emergency Management Agency, National Flood Insurance Program and Improving Coastal Floodplain Mapping Impact of Climate Change, Nationwide. Technical Advisor on the study examining the impacts of climate change on the NFIP by assessing existing research, data, and reports on climate change. The Intergovernmental Panel on Climate Change (IPCC) fourth assessment reports were used to determine the various climate predictions that have been performed for the US. Conclusions of those reports found that temperature is increasing and will continue to increase and that precipitation is projected to become less frequent but more intense. The study was to quantify how the 100-year flood may change, based on climate model projections through the year 2100. The downscaling of the Global Climate Models (GCMs) was accomplished via a statistical procedure compiling some of the extreme climate indicators that were developed as part of the IPCC effort with regression analysis that included watershed characteristics such as drainage area, slops, and impervious area to the current 100-year flood. The observed regression relationships were developed using frequency data from 1951-2003 (assumed stationary) for approximately 2,400 USG Stream Gauge stations located throughout the US. A Monte Carlo simulation was then used to determine how climate change and population growth might impact flood discharges over the next 100 years.

Port Allegany Borough, Stormwater Consulting Services – Flood Protection, McKean County, Pennsylvania. Technical Advisor overseeing the hydrology and hydraulics pertaining to the design of a compacted earth levee system. The Alleghany River and Lillibridge Creek have flooded on many occasions resulting in significant damages to both commercial and residential properties. The team is tasked with acquiring, organizing, and reviewing existing flood data from various stakeholders and agencies. The project involves construction of a compacted earth levee for a total length of 6,000 feet. The project also includes channel improvements of 4,000 feet consisting of constructing of a concrete floodwall for 1,600 feet, increasing flow capacity, stabilizing the streambanks with rock riprap, and constructing a debris basin at the upstream end of the project.

Pennsylvania Department of Transportation, Highway Drainage Design Training, , Pennsylvania. Developed a 2-day culvert design course and assisted with the development of a 4-day advanced HEC-RAS course; instructing these courses as a part of PennDOT's Design Services Drainage Design Series.

Murat Utku, PhD, PE

Coastal Engineering & Resiliency - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
BS, Civil Engineering, Middle East Technical University, 1991
MSc, Civil Engineering, Middle East Technical University, 1994
PhD, Civil Engineering, Old Dominion University, 1998

Licenses/Registrations
- Professional Engineer, Texas
- Professional Engineer, New Jersey
- Professional Engineer, Louisiana

Professional Associations
American Society of Civil Engineers - Coasts, Oceans, Ports, and Rivers Institute
American Society of Civil Engineers
American Shore and Beach Preservation Association
Western Dredging Association

Dr. Utku has more than 21 years of engineering and more than 18 years of hydraulic/coastal engineering experience in projects including river, estuarine and coastal sediment and pollutant transport processes, dredging, navigational dredging, harbor/marina deepening, dredged material management, numerical/analytical wave/coastal/ hydraulic processes modeling, flood, and modeling. He also has experience in monitoring, shoreline erosion mitigation, harbor breakwater modifications, and design wave height information. Dr. Utku has been involved in Federal Emergency Management Agency (FEMA) public assistance for disaster recovery and hazard mitigation projects for more than 5 years. He has successfully managed multidisciplinary engineering projects including construction management services, condition surveys, various investigations, and design/bid reviews. His project management responsibilities have included coordination of multidisciplinary consultants and contractors; preparation of plans, specifications, and cost estimates; and inspection of ongoing and completed projects. In addition, Dr. Utkus has experience in data collection and analysis for monitoring and performance evaluations. He also possesses strong computer skills in numerical hydraulic/coastal engineering software (RMA-2, MIKE11, MIKE21, REF/DIF S, BOUSS2D, GENESIS, CORMIX, EDUNE, FEMA models, CEDAS, and various other US Army Corps of Engineers programs).

Experience

US Army Corps of Engineers - New York District, Raritan Bay and Sandy Hook Bay Combined Erosion Control and Storm Damage Reduction Feasibility Study, New Jersey. Managed, formulated, and prepared preliminary alternatives and preliminary design. This effort included data review and evaluation of the existing studies, development of preliminary improvement alternatives (including floodwalls with closure gates and interior drainage controls, seawalls with and without fronting berm, onshore breakwater, fixed or floating wave attenuators, beach and dune fill, submerged or low-crested offshore breakwaters, as well as non-structural flood measures) against two percent (2%) exceedence storm. Based on the results of the preliminary analysis, final design elements will be developed. These analyses include storm induced recession, wave runup, wave overtopping, wave attack force determination, etc. The final design element will be optimized by sensitivity analysis for varying design levels.

US Army Corps of Engineers - New York District, Woodbridge Creek Ecosystem Restoration, New Jersey. Supervised the hydrodynamic analysis of existing and proposed conditions for the project site. The project includes restoration of inter-tidal marsh and open water habitat at the Woodbridge site located in Woodbridge Township. The purpose of the analysis is to ensure proper design and hydrologic flow such that site velocities are

Murat Utku, PhD, PE Continued

non-destructive and inundation criteria are met. The analysis is also intended to predict hydrodynamic side effects of construction that may not be immediately apparent. To meet the objective of the study, a two-dimensional, depth-integrated finite element RMA-2 model, developed by the US Army Corps of Engineers, is used to better assess the mitigation design in terms of tidal inundation efficiency and hydraulic stability. Two iterations were performed: existing conditions, and proposed selected alternative plan, using 3 tidal events, one observed, a hypothetical 2-year, and a hypothetical 5-year event. The information will then be used to examine the stability of the site when exposed to differing tidal ranges post-construction.

US Army Corps of Engineers - New York District, Jamaica Bay Ecosystem Restoration Project, New York. Managed and performed analysis of shoreline behavior and developed potential alternative shore protection measures for various sites within the Jamaica Bay. The effort included data review and evaluation of the existing studies, shoreline change analysis by using dated and ortho-rectified aerial images, wind and vessel wave analysis to determine potential forces on the shoreline and the structures, and development of three alternative stabilization methods for all of the three sites. These conceptual design approaches were intended to present possible engineering solutions to the local problems at each site. Some of the alternatives included innovative solutions to include recreational and environmental value for the sites.

New Jersey Department of Environmental Protection, Lower Passaic River Superfund Project - Confidential Project - Engagement No. 1, New Jersey. Lead consultant on the Passaic River Restoration Project. Managed tasks within this engagement including assisting the NJDEP in any project related technical matters arising from involvement with other agencies, including reviewing/commenting on the reports produced by these agencies, responsible parties, or other stakeholders. Subtasks included contamination field, concentrations or isopleths mapping and all associated volume/mass determination by means of geo-statistical and 3D/4D modeling, reviewing and commenting on reports produced by others, providing technical and background information or professional opinions on technical matters pertaining to sediment contamination in Newark Bay and up-river sources, providing continued support for the Lower Passaic River early action focused feasibility study. Dredged material management issues included site determination, transporting and processing, development and/or review of sediment sampling and/or monitoring plans for confirmation, predesign, design or long-term maintenance and monitoring of any remedy, cost estimating and scheduling support associated with proposed remedies, CDF, CAD or upland disposal options and their feasibility analysis, 17-mile sediment migration and control evaluations and alternatives analysis, historical area and candidate inventory location searches including potential identification of localized spots/ zones of elevated contamination for both sampling and potential removal, principal threat waste evaluations, and associated analysis.

New Jersey Department of Environmental Protection, Lower Passaic River Source Control Dredge Plan - Engagement Nos. 1 and 2, New Jersey. Responsible for managing and coordinating technical/non-technical activities for the design of SCDP project. Final design to include a dredging plan for six miles of the Lower Passaic River, evaluation of appropriate dredging technologies, protecting shoreline structures, bridge pier fenders, and underground/ underwater utilities; design of appropriate treatment systems to consolidate and decontaminate the dredged sediments; design of appropriate treatment and disposal systems for water removed from the sediments; locate and design of a staging/processing area on a property where dredged sediments can be treated and then removed for disposal; development of an environmental monitoring program to ensure protection of public health and the environment during remedial measures; acquisition of permits necessary for construction. Also involved in design of ancillary systems as needed.

Jeff Gangai, CFM

Coastal Modeling - Discipline Lead

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 5

Years of Experience
20

Education
BS, Maritime Systems Engineering, Texas A&M University , 1995
Licenses/Registrations
Certified Floodplain Manager: US
Affiliations
Association of Coastal Engineers
Association of State Floodplain Managers
American Society of Civil Engineers

Mr. Gangai is a recognized national expert in coastal flood hazard analyses with more than 20 years of professional practice. He serves as a prime resource to the Federal Emergency Management Agency (FEMA) Headquarters and across the regions for consultation on technical issues relating to coastal hazard modeling and mapping in his role as the coastal subject matter expert under past and present Primary Technical Services contracts. Jeff manages coastal flood hazard mapping services and supporting staff at Dewberry. Jeff's experience includes flood insurance studies, coastal hazard analysis and mapping, wave studies, ship simulating studies, 2D numerical models, coordinating physical models, surge gage management, budget preparation, cost estimating, breakwater design, jetty design, dredging quantities and shoaling rates, placement area capacity, oil rig jacket and superstructure design, and beach nourishment design. He is also experienced in establishing and implementing national FEMA coastal methods and policies, including development of Limit of Moderate Wave Action (LiMWA) mapping procedures, 500-year wave height modeling, and numerous updates to FEMA coastal Guidelines and Specifications (G&S), including the development of the Pacific Ocean G&S.

Experience

Hudson River Project: Resist, Delay, Store, Discharge, NJ TRANSIT and New Jersey Department of Environmental Protection, Hudson County, NJ. Coastal Engineer responsible for quality assurance on the wave statistics, coastal boundary conditions for various storm surge events including sea level rise, and Danish Hydraulic Institute's (DHI's) MIKE 21 coastal model mesh. Other tasks will include assessment of coastal flood risk reduction strategies such as coastal levees in applicable sections of the study areas; quality review of wave run up, wave overtopping and wave propagation analysis; quality review of the integrated coastal and stormwater management model results for existing conditions; and quality review of proposed mitigation strategies.

FEMA Risk MAP Production and Technical Services Contract, Regions II, III, and VI. Senior Coastal Technical Lead under Dewberry's Joint Venture RAMPP, Production and Technical Services contract with FEMA. Responsible for managing the coastal modeling and mapping projects as well as providing senior coastal technical guidance and oversight. Project highlights include technical oversight of the New York/New Jersey Storm Surge and Coastal Flood Hazard Analysis for the Atlantic Ocean from the Hudson River and the western portion of Long Island Sound to the southern tip of Cape May, New Jersey, which includes storm surge and near shore wave modeling, a statistical analysis to determine the storm surge recurrence frequencies, overland coastal flood hazard modeling, and floodplain mapping. Served as lead independent

Jeff Gangai, CFM Continued

technical reviewer for FEMA Region III regional storm surge modeling update by U.S. Army Corps of Engineers (USACE) for Virginia, Maryland, and Delaware. Key technical resource to develop coastal flood hazard modeling methodology in collaboration with the USACE in support of the Great Lakes coastal flood study.

Floodplain Study Mapping Services, Term Contract TC-007, New Jersey Department of Environmental Protection (NJDEP), Statewide, NJ. Senior Coastal Engineer for Dewberry's contract to provide floodplain delineation, mapping and information management services to support development of Digital Flood Insurance Rate Map and Flood Insurance Study Reports, as part of NJDEP's partnership agreement with the FEMA. Developed advanced HAZUS–based risk assessments for a total of 21 sites in the Passaic River basin, representing one of the first inundation mapping projects to fully realize the potential of multiple flooding scenarios to evaluate risk exposure along the river.

Cooperating Technical Partners (CTP) Contract, Northwest Florida Water Management District (NWFWMD), Various Counties, AL and FL. Project Manager for the coordination, management, and technical review of a storm surge study for the coastlines of Jefferson, Wakulla, and Franklin, Gulf, Bay, Walton, Okaloosa, Santa Rosa counties in Florida and including Alabama counties. Work includes coordination between several contractors performing various tasks for the study, providing technical guidance on study methods, and technical review of completed modeling and analyses.

CTP Floodplain Mapping Contract, State of North Carolina, Statewide, NC. Senior Coastal Technical Lead for program management and independent technical review contract. Responsible for oversight and review of statewide coastal modeling and mapping and providing programmatic guidance to the North Carolina Floodplain Mapping Program.

Hawaiian Islands Hurricane Storm Surge Study, FEMA Region IX. Senior Coastal Engineer and Technical Lead for coastal flood hazard modeling and mapping update. Provided technical oversight, guidance, and review of ADvanced CIRCulation model Empirical Simulation Technique (ADCIRC/EST) analysis of storm surge return period analysis, wave hazard modeling and mapping.

Map Modernization Term Agreement Subcontract, FEMA Region II. Senior Coastal Technical Lead. Led coastal flood hazard analysis updates for Puerto Rico and the U.S. Virgin Islands. Provided technical support in application and review of ADCIRC modeling, wave height propagation analysis, field reconnaissance, and community outreach meetings. Led development and implementation of the tool GeoCoastal, which automated wave height modeling that resulted in a 100% increasing in transect modeling coverage and improved mapping resolution and accuracy. Analyzed shoreline structures such as seawalls and coastal revetments, developing an alternative methodology for beach erosion due to non-standard composition.

John Roebig, PhD, RLA

Ecosystem Restoration - Discipline Lead

Firm
HDR, Inc.

Personnel Level
Level 6

Years of Experience
48

Education
Ph.D., Natural Resource Conservation; Cornell University, 1979
M.L.A., Landscape Architecture; Harvard University, 1973
B.L.A., Landscape Architecture; University of Oregon, 1970
BS, Architecture; Rutgers University - New Brunswick, 1967

Licenses/Registrations
- Registered Landscape Architect, New York USA (No. 001486-1)
- Certification in Wetland Functions & Values, Wetland Training Institute, 1992
- Hazardous Waste Operations and Emergency Response – 29 CFR 1910.120 (e), (3), (8) 40-hour training and 8-hour refresher

Dr. Roebig provides environmental consulting in ecosystem restoration, landscape design, and wetland services. He is a licensed landscape architect and terrestrial ecologist, with experience in wetland habitat analysis, functional assessment, permitting, design, and mitigation. He also serves as project manager for studies involving watershed planning, stream restoration, wetland function and values, resource inventories, and habitat mapping. Dr. Roebig is certified in all four levels of Natural Channel Design from David Rosgen, Wildlands Hydrology with experience in stream assessment, restoration and design.

Experience

Evergreen Environmental, LLC, MRI-3 Mitigation Bank, Carlstadt, NJ. HDR assisted Evergreen Environmental, LLC (Evergreen) to develop a 51-acre tidal wetland mitigation bank and a 17-acre wetland mitigation project along the Hackensack River. The project required the removal of a tide gate, breaching a flood berm and grading the site to allow free tidal exchange with the river. Dr. Roebig was chief designer and wetland ecologist for the restoration of the site. The purpose was to restore the tidal connection, re-contour the site and plant with native tidal marsh communities. The project was constructed in 2012, and HDR is currently conducting the Year 3 post-construction monitoring program. The wetlands are already in compliance with NJDEP and USACE Year 5 permit conditions of 85% cover of native vegetation, 85% survival and less than 10% cover of invasive species.

Evergreen Mill Creek Point Mitigation Bank, Secaucus, NJ. Dr. Roebig is the lead wetland scientist and chief designer assisting Evergreen to develop a 22-acre mitigation bank in the Hackensack Meadowlands along Mill Creek in Secaucus, NJ. The restoration plan will call for removing the invasive Phragmites australis, recontouring the site to enhance the tidal exchange and establishing native tidal marsh communities. The plan will call for the establishment of islands of "high marsh" species, which is a particular challenge in this region due to the predominance of Phragmites australis.

Evergreen Hackensack River Mitigation Bank, Ridgefield, NJ. Dr. Roebig designed a 45-acre tidal wetland mitigation bank adjacent to the Hackensack River in Ridgefield, NJ. The plan involved recontouring the site to improve tidal connection and flow through a degraded marsh and replanting the site with native, low and high marsh communities, a scrub-shrub wetland and upland habitats. The planned habitat improvements were optimized to improve wetland functions and yield the maximum number of mitigation credits while maintaining cost-effectiveness of the project. Ultimately the project was canceled due to a requirement to cap the site, which decreased the cost effectiveness.

Feasibility Investigation and Pilot Project for Forested Wetland

John Roebig, PhD, RLA Continued

Restoration in the New Jersey Meadowlands, NJ. Dr. Roebig is the lead wetland scientist and habitat designer for the HDR team currently assisting the PANYNJ to conduct a feasibility investigation to determine whether a 79-acre parcel in Carlstadt, New Jersey has the ability to support a freshwater forested system. Dr. Roebig designed a one-acre pilot restoration project that includes a variety of tree and shrub species subjected to different conditions (e.g. pool and mound topography, mulch) and presented the concept of a pilot project to the Meadowlands Interagency Mitigation Advisory Committee. Dr. Roebig was responsible for preparing the conceptual plans and contract documents, inspecting the site during construction, and evaluating the hydrology, salinity and plant health data.

Liberty State Park Restoration, Hudson-Raritan Estuary Restoration Study, NJ. Dr. Roebig served as the Environmental Task Leader for the Liberty State Park reference site, directing and coordinating all environmental studies conducted in support of the restoration effort, which included vegetation, wetlands, threatened and endangered species, water quality, wildlife, bio-benchmarking, and functional assessment. Dr. Roebig managed staff from both HDR and AECOM to conduct the vegetation survey of the 250-acre area, classifying vegetation groups and flagging plant communities of forests, shrubs and grasslands. In addition, Dr. Roebig coordinated the preparation of the conceptual plans and alternatives for the 45-acre salt marsh and the freshwater wetland system.

New Brunswick Landing-Wetland Mitigation, Middlesex County, NJ. Dr. Roebig conducted the field studies and prepared the mitigation plan for the New Brunswick Landing Waterfront Development Project for the development of a 24-slip floating dock for recreational boats along the Delaware & Raritan Canal Towpath which borders the Raritan River. He also conducted the biological inventory, hydrologic budget, wetland functional assessment, prepared the migration monitoring plan associated with the mitigation project. He also conducted an environmental screening (wetlands, vegetation, steep slopes, and watercourses) of other potential mitigation sites owned by Middlesex County. Dr. Roebig prepared all aspects of the design including the preparation of construction documents, mitigation plans and specifications.

Imperial Oil Superfund Site, USACE, Kansas City District and the USEPA Region 2 IDC, Monmouth County, NJ. As part of the surface remediation plan, Dr. Roebig designed the stream restoration and riparian enhancement at the Imperial Oil/Champion Chemical Superfund Site in Morganville, New Jersey. Restoration of the stream running through the project involves securing physical stability and biological function for both habitat restoration and mitigation.

Alley Creek Estuarine Habitat Restoration and Drainage Area Improvement, NY. Dr. Roebig was responsible for preparing an estuarine/salt marsh restoration plan as mitigation for impacts to shallow wetland habitat associated with the NYCDEP CSO Abatement program. A mitigation plan was required by the New York State Department of Environmental Conservation, New York City Department of Parks and Recreation, and USACE. Dr. Roebig was responsible for conducting all necessary studies for the design including biobenchmarking, historic channel analysis, review of reference site channel morphology, sediment characterization, and vegetation community mapping. He prepared a series of habitat restoration plans, including intertidal salt marsh, wildflower meadow, and deciduous woodland restorations. Dr. Roebig prepared design drawings, specifications and engineering bid cost estimates for both wetland and upland habitat restorations.

Hunts Point Landing Shoreline Design and Greenway Design, Bronx River Park, NY. Dr. Roebig is serving as HDR's project manager for the shoreline restoration of Hunts Point Landing and the design of the ecological aspects of the Bronx River Greenway. The team is providing environmental services, supporting the landscape architects and designers that planned and constructed a park along the Bronx River. The Hunts Point Landing project includes upland passive recreation features, a fishing pier, a kayak launch,

Ignacio Bunster-Ossa, FASLA, LEED AP

Urban Planning - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
Loeb Fellowship, Harvard University, 1992-1993
Master of Landscape Architecture, University of Pennsylvania, 1979
Bachelor of Architecture, University of Miami, Florida, 1975
Rome Studies Program, University of Notre Dame, 1974

Licenses/Registrations
Registered Landscape Architect: AZ, FL, GA, HI, IL, IN, IO, KY, MD, MA, MO, NJ, NY, PA, SC, TX, VA, WV
LEED Accredited Professional

Awards + Honours
ULI Global Award of Excellence, Stee Stacks Arts and Cultural Campus, 2014
Honor Award, Floyds Fork Greenway Master Plan
American Society of Landscape Architects National Planning and Analysis Category, 2009
Honor Award, Analysis and Planning, Trinity River
Corridor Design Guidelines, American Society of Landscape Architects, 2009
CNU Charter Award, House Office Buildings Facilities Plan and Preliminary South Capitol Area Plan, 2009
Presidential Award of Excellence, Nashville Courthouse Square, American Society of Landscape Architects, PA/DE Chapter, 2008

Ignacio Bunster-Ossa is the Director of Landscape Architecture (Americas) with AECOM. As a landscape architect and urban designer, he has over 30 years of experience in the planning and design of urban landscapes, including new communities, university campuses, waterfronts, urban and resource-based parks and civic spaces. As a principal with his previous firm, Mr. Bunster-Ossa presided over much of the firm's significant and recognized landscape design work, spanning the East and West Coasts, Florida, Hawaii, the Midwest, Asia and Latin America. He is recognized as a leading proponent of Landscape Urbanism, the planning and design of sustainable and landscape-leveraged urban areas through the integration of green infrastructure and public art. A Harvard Loeb Fellow, Mr. Bunster-Ossa periodically lectures, teaches, writes and serves on design juries.

Experience

Seaside Resort Master Plan, Busan, Korea. Master plan for a leisure and resort destination on 35 acres along the waterfront facing the famous Oruyk Islands, featuring hotel, residential, cultural and entertainment uses.

Des Moines Riverfront Master Plan, Des Moines, IA. Comprehensive vision for the Des Moines Riverfront in the Downtown Des Moines involving, trails, civic plazas, pedestrian bridges and festival grounds along with flood protection and CSO improvements.

Principal Riverwalk, Des Moines, IA. Design of a ½ mile waterfront trail, promenade, ice rink and gateway plaza in the downtown, as commemoration of the 125th anniversary of the Principal Financial Group's civic leadership in Des Moines.

Anacostia Waterfront Initiative, Washington, DC. Open space framework, recreation programming, landscape concept and environmental agenda for the Anacostia River corridor between Maryland and Haines Point.

Upper Mississippi River Master Plan, Minneapolis, MN. Master plan for a 4.5-mile brownfield corridor on the Mississippi River north of the city's downtown involving residential and mix-use development areas, parklands, trails and ecological restoration. With BRW.

Vallejo Waterfront, Vallejo, CA. Comprehensive master plan for the City of Vallejo waterfront involving civic pace programming, multi-modal transit, streetscape design, historical interpretation and public art. With artist Jody Pinto, 1998

Plan de Recuperación de las Ciénagas, Caños y Lagos de. Cartagena de India, Colombia. Comprehensive plan for the rehabilitation of the lagoons, lakes and canals of Cartagena, involving ecological restoration, recreation areas and trails, and new development focused on residential, tourism and cultural uses.

Ignacio Bunster-Ossa, FASLA, LEED AP Continued

South Capitol District Master Plan, Washington, DC Master planning and space programming the US House of Representatives and surrounding South Capitol area. Part of the work entailed the creation of an open space framework, including streetscape, urban trail and green infrastructure standards.

College Avenue Campus Master Plan and Design, Rutgers, University, New Brunswick, NJ. Development of a comprehensive vision for the flagship campus of the State University of New Jersey, including detailed designs for College Avenue, the campus main circulation spine. With TEN Arquitectos.

HUB Plaza and Pollock Road, State College, PA. Design of the main circulation spine at Penn State University's main campus into a pedestrian-friendly corridor connecting multiple research, classroom and administrative facilities, including a new plaza adjoining the HUB Student Union.

South Scripps Neighborhood Plan, University of California, La Jolla, CA. Urban design and preparation of design guidelines for a 20-acre research campus involving 126,000 assignable square feet of classrooms and laboratories within UCSD's Scripps Institution of Oceanography. With architect Rob Quigley.

Campus Landscape Concept , University of California, Santa Barbara, CA. Preparation of campus-wide landscape assessment, leading to the development of a comprehensive landscape concept plan and design guidelines for the campus' singular pedestrian malls.

21st Century Town Square, Bethlehem, PA. Design of the public space anchoring the redevelopment of the historic Bethlehem Steel Stacks site into a national art and performance destination.

Jefferson Memorial Vehicular Barrier Design, Washington, DC. Landscape rehabilitation and security perimeter design for the Jefferson Memorial. The designs seek to restore the Olmsted Jr. era landscape while improving visitor safety, comfort and overall site security.

National Museum of the American Latino Site Selection Study, Washington, DC. Site evaluation studies within the National Mall and adjoining areas for the Smithsonian Museum of the American Latino (SNMAL).

Principal Riverwalk, Des Moines, IA. Design of a 1.2 mile recreational corridor facing the Des Moines River featuring a multi-purpose trail, river promenade, ice-skating rink, art works, gardens, promenades and activity plazas.

Charlottesville Urban Space Design, Charlottesville, VA. Open space design for the city's downtown streets, including the renovation of the downtown pedestrian mall and redesign of West Main Street from Downtown to the University of Virginia.

Nashville Courthouse Square, Nashville, TN. Design of a 5-acre public square facing the city's historic courthouse and current seat of government featuring fountains, play areas, event and performance spaces, historic interpretation and memorials. With Tuck-Hinton Architects and Hawkins Partners.

Kennedy Center for the Arts , Washington, DC. Concept design of a 3-acre plaza surrounding two new education and rehearsal facilities facing the Kennedy Center for the Arts. With architect Rafael Vignoly.

Washington Avenue Loft District Streetscape, St. Louis, MO. Streetscape design for the main spine of the city's historic Loft District, featuring a 2-block "flex" vehicular and pedestrian zone suitable for performances and public gatherings. With Kiku Obata & Co.

Continental Pedestrian Bridge, Dallas, TX. Conversion of a 2,000-foot vehicular bridge into a pedestrian connector over the Trinity River floodaway, featuring performance spaces, water feature, play areas and shade structures. With CH2MHILL.

Georgetown Waterfront Park, Washington, DC. Design of a ten-acre National Park wedged between the Whitehurst Freeway and Potomac River in historic Georgetown featuring a waterfront promenade, overlooks, fountain, labyrinth, rain gardens and bio-engineered shore protection.

William Soper, PE

Hydrologic & Hydraulic Engineering - Discipline Lead

Firm
AECOM (URS)

Personnel Level
Level 5

Education
1993 / BASc / Civil Engineering / University of British Columbia

Licenses/Registrations
- 1999 / Professional Engineer New Jersey

Mr. Soper has over 20 years of experience in hydrologic and hydraulic engineering: He has managed, designed and coordinated residential, institutional, commercial and industrial land development projects specializing in hydraulics and stormwater management. He has conducted hydrologic and hydraulic modeling using the HEC-HMS and HEC-RAS model for several dams and bridges in New York and New Jersey and modeled complex stormwater-management systems.

Experience

New York District Corps of Engineers (USACE-NY) - Green Brook Flood Risk Management Project, New Jersey. Project Engineer - Interior Drainage Analysis & Report for levee system re-evaluation in Borough of Bound Brook NJ. Hydrologic and hydraulic analysis of pump stations and drainage gate structures

New York District Corps of Engineers (USACE-NY) - Green Brook Flood Damage Reduction Project, New Jersey. Project Engineer - Engineering and design of the Segment B of the Green Brook watershed flood control project in Green Brook and Middlesex Borough NJ. Preliminary and final design of flood control measures including floodwalls, levees, channel improvements, closure structures and pump stations. Hydraulic design including pump station modeling, bank stabilization features and the hydraulic input to the Stream Encroachment permit

New York District Corps of Engineers (USACE-NY) - Rahway River Flood Risk Management Project. Project Engineer. Quality Control Review of the Hydrologic and Hydraulic analysis of the Rahway River for the New York District Corps of Engineers (USACE-NY).

New England District Corps of Engineers (USACE-NE) - New Bedford and Fairhaven Hurricane Barrier, Massachusetts. Project Engineer - Hydrologic and Hydraulic analysis of a thirty square-mile interior drainage area for a FEMA flood certification study of the hurricane barrier, modeling and mapping of water surfaces at the Harbor and other areas

New York City Department of Environmental Protection - West of Hudson Dams, Dam Break Analyses - New York. Hydraulic Engneer - Hydrologic and dam break hydraulic analysis for three reservoirs on the Delaware River watershed - 6700 square-mile drainage area and over 250 miles of the Delaware river

FEMA - Passaic River Watershed Hydrologic and Hydraulic Flood Study - Passaic County, NJ. Independent Technical Review of the Hydrologic analysis for the Passaic River watershed prepared for FEMA. 900 square mile drainage area

William Soper, PE Continued

New York City Environmental Protection (DEP) - Dam Break Analyses. Project Engineer for four reservoirs on the Delaware River watershed - 6700 square-mile drainage area and over 250 miles of the Delaware River. Breach Analyses included the development of HEC-RAS unsteady model to determine the limits of inundation under the "sunny day" condition and the PDF event. The models included several tributary confluences to model backwater impacts.

City of Plainfield - Plainfield, NJ. A one-mile rehabilitation project on NJ Route 28 in coordination with, and to NJDOT drawing standards; Design of traffic calming features, repaving and design of a park with a fountain, seating areas and paths.

Cedar Brook Industrial Park - Cedar Brook, NJ. Project Engineer - Complex hydrologic/hydraulic design, stream encroachment and analysis of an 80-acre industrial park with a 12-acre lake and five stormwater-treatment retention ponds.

Woodhaven Village - Project Engineer - Old Bridge, NJ. Management and analysis of stream encroachment hydrologic and hydraulic studies for several stream crossings.

Vornado, Mall Improvements - Project Management - Rockaway, NJ. Project Management/Site engineering to improve utilization of existing mall site. An Applebees restaurant and bank site were designed with a minimum disturbance to existing grading and pavement.

St. Marys Abbey/Delbarton School - Project Engineer - Morris, NJ. Management and design and construction management of several facilities at the Delbarton School including: football, baseball, soccer & lacrosse fields track & field facilities and associated parking lots and all stormwater management ponds and treatment facilities.

Manage, design and coordinate dam removal feasibility study with concept design of pond draining and streambed re-establishment for Lower Pond Dam.

St. Clares Hospital - Project Engineer - Denville, NJ. Site engineering for Patient Access Improvements including 8-story parking deck, tower addition and major road access and stormwater improvements and stream encroachment design and permitting.

Sparta High School - Project Engineer - Morris, NJ. Stormwater management, 8500-acre Flood Study of Wallkill River with seven Lakes and dams and Stream Encroachment permit for expansion of High School.

Rutgers University - Piscataway, NJ. Design golf course driving range on Busch campus and bikeway on the Busch and Livingston campuses.

Pondview Estates - Project Management - Rockaway, NJ. Project Management/Site engineering of 200+ acre, 1050-unit multi-family development with offsite water & sewer improvements and Jack/bore crossing of Rt. 80.

Mall Improvements - Project Management - Hackettstown, NJ. Project Management/ Site engineering/permitting to redevelop existing mall site in the floodplain of the Musconetcong River in coordination with mall owner, Vornado, and lessees Lowe's, Marshal's, Applebee's and Wendy's Restaurants.

Kushner - Mine Hill, NJ. Site engineering of 200-acre, 800-unit multi-family development on former mine site with physical and environmental site constraints also stream encroachment modeling.

100 Lot Single Family Development - Richmond, BC. Pacific Capital Investment, Ltd., PCI Lands on land with severe geotechnical constraints (peat bog).

Bergen County - Old Stone Church Road Bridge - Project Engineer - Upper Saddle Brook. Hydrologic and Hydraulic analyses of a 2000-acre drainage area for a bridge replacement emergency Flood Hazard Area permit to permit the replacement of a washed-out bridge.

Allan Klindworth

Sustainability - Discipline Lead

Firm
AECOM (URS)

Personnel Level
Level 5

Education
MS, Corporate Environmental and Sustainability Management, Monash University, 2004
BCom, Management, E-Commerce, Deakin University, 2000

Professional Associations
American Society for Testing and Materials
Rhode Island Flood Management Association
American Society for Adaptation Professionals

Mr. Klindworth has 13 years of experience in business management and sustainability consulting. He has worked with government, corporate, and tertiary clients to deliver projects covering a broad range of issues including climate risk and adaptation, environmental management, energy efficiency, and water management. Mr. Klindworth has undertaken many tasks including project management, training and facilitation, stakeholder engagement, and auditing. He has been the project manager for the delivery of a range of complex and thought leading climate change risk and adaptation projects for the transportation, power, and government sectors. He has also worked with state and local government agencies on a range of sustainability and environmental management projects.

Experience

US Federal Highway Administration, Hurricane Sandy Follow-Up and Vulnerability Assessment and Adaptation Analysis, New York. Providing project support for a tri-state study of Hurricane Sandy impacts on the region's multimodal transportation system. The effort includes a related analysis of regional climate change and extreme weather potential vulnerabilities and impacts, as well as assessment of feasible, cost-effective adaptation strategies to enhance resiliency. For a limited selection of strategic assets, a conceptual engineering-level adaptation analysis will be performed. Project principals include state departments of transportation of Connecticut, New Jersey, and New York; the metropolitan planning organizations of Northern New Jersey (North Jersey Transportation Authority), the New York metropolitan region, and southwestern coastal Connecticut (SWRPA and GBRC); and the Metropolitan Transportation Authority.

Toronto Hydro, Climate Change Advisory Services, Toronto, Ontario. AECOM is providing advisory services in support of the 2014 submission to the regulator. Providing guidance on the development and presentation of a business case to support investment in understanding the risks posed by a changing climate to its assets and service reliability and developing a proactive plan to prepare.

Various Local Government Authorities, Climate Change Vulnerability, Risk, and Adaptation Planning, State of Victoria. Project Manager to deliver climate risk and adaptation studies for over 20 local authorities including city of Melbourne, Whitehorse City Council, city of Greater Bendigo and Bayside City Council. Also conducted numerous regional climate vulnerability, risk, and adaptation projects for councils often in combination with broader project partners including for Melbourne's Peri-urban region, Port Phillip Bay Adaptation Pathways, councils in the Loddon-Mallee region of Victoria. The projects demonstrate applied experience

Allan Klindworth Continued

in considering climate change vulnerability, risk and adaption for local government, regional bodies and agencies.

City of Greater Bendigo, Integrated Regional Vulnerability Assessment and Climate Adaptation Plan, Bendigo, State of Victoria. Working with six local governments across the Southern Loddon Mallee region to understand climate vulnerability at the local level now and into the future. Climate risks and vulnerabilities relating to the regional economy, community, and environment are being identified to develop a region-wide adaptation plan that responds to significant regional vulnerabilities and increases resilience. Participating councils in the study include city of Greater Bendigo and the shire councils of Macedon Ranges, Mount Alexander, Central Goldfields, Loddon, and Buloke.

Australian Government, Climate Change-Induced Sea Level Change Impact Assessment on Australian Government Properties, Australian Capital Territory. Project Manager for development of a replicable process for undertaking climate change risk assessments at 38 government sites. Led the detailed assessment of 14 sites nationally, which included assessment of flood and erosion risk to built assets including transport and utility infrastructure. Adaptation options were also identified and prioritized for each site.

Australian Government - Department of Environment, Consideration of Climate Change for Commonwealth Coastal Assets, Australian Capital Territory. Deputy project manager for development of a process and guidance manual to assist government personnel to consider and plan for climate change in the management, planning, and delivery of government services associated with assets in Australian coastal zones. The manual provides practical guidance for Australian government personnel as well as case studies which demonstrate how elements of the framework can be appropriately applied to a range of asset classes. This was supported by a climate science document that provides an overview of climate information to support climate assessments.

Municipal Association of Victoria, Association of Bayside Municipalities, and the Central Coastal Board, Port Phillip Bay Coastal Adaptation Pathways - Adapting to Inundation in Urbanized Areas, State of Victoria. Project Manager for the development and testing of a framework to support coastal adaptation planning in urbanized areas in response to changing inundation risks as a result of climate change. The framework was applied at five sites around Port Phillip Bay in conjunction with local government authorities to test its practical application. The framework helps organize complex information to assist the identification of an economically feasible adaptation pathway in the short and long term. The process combines technical approaches to both forecasting potential inundation hazards and economic analysis in an investigative sequence. The pathway is designed for coastal decision-makers at all levels of government. Its approach includes a methodology to assess the value and costs of occupying a flood zone before identifying and comparing the costs and benefits of different strategic responses over time using cost benefit analysis. AECOM was engaged by the Municipal Association of Victoria with funding provided by the Australian government's Coastal Adaptation Decision Pathways Project.

Bayside City Council, Climate Change Strategy, Sandringham, State of Victoria. Led development of the climate change strategy, aiming to identify risks climate change presents to council's services, manage its vulnerability to the impacts of climate change, enhance the resilience of the Bayside community, and identify any opportunities that climate change may present. The strategy provides an important overarching council document that interlinks and enables council's existing plans and strategies to enhance the resilience of Bayside to the impacts of climate change.

Victorian Department of Sustainability and Environment, Climate Change Impacts Literature Review and Synthesis, State of Victoria. Assisted through reviewing and synthesizing climate change impact literature.

Jennifer Baer, AICP

Socioeconomics & Environmental Justice - Discipline Lead

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 5

Years of Experience
28

Education
MPA, Master of Public Administration, New York University, 1985
BA, Political Science, Drew University, 1983

Licenses/Registrations
Certified Planner: US
Affiliations
American Institute of Certified Planners
American Planning Association

Ms. Baer provides environmental impact analyses and conducts public outreach in support of infrastructure improvement programs. She is experienced in using the National Environmental Policy Act (NEPA) and local environmental protection regulations through the decision-making process to minimize negative environmental impacts and support positive mitigation efforts.

Experience

Hudson River Project: Resist, Delay, Store, Discharge Project NEPA Environmental Impact Statement (EIS), NJ TRANSIT and New Jersey Department of Environmental Protection (NJDEP), Hudson County, NJ. Senior Planner conducting socioeconomic and environmental justice studies for the NEPA EIS for a $230-million comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City. Known as Resist, Delay, Store, Discharge, the project incorporates hard and nature-based infrastructure measures to address surge protection, coastal defense, and systemic drainage issues.

Springfield Gardens Flood Control Project, New York City Economic Development Corporation (NYCEDC), Queens, NY. Senior for a flood control project in the low-lying Springfield Gardens area, Springfield Lake, and Idlewild Park. This project involves city street and utility improvements constructed in tandem with habitat restoration and ecological enhancements to waterways. Responsible for preparation of a New York City Environmental Quality Review (CEQR) Environmental Assessment Statement (EAS) addressing aesthetics, community resources, land use, socioeconomic conditions, environmental justice, community facilities analysis, historic resources, natural resources and air and noise studies.

I-295/I-76/Route 42 Direct Connection NEPA EIS, New Jersey Department of Transportation (NJDOT), Camden County, NJ. Senior Planner for feasibility assessment, preparation of a NEPA EIS, NJDEP Green Acres coordination, and public/stakeholder outreach program for this project that weaves through sensitive natural, cultural, and community resources. Involved extensive permitting and regulatory approvals from agencies including NJDEP, US Army Corps of Engineers (USACE), US Environmental Protection Agency, US Coast Guard, and US Fish & Wildlife Service, including USACE Section 404 and NJDEP Individual Freshwater and Coastal Wetlands Permits and mitigation.

Routes 3/21 over the Passaic River NEPA Environmental Assessment (EA), NJDOT, Passaic and Bergen Counties, NJ. Senior Planner for final scope development, NEPA EA, community outreach program, NJDEP Green Acres Program coordination for the $159-million Route 3 bridge replacement and associated improvements. Completed in 2014, this project,

Jennifer Baer, AICP Continued

which is constructed in three municipalities, won the 2015 Globe Award for Environmental Protection and Mitigation.

Route 17 Bottleneck NEPA Documentation, Bergen County Department of Planning and Economic Development, Maywood, Rochelle Park and Paramus, NJ. Senior Planner. As a subconsultant, for socioeconomic, land use, and environmental justice studies related to roadway improvements in Maywood, Rochelle Park and Paramus. Technical Environmental Studies were prepared in anticipation of a NEPA EA.

Pre-Construction Services Related to Hurricane Sandy Relief Programs for NYCEDC and Mayor's Office of Housing, New York, NY. Senior Planner. Supported New York City's housing recovery program post-Superstorm Sandy with NEPA environmental review to qualify properties for US Housing and Urban Development (HUD) Community Development Block Grant-Disaster Recovery (CDBG-DR) funding.

Hoboken Yards NEPA EA, NJ TRANSIT, Hoboken, NJ. Project Manager. Responsible for providing environmental analysis and transportation planning for the redevelopment of Hoboken Yards, an intermodal facility serving NJ TRANSIT commuter rail and PATH subway, bus, and ferry service. Prepared an EA regarding redevelopment of the yards and terminal facilities.

Route 29 Boulevard Feasibility Study and Environmental Analysis, NJDOT, Trenton, NJ. Senior Planner for a study to convert a 1.8-mile-long freeway corridor into an urban boulevard to improve resiliency, access, and open space along the Delaware River waterfront; improve safety; and promote economic development. Included preparation of Technical Environmental Studies in support of an anticipated NEPA document. This project is proposed for a highly urbanized community and needs to address sensitive socioeconomic and environmental justice issues.

Vision Plan, Village of South Orange, South Orange, NJ. Senior Planner. As a subconsultant, facilitated a Visioning Process for revitalization of downtown business districts. This project involved inter-disciplinary study of existing conditions: land uses; buildings; urban design character; historic assets; zoning; open spaces; transportation; water resources and other environmental resources; access and congestion; parking and vehicle storage; utility infrastructure; and pedestrian-level environments.

Rail Line Upgrades, NJ TRANSIT. Project Manager. Responsible for analyzing Main, Bergen, Pascack Valley and Port Jervis commuter rail lines. Led the team that prepared the EA for identified improvements along the Main and Pascack Valley lines. In addition to coordinating and reviewing all the environmental work, prepared the traffic impact, land use, and economic analyse.

Patricia Parvis, LSRP

Site Remediation - Discipline Lead

Firm
HDR, Inc.

Personnel Level
Level 6

Years of Experience
21

Education
M.S., Environmental Studies, Geology Concentration; Long Island University, 1994
B.F.A., Fine Arts; New York University, 1985

Licenses/Registrations

- Licensed Site Remediation Professional (LSRP), NJDEP (License #588503)
- 40-hour OSHA health and safety training;
- Annual 8-hour refresher training;
- Site Remediation Basics for LSRP license (called Practical Applications of the NJ Site Remediation Program)
- LSRP continuing education credits (29)
- NJ Licensed Site Remediation Professionals Association Member, 2011

Ms. Parvis is a Senior Project Manager and Professional Associate with over 21 years of experience. She is a Licensed Site Remediation Professional (LSRP) in New Jersey with experience managing complex remedial and permitting projects for large clients including USEPA, USACE, United Water New Jersey, National Park Service (NPS), Port Authority of New York/New Jersey (PANYNJ) and New Jersey Transit. She has extensive experience preparing environmental permits in New Jersey in support of both remediation and construction/ development including permits issued through the NJDEP Land Use Regulation Program and Office of Dredging and Sediment Technology. For the NPS, Ms. Parvis has managed several architecture/ engineering design projects from schematic design through construction phase services.

Experience

New Jersey Transit Gladstone Line Culvert Replacement Project, Peapack-Gladstone, NJ. Ms. Parvis was the environmental task leader for all aspects of permitting and soil characterization for the Gladstone Line culvert design and construction project. Permits included Flood Hazard Area individual permit, freshwater wetlands general permits 1 and 10B, and soil erosion and sediment control certification.

Evergreen MRI3 Wetland Mitigation Bank, Carlstadt, NJ. Ms. Parvis was the task leader for the sediment contamination investigation for a wetland mitigation bank site along the Hackensack River in the Meadowlands. The project was being overseen by the Meadowlands Interagency Mitigation Committee (MIMAC) which includes multiple regulatory agencies such as the NJDEP, USEPA, USFWS, USACE and the New Jersey Meadowlands Commission. Of primary concern for the development of the bank was the concentrations of mercury in the surface sediments. The MIMAC was concerned that the concentrations of mercury would exceed the Effects Range Median (ERM) standard of 0.71 parts per million following construction. Using the standard technique of sending the samples to an analytical lab would have resulted in significant construction delays. Ms. Parvis designed an approach to measure the mercury concentrations of surface sediments during construction using an XRF sampler in a mobile lab. The approach was satisfactory to the MIMAC and did not cause delays to the construction project.

USEPA Region 2, Remedial Action Contract - Combe Fill South Landfill Superfund Site, Morris County, NJ. Ms. Parvis is currently the project manager for a RI/ FS for the EPA at the Combe Fill South Landfill OU2 Superfund site in Chester, New Jersey. She is responsible for management of all soil, sediment, groundwater and surface water investigation activities being conducted by HDR on behalf of the EPA.

Patricia Parvis, LSRP Continued

Neptune Regional Transmission System Remedial Investigation and Interim Remedial Measures, Permitting, Sayreville, NJ. Ms. Parvis was the Task Leader and was responsible for coordinating permitting and remedial activities, and provided oversight of environmental issues during construction of this 100 million dollar facility on three separate properties. Permits that were obtained for this project include Waterfront Development, freshwater wetlands, stormwater, construction dewatering, and local sewer, building and electrical permits. Three sites were assessed for subsurface contamination in preparation for construction of the converter station and installation of over one-half mile of underground electric distribution cable. Currently, Ms. Parvis is the LSRP of record and is completing the remedial investigation and remedial action services post construction.

USACE New York District, Design and Environmental Services for Packaging, Handling, Shipping and Transportation Center, Picatinny Arsenal, Rockaway Township, NJ. Ms. Parvis was the project manager for a pre-construction Site Characterization subsurface investigation at Picatinny Arsenal. She was also the task manager for environmental permitting and prepared an individual Flood Hazard Area permit, Flood Hazard Area verification, riparian zone mitigation plan, stormwater for major development, and soil erosion and sediment control plan.

Evergreen Hackensack River Mitigation Bank, Ridgefield, NJ. Ms. Parvis was the Task Leader for the sediment contamination investigation for a wetland mitigation bank site along the Hackensack River in the Meadowlands. The site had legacy contamination from surrounding industry. Relatively high concentrations of mercury were found deep in the marsh sediments, and extremely high concentrations of lead were encountered along a utility right of way in an upland portion of the site. Ultimately the contamination levels led for the project sponsor to cancel the project because the remedial costs made it impossible to create a profitable mitigation bank.

PANYNJ Hackensack River PATH Lift Bridge AST, Jersey City, NJ. Ms. Parvis was the Project Manager and prepared a Federal Consistency Determination and Transition Area Waiver for Redevelopment for installation of a new diesel AST structure to operate the lift bridge during power outages.

PANYNJ Goethals Bridge Site Acquisition Due Diligence, NJ. Ms. Parvis was the Project Manager for site investigations at three sites in New Jersey to be acquired by the PANYNJ for reconstruction of the Goethals Bridge. The site investigations consisted of soil and groundwater sampling, preparation of reports, bid specifications and remedial cost estimates.

Suez Energy (formerly Tractebel) Proposed Power Plant Brownfield Redevelopment, Linden, NJ. As Environmental Representative, Ms. Parvis completed a 10-month due diligence assignment on a 98-acre Brownfield redevelopment project in Linden, New Jersey for Tractebel Project Development (now known as Suez Energy). She was responsible for management and oversight of all site contamination and environmental permitting issues as well as in charge of the team of environmental consultants. Ms. Parvis prepared the USACE Nationwide Permit applications for the directional drill from New Jersey to Staten Island, NY.

PANYNJ UST Closure and Report, Newark Airport Building 94, Newark, NJ. Ms. Parvis was the Project Manager for UST closure oversight, post-excavation sampling and reporting for UST removal. Work was conducted under the purview of NJDEP.

United Water New Jersey NJPDES Program Lagoon Closure, Water Treatment Residuals Delineation and Permitting, New Milford, NJ. Ms. Parvis was the Project Manager assisting United Water New Jersey in permit compliance and lagoon closure at the New Milford Watershed Maintenance Yard. A freshwater wetlands delineation, individual Flood Hazard Area permit, Flood Hazard Area verification, stormwater for major development, and freshwater wetlands general permits 11 and 20 were prepared and approved by NJDEP. A soil erosion and sediment control plan was approved by the Bergen County Soil Conservation District.

Donald T.M. Heck, PE

Geotechnical Engineering - Discipline Lead

Firm
Matrix New World Engineering, Inc.

Personnel Level
Level 5

Education
BE, Civil Engineering, 1992, Stevens Institute of Technology
MBA, Management, 2001, Seton Hall University

Licenses/Registrations

- Professional Engineer – New Jersey #24GE04448400, New York #083855, Connecticut #28946, and Massachusetts #50006, Vermont #018.0086695, Maine #13113
- OSHA Hazardous Materials Health & Safety Training; 8-Hour Refresher, updated annually
- OSHA Site Supervisor Training; 8 Hours, 1995
- OSHA Construction Safety Program, 10 Hours, 2004

Mr. Heck has over 22 years of experience in the geotechnical, civil, and environmental engineering disciplines. His experience includes the organization and preparation of Geotechnical, Foundation, and Pavement Design Reports and to provide recommendations for footings, retaining walls (proprietary and sheet pile), driven piles, and drilled shafts in accordance with AASHTO and Federal Highway Administration (FHWA) standards, in addition to the analysis of bearing capacity, settlement, global stability, sliding, overturning, and liquefaction potential. Mr. Heck has also coordinated and inspected the drilling of soil borings, including soil classification for roadway and bridge foundations; and arranged and prepared boring and laboratory contracts for subsurface investigations. Mr. Heck's project involvement have included site inspection; preparation and review of project cost estimates; construction, site grading, cross section, and drainage plans; and specifications.

Experience

NYC Department of Design and Construction, Hurricane Sandy Shorefront Reconstruction, Queens and Brooklyn, NY. The Hurricane Sandy Shorefront Reconstruction project consisted of reconstruction of boardwalks, comfort stations, lifeguard stations, and other miscellaneous facilities damaged during Hurricane Sandy in October 2012. As a task order under the NYCDDC Geotechnical Inspection Services for Various Projects contract, the scope of work included inspection of borings, preparation and coordination of laboratory testing of selected soil samples, and preparation of records of the borings which include boring location plans, logs of the borings, and the results of the laboratory testing. Responsible for managing inspectors, coordinating laboratory testing, and preparing records of the borings to ensure that this highly accelerated and critical schedule is meet in order for the data to evaluated for design and construction requirements of the new structures.

NYC Department of Design and Construction, Geotechnical Inspection Services for Various Projects, New York, NY. Contract Executive and Geotechnical Engineer for a multi-year indefinite quantity contract with the Bureau of Environmental & Geotechnical Services of the New York City Department of Design and Construction (NYCDDC). The tasks performed to date primarily include the field oversight of land and water geotechnical borings, the preparation and coordination of laboratory testing of selected samples of soil and rock, and the preparation of records of the borings which include boring location plans, logs of the borings, and the results of the laboratory testing. Pavement cores, groundwater monitoring wells, test pits, and ground penetration radar have also been completed as part of many geotechnical investigations. During this Contract, Matrix provided services

Donald T.M. Heck, PE Continued

on about 200 different tasks assigned by NYCDDC.

Triborough Bridge and Tunnel Authority, Reconstruction of the Manhattan Approach Ramps at the Robert F. Kennedy (RFK) Bridge (RK-23), Manhattan, NY. Project Manager responsible for coordination of geotechnical, environmental, hazardous materials, and environmental permitting disciplines with the prime client. The project is separated into two tasks: Task A is for the 124th and 125th Street on-off ramps and Task B is for one the FDR Drive and Harlem River Drive Northbound ramp with contract plans and specification to be prepared for each task independently. As Project Manager, coordination with discipline task leaders and the client is essential to ensure project continuity. Matrix geotechnical services is investigating on-site soils for the support of the proposed ramps, which include temporary and permanent foundations. Matrix's environmental services is providing field services which included hazardous materials investigations to evaluate the presence of soil and groundwater contamination in the proposed reconstruction areas. Matrix's hazardous materials services is investigating components for asbestos, lead, PCB) and/or mercury-containing materials that have the potential to be impacted by the project design. Matrix's permitting services is reviewing readily available data regarding the presence of natural resource, including maps such as NYSDEC Article 24 freshwater wetlands and Article 25 tidal wetlands maps, aerial photographs, floodplain maps, and soils maps to identify potential areas of concern and their associated development constraints; and will prepare appropriate permits, as necessary.

New York & Atlantic Railway Wheel Spur Intermodal Facility and Freight Yard, Long Island City, NY. Geotechnical Project Manager responsible for coordinating the geotechnical engineering services to investigate subsurface conditions beneath the site and evaluate the suitability of on-site soils for the support of the proposed construction related to a pre-engineered building and a loading dock extension to the existing Freight House. Twelve borings were performed to determine the subsurface conditions for these proposed structures. Responsible for coordinating the subsurface investigation, soil laboratory testing, and preparing the Geotechnical Report presenting the findings from the subsurface investigation and foundation recommendations, where a deep pile foundation was warranted due to the underlying soft, cohesive soils and the potential for liquefaction.

State University College Fund, New School of Business Building, State University College of Technology, Farmingdale, New York – Geotechnical Project Manager responsible for coordinating and directing the engineering services for subsurface investigation activities and preparation of the Geotechnical Report for a proposed 13,000 square foot building. The project scope was to evaluate the suitability of on-site soils for the support of the proposed structure, to determine the existence of a former building foundation at the site and its impact to the new building, and to provide recommendations for design and construction of foundations and floor slabs to the new building. Five borings and five test pits were performed and recommendations included overexcavation and replacement activities to support a conventional spread foundation system.

Port Authority of New York and New Jersey (PANYNJ), Expert Professional Geotechnical Services for Various Projects, Newark, NJ. Under a "call-in" contract with the PANYNJ, provided expert professional geotechnical engineering services. Mr. Heck performed geotechnical analyses for various projects being performed by the Geotechnical Group of the Authority, which included the Corbin Street Bridge Flyover – a tightly curved bridge, approximately 1,860 feet long supported by piers founded on drilled shafts and mechanically stabilized earth walls supported by timber piles. Tasks performed include geotechnical analyses for footings, retaining walls, driven piles, drilled shafts, and slope stability, and he has assisted in the review of shop drawings.

Jae G. Park, PhD, CFM

Benefit Cost Analysis - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
Ph.D, Urban and Regional Science, Texas A&M University, 1998
MS, Community and Regional Planning, Iowa State University, Ames, 1992

Professional Associations
American Planning Association
Association of State Floodplain Managers
National Emergency Management Association (NEMA)
Advisory Board Member of DHS Center of Excellence – Natural Disasters, Coastal Infrastructure and Emergency Management, University of North Carolina, Chapel Hill

Training and Certifications
- Certified Floodplain Manager (CFM)

Dr. Park has more than 22 years of experience and expertise in the areas of risk management, hazard mitigation, and sustainable disaster recovery from Hurricane Fran, Floyd, Isabel, Katrina, Sandy and other declared disasters. He has been involved in hazard mitigation/recovery policy/program development, risk assessment and benefit cost analysis, mitigation planning, needs assessments, housing recovery program development and implementation, risk perception, and communication research at the Federal, regional, state, and municipal level as well as with private clients.

Experience

New York State Governor's Office of Storm Recovery, State of New York Rising Community Reconstruction, Project Manager, 2013-2014, Mitigation Planning. The primary objective of this work was to provide recovery planning assistances to the communities severely damaged by Hurricanes Sandy and Irene and Tropical Storm Lee for facilitating resilient and sustainable community reconstruction. As a Project Manager, led a team of public outreach specialist; subject matter experts in housing, economic development, structural engineering, stormwater management, risk analysis, GIS, and planning to perform risk assessment, public engagement and consensus building, benefit cost analysis, recovery projects identification and development and plan writing.

New England Regional Catastrophic Planning Initiative, MA, RI, NH, Technical Lead, 2012-2014, Mitigation Planning. AECOM(URS) supported the NERCPI Regional Catastrophic Planners and the Regional Long Term Recovery Workgroup to assess regional capabilities and identify gaps in existing disaster housing planning efforts based on housing stock analysis using a catastrophic event scenario. Based on the gap analysis, URS developed a Regional Disaster Housing Annex, including concept of operation, pre-and post- actions, and lists of housing solutions. An Executive Playbook was also created to provide guidance and decision support tools to promote orchestrated recovery efforts among the impacted communities. In addition Commonwealth of Massachusetts Disaster Housing Recovery Plan and local planning toolkits were developed based on the NERCPI planning template.

FEMA, Unified Hazard Mitigation Assistance Program Guidance Development and Update, Nationwide, Task Lead, 2009-2015, Mitigation Planning. Task is to develop Unified Hazard Mitigation Assistance Program guidance for five hazard mitigation funding programs: PDM, FMA, RFC, SRL, and the Hazard Mitigation Grant Program (HMGP). The intent of this alignment is to enhance the quality and speed of grant awards on an allocation and competitive basis to State, local, and Tribal entities for worthwhile, cost-beneficial activities designed to reduce the risks of future damage in hazard-

Jae G. Park, PhD, CFM Continued

prone areas. At the same time, unification yields new opportunities to expand national outreach for all types of mitigation.

FEMA, Pre-Disaster Mitigation Joint Explanatory Statement Grant Program (PDM-JES) Technical Support, Nationwide, Benefit Cost Analysis Lead, Mitigation Planning. Provided technical supports to FEMA Headquarters, regions, and states in identifying eligible mitigation projects, cost-effectiveness and feasibility review of sub applications, and data collection. The technical assistance also involved a remote sub application review, on-site training, and one-on-one meetings with local government officials to provide comments for lacking information and revise the project application scope that is more aligned with the PDM-JES guidance.

FEMA, Task Order to Develop Methodology for Determining the Losses Avoided as a Result of Adopting Hazard-Resistant Building Codes, Nationwide, Technical Lead, Mitigation Planning. The objective of this task order is to develop a first generation method of calculating building code adoption losses avoided estimates derived from existing data and analyses and propose implementation strategy of the methodology nationwide. The major components to the methodology include the selection of the pilot sites, data collection and screening, calculation of losses avoided using an analysis tool such as Hazus, review and validation of results, if validation data is available.

South Carolina Emergency Preparedness Division, South Carolina Hazard Mitigation Plan, West Columbia, SC, Task Manager, Mitigation Planning. The project for the South Carolina Emergency Preparedness Division involved the development of a hazard mitigation plan for the State of South Carolina. The scope of work included conducting a planning process, assessing risks, and developing a mitigation strategy. A draft was approved by FEMA. Updated elements will include an evaluation of recent hazard events, identification of changes in hazard vulnerability, and a review and update of the proposed mitigation actions. Mr. Park was responsible for conducting hazard analysis and vulnerability assessments of all natural hazards identified in the state.

Hazard Mitigation Technical Assistance Program Analyst. This project for the Federal Emergency Management Agency (FEMA) consisted of providing post-disaster technical support and programmatic assistance to the agency's mitigation program in response to floods, hurricanes, earthquakes, and terrorist attacks throughout the U.S. Support services as a sub consultant included engineering, mitigation planning, benefit-cost analysis and training, and a Multihazards-US (HAZUS-MH) analysis. Dr. Park conducted benefit cost analysis training for various states in the southern region, and reviewed pre-disaster mitigation grant applications for eligibility, accuracy, and feasibility for FEMA headquarters.

New Castle County Flood Mitigation Education and Outreach Project, New Castle County, DE (Delaware Flood Mitigation Program). 2004. Project Manager. This project for the Delaware Flood Mitigation Program involved evaluating mitigation techniques for 33 repetitive flooded properties in New Castle County, and developing education materials for local repetitive loss reduction strategies. With assistance from state officials, a workshop was conducted for the benefit of local officials with the goal of identifying roadblocks to implementing flood mitigation projects at the local level, and identifying local project priorities. Workshop topics included local outreach activities, project selection processes, project management responsibilities at the state and local levels, and funding needs. Mr. Park provided project oversight and interaction with the client. He conducted site visits, evaluated mitigation techniques, and produced the final report.

John A. Rollino

Ecology & Biology - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
MA, Environmental Studies, Montclair State University, 1998
MS, Geoscience, Montclair State University, 2004
BA, History/Anthropology, Upsala College, 1994

Licenses/Registrations
- Certified Arborist, New Jersey
- Certified Wetland Delineator, Minnesota
- Certified Ecologist

Professional Associations
Ecological Society of America
International Society of Arboriculture
Earthwatch Institute - Bahamian Reef Survey

Training and Certifications
- Open Water Search and Rescue Training
- Rescue SCUBA Diver Training
- Wilderness First Responder (80-Hour Course)
- Florida Master Naturalist - Upland Habitats
- Tropical Marine Science & Resource Management Semester Program
- Basic Wetlands Delineation Training for US Army Corps of Engineers Wetland Delineation Certificate Program
- Wetland Hydrology and Soils Course
- Endangered Species Handling (Shortnose sturgeon, Acipenser brevirostrum and Atlantic sturgeon, Acipenser oxyrhyncus)

Mr. Rollino is the section manager of the Water and Natural Resources Group in the Metro District. He has 19 years of experience as a project manager and senior ecologist. He is an expert in designing terrestrial and aquatic ecological studies, impact assessment, designing mitigation strategies, assessing the health of ecosystems and their functional value, and tropical marine ecology. He has conducted wetlands delineations and natural resource inventories and prepared permit applications for numerous projects in the Meadowlands and New York Harbor. He has performed threatened and endangered species surveys and analysis; waterbody and fisheries studies; wildlife survey; and radio collar and telemetry studies. He is often called upon to assess tree health in urban settings, and in woodland and forestry resources in suburban and remote settings. He has conducted numerous public presentations where he has the ability to disseminate complex scientific principles to the lay person.

Experience

U.S. Army Corps of Engineers, New York District (USACE-NYD), Hudson River Estuary (HRE) and HRE-Lower Passaic River Ecosystem Restoration Feasibility Studies, Various Locations, NY & NJ. Currently leading project team as Senior Ecologist for feasibility studies for ecosystem restoration within the HRE, including eight separate planning regions. Work includes assessing existing conditions at potential restoration sites using Evaluation of Planned Wetlands and Stream Visual Assessment Protocol, as well as establishing and applying a quantitative functional assessment of ecological uplift for oyster restoration areas. Field investigations included wetland delineations, habitat mapping, and stream channel and bank conditions mapping. Additional hydrologic & hydraulic data collection and analyses are required to support design development for some of the sites. Based on all this information, alternative designs were created for wetland/stream and oyster restoration sites. Materials lists, and quantity and cost estimates will be prepared and the results functional assessment will be used by the USACE-NYD to complete a Cost Effective/Incremental Cost Analysis (CE/ICA). This will support the selection of a recommended plan, for which further designs and cost estimates. AECOM is leading the effort to prepare a Feasibility Report/Environmental Assessment (FR/EA) to recommend construction of the various recommended site plans for a subset of the overall HRE restoration opportunities, with contributions from LBG for their regions. The FR/EA will include evaluations of alternatives evaluation, NEPA, Essential Fish Habitat, Section 404(b)(1), Section 7 of the Endangered Species Act, and Coastal Zone Consistency.

The Mills Corp., Meadowlands Mills Hackensack Meadowlands, Carlstadt, New Jersey. In support of future commercial development and a size wetland enhancement

John A. Rollino Continued

and creation project, Mr. Rollino served as a biologist in a multi-year ecology investigation of a 590+ acre site in the New Jersey Meadowlands. The site was ringed by a berm feature and the onsite hydrology was influenced by tide gates that only permitted the draining of the site. Mr. Rollino conducted a biological inventory entailing analyses of benthic invertebrate, fish, avian, mammal, herptofauna, and vegetation communities. As part of the year-long avian survey, Mr. Rollino assisted in the design of the site and constructed three transects, that measured approximately 9,000 ft in length, and 20-ft tall observation towers throughout the Phragmites marsh. The transect often cross small creeks which Mr. Rollino constructed small bridges capable of supporting small motorized wheeled vehicles (e.g., ATVs). As part of the avian survey, Mr. Rollino identified over 125 bird species and maintained a data base of thousands of observations. As part of the mammal survey, Mr. Rollino noted the presence of mammals over the three transects. Also via a canoe survey of the onsite creeks, Mr. Rollino enumerated muskrat burrows and after seasonal fires removed dense areas of herbaceous vegetation, Mr. Rollino documented muskrat lodges.

Sea Girt Ecological (Predator Population) Study, New Jersey Army National Guard, Sea Girt, New Jersey. Mr. Rollino served as both the Project Manager and Principal investigator. The purpose of the study is to identify the seasonal red fox, Vulpes vulpes, population and movements in conjunction with a survey of threatened beach nesting bird species (Least Tern and Piping Plover), which are susceptible to fox predation. As project manager and lead scientist, Mr. Rollino designed a predatory mammal survey, which include nocturnal mammal surveys, use of track plates, game cameras, and snow tracking. In addition, Mr. Rollino, who holds a valid NJ trapping license and NJDEP research and collection permit, has trapped red foxes and affixed radio collars to them. Mr. Rollino and his team routinely track the red fox movements throughout the night for distances up to two miles.

Hackensack Meadowlands Development Commission, Wetland Monitoring Project, Secaucus High School, Secaucus, New Jersey. Lead Ecologist responsible for designing and conducting ecological studies to assess utilization of the site by birds, mammals, and benthic invertebrates prior to mitigation. Mr. Rollino cut and prepared natural resource survey transects, erected bird observation towers, and sited mammal trap locations. Mammal traps were part of a mark and recapture survey. Due to tidal ranges of over 6 ft and potential flooding during storm surges, traps in wetter portions of the site were placed on stands with constructed mammal runs to allow mammals to access the traps, yet not suffer mortality when trapped via drowning during higher tide periods. In addition, Mr. Rollino also enumerated muskrat burrows via a canoe survey of tidal creeks that flowed through the site. For the avian survey, survey transects consisted of land transects and canoe surveys within the site's tidal creeks. Mr. Rollino analyzed data and prepared reports after the collection of data was completed.

New York City Economic Development Corporation, Charleston Mixed-Use Development Environmental Survey, Staten Island, New York. Lead Scientist for a year-long ecological survey within a 60-acre undeveloped site within New York City. The site is contiguous to Clay Pit Ponds State Park Preserve, a 300-acre preserve that is habitat to dozens of threatened and endangered species. As part of the year-long survey, conducted a wetland delineation of federal and state regulated wetlands, designed and led an avian, herptofauna, mammal, plant, and threat and endangered species investigations. Also, Mr. Rollino mapped all on-site habitats and wetlands with GPS and lead a survey of approximately 3,000 trees. In addition, Mr. Rollino identified three state-listed threatened and endangered plant species occurring on the property as well as cataloged invasive species on site.

Zachary Davis, RPA

Cultural Resources & Archeology - Discipline Lead

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 5

Years of Experience
22

Education
PhD (ABD), Interdepartmental Doctoral Program in Anthropology, SUNY Stony Brook
MA, Anthropology, SUNY Stony Brook, 2000
MA, Archaeology, University of London, 1994
BA, Archaeological Studies, Boston University, 1993

Licenses/Registrations
Registered Professional Archaeologist: US

Training and Certifications
- An Advanced Workshop for National Register Nomination Preparers, National Park Service and New Jersey Historic Trust
- Cultural Resources Best Practices Workshop, 7-Hour Training Program, New Jersey Historic Preservation Office
- OSHA 40-hour Hazardous Waste Operations Training; Annual Refreshers
- Trenching and Excavation Safety – OSHA Construction Industry Standards, Subpart P (29 CFR 2926. 650-652)

Affiliations
- Register of Professional Archaeologists
- Society for American Archaeology
- Millburn Short Hills Historic Society
- New York Archaeological Council

Mr. Davis is a Senior Archeologist and project manager with over 20 years of experience in the field. He is experienced with the National Environmental Policy Act (NEPA), as well as Phase IA Archaeological Assessments, Phase IB Archaeological Surveys, and Phase II Archaeological Site Evaluations.

Experience

Rebuild By Design Hudson River: Resist-Delay-Store-Discharge, NJ TRANSIT and New Jersey Department of Environmental Protection (NJDEP), Hudson County, NJ. Senior Archaeologist for the Feasibility Study and National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) for a $230-million comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City. The project incorporates hard and nature-based infrastructure measures to address surge protection, coastal defense, and systemic drainage issues.

Flood Mitigation and Resiliency, New York City Transit (NYCT), 207th Street Yard, 8th Avenue Line, Borough of Manhattan, NY. Project Archaeologist. Prepared historic resource consultation correspondence for the proposed construction of flood mitigation measures at the 207th Street rail yard. Provided client with known historic property information relevant to the proposed project area and drafted correspondence for review by New York State Office of Parks, Recreation and Historic Preservation (OPRHP). Prepared additional research related to the historic cemetery present at 207th Street and secured New York State Office of Parks, Recreation and Historic Preservation (OPRHP) concurrence of no historic properties affected by the proposed project.

Flood Mitigation and Resiliency, New York City Transit, 148th Street Yard, Lenox Avenue Line, Borough of Manhattan, NY. Project Archaeologist. Prepared historic resource consultation correspondence for the proposed construction of flood mitigation measures at the 148th Street rail yard. Provided client with known historic property information relevant to the proposed project area, drafted correspondence for review by OPRHP and secured OPRHP concurrence of no historic properties affected by the proposed project.

Cultural Resource Constraints Assessment, North Jersey Transportation Planning Authority, Route 17, Bergen County, NJ. Principal Investigator. Conducted background research on archaeological and historic architectural resources in the project corridor; prepared GIS files for cultural resources and summary cultural resource assessment of the corridor.

Cultural Resources Eligibility/ Effects Documentation, Two Bridges Road Bridge, County of Passaic and the North Jersey Transportation Planning Authority, Lincoln Park, Wayne and Fairfield, Morris, Passaic and Essex Counties,

Zachary Davis, RPA Continued

NJ. Principal Investigator. Cultural resource screening, archaeological survey, and historic architectural resource survey for proposed bridge construction. Survey identified the historical bridge crossing the Pompton River, constructed in 1887 and eligible for the NRHP, identified extensive prehistoric occupation to the project area, and evaluated the surrounding area for additional historic properties. One archaeological site identified in the project area.

Phase IA/IB Cultural Resource Assessment, Beacon Institute for Rivers and Estuaries, DASNY and the New York State OPRHP on behalf of the Beacon Institute for Rivers and Estuaries, Beacon, Dutchess County, NY. Project Manager. Phase IA archaeological assessment and limited Phase IB archaeological field survey of proposed location for the Center for Advanced Environmental Research, positioned on the remnants of nineteenth- and twentieth-century historic brickwork at Denning's Point. Historical document and cartographic research, georeferencing historical maps to modern maps to ascertain past disturbances and/or prior settlement and land use, and assessment of the property's potential to contain historic and/or prehistoric archaeological resources. Identified several locations on Denning's Point with high archaeological potential.

Archaeological Monitoring, Fortesque Creek Dredging Project, Mobile Dredging & Pumping Co., Downe Township, Cumberland County, NJ. Project Manager. Conducted archaeological monitoring for the dredging of sediments deposited in the Fortesque Creek as a result of the storm surge from Superstorm Sandy. Archaeologists monitored the deposition of the dredge material onto the Fortesque beach throughout the duration of the dredging project. As the dredge material was deposited on the beach, the sediment was spread across the beach bulldozer. Throughout the dredging project and re-deposition project, no sign of archaeological resources were observed either in the dredge material or when the bulldozer shifted the dredge material around the beach.

Phase I Archeological Investigation, National Park Service (NPS), Denver Service Center, Fire Island National Seashore, Sailor's Haven Boardwalk and Helipad, Fire Island, Suffolk County, NY. Project Manager. Phase I archeological investigation for the rebuild of the Sailor's Haven boardwalk and helipad in the Fire Island National Seashore (FIIS) destroyed by Superstorm Sandy's storm surge in October 2012. A total of 18 shovel tests were excavated in the project area and failed to identify any archeological artifacts or features.

Julie Stein, ENV SP, LEED BD+C AP

Green Infrastructure - Discipline Lead

Firm
HDR, Inc.

Personnel Level
Level 6

Years of Experience
17

Education
Masters Degree, Regional Planning with a specialization in Environmental and Water Resource Planning; University of North Carolina - Chapel Hill, 2005
Bachelor of Arts, Environmental Studies and Sociology; Saint Lawrence University, 1998

Licenses/Registrations
- ISI Envision Sustainability Professional, New York, USA, Issued: 07/31/2013
- LEED Accredited Professional, New York, USA, Issued: 07/31/2006

Ms. Stein is the Northeast Stormwater Lead in HDR's New York Engineering Group and Sustainability Lead for the Water Business Group. She brings an extensive amount of urban infrastructure and environmental planning experience to HDR and its clients based on her role as the Director of Wet Weather Planning and Water Quality Policy in the Bureau of Environmental Planning Analysis for the New York City Department of Environmental Protection (NYCDEP). During here 8-year tenure at NYCDEP, she led several projects that focused on regulatory compliance with the Clean Water Act and green infrastructure planning as a viable water quality improvement strategy.

Both prior to and after Hurricane Sandy, Ms. Stein performed a variety of impact assessments specific to climate change, sea level rise, storm surge and drainage systems in at-risk communities throughout the City. She co-led the Department's climate resiliency planning initiatives including detailed vulnerability assessments of stormwater and wastewater infrastructure and development of near-term recovery measures and long-term adaptation strategies including hard and soft protections. Ms. Stein was a contributing author of the DEP Wastewater Resiliency Plan and NYC Green Infrastructure Plan and supported the development of Mayor Bloomberg's PlaNYC and Sustainable Stormwater Management Plan. Prior to this, she was the FEMA Community Planning Fellow in 2004-2005 and completed a multi-year feasibility study to integrate hazard mitigation, watershed planning and Smart Growth practices for communities nationwide.

Experience

NYCEDC Coney Island Creek Barrier and Wetland Feasibility Study, Brooklyn, NY. Deputy Project Manager. The Coney Island Creek Barrier and Wetland Feasibility Study will determine the conditions suitable for the design and construction of a surge barrier across Coney Island Creek to protect adjacent neighborhoods and critical facilities from the 100-year storm with 30 inches of sea level rise projected for the future (i.e., 2050). In response to the rebuilding efforts after Hurricane Sandy, the Mayor's Office of Resiliency and Recovery and New York City Economic Development Corporation initiated this study to determine how a tidal barrier would function in light of regional resiliency planning efforts and related regulatory and permitting requirements specific to water quality and ecological conditions within the Creek. Ms. Stein is responsible for overseeing a team of modelers to assess the potential impacts of the barrier on drainage, water quality and ecological conditions as well as develop wetland restoration concept plans to enhance and mitigate short and long term protection strategies

Julie Stein, ENV SP, LEED BD+C AP Continued

Northeast Ohio Regional Sewer District, Green Infrastructure Anticipated Co-Benefits Analysis, Cleveland, OH. As part of its CSO Consent Decree, the District is required to submit a report quantifying the expected co-benefits of 15 green infrastructure projects in Cleveland. The Anticipated Co-Benefits Report will describe the methods used to identify and analyze multiple co-benefits including operational savings and air quality, recreational and other livability improvements. This economics-based approach includes several external stakeholder workshops to review co-benefits evidence and preliminary results. Ms. Stein's role on the project is to coordinate the team that includes economists, engineers and ecologists to ensure credible, balanced results and to support the District to communicate results to the affected communities and its regulators.

Northeast Ohio Regional Sewer District, Woodland Hills Green Infrastructure and Sewer Separation Project, Cleveland, OH. Ms. Stein is serving as the Task Leader for Green Infrastructure and Consent Decree Compliance Task Lead. This project involves the separation of combined sewers throughout a 250-acre drainage area. All separate storm sewer flow will be routed through a series of bioretention basins to treat the flow before discharging to the Cuyahoga River. Ms. Stein is leading a team of consultants to complete pre-design and design tasks for bioretention facilities. A major focus of Ms. Stein's role on the project is to maximize volume reductions and improve performance beyond the current estimate of $2/CSO gallon reduced by expanding the drainage area and identifying additional feasible green infrastructure sites.

Seattle Public Utilities Ballard Natural Drainage Solutions 2015 Options Analysis, WA. Ms. Stein is leading the QA/QC Technical Review process for the HDR Team. She will assist this holistic approach toward prioritizing blocks which contribute not only to CSO reduction but add social value to the community such as mobility, aesthetic and public space improvements. Proposed roadside rain gardens focus on blocks where the project has a greater positive impact as a result of partnering with overlapping city initiatives including: Safe Routes to School, Rainwise, and urban forestry goals. Capitalizing on this overlap, the HDR Team will assess and develop the net social benefits created as a result of the project to increase community support such projects in the Ballard neighborhood.

US Military Academy at West Point Stormwater Master Plan and Design Development, NY. Ms. Stein is managing the initiation, development and completion of a stormwater master plan for a 2,000-acre area of the West Point campus. Ms. Stein will be overseeing a large team of staff and subcontractors to perform existing and future conditions assessments, conduct site visits, develop concepts for Low Impact Development (LID) systems in opportunity areas across the concept and developing a comprehensive stormwater master plan for the site to address multiple local and regional stormwater-related issues over a 20-year planning horizon. This project also entails the development of full designs for an LID Demonstration Project onsite.

Vulnerability Assessments for Pumping Stations and Overflow Facilities for Westchester County, NY. Ms. Stein is managing the review and assessment of Westchester County environmental facilities for vulnerabilities to flooding due to climate change and specifically sea level rise, high levels of precipitation, storms and storm surge. The risk that each facility area and critical equipment poses to the overall operation of the facility will be assessed and hazard mitigation alternatives will be identified based on a cost-risk analysis. The study will conclude with recommendations for cost effective alternatives to be implemented in the near term and those that may be deferred to a later date.

NYCDEP Wet Weather Planning & Water Quality Policy, Environmental Planning & Analysis. In the role of Program Director, Ms. Stein provided detailed data collection and planning-level analyses to support the development of the NYC Green Infrastructure Plan and allocation of $187 million in capital funds over a three-year period to manage runoff from 10% of the impervious surfaces in combined sewer watersheds through stormwater source controls-a critical goal of the Plan.

Brian C. Stobbie, PE, LEED® AP

Structural Engineering - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
Master of Business Administration, Finance; University of Connecticut (2003)
Bachelor of Science, Ocean Engineering; Texas A&M University (1984)

Licenses/Registrations
- Professional Engineer: Connecticut (#16754/exp. 1/31/15)
- Project Management Professional (PMP); Project Management Institute (PMI) (2004), LEED Accredited Professional (AP)

Professional Associations
Board Member – Darien Blue Wave Booster Club

Mr. Stobbie has more than 30 years of progressive design and project management experience in waterfront engineering, construction, and real estate development. He provides proven leadership and supervisory experience with the ability to manage multiple projects and teams simultaneously. Mr. Stobbie has directed feasibility studies and site preparation contracts for waterfront projects for agencies involved in international commerce, including the Port Authority of New York and New Jersey, major energy companies, and the U.S. Navy. He is also experienced with providing owner's representative services to guide the completion of fast-track projects.

Experience

PANYNJ Port Ivory Intermodal Facility. Project Manager. Managed the design from concept to contract documents for the redevelopment of a 38-acre site as an $82 million ship-to-rail container transport operation in the Port Ivory section of Staten Island, NY, for the Port Authority of New York and New Jersey (PANYNJ). Mr. Stobbie also developed and executed a $24 million site preparation contract, which included extensive asbestos abatement and lead removal as well as the handling and disposal of impacted soils.

Regional Interoceanic Authority, Cruise Ship Terminal, Panama City,Panama. Project Manager responsible for a feasibility study to create a port-of-call for cruise ships at Fort Amador. This project involved assessing the impact, costs and feasibility of an existing proposed layout and recommending alternative layouts to berth two cruise ships

NYCDOT, New Ferry Maintenance Facility, Staten Island, New York. Structural Engineer responsible for the analysis and rehabilitation of the piers and wharfs for the Staten Island Ferry berthing. Inspected pile driving operations that took place in and out of the water. Performed a pile cap and foundation redesign for the building structure to take into account the pile eccentricities.

Battleship USS New Jersey Berthing Feasibility, New Jersey Department of Building and Construction, Jersey City, New Jersey. Responsible to coordinate a study for the feasibility of berthing the Battleship USS New Jersey at various locations in Liberty State Park for the New Jersey Battleship Commission. Project involved architectural/engineering services for the three sites to determine the impact, navigational and dredging requirements, costs, and feasibility of creating a berth and to access the optimum location. Upland support faculties such as a visitor's center and parking were also investigated at the sites.

New York City EDC Governor's Island Feasibility Study. Supervised feasibility report analyzing maintenance costs of Governor's Island and presented report to NYCEDC senior staff prior to NYC Mayor Giuliani's press conference.

Brian C. Stobbie, PE, LEED® AP Continued

PANYNJ Parcel C Expansion Plan. Project Manager. Managed and coordinated a Stage I study to extend the wharf and create new containership berths on 77 acres of city-owned land adjacent to Howland Hook Marine Terminal in Staten Island, NY, for PANYNJ. The project would include developing 60 acres of wetlands. Mr. Stobbie reviewed environmental mitigation options and worked closely with the New York City Department of Environmental Conservation and the U.S. Army Corps of Engineers.

NYCDOT, Pier 7 Rehabilitation, Staten Island, New York. As field engineer inspected the construction to retrofit 42,000 square feet of pier used for the Staten Island Ferry Maintenance facility. Reviewed the construction procedures for jacketing piles, repaired the concrete deck, and installed new piles.

PANYNJ, Howland Hook Maintenance Dredging. Project Manager for the Port Authority to coordinate the contract documents in order to receive bids for dredging approximately 100,000 cubic yards of material with disposal of the material at an upland disposal facility.

PANYNJ, New Jersey Marine Terminals, Maintenance Dredging. Project Manager for Port Authority to coordinate the preparation of contract documents for 200,000 cubic yards of material to be dredged and disposed of at the Bark Camp Mine facility in Pennsylvania as part of a demonstration project.

PANYNJ, Brooklyn Marine Terminal, Maintenance Dredging. Project Manager for the Port Authority to coordinate the contract documents to receive bids for dredging approximately 120,000 cubic yards of material from Piers 6 – 12 at the Port Authority Piers. The dredged material was disposed of at the Historic Area Remediation Site (HARS).

Barge Mooring and Unloading Upgrade, Shell Chemical Company, West Virginia. Project Engineer responsible for supervising and coordinating the improvements and upgrade to an existing facility for product barge berthing and unloading. Project required a working access float enabling product barges to berth and unload between two existing cofferdam type structures. Developed and directed the design of the 150-DWT float, its fenders and mooring system. Designed the structures allowing personnel to access the float at the various water levels, which have a seasonal range of 45 feet, and with multidirectional movements of the float. Other responsibilities included overall coordination between three of our offices, all the mechanical and electrical equipment, as well as the off- loading cranes. Chaired meetings to present our design development drawings to the client. Met a very aggressive schedule on time and on budget.

PANYNJ Federal Shipping Channel Deepening. Engineer. Participated in senior-level partnering meetings with PANYNJ and other area agencies for a multibillion-dollar program to dredge both New York and New Jersey shipping channels in New York Harbor from 40 feet to 45 feet below mean lower low water (MLLW), to better accommodate deeper draft vessels. The meetings considered disposal alternatives and adaptive reuse for dredged material. Mr. Stobbie attended meetings with the New York City Economic Development Corporation, Empire State Development Corporation, New Jersey Department of Maritime Resources, New Jersey Department of Environmental Protection, and USACE. He also helped facilitate contract documents.

Daniel McDaid

Cost Engineering - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
BS, Civil Engineering, University at Buffalo/, 2006

AAS, Engineering and Applied Science, Jefferson Community College, 2003

Training and Certifications

- North American Green Erosion Control Materials Design Software, TR-55, HY-8, HydroCAD, MCACES Estimating Software, Primavera P6 program management software
- Trained in NYSDEC Green Infrastructure Standards
- NYSDEC Erosion and Sediment Control Qualified Inspector
- OSHA HAZWOPER Certified

Mr. McDaid is a Civil/Environmental Engineer with nine years of experience in environmental remediation and traditional civil engineering projects. AECOM has utilized Mr. McDaid as a design engineer and cost estimator in the office, and as a Resident Engineer overseeing construction projects. Specific project experience includes stormwater design; erosion and sediment control design; dredging design; revetment design; environmental and agricultural monitoring; Phase I Environmental Site Assessments; excavation, landfarming, and disposal of contaminated soils; installation of sub-slab depressurization systems; resident engineering; indoor air monitoring; groundwater monitoring; soil sampling; cost estimating; interacting with business owners/ residents and preparation of project reports.

Experience

Cost Estimating

Dormitory Authority of the State of New York, Smokes Creek, Lackawanna, NY. Prepared specialized cost estimates for work related to dredging, excavation, re-grading and restoration work at Smokes Creek in Lackawanna, NY. These estimates were prepared for work that included dredging, dewatering, excavation and disposal, site access, erosion and sediment control, revetment, and other associated construction work.

US Army Corps of Engineers, Sebring Mills and London Avenue, Metairie, LA; Algiers Canal in Plaquemines Parrish, LA; Poplar Brook, NJ; Green Brook, NJ, South River, NJ; Little Cuyahoga, OH; Blanchard River, OH. Prepared specialized cost estimates for the USACOE for various hurricane and flood protection projects in Louisiana, New Jersey and Ohio. These estimates were prepared for work that includes levee and floodwall reconstruction, diversion channel construction, stream restoration, utility modification and relocation, and various construction work. Additional tasks included oversight and review of cost estimates prepared by colleagues.

MTA Bus Company, College Point and Mother Clara Hale Bus Depots, New York, NY. Prepared cost estimates for remediation at the College Point and Mother Clara Hale Bus Depots.

Design Work

Stormwater Design – Various Clients- Citrus Hill and Tehachapi, Kern County, CA; Hounsfield Wind Farm SWPPP, Jefferson County, NY; Roth Rock Wind Farm SWPPP, Garrett County, MD; Marble River Wind Farm, Clinton County, NY. Assisted with the production of a Storm Water Pollution Prevention Plans, Grading Plans, and similar for various wind farm projects in New York, California and Maryland. Project activities included delineating watersheds and performing calculations based on regulatory peak flow and Erosion & Sediment Control considerations

Daniel McDaid Continued

for the sizing and placement of swales, culverts, stream crossings, micropools and low-water fords as they apply to each project. Associated work also included negotiating with regulators regarding design standards and client preferences.

Stormwater Design - Chautauqua County Landfill, Chautauqua County, NY. Assisted with the production of a Part 360 Permit Application, which included preparing stormwater and landfill liner design calculations, designing stormwater management facilities, and modeling stormwater using HydroCAD software.

Sediment Removal Design - Dormitory Authority of the State of New York, Smokes Creek, Lackawanna, NY. Assisted with the design of a US Army Corps of Engineers sediment removal project to restore the hydraulic capacity to Smokes Creek in the City of Lackawanna, NY as part of a federal flood control project. Tasks included performing quantity takeoffs, cost estimating and design calculations for dredging, excavation, grading, and stream bank revetment and restoration.

Resident Engineer/Construction Oversight

NYSDEC Excavation and On-site Remediation of Contaminated Materials, Lapp Insulator Site, Leroy, NY. Served as the Resident Engineer overseeing the excavation, stockpiling, and remediation of soils impacted with chlorinated solvents. Additional project work elements included excavation dewatering/ treatment, backfilling, compaction, surveying, hydroseeding and asphalt paving. Responsibilities included submittal review, quantity tracking, conducting project progress meetings, preparing daily inspection reports, communicating with NYSDEC, and ensuring the work conformed to Contract Documents. Ongoing work includes preparing the Final Engineering Report, groundwater/drum sampling and review of contractor invoicing.

Invenergy High Sheldon Wind Farm, Town of Sheldon, NY. Served as the Environmental/Agricultural Monitor overseeing the construction of a 112 megawatt wind energy facility in Wyoming County, New York. Project construction included over 20 miles of access roads, 75 wind turbines, an underground electrical collection system, a substation and an O&M building on over 30,000 acres. Mr. McDaid was responsible for ensuring that construction complied with the project Stormwater Pollution Prevention Plan (SWPPP), Agricultural Protection Plan, and all other applicable NYSDEC and U.S. Army Corps of Engineers plans and permits. In this role, he made modifications to the SWPPP to reflect actual field conditions; directed contractors in the implementation of erosion and sediment control practices, spill containment, cleanup; reported spills as required; and prepared daily/monthly reports. During this long-term project Mr. McDaid routinely interacted with participating landowners. He also prepared a Phase I Environmental Site Assessment for 20 properties.

James Mansky

Permitting & Regulatory Compliance - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
MS, Zoology/Botany, State University of New York, Brockport

BS, Biology, University of Miami, Florida

Professional Associations
Association of State Wetland Managers
Society of American Military Engineers

Mr. Mansky has more than 25 years of experience as a principal ecologist. He is responsible for the management of environmental impact analyses, including alternatives evaluations, wetlands delineations, mitigation concepts and designs, water quality studies, dredged material disposal, permit applications, and regulatory coordination. He directs the evaluation of wildlife habitat and wetlands functions and values. He is thoroughly knowledgeable in the application of federal wetland delineation and mitigation methodologies. Mr. Mansky is largely involved with federal and state regulatory studies, e.g., Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and other permitting requirements for the US Coast Guard and the State of New Jersey.

Experience

The Mills Corp, Meadowlands Mills (US Army Corps of Engineers Permit Application), Secaucus, New Jersey. Project Manager for the preparation of preliminary draft NEPA EIS and environmental studies for a 600-acre mixed-use development involving the placement of more than 200 acres of fill material in wetlands. The evaluation of existing habitat quality included a four-season avian survey and monitoring of the site's hydraulics and hydrology. Wetlands mitigation included the conceptual design of a 206-acre freshwater marsh and a 129-acre brackish marsh. Water resource planning was conducted to determine the hydrology and hydraulics of the marsh systems to ensure adequate supply for the diverse vegetation proposed. Conducted freshwater and brackish wetland value assessments for mitigation compliance and environmental testing of sediment and water.

New Jersey Meadowlands Commission, Ecological Studies at the Secaucus High School Site, Secaucus, New Jersey. Deputy Project Manager responsible for baseline ecological studies on a 38-acre site including birds, mammals, and benthic invertebrates. A testing program that evaluated the physical and chemical properties of the sediment and was also conducted. Evaluated design alternatives to enhance the ecological value of the existing wetlands.

New Jersey Meadowlands Commission, Wetland Mitigation Design of Secaucus High School Site, Secaucus, New Jersey. Principal Ecologist for the ecological enhancement of a 38-acre common reed (Phragmites australis) dominated wetland site along the Hackensack River. Assisted in the preparation of a qualitative analysis of the water quality, wildlife habitat, and social benefits of the project.

New Jersey Department of Transportation, Route 1&9 #28 Improvement, Hudson County, New Jersey. Responsible for the delineation of wetlands and environmental documentation for proposed road improvements to Route 1&9 over Wolf Creek in Bergen County, New Jersey.

James Mansky Continued

Prepared applications for US Army Corps of Engineers and NJDEP permits.

Halecrest Company and Mt. Hope Hydro, Inc., Mount Hope Pumped Storage Hydroelectric Project - Federal Energy Regulatory Commission (FERC) License Application, Rockaway Township, New Jersey. Project Manager responsible for all components of the application for the 2,000-megawatt facility, including; preparation of sections of the NEPA EIS, wetlands, water quality, historic properties, traffic, land use, and recreation. Supervised habitat evaluation procedures (HEP), geotechnical studies, and a dam safety analysis. Supervised the HEP analysis that were instrumental in defining and refining project alternatives acceptable to regulatory agencies, including the US Environmental Protection Agency, the US Fish and Wildlife Service, the US Army Corps of Engineers, FERC, and the New Jersey Department of Environmental Protection (NJDEP). Conceptual designs were prepared for four freshwater wetland mitigations areas that totaled 3.5 acres. Coordinated with state and federal agencies and local officials regarding regulatory compliance by the project.

New Jersey Department of Transportation, Pearl Street Bridge Replacement, Burlington, New Jersey. Responsible for the preparation and coordination of NJDEP permit applications for tidal wetlands, coastal development and required wetlands mitigation.

New Jersey Department of Transportation, Environmental Assessment for Route 1&9 Elizabeth River Viaduct, Elizabeth, New Jersey. Responsible for preparing an environmental technical study concerning the impacts to tidal and freshwater wetlands related to the replacement of the viaduct. Prepared tidal wetlands, stream encroachment, and coastal development permit applications for NJDEP.

New Jersey Department of Transportation, Amwell Road Levels of Action Assessment, Somerset County, New Jersey. Responsible for the preparation of environmental information for the levels of action assessment (LOAA) for replacing the Amwell Road Bridge over Conrail tracks. The purpose of the LOAA was to determine the effects on air and noise receptors, socioeconomic impacts, aesthetics, ecology, archaeology, historic architecture, hazardous waste materials and landfills, and recreational use of the area.

Steven Eget, PE, CEM

Air Quality - Discipline Lead

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 5

Years of Experience
23

Education
ME, Environmental Engineering, Stevens Institute of Technology, 2004
BS, Civil and Environmental Engineering, Rutgers University, 1994

Licenses/Registrations
- Professional Engineer: NY, NJ
- Training and Certifications
- Certified Energy Manager: US
- Certified ISO 14001 Internal
- Auditor: US
- Hazardous Waste Operations Training, 40 Hour; Annual Refreshers, OSHA

Affiliations
- Transportation Research Board, Member of Hazardous Waste and Sustainability in Transportation

Mr. Eget has over 20 years of experience in environmental engineering specializing in air quality permitting and compliance, sustainability, environmental compliance auditing, industrial hygiene and renewable energy. He has also experience managing multi-million dollar on-call engineering contracts for federal and state agencies. He has served as Project Manager or Team Leader for numerous projects in the areas of sustainability, air quality engineering, permitting, and compliance.

Experience

Rebuild By Design Hudson River: Resist-FutureGen Initiative National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS), US Department of Energy (DOE), Various Locations, Nationwide. Air Quality Lead. Served as the Technical Lead for preparation of the air quality section of the EIS for DOE's FutureGen initiative. FutureGen is a billion-dollar initiative to build the world's first integrated sequestration and hydrogen production research power plant. The proposed project plans called for the development of an approximately 250-MW power plant using coal gasification technology. The air quality analysis included quantification of emissions from sources in the preliminary design and construction operations, a dispersion modeling analysis, and health risk assessment. These results were compared for the four locations under consideration for the project. In addition to technical oversight, provided comprehensive outreach support, including direct discussions with concerned stakeholders, during public outreach meetings at all proposed locations.

Taylorville Energy Center NEPA EIS, Tenaska, Taylorville, IL. Air Quality Lead. As subcontractor, served as the lead for preparation of the air quality section of the EIS in accordance with the DOE Loan Guarantee program. The proposed plant is a 770-MW power plant (nominal) using coal gasification technology and will include carbon sequestration. The air quality analysis included evaluation of emissions from sources in the preliminary design and construction operations, regulatory applicability review, and health risk assessment.

Pre-Construction Services Related to Hurricane Sandy Relief Programs, New York City Economic Development Corporation and Mayor's Office of Housing, New York, NY. Environmental Task Lead for Dewberry's contract to support New York City's permanent housing recovery program post Superstorm Sandy by conducting detailed assessments of approximately 20,000 damaged homes and performing site assessments and environmental review to qualify properties for US Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) funding. Environmental review is pursuant to NEPA, Section 106 of the National Historic Preservation Act (NHPA),

Steven Eget, PE, CEM Continued

other governing regulations, and Programmatic Agreements.

Study to Assess Adaptation of Infrastructure to Climate Change, NJ TRANSIT, New Jersey, Pennsylvania, New York. Project Manager. As a subconsultant, Dewberry was involved in assessing potential risks of the projected impacts of climate change on vulnerable infrastructure. The project also involved developing cost-effective strategies for adaptation of at-risk infrastructure potentially subject to climate change including such issues as flooding, high tides, extreme cold, and extreme heat. Assessment activities will facilitate planning to maintain service and operations over the 5-, 10- and 20- year planning horizons.

Project Management Contract for Superstorm Sandy Waterway Debris Removal, New Jersey Department of Environmental Protection (NJDEP), New Jersey. Senior Environmental Engineer/ Health & Safety. Dewberry was responsible for supporting the NJDEP in planning and managing a state-level, regionally organized contract to remove and monitor debris from waterways, while maximizing FEMA reimbursement under the Public Assistance Program.

Environmental Term Contracts, MTA NYC Transit, Five Boroughs, New York, NY. Senior Project Manager, Senior Environmental Engineer, Air Quality Specialist for multiple 5 year contracts. Tasks have included NEPA assignments related to the rebuilding of Lower Manhattan following the events of 9/11 as well as capital projects, air quality assessment and permitting, hazardous materials inspections, remedial investigations, environmental construction management, regulatory compliance, and permitting.

Management Support Services for Environmental Assessment, Governor's Office of Storm Recovery (GOSR), Various Locations, NY. Project Manager responsible for supporting GOSR with environmental and program management services across a range of CDBG-DR funded programs statewide. These programs are aimed at the long-term recovery of communities impacted by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee.

Environmental On-Call Contract, Lower Manhattan Development Corporation, New York, NY. Air Quality Lead. As part of the on-call contract to provide environmental services, developed a conceptual air monitoring plan and later reviewed the final air monitoring plan for the deconstruction of the 130 Liberty Street Building in Lower Manhattan.

Robin Miller

Water Quality & Sediment Modeling - Discipline Lead

Firm
HDR, Inc.

Personnel Level
Level 6

Years of Experience
28

Education
MS, Environmental Engineering;
Manhattan College, 1990
B.S., Biology and Mathematics;
Manhattan College, 1988

Ms. Landeck Miller has been an environmental scientist since 1988, focusing on water and sediment quality analysis within the context of the Clean Water Act (CWA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). She has conducted and managed projects involving detailed numerical modeling, including contaminant fate and transport; nutrients, dissolved oxygen, and eutrophication; pathogen indicator organisms; hydrodynamic transport; and sediment transport.

Her projects have involved issue such as: development and verification of water and sediment quality criteria and standards; Total Maximum Daily Loads and Allocations (TMDLs/WLAs/LAs) development and review; dredging and dredged material management; Environmental Impact Statements (EIS); Use Attainability Analysis (UAA); projections of water quality impacts due to relocation, modification, or construction of waste treatment facilities; analysis of synoptic rainfall data to determine storm-related impacts; design of sampling programs; and estimation of watershed loadings. Ms. Miller also has experience in the development of federally approved Quality Assurance Project Plans (QAPPs).

Experience

Evaluation of the Effect of Sussex Borough STP on Water Quality in Clove Brook and Papakeeting Creek, NJ. Conducted model calibration and projection scenarios supporting the assessment of potential water quality impacts in Clove Brook and Papakeeting Creek associated with a proposed expansion of the Sussex Borough STP. Applied the steady-state model QUAL2E.

USEPA Region 2, Tech Transfer of NYNJ Harbor Water Quality Models. As Project Director, Ms. Miller provided EPA with the model codes, input, and output files and compilation instructions necessary for EPA to benchmark results of HDR's pathogen, nutrients/dissolved oxygen, and toxics TMDL models.

Model to Evaluate and Manage Contaminants in Water Sediment and Biota in NY/NJ Harbor Estuary. Ms. Miller led the principal research investigators and technical staff teams in the development and application of mathematical models to analyze contaminant transport, fate and bioaccumulation in the NY/NJ Harbor Estuary. She directed data analysis, endpoint identification, and user interface development teams. She also led the development, calibration, and application of state-of-the-science hydrophobic organic contaminant and mercury methylation models and used prior experience and expertise in the modeling of hydrodynamic transport and organic carbon production. Ms. Miller developed presentations for independent peer review panels and wrote final reports.

Sampling and Analytical Plan Development for the Lower Passaic River and Newark Bay near

Robin Miller Continued

Newark, NJ. Ms. Miller was the lead document author, Combined Sewer Overflow and Storm Water Overflow Sampling and Analytical Plan, prepared at the request of EPA Region 2 and USACE Kansas City District for the Diamond Alkali/ Lower Passaic River Superfund Site. Directed a multi-firm team in producing the plan following Uniform Federal Policy (UFP) guidance and served as an advisor regarding availability of toxics data in the NY/NJ Harbor, design of other sampling programs and toxic contaminant fate and transport model development needs.

System-Wide Eutrophication Model, NY/NJ Harbor. Ms. Miller was project manager responsible for the calibration of the eutrophication model and many project specific enhancements to the model code and managed the computer resources for the project and was able to conduct more than fifty long-term projection scenarios in a very short time frame. Formulated projection scenarios with the client and transmitted the scenario results to both the client and regulatory agencies. Performed model simulations of water quality based effluent nitrogen trading. Made several technical presentations during this study to an independent panel of peer reviewers convened by EPA which led to the regulatory acceptance of the model.

TMDL/WLA Development in the NY/NJ Harbor and Long Island Sound. As Project Director, Ms. Miller led a series of projects and contracts on behalf of USEPA for the development of TMDLs in Long Island Sound and the NY/NJ Harbor for nitrogen, carbon, dissolved oxygen, pathogen indicator organisms and toxic contaminants (PCBs, dioxins/furans, pesticides, PAHs, mercury). Harbor efforts include assessments of numerous states' and federal criteria and standards, numerical model applications, TMDL calculations and preparation of public TMDL documents. Long Island Sound efforts include a phased TMDL approach for proximal and distant watershed sources and evaluation of shellfish and seaweed aquaculture bio-extraction as an alternative to point and nonpoint nitrogen loading reductions. Efforts for both waterways included participation in the USEPA National Estuary Program management conference structure and adoption of standards consistent with EPA's marine dissolved oxygen criteria. The most recent efforts have included training EPA and states' staffs to run the Harbor TMDLs models.

Port Jersey Channel Navigation Improvement Project, NJ. Serving as project manager, Ms. Miller worked in conjunction with other technical staff to perform water quality evaluations in support of an environmental assessment (EA). For the water quality evaluations, a high resolution, 3-D model of the channel and contiguous waterways was developed and applied. Changes in channel salinity, temperature, circulation patterns, residence time, water elevation, and dissolved oxygen as a result of channel realignment, deepening, and restoration were calculated.

NYCDEP LTCP2 Development for Gowanus Canal and Newtown Creek, NY. Serving as the Lead Modeler and Water Quality Consultant, Ms. Miller supported the CSO LTCP development in Gowanus Canal and Newtown Creek. An important element of the work is designing and implementing the modeling to meet the City's deadline sensitive obligations under both the Clean Water Act and CERCLA.

Great Lakes Environmental, NJ Harbor Consultation - Nutrient TMDL Planning, NJ. Ms. Miller served as an Expert Adviser to the New Jersey Harbor Dischargers Group in terms of explaining HEP TMDL modeling results.

NEIWPCC Additional Water quality Modeling Services for NY/NJ Harbor. Provided training to USEPA Region 2 and the States of NY and NJ on running 3-D, time-variable models developed for establishing TMDLs for NY/NJ Harbor for pathogen indicator organisms, nutrients, and toxic contaminants.

Peter G. Naumoff, PG, LSRP

Geology - Discipline Lead

Firm
AECOM (URS)

Personnel Level
Level 5

Education
BA/Geology/City University of New York
MA/Candidate / Geology / City University of New York

Licenses/Registrations
- 1994 / Professional Geologist Pennsylvania PG-000788-G
- 2009 / Licensed Site Remediation Professional New Jersey 579066

Mr. Naumoff is experienced in developing, implementing, and managing hazardous waste and geological investigations throughout the northeast region. He has served as Project Manager, Project Geologist, and Site Manager for multi-million dollar projects including Federal Investigations, RCRA Facility Investigations, New York City landfill closures, New Jersey remediation projects, and Superfund investigations.

Experience

Joint Base McGuire-Dix-Lakehurst, NJ, RCRA Phase II Investigation/Removal Action, JB-MDL, New Jersey, Task Order 0137. Project Manager for a Phase II RCRA Facility Investigation (RFI) in the areas of four former buildings associated with USTs, which experienced historical petroleum spills and releases. Directed Interim Removal Actions (IRAs) at three areas to remove contaminated soil to meet NJDEP residential standards. URS completed the removal action with the excavation and disposal of over 2,000 tons of impacted soil to the satisfaction of JB MDL and NJDEP and without any disruptions to the base's mission-critical operations. The work also included installation of over 40 shallow and deep monitoring wells, groundwater sampling, and laboratory analyses of soil and groundwater samples to complete horizontal and vertical delineation of contamination. URS received an ACASS rating of Very Good for this $1.4M project.

Joint Base McGuire-Dix-Lakehurst, NJ, Remedial Investigations of Multiple Sites. Project Manager - Under AFCEE and USACE contracts, project activities include supervision of closure investigations for eleven Air Force ERP sites, preparation of USEPA and NJDEP Work Plans and RI reports, and directing field activities and interim removal actions in compliance with CERCLA, Air Force Policy, and NJDEP requirements. Prepared a base Strategic Management Action Plan, which was used during partnering sessions between USEPA, NJDEP, McGuire AFB, and Air Mobility Command to select a long term remedial strategy for the base. Prepared CERCLA scoping documents for USEPA and NJDEP to conduct a USEPA/ USACE Triad investigation of LF-04 (Landfill No. 3), beginning with systematic planning with the project stakeholders. Providing technical support for McGuire AFB Restoration Advisory Board public meetings.

Joint Base McGuire-Dix-Lakehurst, NJ, Triad Investigations of Multiple Underground Storage Tank Sites. Project Manager for the Air Force initiative of conducting site and remedial investigations using the Triad approach, consisting of systematic planning, real time field measurements using test kits, rapid laboratory analyses, and membrane interface probes, and following a dynamic work plan strategy. This rapid characterization approach follows site-specific data-quality objectives and reduces site uncertainties through the

Peter G. Naumoff, PG, LSRP Continued

collection of a high number of samples and allows for the rapid development of a conceptual site model. The work is done consistent with NJDEP requirements and led to the quick development of defensible remedial action decisions for the McGuire AFB UST sites in Military Residential housing complexes., active flight lines, and other sensitive area.

Former BOMARC Missile Facility Trichloroethene Plume, Joint Base McGuire-Dix-Lakehurst, NJ. Project Manager directed a NJDEP Remedial Investigation under USACE contract of a 100-acre TCE plume discharging off site to Pinelands streams in the NJ Colliers Mills Wildlife Management Area. Because of sensitive ecology, the plume generated Congressional and Public concern. The project team successfully conducted stream sampling and installed sentinel wells in a remote and sensitive NJ Pinelands area to provide definitive delineation data for plume.

LSRP, Continental Airlines (United), Newark Liberty Airport, NJ. LSRP and Lead Geologist for the remedial investigation of former underground storage tanks in the active taxiway/hangar 55 area. The soil and groundwater is impacted with petroleum products and historical fill. Work includes excavation and removal of out of service USTs. Coordinating with the Port Authority of NY&NJ and United Airline to comply with NJDEP requirements.

LSRP, GPU Nuclear, Oyster Creek Nuclear Generating Station and Forked River Site, NJ. Retained by FirstEnergy as the LSRP for the remediation of these two power generating facilities. Oyster Creek remediation consists of ISRA compliance and the Forked River site requires remediation of an active firing range.

Richard Paupst

Transportation Engineering - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
MS, Civil Engineering, Manhattan College, 1985
BS, Civil Engineering, Manhattan College, 1980

Licenses/Registrations
- Professional Engineer, New York
- Professional Engineer, Connecticut
- Professional Engineer, Georgia
- Professional Engineer, New Jersey

Professional Associations
American Society of Civil Engineers
Metropolitan Railway Club
New England Railroad Club

Mr. Paupst has more than 30 years of experience on rail and transportation projects, providing planning, design, and construction-related services. By virtue of his daily involvement with the design of major transit facilities, he has experience in the operational requirements of working on large, visible, public-use facilities. Mr. Paupst is thoroughly familiar with local permitting requirements and codes, and has a broad familiarity with state and federal agency requirements for major public transportation projects.

Experience

Federal Aviation Administration, Technical Center Task Order Contract, Atlantic City, New Jersey. Project Manager that provided engineering services on a call-in basis. The tasks were new designs as well as retrofit installations for maintenance and testing facilities. The services ranged from inspections, studies, and permitting to complete design and bid documents. 28 specific tasks were undertaken, including alternative site evaluations, site layout development and drainage, access road provisions, surface recharge basins, hazardous waste retention facilities, and paving for 50,000 square feet of maintenance/testing hangar and associated facilities, underground roof repairs, replacement of underground storage fuel tanks, environmental assessments, and modifications to a sewage treatment plant. Other projects included a day care center, physical fitness facility, and a 16,000-square-foot computer laboratory.

New York City Transit, Second Avenue Subway, New York, New York. Station and Facilities Manager for six stations with an approximate construction value of $2.3 billion. Stations included a mined station at 86th Street, cut-and-cover stations at 96th, 106th, 116th, 125th, and Houston Street stations, and yard facilities located at 125th Street station. All stations were center island platforms that are 615 feet in length. NFPA along with ADA requirements dictated the types and quantities of vertical circulation elements. All stations were modeled using pedestrian simulation and smoke extract models to verify full compliance. Other responsibilities included evaluating and establishing the project GIS system, numerous presentations to community boards and client, and coordinating the design with the approved environmental impact statement.

Metropolitan Transportation Authority - Long Island Rail Road and New Jersey Transit, Penn Station Vision Study, New York, New York. Project Manager for the development of an overall masterplan for Penn Station, including developing overall layout of new concourses along with increased vertical circulation, evaluation of PSNY improvements using Legion pedestrian analysis modeling, and developing new uniform architectural finishes and signage for all station users. Study also included developing a roadmap for achieving the final plan by

Richard Paupst Continued

phasing the improvements, which also incorporated Amtrak moving to the new Moynihan Station and LIRR East Side Access project. Various presentations were provided to various NYC departments, adjacent property owners, community organizations, and politicians to develop project support.

New Jersey Transit, Pennsylvania Station Concourse and Other Improvements Analysis and Preliminary Design, New York, New York. Project Manager and client liaison responsible for day-to-day operations for the alternative analysis and design of NJ Transit's portion of Level A at Penn Station. The project encompassed rehabilitation of the existing concourse shared by New Jersey Transit and Amtrak and design of new concourse areas in underutilized portions of the station to will improve pedestrian passenger flow through the station, improve life safety conditions, create a presence for New Jersey Transit, and provide a coherent environment through new architectural finishes, lighting, signage, communications, and heating and air-conditioning systems while being fully ADA compliant. The initial phase of the project involved extensive field survey efforts, as much of the documentation regarding the original construction of the station and the 1963 overbuild was lost, destroyed, or incomplete. Using all available data and the results of the surveys, five alternative concourse configurations were analyzed with regard to their physical, operational, fiscal, environmental, and economic viability. The station's electrical, HVAC, mechanical, structural, and architectural elements were rated with regard to the relevant codes and standards and the selected alternative incorporated the required modifications and additions into a fully functional, aesthetically pleasing design. The design phase of this project incorporated all of the findings into construction documents. This was performed using the Intergraph CADD system that helped in our understanding of the existing conditions and how they related to the new concourse being introduced. The CADD model of Penn Station was fully developed in three dimensions in order to see how the concourse impacted the station, and how the final product would appear.

New Jersey Transit, West Shore Line Evaluation Study, Bergen County, New Jersey. Project Manager for the feasibility study, cost/benefit ratio evaluation and conceptual design for restoring commuter rail service to the West Shore Line between Hoboken, NJ and West Haverstraw, NY. The study involved evaluating the previous design and modifying it to improve train operations and locations of the stations, yard, and maintenance facility. The conceptual design included right-of-way improvements, track and line structures, typical stations, and a layover yard with a 10-set train capacity. The project also involved utilities and support facilities for the terminal yard. Critical to the success of the service was efficient and dependable transfer stations at North Bergen and Secaucus, NJ, which would provide access to the New Jersey waterfront and Penn Station, NY. Value engineering was an integral part of the study.

New Jersey Turnpike Authority, Turnpike Widening, Various Locations, New Jersey. Project Oversight Manager responsible for overall project coordination, and ensuring the quality and timeliness of all submissions. Responsibilities encompassed the oversight of all personnel and the daily progression of the contract documents for this major 3-mile section of the 1990 widening and improvement program through the cities of Elizabeth and Linden (including Interchange 13) leading to the Goethals Bridge. 35 bridges were reconstructed, and many major retaining walls were required. As this turnpike is one of the busiest roads in the nation, complicated and detailed maintenance of traffic and staging plans had to be developed.

New Jersey Transit, Metropark Station Circulation, Iselin, New Jersey. Project Manager for the addition of a new kiss-and-ride drop off area located west of the existing parking decks. The facility was designed to eliminate the passenger drop off area within the deck structures that reduced the level of service of the deck's vehicular circulation. The new facility accommodates 60 cars and incorporates a new 20-foot-long canopy to help protect pedestrians awaiting rides.

Sheldon L. Fialkoff

Transportation Planning - Discipline Lead

Firm
AECOM

Personnel Level
Level 5

Education
BS, Electrical Engineering, Polytechnic Institute of Brooklyn (now Polytechnic Institute of New York University), 1972
MS, Bioengineering, Polytechnic Institute of Brooklyn (now Polytechnic Institute of New York University), 1974

Professional Associations
Institute of Transportation Engineers
Women's Transportation Seminar

Mr. Fialkoff is highly proficient in the transportation industry as a project manager and transportation engineer. He has served as deputy director of planning for the New York State Metropolitan Transportation Authority and was responsible for the planning of new facilities for both rapid transit and commuter rail systems. His responsibilities included supervision of federally-funded transportation programs. Mr. Fialkoff's transit experience includes conceptual feasibility studies for new and high technology (AGT) transportation systems, transit and commuter rail stations, new transit expansion projects, environmental impact analyses of transportation projects, and transit related capital planning studies.

Experience

Metropolitan Transportation Authority - New York City Transit, Queens Subway Option Study, New York, New York. Deputy Project Director and Project Director for the planning for completion of the 63rd Street subway line. As part of this project, supervised both MTA and consultant staff in the analysis of alignment alternatives and the preparation of a draft environmental impact statement (DEIS) for completion of the connection of the 63rd Street Subway Line in Queens. The resultant DEIS provided the basis for the approval of the MTA NYC Transit 63rd Street Subway Line connection to the Queens Boulevard Subway Line, currently under construction.

Metropolitan Transportation Authority, Public/Private Joint Development, New York, New York. MTA's Director of Planning, managed the public/private joint development projects for the agency, including station improvements and extensions paid by private developers. Resulted in the construction and operation of new or expanded transit station passenger facilities at no cost to the MTA or its operating agencies. Included supervision of planning and architectural staff that reviewed private developer proposals and developed recommendations based upon these reviews. Negotiated business terms and conditions for proposed improvements, which included operating and maintenance agreements with other agencies and private developers.

Metropolitan Transportation Authority - New York City Transit, Second Avenue Subway - Preliminary Engineering, New York, New York. Providing preliminary engineering services for the design of a new subway line under Manhattan's East Side. The project consists of a new 10-mile rapid transit two-track alignment and the design of 16 new underground rail stations with modernization to one existing station. As manager of real estate, responsible for developing the real estate program for the project and coordinating with the MTA and outside agencies to ensure the acquisition of all rights necessary for the construction and operation of the new line. As EIS coordinator, responsible for working with the external consultant

Sheldon L. Fialkoff Continued

developing the EIS documents to ensure that the preliminary engineering design and proposed mitigations were consistent with the environmental documents being developed.

Maryland Department of Transportation, Bethesda-Silver Spring Light Rail Transit, , Maryland. Deputy Project Manager for development of conceptual engineering and planning for construction and operation of a 6-mile new light rail project. Evaluated operating plans as well as the development of alternative station locations. Supervised the development of operational analyses to confirm operating reliability of the operating and service plans. Developed traffic analyses to determine the need and applicability of at-grade versus grade-separated crossing of major roadways within the study area.

Metropolitan Transportation Authority, West Midtown Peoplemover Feasibility Study, New York, New York. Project Director for the MTA for the development of a peoplemover system between New York Penn Station and LIRR's Cammaerer Rail Yard. Study elements included the development of a conceptual engineering alignment and operating plan for an automated guideway technology as well as determination of the feasibility of constructing and operating the system to support development of a new Madison Square Garden on the west side of Manhattan. The entire study was completed within 90 days.

Port Authority of New York and New Jersey, Airport Access Program, Various Locations, New York. Planning Manager responsible for program planning, for a 22-mile automated guideway transit (AGT) system between Manhattan, LaGuardia, and John F. Kennedy international Airports. Responsible for coordination of the station area planning for off-airport stations as well as development of the fare control concept for the project. In addition to direct supervision of consultant staff, responsible for the review and application of the ridership estimates developed for the project. Assisted in coordination of PANYNJ input in the preparation of the FAA Newark Airport monorail draft environmental impact statement.

Los Angeles County Metropolitan Transportation Authority, Los Angeles Metro Gold Line Eastside Extension - Phase II, Los Angeles, California. Project Manager for alternatives analysis and environmental impact statement/ environmental impact report for a 7-mile light rail extension to the Metro Gold Line Eastside Line. The project estimate is approximately $750 million to construct. The alternative analysis was completed in September, 2008, and the draft environmental impact statement/ draft environmental impact report (DEIS/DEIR) will be completed in January of 2011.

Metropolitan Transportation Authority - New York City Transit, LaGuardia Airport Subway - Rail Transit Service Extension - Access Study, Conceptual Engineering, and Planning, New York, New York. Project Manager in charge of the planning, development of alternatives analyses, conceptual engineering, and environmental impact studies for extension of the NYCT subway service from Manhattan to LaGuardia Airport.

Chicago Transit Authority, Circle Line Alternatives Analysis Study, Chicago, Illinois. Project Manager providing planning and engineering services to the CTA for completion of a Federal Transit Administration (FTA) alternatives analysis study for a new rapid transit line in the city. The new line would provide an expansion of the transit rail service west of downtown with passenger connections to the regional commuter lines. The current study calls for the analysis of modal and alignment alternatives to verify the selection of the most appropriate transit solution for further evaluation under the FTA New Starts program.

Metropolitan Transportation Authority - New York City Transit, Bus Rapid Transit, New York, New York. Project Manager providing planning and engineering service to the New York City Transit Authority in identifying and developing five demonstration corridors for the introduction of bus rapid transit (BRT) lines. The project identifies existing or new corridors for consideration of implementing a bus rapid transit system.

Jack Kanarek, PE

Transit Planning - Discipline Lead

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 5

Education
MS, Civil and Urban Engineering, University of Pennsylvania, 1976
BS, Civil Engineering, University of Buffalo, 1972

Professional Associations
American Society of Civil Engineers
Metropolitan Railway Club of New York

Mr. Kanarek has worked in the public transportation industry for over 40 years. He spent most of his career with NJ TRANSIT, where he last served as Senior Director of Project Development. At NJ TRANSIT, he was deeply involved in planning and developing improvement and expansion projects for New Jersey's extensive bus and rail system. He participated in leading the team that developed NJ TRANSIT's groundbreaking rail system integration program that led to the construction of projects that implemented Midtown Direct service and the Secaucus Junction Station. He led planning work for railroad capacity improvement projects and development of new rail equipment. In addition, he directed planning work and public involvement for several rail system extension projects and bus rapid transit initiatives.

Experience

Evaluation of Next Generation Bus Rapid Transit (BRT), North Jersey Transportation Planning Authority. Project Manager for a study that prepared planning and implementation guidance for future BRT applications in northern New Jersey.

Transit System Extension Studies, NJ TRANSIT, Multiple Locations, NJ. As Senior Director, Project Development for NJ TRANSIT's Planning Department, directed project managers responsible for major investment/alternatives analysis, environmental impact studies and public outreach for a wide range of projects, including: Access to the Region's Core (proposed New Jersey to midtown Manhattan Hudson River rail tunnel); Bergen and Passaic counties' rail service extensions; Burlington/Gloucester rail studies; Central New Jersey Route 1 Bus Rapid Transit; Meadowlands Sports Complex rail service; Lackawanna Cutoff passenger service restoration; Monmouth-Ocean-Middlesex rail service; Raritan Valley Line extension; West Trenton rail service restoration; and implementation of Boonton Line extension to Hackettstown.

Railroad Infrastructure and Capacity Improvement Planning, NJ TRANSIT, NJ. As Senior Director, Project Development for NJ TRANSIT's Planning Department, directed planning studies that supported the expansion of rail service on the Main, Bergen County and Pascack Valley lines in coordination with the development of the Secaucus Junction Station. He also directed Northeast Corridor railroad capacity analysis that proposed signal improvements, the Midline Loop, County Yard Expansion and the Delco Lead. In addition, he guided concept development of NJ TRANSIT's multi-level coaches and dual power locomotives.

Passenger Facility Projects Multiple Locations, NJ TRANSIT, NY and NJ. As Senior Director, Project Development for NJ TRANSIT's Planning Department, responsible for multi-year program and project

Jack Kanarek, PE Continued

planning for major passenger transit terminals, rail stations, and bus and rail park-and-rides, including ADA compliance; historic station restoration; multi-modal facility improvement planning, including Newark Penn Station, Hoboken Terminal, Newark Broad Street Station, Hamilton Station, Montclair University Station and Secaucus Junction. Planning for Newark Penn Station led to improved station access, vertical circulation improvements and bus priority lanes. In addition, Mr. Kanarek directed the development of passenger facility guidelines and standards for NJ TRANSIT rail stations.

Bus Service Improvements, NJ TRANSIT, NJ. As Senior Director, Project Development for NJ TRANSIT'S Planning Department, directed planning for the US 9 bus on shoulder bus service improvement project, and the Central New Jersey Route 1 Bus Rapid Transit Alternatives Analysis.

Transit Oriented Development and Land Use Planning, NJ TRANSIT, NJ. Directed initiatives to encourage and implement smart growth and transit village development in partnership with municipalities; planning for joint development; and education, including preparation of NJ TRANSIT's publication, Planning for Transit-Friendly Land Use: A Handbook for New Jersey Communities.

Transit Shared Use Studies, Federal Transit Administration. Co-Author, on behalf of Systra Consulting, Inc., for two Federal Transit Administration (FTA) research studies that evaluated techniques for shared use operations by non-compliant light rail transit with Federal Railroad Administration (FRA) compliant railroad operations. The initial research study, Safe Transit in Shared Use Study, developed operations and infrastructure plans for expanded shared use of track by the NJ TRANSIT River LINE and freight railroad operations. The design provides a template for other shared use applications utilizing off the shelf signal technology. The second research study, Rail Transit Shared Use And Control Systems Study, evaluated current Positive Train Control (PTC) technologies for shared use operations, and identified the changes needed to PTC systems and underlying signal systems they enforce to enable shared use operations.

I-287 Regional Transportation White Paper, NJ TRANSIT and North Jersey Transportation Planning Authority. Project Manager for a study that reviewed the I-287 Corridor in NJ and identified potential strategies for improving mobility.

G. Noemi Castillo, PE

Noise - Discipline Lead

Firm
HDR, Inc.

Personnel Level
Level 6

Years of Experience
16

Education
Master of Science, Environmental Engineering; Manhattan College, 2004
Bachelor of Science, Environmental Engineering, Manhattan College, 2000

Licenses/Registrations

- Professional Engineer, New York, United States, No. 084926
- Engineer in Training, New York, United States, No. 082139
- OSHA, Certified 10-hour Construction Training

Ms. Noemi Santiago is an Associate and project manager at HDR. She has diverse experience, including noise monitoring and noise analysis, air quality analysis, waterfront permitting, site assessment, site investigation, site remediation, dredging, procurement, cost estimating, and telecommunications. Ms. Santiago is a member of the Women in Transportation Seminar (WTS) and Society of Women Engineers (SWE).

Experience

Tappan Zee Constructors / New York State Thruway Authority, The New NY Bridge (Tappan Zee Hudson River Crossing), Westchester-Rockland County, NY. Noise/ Vibration/Air Quality Task Leader for this project on behalf of Tappan Zee Constructions LLC. In this role, she was responsible for developing environmental compliance plans, implementing environmental compliance plans, performing regular inspections of construction activities and equipment including noise monitoring, and developing compliance reports. Ms. Santiago was also responsible for the creation of an equipment database to document real-time in the field pertinent equipment information. She was also responsible for noise modeling performed by TZC using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) for proposed noise walls. Ms. Santiago held the role of interim Deputy Environmental Compliance Manager and assisted in overseeing all the project's environmental compliance activities including underwater noise, water quality and airborne air/noise monitoring. HDR is the lead designer, and a subcontractor for Tappan Zee Constructors LLC, a consortium of construction and A/E firms.

The new bridge will replace the existing Tappan Zee Bridge crossing which handles more than 138,000 vehicles every day—far more than its design capacity. The new twin bridges are more than 3 miles long and will cross the Hudson River at one of its widest points to connect Rockland and Westchester counties. Key features of the new bridge include twin iconic cable-stayed main spans with 1,200-foot center spans. The project team is following strict environmental performance commitments to protect the Hudson River estuary. The New York State Thruway Authority selected design-build as the delivery method for this project to meet an aggressive schedule.

New York Planning Board Warwick Environmental Impact Statement (EIS) Noise and Air Review, NY. Noise and Air Task Leader for reviewing environmental review documents submitted to the Planning Board for approval, including the Watchtower Environmental Impact Statement.

New York City Economic Development Corporation (NYEDC), Taxi Medallion EIS Noise and Air Analyses, NY. Task Leader for the air and noise analyses being performed for the New York City Taxi and Limousine Commission (TLC) Taxi Medallion project. The environmental review was being

G. Noemi Castillo, PE Continued

conducted pursuant to the State Environmental Quality Review Act (SEQRA) and City Environmental Quality Review (CEQR) procedure, including conformance with Executive Order 91, the regulations implementing CEQR, and the guidance provided in the CEQR Technical Manual (2010). Ms. Castillo was responsible for conducting noise screening and air quality screening and modeling using the CAL3QHCR model, in accordance with applicable rules and regulations.

New York City Department of Environmental Protection (NYCDEP) Bronx CSO Storage Facility, NY. Task Leader for the noise assessment conducted for the construction and post-construction phases of a proposed Combined Sewer Overflow Storage Facility. This information was used by the prime consultant to support an Environmental Assessment Statement for the project. She was responsible for conducting noise screening, noise monitoring and noise analyses using spreadsheet models in accordance with the New York City Environmental Quality Review (CEQR) Technical Manual.

NYCDEP Noise Analyses Technical Review, Various Locations, NY. Provided assistance conducting technical reviews of noise analyses included in Environmental Impact Statements/ Environmental Assessment Statements (EISs/ EASs) submitted to the NYCDEP's Office of Environmental Planning and Assessment (OEPA) for review under State Environmental Quality Review Act/City Environmental Quality Review (SEQRA/CEQR). The analyses reviewed were based on on-site stationary equipment analyses and the Federal Highway Administration's Traffic Noise Model (FHWA's TNM) version 2.0/2.5 for off-site mobile analyses.

New York City Department of Sanitation (DSNY) EIS Noise and Air Quality Analyses, NY. Project Manager for all supplemental environmental reviews including a Technical Memorandum updating the New York City Solid Waste Management Plan (SWMP) Final EIS analyses for various SWMP facilities. This information is used to assist the City of New York with the implementation of the SWMP. Ms. Santiago is also the task leader for all noise and air quality analyses performed for the environmental reviews. The noise analyses typically include noise screening, noise monitoring and noise modeling using spreadsheet models, the CADNaA noise model and the Federal Highway Administration (FHWA) Traffic Noise Model (TNM), in accordance with the New York City Environmental Quality Review (CEQR) Technical Manual, the New York City Noise Code, as well as the Title 6, Part 360 of the State of New York Codes, Rules and Regulations (6 NYCRR Part 360) Solid Waste Management Facilities Section 360-1.14(p). The air quality analyses typically include screening and modeling using the AERMOD Model and the CAL3QHCR model to determine compliance with the U.S. Environmental Protection Agency (USEPA) National Ambient Air Quality Standards (NAAQS), the New York State Department of Environmental Conservation (NYSDEC) Guidelines for the Control of Toxic Ambient Air Contaminant, and the NYSDEC and New York City Department of Environmental Protection (NYCDEP) Interim Guidance for PM2.5 analyses.

New Brunswick Landing Waterfront Development, Middlesex County, NJ. Task Leader for the preparation of the New Jersey Department of Environmental Protection (NJDEP) Waterfront Development Permit and the United States Army Corps of Engineers (USACE) Permit for the New Brunswick Landing Waterfront Development Project in the Raritan River in New Brunswick, New Jersey. She was involved in the preparation of the Strategy Plan for the Raritan River from the Raritan Bay to the Albany St. Bridge in New Brunswick, which included participating in numerous meetings with the Stakeholders of the Raritan River. Ms. Santiago was also responsible for obtaining a NJDEP Sampling Plan and for sampling activities, including the procurement of contractors, to perform a Sediment Characterization of the material to be dredged. She was responsible for managing the tasks related to performing mitigation for the disturbance of intertidal/subtidal shallows resulting from the dredging.

Rose E. Reichman

Public Outreach & Community Engagement - Discipline Lead

Firm
Reichman Frankle Inc.

Personnel Level
Level 5

Education
BA, University of Michigan
MS, New York University

Professional Associations
ACE Mentor Program of Greater NY, Board Member and Public Relations Counsel
ACE Mentor Program of NJ, Board Member and Public Relations Counsel
American Council of Engineering Companies of New York, Member
New York Building Congress, Member, Economic Development and Transportation Committees

Rose Reichman has over 30 years' experience in developing strategy for and implementing public outreach programs, multifaceted marketing campaigns and other communications programs that affect decision making for transportation infrastructure projects. Her experience includes working with public agencies, private sector firms, and a number of industry associations such as the American Council of Engineering Companies of New York and the General Contractors Association of New York. She brings to all of her projects a focused, strategic methodology, and perspective of the importance of presenting positive, clearly written messages and images to meet clients' objectives.

Experience

As President and Founding Principal of Reichman Frankle Inc. (RFI), Rose Reichman provides oversight and quality control for the firm's projects. She also serves a project manager for individual public agency and private company projects.

Project Manager, Marketing Program for the Rehabilitation of the Pulaski Skyway, NJDOT. Services to date include development and implementation of a multifaceted marketing communications program in advance of and during closure of northbound lanes for the $500+ million rehabilitation of this vital link in northern New Jersey.

Principal in Charge, Component Rehabilitation of 10 Bridges in Brooklyn, NYCDOT Division of Bridges. A proactive three-year public outreach program to conclude in 2015, the 10 Brooklyn Bridges project involves community liaison meetings with community leaders and community boards as needed, preparation and distribution of newsletters and brochures, and reporting status of outreach activities to NYCDOT and Resident Engineer at monthly progress meetings.

Project Manager, Portal Bridge Replacement Project, NJ TRANSIT and AMTRAK. Public outreach services in support of planning, environmental and engineering assistance for a replacement for this key rail transit bridge that will feed capacity to a new tunnel under the Hudson River. Multi-agency coordination, development of graphic identity and image, an independent website for the project, newsletters, displays, presentation materials, advertising, and support for public meetings.

Project Manager, Coastal Monmouth Strategic Plan, Monmouth County Planning Board. Support of the planning process with development of a graphic identity and image for the project, creation of an interactive web page for the County Planning Board website, newsletters, fact sheets and other informational and marketing tools.

Rose E. Reichman Continued

Project Manager, Coastal Evacuation Routes Study, Monmouth County Planning Board. Project Manager for a planning and engineering study to determine transportation routes during a coastal evacuation. The effort included branding, creation of an interactive Web page for the County Planning Board website, and a well-coordinated media effort.

Project Manager, East Side Access Project, MTA Capital Construction Company. Public Outreach support, print and electronic materials for the massive $8 billion transportation project to bring the LIRR into Grand Central Terminal. Development and production of brochures, newsletters, Q & A documents, and support in Manhattan and Queens at public meetings and one-on-one meetings with property owners.

Project Manager, American Public Transportation Association's Public Transportation for Tomorrow (PT^2) Campaign, 2000-ongoing. Strategic direction and development of award-winning advocacy brochures used to lobby Congress on behalf of TEA 21 Reauthorization and SAFETEA-LU. Produced a series of 12 pieces, including an overview brochure, and brochures/ monographs on the economic, energy, mobility, congestion and health benefits of public transportation, particularly rail transit.

Principal in Charge, Route 139 (1&9) Rehabilitation/Reconstruction of the 12th St., 14th St., Conrail and Hoboken Viaducts, Jersey City, New Jersey Department of Transportation. Responsible for comprehensive public outreach services for both the design and construction phases of the replacement/rehabilitation of this heavily traveled roadway between the Holland Tunnel and the Tonnelle traffic circle.

Principal in Charge, Newark Elizabeth Rail Link MOS-Route 21 Reconstruction, NJ TRANSIT and New Jersey Department of Transportation. Public outreach services for this 1-mile rail extension of the Newark City Subway from Penn Station to Broad Street Station and the simultaneous reconstruction of Route 21 in downtown Newark. Services included production of brochures in English, Spanish and Portuguese, maps for NJDOT's website.

Jamie Torres Springer

Real Estate Development Analysis - Discipline Lead

Firm
HR&A Advisors, Inc.

Personnel Level
Level 5

Education
Harvard University
John F. Kennedy School of Government
Master of Public Policy
2005

McGill University
Bachelor of Arts with Honors Political Science
1998

Professional Associations
Fifth Avenue Committee, South Brooklyn Board Chair

New York City
Economic Development Corporation
Strategic Investments Group
Incentives Reform Advisory Committee Member

New York University
Schack Institute of Real Estate Adjunct Lecturer
2010 – 2011

Work Experience
HR&A Advisors, Inc.
(Formerly Hamilton, Rabinovitz & Alschuler, Inc.)
Partner 2006 – Present

Brooklyn Bridge Development Corporation
Project Director 2005 – 2006

Office of the Premier of Ontario Special Policy Advisor 2004

Minister of National Revenue Canada
Senior Political Advisor 2002 – 2004

Minister of Citizenship and Immigration Canada
Special Assistant 1999 – 2002

Jamie Springer provides public, private, nonprofit, and institutional clients with strategic planning, policy, community engagement, and real estate advice drawn from a deep understanding of forces driving growth and development. His expertise spans public sector management, public-private partnerships, economic development and planning, community relations, and open space governance and management, as well as economic and fiscal impact analysis. Jamie guides private sector clients to envision real estate development potential and advises cities on strategic investments that reposition districts and reimagine downtowns. Jamie established and spearheads HR&A's resiliency planning practice, having served as Deputy Director for Community Initiatives for the New York City Mayor's 2013 Special Initiative for Rebuilding and Resiliency. He informs communities and public agencies about resilience thinking, planning, and holistic and integrated agenda-setting in the face of climate change. Jamie is also Board Chair of the Fifth Avenue Committee in South Brooklyn.

Experience

Deputy Director of Community Initiatives, Special Initiative for Rebuilding and Resiliency. In 2013 served as Deputy Director for Community Initiatives on special assignment for the New York City Mayor's Office Special Initiative for Rebuilding and Resiliency, founded after Superstorm Sandy to increase resilience citywide through long-term provision for and protection against climate change impacts. With 40 professionals, prepared a citywide systems and infrastructure recovery and preparation strategy. Proposed plans for the highly impacted Brooklyn-Queens Waterfront, Staten Island's East and South Shores, South Queens, Southern Brooklyn, and Southern Manhattan. Led community planning; outreach to elected officials, community-based organizations, and residents; design and planning; demographic studies; and land use and risk analyses. Published over 250 actionable recovery and resilience proposals in the Mayor's "PlaNYC Report for a Stronger, More Resilient New York."

HUD Rebuild by Design Competition: Small Business Resiliency Financing. With Cooper, Robertson & Partners, led one of ten finalist teams in the U.S. Department of Housing and Urban Development Rebuild by Design competition for the Superstorm Sandy- affected northeast. Led physical and economic analysis of resiliency and vitality of coastal commercial corridors and retail destinations in Red Hook and Beach 116th Street in New York City and Asbury Park, New Jersey. Engaged with business owners, community organizations, and officials to generate interventions for business recovery and resiliency eligible for federal funding. Proposed a replicable methodology to identify needs, physical designs to strengthen businesses, and a local financing framework. The team's proposal inspired

Jamie Torres Springer Continued

the Mayor's Office of Recovery & Resiliency initiative Business PREP to prepare and protect small businesses and a feasibility study for integrated flood protection in Red Hook funded by the City, State, and FEMA Hazard Mitigation Grant Program.

New Jersey Economic and Fiscal Impact Analyses. Conducted fiscal impact studies supporting approvals by the New Jersey Meadowlands Commission of a 62-acre redevelopment involving environmental remediation near the Teterboro Airport with potential for 900,000 square feet of retail, office, hotel, and industrial uses approved in 2009; the 640-unit Highland Cross development in Rutherford; a new development phase in 2011 for the Xchange at Secaucus Junction, a 2,035-unit mixed- income, transit-oriented development in Secaucus; and a 192-unit Lyndhurst residential development proposed in 2011.

Southern Manhattan Multipurpose Levee Feasibility Study. On behalf of the New York City Economic Development Corporation and the Mayor's Office of Recovery and Resiliency, led economic, planning, and regulatory portions of a feasibility study for the City's Special Initiative for Rebuilding and Resiliency proposal for a levee combining flood protection, new real estate, and open space along Southern Manhattan's eastern shoreline. Tested multiple scenarios against flood protection goals using precedents for infrastructure financing, public-private partnerships, and economic and community development. Directed planners, lawyers, and consultants evaluating regulatory obstacles to implementation and led real estate and financial analyses. The final market study projected real estate development potential and a dynamic pro forma tested construction and open space alternatives. Drafted the funding and implementation chapter of the May 2014 study.

NY Rising: Resiliency Planning in New York City. Led a multidisciplinary team over eight months to plan comprehensively for economic growth and physical and social resilience in ten communities impacted by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. Directed engineers, architects, planners, and housing and healthcare specialists working in ten New York City communities eligible for $127.5M of federal Community Development Block Grant Disaster Recovery funds over the course of eight months. Managed an extensive community-driven process of over 100 committee meetings and 40 large public events. Proposed over 100 near-team projects to Governor Andrew Cuomo and Mayor Bill de Blasio and received funding for five communities to date.

Resilience Capacity-Building for The Rockefeller Foundation. On behalf of The Rockefeller Foundation, serving as program manager delivering a capacity-building initiative in support of the U.S. Department of Housing and Urban Development's (HUD) National Disaster Resilience Competition, which invites 67 communities impacted by recent disasters to devise resiliency interventions and apply for $1 billion in federal funding. Developed and delivered a core resilience curriculum for potential grantees during a Summit in 2014 and eight regional Academies in 2015 over the course of two competition phases. Provided jurisdictions with support and facilitated access to direct technical assistance from advisors and a "design bench" of experts. In late 2015 HUD will review applications and select projects. Also working with The Rockefeller Foundation to incorporate Academy teachings into an officially-recognized resiliency curriculum and produce a funders' summit to inform and solicit support from potential financing entities.

OneNYC Project Management and Advisory. For the New York City Mayor's Office, served as lead consultant for "OneNYC," a multi-agency, cross-disciplinary, long-term planning effort succeeding HR&A's support for the City's 2007 and 2011 "PlaNYC" strategic planning efforts and Springer's contributions as a Deputy Director for the 2013 post-Sandy report "A Stronger, More Resilient New York." Conducted project management, agency coordination, and public and stakeholder outreach; analyzed economic, demographic, and environmental trends influencing the city and region in the near- and long-term; and applied analysis to produce economic, transportation, and housing proposals.

James M. Gilsenan, AIA, NCARB

Architecture - Discipline Lead

Firm
AECOM (URS)

Personnel Level
Level 5

Education
1976 / Bachelor of Architecture / Oklahoma State University
1978 / Bachelor of Architecture / Engineering / Oklahoma State University

Licenses/Registrations
Registered Architect

- 1980 / Oklahoma
- 1992 / New Jersey
- 2003 / New York 029383-1
- 2011 / Alabama
- 2012 / Connecticut
- 2011 / Indiana
- 2011 / Louisiana
- 2013 / Maine
- 2011 / Maryland
- 2011 / Massachusetts
- 2013 / Nebraska
- 2011 / South Carolina
- 2011 / Virginia
- 2002 / National Council of Architectural Registration Boards Certification (NCARB)

Mr. Gilsenan has more than 37 years of experience directing design teams for multi-disciplined projects, developing in-house schedules and budgets, coordinating contract documents and administering construction. Responsible for administration, management and coordination of public and private sector projects including facilities for major corporations, colleges and universities, and government agencies. He also has Super Storm Sandy residential housing experience as well as emergency repair program experience.

Experience

NJDCA, Renovate, Rehabilitate, Elevate and Mitigate, New Jersey Block Grant Disaster Recovery Program - New Jersey. Architect of Record responsible for development of fifty-seven new house models consisting of 2, 3 and 4 bedroom units designed in context with local New Jersey neighborhoods impacted by Super Storm Sandy. Responsible for obtaining plan review approval of each model from NJ Department of Community Affairs as prototypical house designs. Also, responsible for designs to rehabilitate damaged homes that require repair due to storm damage, and require elevation to meet new FEMA guidelines.

NJ Sandy Recovery RREM Program - New Jersey. Principapl Architect responsible for development of fifty-seven new house models consisting of 2, 3 and 4 bedroom units designed in context with local New Jersey neighborhoods impacted by Super Storm Sandy. Responsible for obtaining plan review approval of each model from NJ Department of Community Affairs as prototypical house designs. Also, responsible for designs to rehabilitate damaged homes that require repair due to storm damage, and require elevation to meet new FEMA quidelines.

USACE New York District, Bartlett Hall Science Center, U.S. Military Academy - West Point, NY. Deputy Project Manager for STV/URS JV that completed final design for Phase II for the major $210 million renovation which includes teaching and research laboratories for biology, chemistry, physics and photonics (lasers), 45 general classrooms, a 340-person auditorium, faculty office space, computer labs and special facilities -- including NMR, subcritical nuclear reactor, linear accelerator, astronomical observatory and chemical storage. Designed to achieve LEED Silver certification (or higher).

USACE New York District, New Cadet Barracks, U.S. Military Academy - West Point, NY. Project Manager for STV/URS JV for the 15% design and development of bridging documents for a Design/Build RFP package of a new 286,000-sf barracks building at the U.S. Military Academy. The $167 million project is a 6-story barracks building that will house 650 cadets and includes meeting and common rooms, bathrooms, and laundry facilities.

James M. Gilsenan, AIA, NCARB Continued

United States Army and Air Force Exchange Service Post Exchange at Fort Hamilton - Brooklyn, NY. Project Manager for the expansion to the US Army and Air Force Exchange Service's Post Exchange at Fort Hamilton. The 60,000 SF facility, houses retail, food service, warehouse and support areas.

United States Golf Association Museum - Fair Hills, NJ. Project Manager for the 18,000 SF United States Golf Association Golf Museum. Adaptive reuse design of historic 1921 residential mansion by John Russel Pope (architect for the Jefferson Memorial in Washington, D.C.) into a modern museum for golf memorabilia. Project scope included restoration of exterior brick facade, design and installation of air conditioning and humidity control system, sprinkler system and museum lighting.

United States Postal Service - Medium Standard Building Design. Project Manager for an Indefinite Quantity Contract consisting mostly of building designs for new Post Offices containing Postal Stores. The projects, which included approximately 12 new buildings and 5 renovations, are typically 17,000 to 27,000 SF in size.

Demolition Consultant Multiple Award Term Contract. Project Principal to provide demolition and site remediation and restoration design and construction administration services for the NJ DEP Blue Acres Acquisition Program, and other statewide demolition projects, on properties owned by the State to a more natural state. Services include obtaining letters of disconnection for all utilities, removal of all impervious paving materials and abatement of hazardous materials from the properties. URS is responsible for preparing the necessary documents to be advertised for bid to DPMC classified construction contractors and provide permit coordination, bidding support and construction administration services.

Yankee Stadium Modernization - Bronx, NY. Project Manager responsible for this extensive modernization project that included updating the stadium to meet strict Americans with Disabilities Act (ADA) guidelines for access, including toilet facilities and fire alarms. A complete physical assessment of the stadium including structural, HVAC, electrical and plumbing systems was conducted which identified deficiencies and established priorities for an ongoing capital improvement program. Completed general building improvements included a new cat walk system for access to suspended mechanical equipment, installation of floor drains in public toilets, and waterproofing of portions of the seating decks.

New York City Department of Design and Construction - New York, NY. Project Manager for roof replacement at the correctional institute for men at Rikers Island. The roof replacement and masonry restoration also included replacement of rooftop, HVAC equipment and construction phasing.

New York City Board Education, Emergency School Repair Program - New York, NY. Project Architect for the Emergency School Repair Program for the New York City Board of Education involving 8 early twentieth century school buildings. Work included window repair and replacement, roofing replacement, masonry restoration, paint and plaster repair.

Home Builders Guide to Seismic and Wind-Resistant Construction Series. Project Manager for contract to FEMA to develop Volume 2. Wind-Resistant Coastal Construction of the Home Builders Guide. The document was targeted toward the primary objective of creating a manual that provides pictorially prescriptive details that are applicable to residential wood-frame and masonry construction with the intent of maximizing the integrity of the building envelope to enable the structure to successfully survive a coastal storm.

Scott Bleeker, PLS

Land Surveying - Discipline Lead

Firm
Dewberry Engineers, Inc.

Personnel Level
Level 5

Education
BS, Civil Engineering, New Jersey Institute of Technology, 1994

Licenses/Registrations
- Professional Land Surveyor: NJ
- National Council of Examiners for Engineering and Surveying: US

Professional Associations
Association of State Floodplain Managers

Scott Bleeker has 24 years' experience working on large-scale projects from conception to completion. With his extensive, multidisciplinary knowledge of the construction industry and civil engineering, he is able to complete survey projects on time and within budget. Areas of expertise include: land surveying, boundary surveying, topographic surveying, survey grade GPS, geodetic control networks, robotic total stations, land development, site planning and engineering, major and minor subdivisions, stormwater design, drainage construction, grading design, and local/state permit processes.

Experience

Rebuild By Design Hudson River: Resist-Delay-Store-Discharge, New Jersey Transit, Hoboken, Weehawken & Jersey City, NJ. Land Surveyor for a Feasibility Study and Environmental Impact Statement (EIS) for the Rebuild By Design Hudson River project. The project is a comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City. Design factors such as utility impacts, subsurface soil conditions, right-of-way impacts, traffic/pedestrian flow, and construction cost will be evaluated for the concepts to narrow the focus on practical alternatives that can be discussed and evaluated in the context of an EIS.

Route 3 over Passaic River, New Jersey Department of Transportation (NJDOT), Passaic and Bergen Counties, NJ. Land Surveyor for this $159 million replacement of the existing moveable Route 3 Bridge over the Passaic River with several fixed bridges and associated roadway work. The project area is 2.5 miles and involves complex MPT, along with complex construction staging to ensure all roadways remain open during construction. The project included final scope development, preliminary and final design. It involved the addition of collector-distributor roadways to separate traffic flow, acceleration and deceleration lanes, shoulders to improve safety; it also included bridge replacements/widening, 20 retaining walls and 7 noise walls. Dewberry is currently providing construction services, which includes: material approvals, utility coordination and preparing responses to contractor generated RFIs.

Route 7 Wittpenn Bridge over the Hackensack River, NJDOT, Jersey City/Kearny, NJ. Land Surveyor for survey services and proposed ROW information for this $730-million vertical lift replacement for the Route 7 Wittpenn Bridge over the Hackensack River and related approach interchange work.

Scott Bleeker, PLS Continued

Pulaski Skyway Rehabilitation, Contract 7, NJDOT, Jersey City, NJ. Land Surveyor responsible for the topographic survey, baseline survey, existing profile, pavement cross sections, utility surveys and Survey Control Report. for rehabilitation of the superstructure and substructure of the two ends of the Route 1 and 9/Pulaski Skyway and the Newark ramp.

Replacement of the Fair Lawn (Fifth) Avenue Bridge over the Passaic River, Passaic County, NJ. Land Surveyor responsible for the topographic survey using conventional survey methods and property/title survey to establish the existing right-of-way line, baseline survey, existing profile, pavement cross sections, utility surveys and Survey Control Report. Also responsible for the preparation of right-of-way layout maps (including GPPM, ETM and IPM) and writing deeds/parcel descriptions (metes and bounds) for ROW acquisitions. for the $6-million replacement of the Fair Lawn (Fifth) Avenue Bridge over the Passaic River. The new two-span, 30-foot-wide vehicular bridge will be designed above 100-year flood elevation. The project will also include intersection improvements at the T-intersection of Fair Lawn Avenue and Route 20.

Permits for Dynamic Message Signs (DMS) and Support Structures, NJDOT, Multiple Locations, NJ. Land Surveyor, as a subconsultant, for this project which involved developing NJDEP permit packages for the Smart Moves 2014 North Contract. During the environmental screening of the 16 proposed CSS and 13 proposed DMS locations, environmental constraints involving impacts to NJDEP regulated areas were identified at a number of sites. Although some sites were able to be relocated, there are still outstanding environmental issues at a number of sites. The scope of services being performed includes wetland and stream bank delineations, NJDEP Freshwater Wetlands Transition Area Waiver, FHA Individual Permit and Waterfront Development Upland Individual permit application preparation, and field survey to locate wetlands flags.

Peter J. Biondi Route 206 Bypass - Contract A, NJDOT, Hillsborough, NJ. Land Surveyor responsible for the topographic survey and property/title survey to establish the existing right-of-way line, baseline survey, existing profile, pavement cross sections, utility surveys and Survey Control Report. Also responsible for the preparation of right-of-way layout maps (including GPPM, ETM and IPM) and writing deeds/parcel descriptions (metes and bounds) for right-of-way acquisitions for Contract B for the $130-million final design of three miles of a new limited access bypass section of Route 206, designed as a divided roadway with two lanes in each direction. Eight water quality basins were designed in accordance with NJDEP regulations.

Marc Korpus

GIS - Discipline Lead

Firm
HDR, Inc.

Personnel Level
Level 5

Years of Experience
13

Education
Bachelor of Arts, Computer Science; Rutgers Univ New Brunswick, 2001
Juris Doctor, Law; Rutgers University - Newark, 1981
Bachelor of Arts, Political Science/ Government; Brooklyn College, 1977

Licenses/Registrations
- Esri ArcGIS Desktop Professional, United States National Registration, No. ESRI00103878

Mr. Marc Korpus is a geographic information systems (GIS) analyst, providing professional GIS support for environmental science and management, water and wastewater and general engineering services at HDR, together with consultation, training and trouble-shooting for other GIS users. He has 12 years of experience in the compilation, organization, and creation of geographic data, spatial analysis, and map creation in support of a broad range of activities, including environmental monitoring, sampling and modeling, environmental baseline and impact analysis, urban mass transit and highway planning and construction, military base maintenance, urban and watershed planning, and open space acquisition.

Mr. Korpus' technical capabilities include advanced use of ESRI's suite of GIS software products, including ArcGIS for Desktop 10.3, model building and scripting using Python and Model Builder, conversion, importation and use of CADD data in the GIS environment, spatial analysis, metadata creation under FGDC standards, geographic database creation under federal SDSFIE requirements, geocoding, GPS data collection planning and processing, GIS quality control methods, and integration of GIS with database software.

Experience

Evergreen MR13 Wetland Mitigation Bank, Carlstadt, NJ. As primary GIS analyst in connection with the environmental investigation and design of a wetland mitigation bank within the New Jersey Meadowlands, Mr. Korpus was responsible for managing the importation of design, survey and sampling data, compiling and mapping public GIS themes across a broad spectrum and accurate determination of estimated available mitigation credits using GIS analytical tools.

USACE Hudson Raritan Estuary/ Harbor Deepening Project, NY. Working at the interface of GIS and more sophisticated database software, Mr. Korpus created a number of habitat suitability models and mapped the results in the Comprehensive Restoration Plan for the Hudson-Raritan Estuary.

New York City Department of Environmental Protection (NYCDEP), Office of Green Infrastructure, Capital Project No. WP-169, Queens, NY. Mr. Korpus contributed GIS analysis to a team selecting sites for bioswales and green streets, including overlay of data representing, topographic, transportation and human environment conditions, design of a live-link field data collection app running on i-Pads and training of personnel in GIS tasks.

USACE New York District, New York Harbor Fish, Benthic Invertebrate and Sediment Surveys, NY. Working at the interface of GIS and more sophisticated database software, Mr. Korpus has contributed to reports focusing on the impacts of dredging activities in navigational channels and nearby shoal areas in Newark Bay, New York Bay and

Marc Korpus Continued

associated channels and straits. This has included creation of chart maps using the output of database queries to show impacts of multiple species at varying harbor locations.

US Army Garrison at West Point, Storm Water Control Plan, NY. Mr. Korpus prepared elevation and drainage analysis and more than 100 maps depicting storm water flow conditions and proposed remedial action at the campus of the U.S. Military Academy.

Port Authority of New York/ New Jersey, John F. Kennedy International Airport Water Quality Modeling and Monitoring, Queens, NY. As GIS Analyst, using ArcGIS tools and map algebra methods, Mr. Korpus has converted the full airport storm water system CADD depiction to the GIS framework, created an airport-wide land use/ land cover layer distinguishing between pervious and impervious surfaces, provided elevation/ landform analysis, and provided a three-dimensional GIS depiction of Jamaica Bay to support modeling and monitoring of runoff of de-icing chemicals from airfield to Jamaica Bay.

PANYNJ, Wetland Delineations at Transportation Facilities, NY-NJ Metropolitan Area. Mr. Korpus has developed efficient methods for processing field collection of delineation data for wetlands and vegetation at airport, seaport commuter rail and river crossings, including conversion to GIS format, preparation of final GIS datasets and maps.

Norfolk Southern Corporation, Capital Region Intermodal Facility, Mechanicville, NY. As Principal GIS Analyst for environmental review and permitting for this major rail facility development, Mr. Korpus has been responsible for compilation of public geographic data, wetland, watershed, and streamflow analysis, interpretation and mapping of field-collected GPS data and property impact analysis.

Passaic County Planning Department, Passaic River Survey, NJ. Mr. Korpus created a new geodatabase model in ArcView to record and map the condition of the banks of the Passaic River, wrote VBA code for automated creation of features and import of attributes, supervised field data collection and developed a viewer program on disk linking field photographs to map display.

NYCDEP, CSO-PlaNYC Ecological and Best Management Practices (BMPs) Planning to Address Combined Sewer Overflows Contract, NY. Mr. Korpus has provided geographic analysis for this $18 million design-build-operate-test contract, under which stormwater BMP controls have been installed and tested. He contributed GIS analysis using City of New York datasets, including LiDAR elevation data, to assist in the evaluation and design of a large bioretention system within the center median of a City DOT controlled roadway.

NYCDEP BEDC, Aqueduct Connection Environmental Services (ACES), NY. For this multi-year project rehabilitating the New York City water supply system aqueducts, Mr. Korpus has developed an automated methodology for integrating electronic field data collection into the project database, employing Python scripting. This process is now in regular use in the collection of environmental data.

Westchester County Public Water Supply Systems Spatial Database, NY. Mr. Korpus is GIS Task Leader under this contract for the creation of a new spatial database integrating water supply system plans maintained by hundreds of suppliers across a suburban county with population nearing 1,000,000. Mr. Korpus prepared the database design and is supervising the compilation of varying data sources and their conversion into the GIS framework using CAD and GIS software.

PANYNJ Bayonne Bridge Feasibility Study to Increase Navigational Clearance, NY. Mr. Korpus provided an extensive series of maps illustrating the potential impact on the human and physical environment of several alternative designs for replacement or modification of the Bayonne Bridge. This effort required compilation and reconciliation of geographic data from federal, New Jersey, New York State and municipal source and translation of design data into GIS format.

Kevin Hamby, JD

HUD Grant Compliance - Discipline Lead

Firm
Remora

Personnel Level
Level 5

Education
Juris Doctor, The Catholic University of America, Washington, DC, 1993
BA, Government, University of Texas, Austin, Texas, 1981

HUD and Housing Expertise

- Program Design
- Policy Development
- Fair Housing
- Program Guidelines
- Agency Negotiations
- Housing Tax Credits
- Procurement Drafting and RFP Responses
- Needs Assessments

Kevin Hamby has been involved in working with federally funded programs since 2005. Kevin has applied his expertise to state and local governments providing program design, procurement, policies and procedures development, operational plans, implementation guidance, and issue resolution for technical problems that are encoutered during the implementation process. As the former General Counsel for the Texas Department of Housing and Community Affairs, Kevin developed the Texas CDBG-DR Program from its inception working with state agencies, local subrecipients, HUD, program management consultants, non-profit organizations, and Fair Housing Advocates to implement over $3B in CDBG-DR funds. Kevin is also a key leader in assisting state and local governments with developing strategies to comply with the Fair Housing Act's affirmatively furthering fair housing components and he skillfully works with civil rights advocacy communities to ensure community understanding and support for program compliance for both housing and non-housing programs.

As a state employee, Kevin was the subject matter expert working with the private law firm hired by the state to handle a challenge to the distribution of tax credits for Texas housing programs funded by the Treasury Department as it relates to Fair Housing. The case, ICP v. TDHCA, was decided by the U.S. Supreme Court in June 2015 upholding HUD's disparate impact rule, but signaling the Texas approach to distribute funds bsed on community interests may be valid but is under further review in lower courts.

Experience

Remora Consulting, a Limited Liability Company

Remora Consulting continues Kevin's work at Hamby & Piatt, LLC in providing compliance strategy in meeting federal requirements on the expenditure of federal funds. Kevin's work with companies, both Fortune 500 and start-ups, has included guidance and review of responses to federal procurements, drafting of record-keeping policies, funding, program management and close-out standard operating procedures.

Hamby & Piatt, LLC

Since its inception, Hamby & Piatt was designed to build on Kevin's years of state and federal compliance experience and translate that into helping clients. Kevin has helped clients with program design, program management, and legal compliance, to achieve effective results on programs related to HUD funding, Fair Housing, Davis Bacon compliance and Section 3 policy requirements. In addition to comprehensive work with federal programs administered by the Department of Housing and Urban Development, Kevin has worked with federal programs from Treasury through IRS credit programs, Department of Energy, and Health and Human Services.

Kevin Hamby, JD Continued

Kevin has also worked with cross cutting federal requirements including OMB Circulars and other advisories on allowable activities.

Kevin's approach to working with federal programs is that working with federal programs requires adapting to agency discretion within cross cutting federal requirements while still achieving corporate interests. Kevin understands public sector projects must balance meeting traditional regulatory standards and creative approaches in solving compliance concerns.

Using best practices learned in Texas and other disaster recovery programs that were administered by HUD's Washington D.C. team, Kevin was recruited to work on the State of New Jersey RREM, the State of New York's New York Rising and New York City Build it Back programs. Kevin was also involved in disaster delivery efforts in Texas for Katrina, Rita, Ike and Dolly in the public and private sectors.

Kevin has developed and managed HUD issues like Section 3, Affirmatively Furthering Fair Housing, public participation, and also conducted procurements for programs. Kevin worked directly with HUD to determine that under the New York Rising approach, Section 3 requirements were not necessary. Kevin provided policy reviews for HUD compliance related to construction and methods for closing the applicant's file. Kevin also worked with the legal team to develop contracts and riders to work with construction teams that included HUD and other federal requirements. Utilizing his years of Multi-family experience, Kevin advised the state on HUD compliance issues related to rental properties with less than four units, units of more than eight units and CDBG DR funds combined with tax credits.

Kevin has worked with the NJ RREM program as a compliance consultant developing program guidelines for contract managers. In this capacity, Kevin developed Standard Operating Procedures that were compliant with Sandy regulations in New Jersey. Kevin has been working on similar issues as the Policy and Compliance advisor for URS/AECOM team in the NYC BiB team.

With his legal background work in private practice as a large-firm litigator and as an assistant attorney general, Kevin's value in resolving conflicts that arise as a routine part of any large multi prong program helps the client be more productive. Kevin has experience in helping to address out-of-the-norm issues that arise and finding ways to make them work within the rules or, when necessary, limiting the exposure to the project by preventing further action.

PUBLIC SECTOR

Texas Department of Housing and Community Affairs, Austin, Texas

General Counsel/Secretary to the Board/Senior Counsel

Kevin served as General Counsel/ Senior Counsel for the agency, developing and reviewing policy for consistency for Low Income Housing Tax Credit Program (Multi Family housing) administered by the Internal Revenue Service, HOME and CDBG programs administered by the U.S. Department of Housing and Urban Development. In this capacity Kevin was responsible for compliance with all state and federal laws and drafting or review of all rules and policies to implement HUD, IRS, and/or DOE programs. Texas has the second largest tax credit program in the country awarding over $400 million per year. Many of the issues that arose for strategic and legal advice were cases of first impression. Many of those issues presented legal conflicts that had to balance the requirements of the Federal Tax Code against specific state law. That environment led to opinions that that potentially impacted tens of millions of dollars. Kevin had to advise both the staff and the board on difficult matters, often over the opposition of private sector develop legal teams.

Lakhbir Chauhan, PE

MEP Engineering - Discipline Lead

Firm
AECOM (URS)

Personnel Level
Level 5

Education
Professional Engineer, Mechanical, 1977, LA License #16530 (Exp. 09/30/2014)
Professional Engineer, Mechanical, 1986, FL License #37639
Member ASME
Extensive participation in HI Standards Reviews

Licenses/Registrations

- Professional Engineer, Mechanical, 1977, LA License #16530 (Exp. 09/30/2014)
- Professional Engineer, Mechanical, 1986, FL License #37639
- Member ASME
- Extensive participation in HI Standards Reviews

Mr. Chauhan has 12 years of experience as a Registered Professional Engineer with Louisiana Department of Transportation and Development (LA DOTD) in major flood control and water and wastewater infrastructure pumping projects. Mr. Chauhan has worked 14 years in manufacturing for axial, mixed flow, hydraulically driven, and submersible electric pumps as a Chief Mechanical Engineer/ Director of Engineering. Mr. Chauhan has 10 years of experience as a Consulting Mechanical Engineer in pumping applications for water, wastewater and water-resources projects; pump design and applications; pump project identification, development and implementation.

Experience

Permanent Canal Closures and Pumps, New Orleans, LA (USACE, New Orleans District. Design Review and Construction Management for Hurricane Protection Project for the Outfall Canals at 17th Street, Orleans Avenue, and London Avenue, Orleans Parish. Pump Sizes: #10-1,800 CFS, 142", 5,000 HP Gear-Motors Drives #7-900 CFS, 100", 2,500 HP Gear-Motors

The Contra Costa Water District (CCWD) Oakland, CA. Pump Engineer. CCWD proposes to raise the current Los Vaqueros Reservoir (LVR) level by 35-ft to a new peak elevation of 507-ft. The CCWD retained URS Corporation to evaluate pumping options relating to the existing pumping station for filling the reservoir to the new elevation while maintaining the current average weekly pumping rate of 200-cubic feet per second (cfs). The new pumping system must be capable of operating under the varying head conditions that it could experience during its life cycle. The task consists of providing new design conditions, selection and evaluation of existing and new equipment, cost analysis and prepare plans and specification for replacement of existing equipment.

Value Engineering Study - Rehabilitate East and West Floodgates, Freeport, TX. Mechanical Engineer. AECOM(URS) conducted a value engineering (VE) study of the Brazos River Floodgates Rehabilitation East and West Floodgates and Guide Walls at the Gulf Intra-coastal Waterway. The topic was the 95% design submission prepared by Galveston District of the U.S. Army Corps of Engineers. The VE team undertook the task assignment using the value engineering work plan and approach. The ideas generated from this process and chosen for full development as VE Team Recommendations were developed into a report. Cost: $250M

City of Cleveland - Department of Public Utilities, Fairmont Pump Station Rehab. Witness Factory Performance Test at Patterson Pump facility, Toccoa, GA (2010). Pump Engineer. Type of Pumps: Horizontal Split-case Bottom Section Centrifugal Pumps No of Pumps: 7 Type of Tests: Performance, NPSHR, Hydrostatic

Lakhbir Chauhan, PE Continued

and Vibration Design Condition: 20 MGD @ 420 ft TDH -1750 HP Motor.

Fairmont Pump Station Rehabilitation Witness Factory Performance Test at Patterson Pump facility, Toccoa, GA (City of Cleveland - Department of Public Utilities). Pump Engineer. Type of Pumps: Horizontal Split-case Bottom Section Centrifugal Pumps No of Pumps: 7 Type of Tests: Performance, NPSHR, Hydrostatic and Vibration Design Condition: 20 MGD @ 420 ft TDH -1750 HP Motor.

Hurricane Protection Office (HPO) LPV 105-111, New Orleans, LA (USACE-Hurricane Protection Office (HPO). Pump Engineer. Due to the raising of the levees, three pumping station required replacement pumping equipment that will enable them to contend with increased head conditions. The projects included selection of new equipment, specifications and drawings, cost estimates and follow up on the reviews and engineering support.

Task Force Guardian – Hurricane Katrina Storm Repairs to Levee System, New Orleans, LA. Pump Engineer. Due to the raising of the levees, three pumping station required replacement pumping equipment that will enable them to contend with increased head conditions. The projects included selection of new equipment, specifications and drawings, cost estimates and follow up on the reviews and engineering support.

Dallas Drainage Pump Station Improvements, Dallas, TX (City of Dallas Public Works and Transportation). Pump Engineer. URS was selected to design flood control pump stations for the City of Dallas utilizing Concrete Volute Pumps (CVP). The City called for URS to design the stations to operate for the 100-year frequency storm event. The stations consisted of three new and two refurbished stations. The task consisted of head calculations, pump selection, budget pricing and independent technical reviews of the 35% design.

PUMP CONSULTING SERVICES

Design of a 72"- Axial Flow Pump for Production. Pump Engineer. The consulting work consisted of assisting the client in the design of an axial flow pump from scratch to replace existing pumps. The flow and head conditions and the propeller size were fixed by the site conditions. Most stringent requirements existed for the design and efficiency for the pump. The model for the pump was designed and tested and then extrapolated to the prototype from the information obtained. The skills required consist of the design of pump for specific operating conditions and existing propeller size and factory testing based on the specific field conditions. Design Condition: 180,000 GPM @ 6 ft TDH. Type of Pumps: High Specific Speed, low-head, vertical Axial-flow; Motor HP: 450.

Florida Power and Light (FPL), FL. Pump Engineer, applications included boiler feed pumps, circulating water pumps, and other pumping applications; failure analysis, predictive performance analysis, installation and test reviews; specifications for new and repair equipment; design-improvement and performance-enhancement analysis; testing and design support; purchase and refurbishment of large circulator water pumps, boiler feed pumps, condensate pumps and pumps associated with the power plants; design modifications and upgrades to pumps; vibration monitoring and balancing of pumps; development of programs to help prioritize testing, monitoring and maintenance of rotating equipment to maximize reliability.

FPI Pumps, Pompano Beach, FL. Pump Engineer. Customized pump designs and applications and built pumps based on customer requirements; provided technical support for repair and improvement of pumps; developed new or enhanced existing pump designs and applications; provided shop and field pump testing support, including application and testing certifications; provided continuous client contact to develop and execute projects; provided lead in the company growth and expansion opportunities.

Frank J. Barlowski, PLS

Hydrographic Surveying - Discipline Lead

Firm
Matrix New World Engineering, Inc.

Personnel Level
Level 5

Education
Land Surveying, Drexel University, Philadelphia
Continuing Education Courses, Ocean County College, Toms River

Licenses/Registrations
- Professional Land Surveyor – New Jersey, #24GS03973500, 1996
- Transportation Worker Identification
- Credential (TWIC)
- American Safety & Health Institute (ASHI) – CPR, AED & Basic First Aid

Professional Associations
New Jersey Society of Professional Land Surveyors
Jersey Society of Professional Land Surveyors

Mr. Barlowski is a professionally-licensed land and hydrographic surveyor. With over 35 years experience, his career has spanned a broad range of project types and survey technologies. His responsibilities include management and preparation of survey deliverables for large infrastructure projects that include dredging, levees, marine structures, boundary survey resolutions, right-of-way acquisitions, topographic surveys, and field stakeout for private and public clients. Mr. Barlowski's experience has particular emphasis on large and complex urban surveys in support of redevelopment and waterfront/port-related projects. Likewise, he has performed hundreds of hydrographic surveys and prepared exhibits and applications in support of riparian transactions.

Experience

Cape Liberty Cruise Port, Bayonne, NJ. Performed pre- and post-dredging hysdrographic surveys, and condition surveys, for multiple dredging events at a large passenger ship terminal.

On-Call Hydrographic Surveying, Port Authority of New York and New Jersey. Mr. Barlowski has performed a variety of hydrographic surveys pursuant to on-call services contract that includes the Holland and Lincoln Tunnels as well as other waterfront cargo facilities in New York Harbor.

Oyster Creek Nuclear Generating Station, Lacey, NJ. For 20 continuous years, Mr. Barlowski has performed annual bathymetric condition surveys for 3 miles of the Oyster Creek Nuclear Generating Station's intake and discharge canals.

Turtle Thorofare Electric Transmission Facilities, Middle, NJ. Mr. Barlowski is the surveyor of record for topographic, hydrographic, and boundary surveys for approximately 3-mile overhead electric transmission route utilized by Atlantic City Electric.

Rockaway Shore Protection Surveys, Rockaways, NY. Mr. Barlowski is the surveyor of record for topographic, hydrographic, sidescan, and property surveys for the replacement of a failing bulkhead along Beach Channel Drive in Rockaway, NY.

Greenville Yards Hydrographic and Topographic Surveys, Jersey City, NJ. Mr. Barlowski is the surveyor of record for comprehensive hydrographic and topographic surveys in support of substantial rail and marine transfer upgrades being undertaken by the Port Authority of New York and New Jersey and private tenants.

Port Jersey Channel Hydrographic and Outfall Tunnel Surveys, Jersey City and Bayonne, NJ. Mr. Barlowski performed multiple hydrographic surveys of the Port Jersey Channel in support of dredging operations. Surveys included complex analysis to locate the Passaic Valley Sewage Commission's circa-1920's outfall tunnel that lies underneath the channel and adjoining land masses.

Frank J. Barlowski, PLS Continued

Peninsula at Bayonne Harbor, Bayonne, NJ. Mr. Barlowski was the surveyor of record for BRAC transfer and subsequent parcelization and redevelopment of the 700+ acre former Military Ocean Terminal, Bayonne (MOTBY). Surveys included resolution of a complex title history that involved riparian interests, US Government takings, and various user agreements. Responsible for comprehensive surveying services for the subdivision, redevelopment, and waterfront development of a 450-acre tract.

Liberty Harbor North, Jersey City, NJ – Mr. Barlowski is the survey of record for boundary, ALTA, topographic, as-built, and construction layout surveys for the redevelopment of three blocks designed with mixed-use high-rise buildings and internal structured parking. Responsible for oversight of NJ Transit Hudson-Bergen Light Rail track monitoring during bore drilling.

Tycom Transatlantic Fiber Optic Cable Installation, Monmouth County, NJ – Mr. Barlowski was responsible for comprehensive surveying services for the planning, engineering, and construction of multiple shore landings in the boroughs of Manasquan and Avon-by-the-Sea.

Conectiv BL England Series, Gloucester, Cumberland, Salem, Atlantic, and Cape May Counties, NJ. Mr. Barlowski was responsible for comprehensive surveying, mapping, and engineering services for planning and construction of 56 miles of new high voltage overhead transmission lines in southern New Jersey. Surveys included mapping of regulatory features (wetlands, tidelands, etc.), and construction support areas.

Verrazano Narrows Span Elevation Survey, New York Harbor. Mr. Barlowski performed an emergency survey of the Verrazano Narrows bridge's substructure to verify adequate clearance for incoming post-Panamax container cranes that were sequestered in the Harbor for delivery to the port.

NJDOT Route 37 and 72 Bridge Modifications, Ocean County, NJ. Mr. Barlowski was the survey of record for hydrographic surveys and underwater field stakeout associated with an intensive submerged aquatic vegetation survey of over 50 acres adjacent to two New Jersey bridges crossing Barnegat Bay.

Pinewald Road Acquisition, Beachwood, Ocean County, NJ. Mr. Barlowski was responsible for the boundary survey of Pinewald Road and surrounding areas (+/- 20 ac) and ROW of Pinewald Road and NJ Garden State Parkway for NJDEP Green Acres Program.

Oaks at Glenwood Residential Development, Old Bridge, NJ. Mr. Barlowski was responsible for comprehensive surveying services for the planning and engineering of this 433-acre residential redevelopment.

GPU Nuclear Plant, Oyster Creek, Lacey Township, NJ. Mr. Barlowski oversaw a GPS survey of 177 parcels of land at Oyster Creek Generating Station.

Texaco Tank Farm, Bayonne, NJ. Mr. Barlowski was responsible for boundary and topographic surveys for petroleum tank farm and marine transfer facility.

County-Wide Utility Easements, Hudson County, NJ. Mr. Barlowski was responsible for parcel surveys for the acquisition of multiple utility easements within the municipalities of Bayonne, Jersey City, and North Bergen.

Steven H. Mazurek, P.L.S., P.P.

Aerial Survey & Mapping - Discipline Lead

Firm
Robinson Aerial Survey, Inc.

Personnel Level
Level 5

Education
Newark College of Engineering, Newark, NJ, 1967-1970

Licenses/Registrations

- NJ Land Surveyor 24GS02419600
- NJ Professional Planner
- 33LI00312100
- 40 Hour OSHA Certified

Mr. Mazurek has over 44 years' experience in surveying disciplines including. but not limited to title survey, large boundary tracts, ground control for aerial surveys, including experience on global positioning satellite systems, route surveys, topographic surveys, groundwater monitoring well locations, floodplain certificates, riparian and freshwater wetlands delineation, and solar observations for astronomic North references.

Mr. Mazurek has also been involved with surveying disciplines both conventional and hydrographic at various Lake and or Dam projects. He has experience and background in pre-fabrication steel measurements, anchor bolt location plans and structural steel certifications according to AISC Code of Standard Practices. His certifications include OSHA "Health and Safety for Hazardous Waste Site Investigations"

Mr. Mazurek has served on the Executive Board for the New Jersey, Society of Professional Land Surveyors from 1992 to its Presidency in 1999. Active for over 35 years with NJSPLS he is now Past-President of the organization and was honored being Surveyor of the Year in 2002. Mr. Mazurek still participates in the annual Conference as an instructor or chairs committees as needed.

Experience

Contract #069950373 Route 46 Project (NJDOT). The project consists of multiple stages of work to improve the Route 46 Little Ferry Circle and to reconstruct the deck of the 16 Span, Double Leaf Bascule Bridge that crosses the Hackensack River from Little Ferry to Ridgefield Park. Under this contract and as part of the professional consultants' team lead by Conti Enterprises, Mr. Mazurek is currently the Project Surveyor, managing the effort to provide professional land surveying services in the form of: control verification, construction stakeout services, preparation of record of construction documents (as-builts), and to provide on-call professional land surveying services as required during the project. Mr. Mazurek is responsible for oversight of all land surveying and topographic survey tasks.

Contract #026113010 Route 295/42/I-76 (NJDOT). In February 2014, NJDOT awarded Contract 2, a $153 million construction contract, to Conti Enterprises of Edison, New Jersey. Construction began in June 2014. Under this second contract, work will be carried out along I-295 north of Browning Road to Route 168 and along I-76 from Browning Road to Kings Highway. The I-76 eastbound ramp to I-295 northbound will be replaced on a new alignment and a new bridge will be constructed. I-295 will be reconstructed in the northbound and southbound direction and several ramps will be widened and realigned. Work under Contract 2 is expected to be completed in Fall 2017.

Steven H. Mazurek, P.L.S., P.P. Continued

Under this contract and as part of the professional consultants' team lead by Conti Enterprises, Mr. Mazurek is currently the Project Surveyor, managing the effort to provide professional land surveying services in the form of: control verification, construction stakeout services, preparation of record of construction documents (as-builts), and to provide on-call professional land surveying services as required during the project. Mr. Mazurek is responsible for oversight of all land surveying and topographic survey tasks.

Photogrammetric Mapping for Preliminary Engineering for the I-287, MP 46.6 to 58.9 (12.3 miles) Re-Surfacing Project (NJDOT). For this NJDOT project RAS's team scope of services included the following: obtaining Color Digital Mapping Photography in order to map the area. Scope of services also included: establishing approximately 368 aerial control points for the project and compiling a control report with a narrative description of the survey methodology, survey adjustments and sketches for each of the aerial control points, and production of color digital ortho-photographs as well as a digital terrain model (DTM), editing the aerial mapping provided in the NJDOT standard format at appropriate scales, and performing a field edit of the aerial mapping provided.

RAS is able to utilize existing mapping and documents available and provided by NJDOT to establish a "best fit" existing alignment and ROW/tax map mosaic & survey baseline along the I-287 corridor and shown on the NJDOT straight-line diagrams, for this project to provide additional value for NJDOT. Mr. Mazurek is currently the Project Surveyor, managing the effort to provide professional land surveying services in the form of: control verification, construction stakeout services, preparation of record documents, and to provide on-call professional land surveying services as required during the project. Mr. Mazurek is responsible for oversight of all land surveying and topographic survey tasks.

Photogrammetric Mapping for Preliminary Engineering for the Rt. 70 (MP 27.4 to 31.7, 37.95 to 51.08, 57.3 to 59.2 – 19.33 miles) Re-surfacing Project (NJDOT). For this NJDOT project RAS's team scope of services included the following: obtaining Color Digital Mapping Photography in order to map the area. Scope of services also included: dispatching a field team to evaluate the current pavement conditions in the areas previously mapped and to pre-target up to 314 control points along the roadway shoulders, as well as to establish approximately four hundred-eighty (480) aerial control points. RAS is processing the aerial triangulation adjustment output data through Aerosys software for the generation of a photogrammetric control file, which is to be migrated to Analytical Plotting Systems. The digital file for the 1"=30' scale mapping, to be delivered, will contain all land use features within the project limits. RAS' team will also deliver a control report with a narrative description of the survey methodology, survey adjustments and sketches for each of the aerial control points. The project survey report will be prepared in accordance with the NJDOT Survey Manual Chapter 7 Photogrammetric Survey requirements. Upon completion, RAS will provide a Quality Control and Quality Assurance Checklist and Certification to be included in the Photogrammetric Survey Control and Primary Survey Control reports. Mr. Mazurek is currently the Project Surveyor, managing the effort to provide professional land surveying services in the form of: control verification, construction stakeout services, preparation of record documents, and to provide on-call professional land surveying services as required during the project. Mr. Mazurek is responsible for oversight of all land surveying and topographic survey tasks.

Photogrammetric Mapping for Preliminary Engineering for the I495/Rt. 3 Interchange Mapping Project (NJDOT). For this NJDOT project RAS's team scope of services included the following: obtaining Color Digital Mapping Photography in order to map the area, by conducting Low-Altitude flight, consisting of seven (7) flight lines with 249 individual images. Scope of services also included: production of color digital ortho-photographs, using Datem Summit Evolution Softcopy Ortho-photo Module ortho rectification software which are spatially and radiometrically correct in scale to the digital mapping, and processing of the aerial triangulation adjustment output data through

PROJECT KEY PERSONNEL LIST

FIRM NAME	KEY PERSONNEL & TITLE	PERCENTAGE OF TIME ASSIGNED TO PROJECT							
		FEASIBILITY STUDY	ENVIRONMENTAL IMPACT STATEMENT	DESIGN PHASE	BIDDING & AWARD PHASE	CONSTRUCTION OFFICE	CONSTRUCTION FIELD	CLOSE OUT PHASE	HOURLY WAGE LEVEL 1-7
AECOM	**T. MacAllen** - Project Executive	10	5	15	5	2	2	2	7
AECOM	**C. Benosky** - Project Manager	30	20	30	20	5	5	5	7
AECOM	**E. Sullivan** - Quality Assurance Lead	5	2	5	2	0	0	0	6
AECOM	**R. Hinkle** - QC/TA - Ecosystem Restoration	5	2	5	0	0	0	0	7
AECOM	**A. Sarmad** - QC/TA - Structural Design	5	2	5	0	0	0	0	7
AECOM	**M. Khoury** - QC/TA - Geotechnical Design	5	2	5	0	0	0	0	7
AECOM	**S. Edelman** - QC/TA - Flood Risk Management	5	2	5	0	0	0	0	7
AECOM	**J. Dromsky-Reed** - Deputy Project Manager	20	20	20	20	5	2	5	5
AECOM	**P. Gregory** - Health & Safety Manager	5	5	5	1	1	1	0	6
AECOM	**M. Cannon** - Feasibity Study	20	20	10	0	0	0	0	7
AECOM	**A. Chaisson** - NEPA EIS	30	30	5	0	0	0	0	6
AECOM	**M. Smith** - NEPA EIS	20	20	5	0	0	0	0	6
AECOM	**B. Beckenbaugh** - Public Outreach & Community Engagement (Task Area Lead)	15	20	10	0	1	0	0	5
AECOM	**J. Bianco** - Flood Risk Management Design	20	15	30	10	5	5	5	6
AECOM	**C. Benosky** - Construction Administration	0	0	0	10	15	15	10	7
AECOM	**E. Bodner** - Civil Engineering	20	10	25	10	15	10	0	6
AECOM	**A. Miller** - Climate Change & Sea Level Rise	15	10	15	0	0	0	0	7
AECOM	**M. Utku** - Coastal Engineering & Resiliency	20	10	25	10	10	0	0	6
AECOM	**D. McDaid** - Cost Engineering	10	10	25	10	10	0	0	5
AECOM	**P. Naumoff** - Geology	5	5	10		5	5	0	5
AECOM	**R. Paupst** - Transportation Engineering	10	5	20	5	10	2	0	6
AECOM	**J. Gilsenan** - Architecture	10	5	20	10	10	2	0	7
AECOM	**J. Park, PhD, CFM** - Benefit Cost Analysis	20	10	20	0	0	0	0	6
AECOM	**S. Fialkoff** - Transportation Planning	20	10	10	0	0	0	0	6
AECOM	**I. Bunster-Ossa** - Urban Planning	20	5	20	5	0	0	0	7
AECOM	**W. Soper** - Hydrologic & Hydraulic Engineering	30	10	20	5	5	0	0	5
AECOM	**A. Klindworth** - Sustainability	20	2	10	0	0	0	0	6
AECOM	**L. Chauhan, PE** - MEP Engineering	5	5	15	5	5	0	0	5
AECOM	**J. Mansky** - Permitting & Regulatory Compliance	25	20	20	0	2	0	0	7
AECOM	**J. Rollino, CE** - Ecology & Biology	20	20	15	0	2	0	0	6
AECOM	**B. Stobbie** - Structural Engineering	15	10	20	5	5	0	0	7
DEI	**J. Boule, II, PE** - Executive Committee	5	2	5	0	0	0	0	7
DEI	**I. Ivanciu, PhD, PG** - QC/TA - NEPA Documentation	5	2	5	0	0	0	0	7
DEI	**M. Sears, PE** - QC/TA - Hydrologic & Hydraulic Engineering	5	2	5	0	0	0	0	7
DEI	**J. Squerciati, PE, CFM** - QC/TA - Benefit Cost Analysis	5	2	5	0	0	0	0	5
DEI	**P. Black, PE, CFM - QC/TA** - Civil Engineering	5	2	5	0	0	0	0	7
DEI	**J. Heeren , PE** - Deputy Project Manager	20	20	20	10	5	2	5	7
DEI	**J. Kanarek** - Transit Planning	20	2	10	0	0	0	0	6
DEI	**J. Gangai** - Coastal Modeling	30	5	10	0	0	0	0	5
DEI	**J. Baer** - Socioeconomics & Environmental Justice	15	5	5	0	0	0	0	5

PROJECT KEY PERSONNEL LIST

FIRM NAME	KEY PERSONNEL & TITLE	PERCENTAGE OF TIME ASSIGNED TO PROJECT							
		FEASIBILITY STUDY	ENVIRONMENTAL IMPACT STATEMENT	DESIGN PHASE	BIDDING & AWARD PHASE	CONSTRUCTION OFFICE	CONSTRUCTION FIELD	CLOSE OUT PHASE	HOURLY WAGE LEVEL 1-7
DEI	**S. Eget** - Air Quality	10	10	5	2	2	0	0	7
DEI	**S. Bleeker** - Land Surveying	10	0	5	0	0	0	0	5
DEI	**Z. Davis** - Cultural Resources & Archeology	15	5	5	2	2	0	0	5
HDR	**W. Mueller** - Executuve Committee	5	2	5	0	0	0	0	7
HDR	**D. Gapinski** - QC/TA - Feasibility Study	5	2	5	0	0	0	0	7
HDR	**C. Srickland** - QC/TA - Sustanability	5	2	5	0	0	0	0	7
HDR	**M. Murphy** - Deputy Project Manager	20	20	20	10	5	2	5	6
HDR	**J. Curran** - Ecosystem Restoration Design (Task Area Manager)	20	20	20	5	5	0	0	6
HDR	**J. Roebig** - Ecosystem Restoration (Discipline Lead)	20	20	20	2	2	0	0	6
HDR	**S. Parvis** - Site Remediatoin	15	10	20	10	5	2	0	6
HDR	**R. Miller** - Water Quality & Sediment Modeling	20	20	10	0	0	0	0	6
HDR	**N. Castillo** - Noise	2	10	0	5	2	0	0	6
HDR	**M. Korpus** - GIS	20	20	20	5	2	0	0	5
HDR	**J Stein** - Green Infrastructure	20	15	20	5	5	0	0	6
HR&A	**J. Springer** - Real Estate Development Analysis	15	0	0	0	0	0	0	7
Matrix	**k. Lucianin** - QC/TA - Government & Community Affairs	5	2	5	0	0	0	0	7
Matrix	**A. Raichie** - Small Business Liaison	5	2	5	0	0	0	0	7
Matrix	**D. Heck** - Geotechnical Engineering	15	10	20	5	5	5	0	6
Matrix	**F. Barlowski** - Hydrographic Surveys	10	0	10	0	0	0	0	5
Remora	**K. Hamby** - HUD Grant Compliance	15	5	15	0	0	0	0	7
RFI	**R. Reichman** - Public Outreach & Community Engagement (Discipline Lead)	5	15	5	0	0	0	0	7
Robinson	**S. Mazurek, PLS** - Aerial Survey & Mapping	15	5	10	0	0	0	0	5
Stevens	**A. Blumberg** - QC/TA - Coastal Engineering & Modeling	5	2	5	0	0	0	0	7

INSERT THE WAGE LEVEL FROM 1 TO 7 OF EACH KEY PERSON. **DO NOT INSERT ANY HOURLY RATE**

2 Similar and Relevant Experience

DPMC / DEP will have the benefit of the AECOM Team's extensive practical experience in implementing flood risk feasibility studies, environmental analysis, permitting, design, and construction on critical projects that have been built with Federal and local sponsorship.

INTRODUCTION

The AECOM Team has an established track record in the design, permitting, and construction of flood risk management, infrastructure, and ecosystem restoration projects in the State of New Jersey and in the Meadowlands project area.

AECOM and our team members are the primary US Army Corps of Engineers (USACE) New York District A/E contractors that have been involved with and responsible for the feasibility studies, designs, permitting, and construction of some of the largest Flood Risk Management and Ecosystem Restoration projects in the region over the past few decades. We have also been one of the primary FEMA contractors for Region II over the past few decades through the RAMP Joint Venture with AECOM(URS) and Dewberry, and are still one of FEMA's primary contractors through the current Compass JV led by AECOM.

AECOM and its Legacy companies are already working for DPMC/DEP. Including members of our team. We are currently successfully managing a number of your Term Contracts, including the Floodplain Mapping and the Demolition and Consultant contracts.

We are already working with you. AECOM and our team members are currently successfully managing a number of the DPMC/DEP Term Contracts, including the Floodplain Mapping and the Demolition Consultant contracts.

The AECOM Team has the experience, relationships, expertise, capacity, and technical competence necessary to successfully complete all aspects of the New Meadowlands Project for the state and its stakeholders.

OVERVIEW OF TEAM'S PROJECT EXPERIENCE

We know how to get projects done, and we deliver; we don't just develop high-concept renderings and plans (although we do that too, and very well). The AECOM Team has well over 40 years of experience in developing implementable flood risk management projects from concept development through pre-design (feasibility study, NEPA EIS preparation, permitting), design, construction, project turnover and close-out. Our project team has performed these services around the country, within the state, and in the Meadowlands itself. AECOM and its lead team members are currently heading many HUD-funded projects in the New York / New Jersey Metropolitan area in an effort to increase community resilience and protect against cosstal and fluvial flooding.

Nationally, the AECOM Team has completed the planning, design and permitting, construction for countless miles of levees and berms for flood risk reduction projects, and tens of thousands of acres of ecosystem restoration, creation, and enhancement projects that are built and in the ground.

In a project of this magnitude, the federal government via HUD, and, very likely, the USACE, will be a major partner in the implementation of funding. The AECOM Team will be there to support DPMC/DEP. AECOM and HDR have

continuously served the USACE's New York District for more than 40 years in their flood risk reduction and mitigation project needs. AECOM and Dewberry have served FEMA for their floodplain mapping and Public Assistance application needs. AECOM, AECOM(URS) and Dewberry have also partnered with DPMC/DEP for their ongoing FEMA RiSKMAP Cooperative Technical Partner (CTP) program for flood hazard assessment and floodplain mapping for FEMA flood insurance rate maps in New Jersey, and Dewberry is working with DPMC/DEP on the Rebuild By Design: Hudson River (Hoboken) Project. AECOM, HDR, Dewberry, and our other team partners have direct work experience with all of the major regional stakeholders including NJDOT, NJTA, NJTransit, Port Authority of NY & NJ, PSEG, New Jersey Meadowlands Commission, mitigation banks in the Meadowlands, and many other regional government and non-government enterprises.

The AECOM Team is exceptionally qualified, well versed, and experienced to assist in every facet of the scope and potential work order assignments for the New Meadowlands Project.

Feasibility Studies

The AECOM Team has prepared numerous feasibility studies for flood risk management and ecosystem restoration projects nationwide. AECOM and its team members have worked with multiple USACE districts, FEMA, State and local governments, and other organizations for development of flood risk management and mitigation projects for regional, community and property level protection designs. Currently, the AECOM Team is engaged in preparing feasibility studies, flood risk assessments, alternative analyses, and conceptual designs for the Hudson Raritan Estuary (HRE) and Bronx River for ecosystem restoration projects, the Green Brook and Passaic River flood risk reduction projects, South Shore of Staten Island, Passaic Valley Sewer Commission, and the Rebuild By Design: Hudson River (Hoboken) Project, (*just to name a few*). Since our Team's experience is up to date, we are fully knowledgeable with regard to current practices, procedures and regulations and our Team will have no learning curve such that we can immediately initiate work and produce high quality and productive studies.

The AECOM Team also has direct Hydrologic and Hydraulic / Flood Risk modeling experience in the Meadowland project area. Under the DPMC/DEP CTP contract we completed the modeling and the preliminary flood map development for Bergen County, NJ — which includes the Meadowlands project boundaries. The Team was also responsible for analyses and mapping for the coastal flood hazard boundary for New Jersey under FEMA Region – II task order from Cape May County to Bergen County and we were the primary consultant for the USACE's recently completed North Atlantic Comprehensive Coastal (NACCS) Study. The AECOM Team has completed thousands of miles of riverine and coastal flood analyses in support for FEMA's on going RiSKMAP program as well as legacy flood mapping initiative.

NEPA EIS

The AECOM Team has prepared NEPA documentation for a countless number of Environmental Impact Statements (EIS) for the design of flood risk management projects locally and nationwide. Currently, our team member Dewberry is working on the Rebuild By Design: Hudson River (Hoboken) Project. NEPA EIS for the State and AECOM, through our NEPA Task Leader for this project, Ms. Angela Chaisson, CWB, is preparing the NEPA, Section 106, and Endangered Species Act Compliance for Hurricane Sandy Recapitalization Projects throughout New Jersey for the U.S. Coast Guard. We have also recently completed the preliminary draft NEPA EIS for the 600-acre Meadowlands Mills mixed use development project in Secaucus, NJ.

Community Outreach and Stakeholder Support

While community outreach and stakeholder support are not part of the main tasks called out in the New Meadowlands Term Contract title: "**Rebuild By Design – New Meadowlands Project: Feasibility Study, Environmental Impact Statement, Design, And Construction Administration Services,**" we know the processes, mechanisms and methods to advance projects. Infrastructure projects disrupt communities, but a good communications program that informs, communicates the need, benefits and process goes a long way toward building goodwill and consensus among stakeholders. We fully understand that without consensus among the various stakeholders, this project cannot and will not move forward. You will not have to worry, as we've got you covered. The

AECOM Team, which includes the firm Reichman Frankle Inc. (RFI), as our Public Outreach Specialist has a proven track record of providing comprehensive community outreach and stakeholder support for large scale projects affecting multiple communities in the region.

In fact, the AECOM Team led the communication and outreach in coastal New Jersey for FEMA's Superstorm Sandy recovery efforts and provided support to FEMA, NJDEP, county, and municipal governments, and perhaps most importantly, to the local residents. Our approach was to emphasize effective communication, to explain things in simple terms, and to use open source web based tools to ensure open and easy access to information. To support this effort, and provide data to the technical community, the Team developed the **www.region2coastal.com** website.

In addition, outreach and stakeholder engagement is a critical element of the Rebuild By Design: Hudson River (Hoboken) Project with Dewberry and DEP advancing the effort along a critical path.

Design

The AECOM Team has provided design services for many projects throughout New Jersey and the NY/NJ Metropolitan area, ranging from small municipal drainage projects to some of the largest infrastructure and public realm projects in the state, nation, and around the globe. The AECOM Team has provided design services for projects such as the Access to the Regions Core (ARC), the Passaic River Flood Control Program, the Green Brook Flood Control Program, the Atlantic Coast of New Jersey Sea Bright to Manasquan Beach Erosion Projects, World Trade Center Public Realm,

Our team can confidently state that we have successfully provided design services for all the major Federal, state, and local agencies in and around New Jersey.

Second Avenue Subway, the NJTA Interchange 6 to 9 Widening Program, the New Tappan Zee Bridge, Route 3 Passaic River Bridge, the PSEG Estuary Enhancement Program, and the Passaic Valley Sewage Commission (PVSC) Resiliency Project.

Construction Administration

AECOM and its Legacy companies, have provided Bid Phase services, Construction Administration (CA) and Construction Management (CM) for many of its Federal, state, local and private clients for well more than 100 years. In fact, AECOM is currently providing construction administration services for Contracts 1 and 2 of the USACE Atlantic Coast of New Jersey Sea Bright to Manasquan Beach Erosion Projects, Elberon to Loch Arbour Reach, where our our proposed Project Manager, Mr. Benosky is leading the CA effort. The construction costs for Contracts 1 and 2 are approximately $125 million. AECOM is also in the process of completing the construction administration, construction management, and program management for the NJTA Interchange 6 to 9 Widening Program where the overall construction cost is approximately $2.5 billion.

OUR REPRESENTATIVE PROJECTS

The six (6) projects that we are illustrating on the following pages, not only highlight the strengths and expertise of our individual team members, but perhaps more importantly, these projects illustrate the long history of collaboration that our Team members possess working together on projects and term contracts. As you review these projects, you will notice that the majority of them have two or more of our Team members providing complimentary services to our mutual client.

We have a long history of working together and we look forward to maximizing the effectiveness of our existing professional relationships and align toward strengths as we collaborate on the New Meadowlands project by helping the State of New Jersey realize its mission to "**Protect, Connect, and Grow**" the communities within the Phase I Pilot Area and beyond.

1. USACE, Greenbrook Flood Control Project [**AECOM**, **AECOM(URS)**, and **HDR**]
2. NJ Transit/DEP, Rebuild By Design: Hudson River (Hoboken) Project [**DEI**]
3. DPMC/DEP, FEMA Floodplain Mapping Term Contracts [**AECOM**, **AECOM(URS)**, and **DEI**]
4. Evergreen Environmental, LLC, Meadowlands Wetland Bank [**HDR**]
5. USACE, Hudson Raritan Estuary / Harbor Deepening Project [**AECOM**, **AECOM(URS)**, and **HDR**]
6. USACE, South Shore of Staten Island [**AECOM** and **AECOM(URS)**]

SIX (6) HIGHLIGHTED PROJECTS	Surveys and Site Investigations	Feasibility Studies	Environmental Impact Statements	Project Scoping Documents	Preparation of Designs and Bid Specifications	Removal of Hazardous Material	Site Remediation and Restoration	Stakeholder Outreach and Coordination	Construction Oversight Services
USACE, Greenbrook Flood Control Project	●	●	●	●	●		●	●	●
NJ Transit/DEP, Rebuild By Design: Hudson River (Hoboken) Project	●	●	●	●				●	
DPMC/DEP, FEMA Floodplain Mapping Term Contract	●	●						●	
Evergreen Environmental, Meadowlands Wetland Bank	●	●		●	●	●	●	●	●
USACE, Hudson Raritan Estuary / Harbor Deepening Project	●	●	●	●	●	●	●	●	
USACE, South Shore Staten Island	●	●	●				●	●	

Green Brook Flood Control Project and Finderne Wetland Creation and Restoration 1

New Storm water Pump Station & Levee

Firms
AECOM and AECOM(URS).

Location
Green Brook Sub Basin, Somerset, Middlesex, and Union Counties, NJ

Reference
Sheila Rice-McDonnell
US Army Corps of Engineers
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New York, NY 10278
Tel 917.790.8297

Services
Planning; Design; Ongoing Construction; and Monitoring and Adaptive Management

Project Value
$ 610 million

Relevance to TC-001 / P1131-00
- Parallel Services to the New Meadowlands Project
- Analysis of Alternatives
- Benefit Cost Analysis
- Feasibility Report
- Design Services
- Permitting Services
- Mitigation Monitoring and Adaptive Management
- Construction Administration Services
- Levee Design
- Flood Wall Design
- Closure Structure (Flood Gate) Design
- Hydrology and Hydraulic Analysis
- Interior Drainage Analysis and Design

PROJECT DESCRIPTION

AECOM(URS) is assisting the New York District in planning, design and ongoing construction of this large-scale Flood Risk Management Project in the Green Brook Sub-basin of the Raritan River in NJ. AECOM(URS) has been the lead consultant on the Green Brook Project for the New York District Corps of Engineers for the Feasibility level Investigations and Report (1980), the General Re-Evaluation Report (1997), Plans and Specifications (1999-2014) and Construction Administration (2011-2015). While many of our team staff members have worked on this project over this time period, our Project Executive, Mr. Mac Allen, PE,PP, our Feasibility Task Leader Mr. Michael Cannon, and HDR's Executive committee representative Mr. Werner Mueller, PE have all been involved on the project since its inception.

Feasibility Study

AECOM(URS) through a legacy company prepared the feasibility study for the 65 square mile drainage basin of Green Brook, a sub-basin of the Raritan River. The study area encompassed 13 municipalities, and 3 counties, and included a flood control commission that served as the point of contact for the local interests. For planning purposes the watershed was divided into three distinct areas; the Lower Basin, defined by the watershed below Stony Brook an area most impacted by severe flooding from the Raritan River; the Upper Basin, that portion of the watershed above Stony Brook, where a major natural diversion occurs, killing five people in August 1973 and flooding a large portion of the commercial district of Scotch Plains and residences in Plainfield; and Stony Brook a steep fast rising major tributary to the peak flood events on Green Brook and where one person died in the 73' flood.

The alternatives considered ran the gamut of flood control solutions available; Preliminary designs were prepared for levees, floodwalls, ponding areas, pump stations, channel improvements, concrete flumes, diversion pipes, bridges and regional detention basins, as well as for floodproofing individual structures. Over twenty various alternatives were considered, construction cost estimates prepared, benefits computed and a benefit-cost analysis performed leading to a recommendation for a selected plan consisting of a network of levees, floodwalls, buyouts and floodproofing for the Lower Basin, and a channel improvement, flume and levees for Stony Brook, the upper basin did not result in an economically viable solution. The recommended plan was forwarded to Washington for approval, authorization and funding.

General Re-evaluation Report Phase:
The project was authorized for construction by the 1986 WRDA Bill. As a result of lobbying efforts by the Green Brook Flood Control

Commission the Upper Basin portion was included in the authorization. As this portion of the basin had been determined to be a negative element, the time lapse since the earlier feasibility report and in light of some planning guidance changes, the District contracted with AECOM(URS) to perform a Reevaluation Study to determine if a positive project could be identified for the Upper Basin, to update the recommended plans for the Lower Basin and Stony Brook and to optimize the interior drainage facilities. AECOM(URS) evaluated several additional alternatives for the Upper Basin and ultimately revamped the outlets for the regional detention basins allowing greater flow to pass for the more frequent storms, thereby providing more storage availability for the larger events, integrated with a smaller channel improvement through Scotch Plains and Plainfield, the result yielding a positive BCR. Another major effort was optimization of 30 interior drainage facilities trading off storage costs, pumping costs and diversion costs against the benefits each derived to define the best overall solution for each location. A positive General Re-evaluation Report was published in 1997 and design began the following year.

Design Phase:

The effort has been a collaborative effort between the USACE and AECOM(URS). AECOM(URS) began design work in 1998 and the initial ground breaking was in 1999, three weeks before Hurricane Floyd hit the basin, the flood of record for the Raritan River. While AECOM(URS) role is still ongoing, to date AECOM(URS) has been responsible for the design of **2900 LF of Levee** (Segments B1 & T-Raising); **2000 LF** of floodwall (Segments B1& R2); three (3) **Closure Gates** (80 ft. wide swing gate; 47 ft. wide roller gate and 40 ft. wide stop log gate, two across NJT rail lines); a Ringwall at Union Avenue Apartments; **three (3) Bridge Replacements & Appurtenant Approach Roads** (Main St. and Talmage Ave., Bound Brook, NJ & Sebring's Mills Road, Middlesex, NJ); and Interior Drainage works consisting of Two (2) **Pump Stations** (100 & 10 cfs); six (6) **pipe penetrations through NJ Transit** rail road embankment, numerous outlet structures, and miscellaneous local drainage upgrades. AECOM(URS) completed the final design analyses, prepared the Contract Drawings (Microstation) and Specifications (USACE SpecsIntact), and engineers construction cost estimates (USACE MII (MCACES)). For several of the larger design segments participated in a value engineering exercise.

The above design services represent nearly $60 million in construction and seven (7) separate bid packages.

Permitting Phase:

AECOM(URS) performed the wetland delineations; obtained the LOIs; prepared the permit applications, and supporting engineering reports, including a hydrologic balance analysis; attended the pre-application meetings, and obtained the state Flood Hazard Area Act and Individual Wetlands permits for both the Borough of Bound Brook (Segments U, R &T) and Borough of Middlesex (Segment B1). In addition AECOM(URS) obtained several general permits to perform field investigations. Additionally AECOM(URS) supported the Corps and contractors in obtaining NJDOT highway opening permits and NRCS soil erosion certifications. As part of the permitting process for the Individual Wetlands permits the Corps has designed a wetland mitigation project known as the Finderne Wetland Mitigation Site. As a compliance action to the permit, AECOM providing post-construction monitoring and adaptive management services for this 179-acre parcel of undeveloped land containing 1,100 linear feet of stream in Somerset County, New Jersey.

Benefits to Client
Through carefully scaling the project formulation and by performing incremental cost analysis, a positive BCR was achieved for an overall watershed-wide plan and the project was authorized and funded for construction.

Construction Administration Phase:

AECOM(URS) is providing a similar construction administration role on this project as we foresee for the upcoming New Meadow Lands Project. In this instance the Corps in-house staff is the CM/PM for the construction project and relies on AECOM(URS) to provide construction administration. For each of the seven bid packages AECOM (URS) has responded to bidders questions during the bid phase, assisted the USACE with analyzing the bids, attended partnering sessions for the larger contracts, responded to RFIs during construction, review and approved selected shop drawings, provided revisions during construction phase,

attended field meetings and performed periodic inspections as needed, assisted the USACE with final inspections.

Key services relevant to the New Meadowlands Project are detailed below:

Hydraulic/Hydrologic Engineering/Open Channel

Hydraulics Analysis & Design: AECOM(URS) applied extensive **hydrologic and hydraulic modeling analysis** including HEC-2/HECRAS hydraulic modeling of over 44 miles of river, including the Raritan River, and the application of a basin-wide HEC-1 model. Models were used to size channels and bridge openings, set levee and floodwall heights and size interior drainage facilities. Modeling results were matched with flood damage survey and structure inventory data to create a **basin-wide, reach-by-reach risk assessment to determine the probability of flood damages.** The **economic risk assessments** were performed using the Corp's HECFDA program, which incorporates risk and uncertainty principles.

AECOM(URS) developed HEC-1 models of over 30 interior drainage areas behind proposed levees. Through carefully scaling the project formulation and by performing incremental cost analysis, a positive BCR was achieved for an overall watershed-wide plan and the project was authorized and funded for construction.

Structural Flood Damage Reduction Alternatives and Design

Flood Control and Drainage Design: AECOM(URS) formulated the alternatives in accordance with USACE regulations, guidelines and procedures, and performed preliminary designs for this watershed-wide flood risk management project. Project features included local protection works including channel modifications, levees and floodwalls. The preliminary feasibility level design includes eight closure structures to pass roadways and rail lines through the line of protection, and two detention structures in the upper watershed to reduce peak runoff. Safe management of stormwater trapped behind the line of protection, required **design of interior drainage facilities** including ponding areas and pump stations.

Levees and Floodwalls: Representative design sections were examined for lateral, sliding, and overturning stability, uplift pressures, and seismic forces. Wall sections were

URS Designed 1900 LF of Composite Sheet Pile and Tee Floodwall, Middlesex Borough NJ

designed in accordance with EM 1102-2-2502 "Retaining and Floodwalls" and ETL 1110-2-265, "Sliding Stability for Concrete Structures," for stability in sliding and overturning. Lateral stability analyses were performed in accordance with ER 1110-2-1806, Earthquake Design and Analysis for Corps of Engineers Projects and ETL 1110-2-256. Structural and reinforcing designs were developed using the ultimate strength method in accordance with provisions of "Strength Design for Reinforced Concrete Hydraulic Structures," EM 1110-2-2104.

Combinations of levee heights and subsurface stratigraphy were examined throughout the proposed project area. Project cost savings were attained by close examination of levee design and construction features. Based on analyses of design sections, flood durations, and seepage rates, impermeable cores were determined unnecessary for the levees. In addition, the low seepage rates of the native material in conjunction with short flood durations allowed a reduction in the size of inspection trenches, increasing anticipated production rates and eliminating needless movement of native materials. Throughout the project, levee design sections and underlying soils were analyzed for primary consolidation and secondary compression. Levee stability was analyzed using the two-dimensional equilibrium program PCSTABL5M, and minimum required safety factors met generally accepted practices and EM 1110-2-1902 "Engineering and Design Stability of Earth

URS is Designing 1.5 to 2.8 Ft. Added Height Following Hurricane Irene

and Rockfill Dams". Seepage analyses were performed in accordance with EM 1110-2-1901 "Seepage Analysis and Control for Dams," and EM 1110-2-1913, "Design and Construction of Levees." Final Bid documents were prepared for a segment of Levee and floodwall near the Talmage Avenue Bridge.

Closure Structures: AECOM(URS) completed the final design and prepared plans and specifications for the closure gates at the South Main Street underpass, the NJ Transit main commuter line and a transfer rail line between CSX and NJT. As part of the final design process and coordination with local interests a roller gate was constructed for the S. Main Street underpass to reduce complications of interference with the existing bridge abutments and for aesthetic purposes.

URS Designed Swing Gate Spans NJT Tracks

Detention Reservoirs: During the feasibility and GRR stageThree detention reservoir sites were considered in connection with this project. At one site, roller-compacted concrete was evaluated as a cost-effective alternative to an earthen dam. For the final two dams, up to 20 rock-core borings were taken per site and a 35% design report has been prepared. **AECOM(URS) formulated the dam outlets to maximize storage while minimizing the structure height** enabling a cost effective feature to be identified.

Channel Modifications/Flumes: Improvement plans for the upper watershed consist of six miles of **channel modifications,** with earthen trapezoidal sections and concrete flumes. A key design issue was achieving a balance between reductions in flood stages and alterations to a naturally occurring diversion against inducing increased flows downstream. A supercritical concrete flume and stilling basin was fully modeled for Stony Brook.

Engineering Investigations

Geotechnical Investigations/Soil Analysis: AECOM(URS) directed efforts to obtain 67 new **geotechnical test borings** including their location by survey as part of the GRR effort. Depths ranged from 11 to 55 feet and averaged 25 feet. Forty-one (41) of the borings were converted to ground water observation points. Falling head tests were conducted at 9 of the piezometer locations. Packer tests were conducted in 2 borings in bedrock, one at each Detention Control Structure site. The field testing results were included in Geotechnical Calculations. Test pits were conducted along a segment of the proposed levee that passes through a historical landfill area. The laboratory testing program consisted of identification and physical property testing. Identification testing included grain size with hydrometer (ASTM D422), moisture content (ASTM D2216), Atterberg Limits (ASTM D4318), unit weight, and specific gravity (ASTM D854). Physical testing included triaxial (ASTM D4767) and unconfined (ASTM D2166) compressive tests on undisturbed soil, and compressive tests (ASTM D2938) on rock core samples. AECOM(URS) prepared a geotechnical report summarizing the findings.

Contaminated Soil-HTRW Assessment: Assessment consisted of Phase I Records Search and Phase II Intrusive Site Investigations. Efforts included the development of Limited Health and Safety Plan, Chemical Data Acquisition Plan, and Sampling Plan. Findings of the site investigations, title and deed searches, and database searches were compiled into a report that included recommendations for the construction features of the project. A number of sites were identified as having a potential for contamination, and more intrusive investigations were performed. During design stage AECOM(URS) performed a site investigation of Apollo Glass and a residence for Lead, Asbestos and USTs matching HUDs similar environmental requirements prior to demolition of structures.

Aerial Photography and Topographic Survey: AECOM(URS) subcontracted aerial photographic updates of the basin and provided surveys to update the topographic mapping in specific areas of the project.

Public and Inter-agency Coordination: AECOM(URS) assisted in resolving USGS and USACE differences in flow estimations for Tropical Storm Floyd and partnered with NJDEP to facilitate development of Flood Plain Management Plan, which will included coordination with the NJDEP and local communities to resolve difficult issues regarding future development within protected areas. During pre-construction AECOM(URS) staff prepared project renderings and participated in several public meetings with local residence.

Post-Construction Services

Monitoring and Adaptive Management: The goal of the Finderne Mitigation Site Monitoring and Adaptive Management Plan is to conduct the appropriate monitoring activities and habitat assessments to document the level of success for the mitigation site and then measure compliance with the New Jersey Department of Environmental Protection permit requirements and Corps of Engineers mitigation policy. Due to widespread site functionality issues, AECOM was contracted to develop and implement a phased Adaptive Management Plan to support site success and control invasive species. Under this ongoing effort that commenced in 2008, AECOM has/is performing the following services:

- **Vegetation Monitoring:** AECOM conducted two vegetation surveys, one in the spring and one in the fall, to determine whether there was at least 60% areal coverage of the planted vegetation or target hydrophytes which are species native to the area and similar to the ones identified on the mitigation planting plan.
- **Soil Investigation:** In order to demonstrate to the NJDEP that hydric soils are developing on the site, AECOM took six (6) soil profiles at various locations throughout the mitigation site to a depth of 24 inches. The location of each soil profile was documented with GPS and will be depicted on the as built plan.
- **Stream Survey:** AECOM conducted a survey of the restored stream to determine if the stream was functioning as designed. Utilizing the five (5) channel cross-sections previously identified during the stream restoration design, AECOM measured bankfull width, bankfull mean depth, bankfull maximum depth, flood prone area width, entrenchment ratio, bankfull cross-sectional area, bankfull velocity, and estimated bankfull discharge. Additionally, AECOM performed a pebble count to assess any changes to the substrate. AECOM noted any evidence of accelerated erosion to any part of the restored stream.
- **Hydrologic Assessment:** AECOM performed an evaluation of the hydrologic regime of the mitigation site to determine if the site was functioning as specified in the mitigation proposal. AECOM utilized information gained from visual observations during site visits, any available existing information (e.g. existing and new stream gauges), and the information generated from the Vegetation Monitoring and Stream Surveying to perform the evaluation. Results of the evaluation were incorporated into the Monitoring Report and are guiding the Adaptive Management Plan updates. Additional work has included installation and monitoring of additional piezometers, multiple post-flood site evaluations, HEC-RAS model review, and a more detailed hydraulic and site failure analysis and recovery plan.

- **Invasive Species Inspection and Management:** Invasive species noted on the site during monitoring include reed canarygrass (Phalaris arundinacea), purple loosestrife (Lythrum salicaria), giant burdock (Arctium lappa) and Japanese hops (Humulus japonica), Japanese knotweed (Polygonum cuspidatum) and rosa multiflora. AECOM used wandering surveys of each planting zone to record the location and extent of invasive plant species populations. To address changing site conditions, AECOM developed a revised invasive species management plan that involved multi-season herbicide and mechanical cutting.

Site Monitoring at Finderne Wetland Mitigation Site

- **Wetland Delineation and Supplemental Survey Data:** Based on the above monitoring and management efforts, it was determined that further investigations were needed to identify the cause of the deficiencies in the site achieving the hydrology required to sustain the ecotypes constructed. To support this effort, AECOM completed a revised wetland delineation and report on the non-functional portions of the site. Based on site conditions, it was necessary to supplement the Corps of Engineers' standard 1987 delineation manual with delineation methods in Chapter 5 of the Corps of Engineers' Regional Supplement, which focuses on guidance for difficult soils/areas. In addition, AECOM coordinated with a licensed surveyor to collect supplemental elevation data for adaptive management measure evaluation. The results allowed for identification of further adaptive management measures to be implemented.
- **Monitoring Report and Adaptive Management Plan:** AECOM prepared annual Monitoring Reports to document the findings of the tasks mentioned above. AECOM also prepared an Adaptive Management Plan and continues to update the document based on the data collected and analyzed.

AECOM was recently awarded the next phase of the adaptive management work on the site, including updates to the invasive species management plan and conceptual design for further site hydrologic improvements, as well as further coordination with the Corps of Engineers, NJDEP, and other stakeholders.

The project cost is $610M for the entire project.

Rebuild By Design: Hudson River (Hoboken) Project

2

Firm
Dewberry Engineers Inc.

Location
Hoboken, Weehawken, and Jersey City, Hudson County, NJ

Reference
Mr. Dennis Reinknecht
New Jersey Department of Environmental Protection
609.292.1976

Services
Feasibility Study and Environmental Impact Statement (EIS)

Project Value
$230 million

Dates
Ongoing

Relevance to TC-001 / P1131-00
- New Jersey's other Rebuild By Design Project
- Feasibility Study
- NEPA EIS pursuant to HUD CDBG-DR

Proposed Staff Involved on this Project
- John Boulé
- James Heeren
- Ileana Ivanciu
- John Squerciati
- Michael Sears
- Jeff Gangai
- Matthew Shultz
- Rahul Parab
- Jennifer Baer
- Zachary Davis
- Scott Bleeker

PROJECT DESCRIPTION

DEWBERRY as prime consultant, is preparing a Feasibility Study and Environmental Impact Statement (EIS) for the Rebuild By Design (RBD) Hudson River project. The project is a comprehensive urban water strategy conceived to protect the Hoboken waterfront, as well as parts of Weehawken and Jersey City.

The project involves these resilience measures:

- Hard infrastructure and nature-based (soft landscape) infrastructure for coastal defense (resist)
- Policy recommendations, guidelines, and urban infrastructure to slow rainwater runoff (delay)
- A circuit of interconnected green infrastructure to store and direct excess rainwater (store)
- Water pumps and alternative routes to support drainage (discharge)

The Feasibility Study and EIS process emerged from concepts developed during the U.S. Department of Housing and Urban Development's (HUD's) Rebuild By Design (RBD) Competition. HUD created RBD in the summer of 2013 to develop ideas capable of dramatically improving the physical, ecological, and economic resilience of coastal areas. Teams created coalitions with local and regional stakeholders to develop proposals to improve the resilience of waterfront communities. As one of the winning proposals, Rebuild By Design Hudson River received $230 million in funding.

The Feasibility Study will investigate the constructability, viability, and environmental impacts of the improvements included in the RBD competition proposal. The project elements will complement and reinforce other resilience measures being undertaken by NJ TRANSIT on the Federal Transit Administration funded-Hoboken Long Slip project. Design factors such as utility impacts, subsurface soil conditions, right-of-way impacts, traffic/pedestrian flow, and construction cost will be evaluated for the concepts to narrow the focus on practical alternatives that can be discussed and evaluated in the context of an EIS.

HUD's award comes in the form of Community Development Block Grant-Disaster Recovery (CDBG-DR) funds requiring compliance with the National Environmental Policy Act (NEPA) and its associated regulations. The NEPA EIS process dictates a significant public outreach program, which will enable stakeholders to agree on a recommended alternative to advance into design and construction.

The NJDEP is charged with planning, designing, and constructing this project. DEI is partnering with the NJDEP to complete the Feasibility Study and EIS within HUD's requirements, including obligating the grant funding by September 30, 2017.

The framework for the project is tied to gaining a Record of Decision in December 2016. Implementation of the Public Involvement Action Plan (PIAP) is a crucial ingredient in gaining support from all key stakeholders. The PIAP is structured and executed through a phased approach consistent with the project phases. The Plan is a tool for obtaining public input in the development of the concept screening process and alternatives screening process, and ultimately the selection of Build Alternatives and the recommendation of a Preferred Alternative.

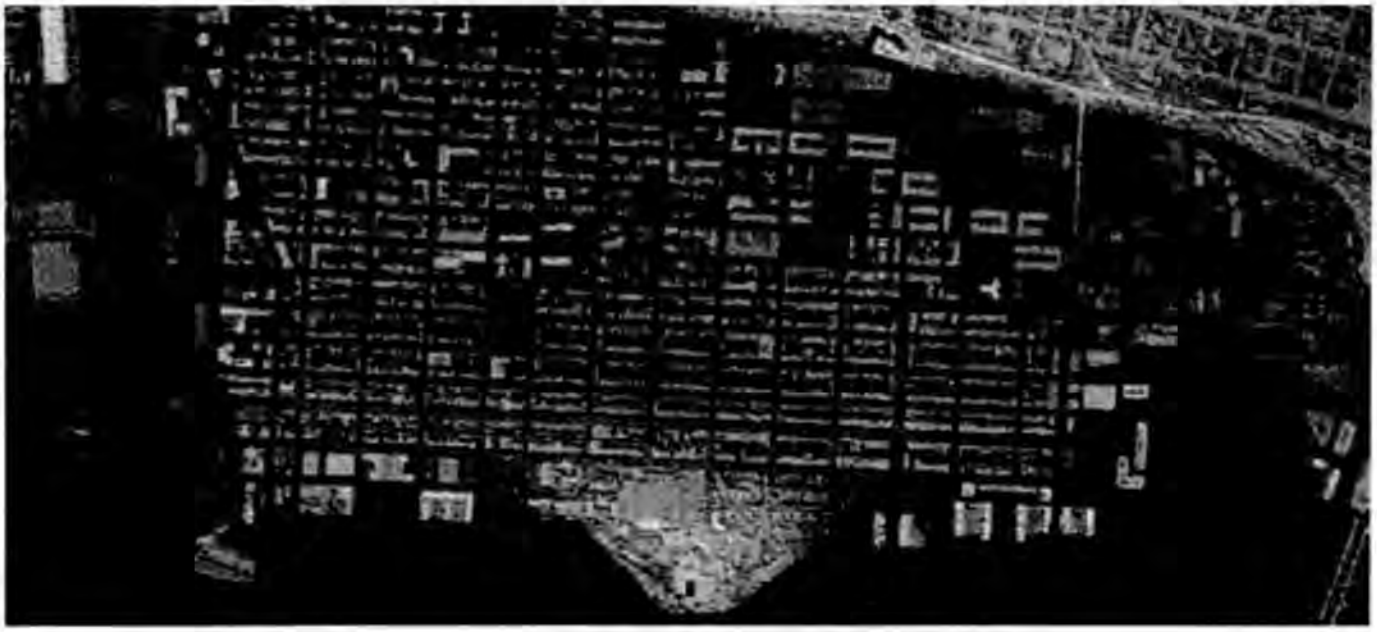
Key Stakeholders:

Public participation is an ongoing process that is closely linked and performed in conjunction with the environmental (NEPA) and engineering (feasibility) aspects of the project. A fundamental goal of the stakeholder and public outreach process is to gain an understanding of the community and its needs and desires in regard to the flood risk reduction system. A database of contact information was developed for project area representatives, media organizations, and representatives from the business community, as well as other stakeholders.

Stakeholders are organized into four groups as part of the information sharing and decision-making process. The four groups are:

- Executive Steering Committee (ESC) – The ESC is comprised of state and elected local officials who are informed through regular meetings.
- Technical Coordination Team (TCT) - The TCT was formed by the federally convened Sandy Regional Infrastructure Resilience Coordination (SRIRC) Group. It is comprised of federal, state and local officials with subject matter expertise in resilience, planning, environmental review, and permitting.
- Federal Review and Permitting (FRP) - The FRP Team consists of federal officials with responsibility for federal review and permitting of complex Sandy infrastructure projects who have been convened to facilitate permitting and review for Sandy projects.
- Citizen Advisory Group (CAG) – The CAG is composed of representatives from each community, selected by the Mayors or their delegates. The CAG members share project information including processes with their constituents, determine and promote community priorities and concerns; make recommendations on enhancing dialogue through community channels.

Project Framework – Key Milestones:



The milestones below are consensus points during the EIS and Feasibility Study. In addition to the stakeholder committee groups, the Project Manager and Subject Matter Experts (SMEs) attend each meeting to help inform stakeholders and the public about technical aspects that are being addressed.

- Purpose and Need Meetings – The purpose of these meetings is to obtain concurrence on the Project's Purpose and Need so that the planning of the Project can continue within the NEPA framework. coping/Data Gathering Meetings – The purpose of these meetings is to achieve buy-in on the draft Purpose and Need and to initiate the scoping process, which frames the project as it moves forward. The goal of the scoping meetings is to gain informed consensus on the broad project goals. Dewberry is responsible for presenting a summary of existing deficiencies in the Project Area, as well as baseline environmental data. In addition to meeting with the ESC, TCT, and CAG at this phase, the FRP is involved to gain feedback from federal authorities on the proposed scope of work for the project.
- Screening Criteria/Metrics Meetings – These meetings provide an opportunity for stakeholders to help establish, as well as understand, what criteria will be used during the concept screening process. The goal of these meetings is to gain consensus on what constraint criteria (i.e. construction cost, ROW impacts, cultural resources, etc.) to include in the concepts screening matrix as well as what metrics are used for each constraint criteria. At the conclusion of these meetings, the format for the concept screening matrix will be agreed upon.
- Concepts Screening Workshops – Building upon the previous meetings, these workshops present a detailed review and screening of the concepts developed to date. A screening matrix will be presented at each meeting, with Dewberry SMEs explaining to stakeholders how concepts were ranked based on impact to the areas of study. Based on input from the stakeholder groups, the rankings will be confirmed or changed. Ultimately, the workshops will conclude by ranking concepts in terms of their environmental impacts and engineering constraints. The concepts that are ranked with the lowest impacts will be advanced for further study as the Build Alternatives.
- Alternatives Analysis Workshops – The purpose of these meetings is to present a review of the Build Alternatives advanced for further study. Information gathered in data gap surveys will inform the meeting participants on the impacts of each alternative. As with the concepts screening meetings, Dewberry attends each meeting with a matrix preliminarily filled out, and SMEs explain how each alternatives was ranked. The stakeholders will provide input as to whether they feel the ranking should be adjusted. The ultimate outcome of this process will be the selection of the Preferred Alternative.
- EIS Public Meetings and Public Hearing – In addition to the above stakeholder milestone meetings, there will be three Public Meetings for the general public: first meeting after the scoping meetings; second meeting after the concept screening milestone meetings; and third meeting after the alternatives analysis. A formal public hearing will be held during the DEIS comment period with a stenographer present to record public comments at the hearing. These meetings are planned for a location that is easy for attendees to reach (transit and ADA accessible) and at a time of day and during the week convenient for the most people. Translators and translated printed material will be available.

In accordance with the RBD program requirements as stated in 79 FR 62182, a substantial Action Plan Amendment is required. Subsequent to the completion of the DEIS, NJDEP will prepare and submit a substantial Action Plan Amendment. As part of the requirements for the Action Plan Amendment, a public meeting will be necessary to describe the Action Plan Amendment. In an effort to streamline the NEPA and Action Plan Amendment process and following what is recommended in the federal register notice, the public meeting for this substantial Action Plan Amendment and the public hearing for the DEIS will be combined.

DPMC / NJDEP, FEMA Floodplain Mapping Term Contract 3

Firms
AECOM, AECOM(URS), and DEI.

Location
New Jersey Statewide

Reference
Joseph Ruggeri
NJ Department of Environmental Protection - Bureau of Dam Safety and Flood Control
501 East State Street
Trenton, NJ 08625
Tel 609.292.2296

Services
Floodplain Mapping Services under two Indefinite Delivery Indefinite Quantity Contracts; Design; Ongoing Construction; and Monitoring and Adaptive Management

Project Value
$1.4 million (fee) - AECOM
$1.25 million (fee) - URS now AECOM
$898,117 (fee) - Dewberry

Dates
May 2011 - Ongoing

Relevance to TC-001 / P1131-00
- Familiarity with DPMC/DEP project requirements and terms
- Current experience with flood analysis and mitigation requirements with Meadowlands
- Delivering large project assignment on schedule and budget
- Recent experience working with local stakeholders and their issues and expectations
- Project outreach and communication to state, community, and federal agencies as well as residents

Proposed Staff Involved on this Project
Christopher Benosky, Tom Mac Allen John Dromsky-Reed, William Soper, Brian Beckenbaugh, Arthur Miller, Jeff Gangai

PROJECT DESCRIPTION

The AECOM team members are providing professional technical services to the New Jersey Department of Environmental Protection (NJDEP) in support of their Cooperative Technical Partnership (CTP) with FEMA under three separate IDIQ contracts. The work under these contracts spans multiple work orders to address the floodplain mapping and Hydrologic & Hydraulic (H&H) analyses needs for the state of New Jersey.

Under different work orders, AECOM has processed approximately 800 square miles of detailed LiDAR data in preparation for the H&H analyses. The AECOM and URS work orders entailed performing detailed H&H modeling for 109 miles of stream and 46 miles of limited detailed H&H modeling in the Hackensack-Passaic River basin. This effort resulted in the need for field data collection of over 100 cross sections, 250 bridges/culvert and 250 structures. The major watercourses under this effort included the Pompton River, the Ramapo River, the Wanaque River, The Pequannock River, the Third River, the Hackensack River and Pascack Brook.

Multiple survey teams collected field survey data for the selected stream reaches, which was used to perform detailed hydraulic analyses using AECOM's Watershed Information System (WISE) software, a FEMA approved software package. WISE includes automated tools to develop hydraulic models, final floodplain mapping, and FEMA DCS-compliant data files. For model development, AECOM and URS developed an integrated GIS database, including bare-earth elevation models, stream vectors, stream perimeters, bank stations, and model features.

A new county-wide FIS is prepared by URS for Bergen County, NJ. In addition to the new detailed studies, the effective DFIRM data base and current mapping was converted from the NGVD29 datum to the NAVD88 datum. This effort required conversion of over 250 profile panels, the floodway data table, and base flood elevations depicted on the DFIRMs. The FIS effort also includes incorporating additional detailed study information for both fluvial and coastal flooding sources from other contractors. In addition to drafting an updated FIS report, 89 DFIRM panels were distributed to the 70 communities within Bergen County.

One of the most significant aspects of this project was the analysis of the operation of the Pompton Lake Dam floodgates and its influence on the occurrence of downstream flooding. An

existing HEC HMS model was calibrated to four storm events using Storm Precipitation Analysis System (SPAS) data and used as the input into a 6 mile reach of Ramapo River and Pompton River that was studied upstream and downstream of the dam with an unsteady HEC-RAS model. Due to the high public interest in the Pompton Lake Dam floodgate study, AECOM supported NJDEP during several phases of public outreach efforts.

AECOM produced non-regulatory Risk MAP flood risk datasets for the Hackensack-Passaic River basin to assist state and community officials with flood risk identification and communication efforts and will help lead public outreach efforts. The flood risk GIS datasets that are being produced include:

- Water Surface Elevation Grids (flood levels)
- Depth Grids (depth of flooding within the floodplain)
- Flood Probability Grids (highlight the percent chance of flooding on an annual basis, as well as the likelihood of flooding over the course of a 30-year time period)
- Risk Assessments (estimated damage to occur for a given flood event using FEMA approved methods and tools)
- Changes Since Last FIRM (areas that have been added to or removed from the floodplain since the last FIRM update)
- Identification of Areas of Mitigation Interest
- Food Risk Maps and Flood Risk Report

Dewberry produces regulatory and non-regulatory Risk MAP flood risk datasets for the multiple regions in New Jersey to assist state and community officials with flood risk communications, recovery efforts, and outreach and communications. The flood risk GIS datasets includes:

- Developing flood inundation mapping for 12 sites and risk assessment for 21 sites within the Passaic River basin and 3 sites within the Raritan River basin
- Created 150 DFIRM panels for preliminary and final issuance for coastal Cumberland County
- Developed building footprint data for ~335,000 parcels affected by Hurricane Sandy in 4 months
- Developing non-regulatory Risk MAP products, including enhanced products such as coastal Primary Frontal Dune erosion areas, for dissemination and discussion at Resilience Meetings

SCOPE OF SERVICES

- LiDAR processing and hydro-enforcing
- Field Survey
- HEC-HMS model validation and calibration
- Detailed Hydrologic and Hydraulic studies
- Limited detailed H&H studies
- Floodplain Mapping
- MIP Submittals
- Risk MAP products production
- Public Outreach
- Independent dam floodgate operation study
- Unsteady HEC-RAS modeling
- 3D Flood Animation
- Digital Flood Insurance Rate Maps
- Integrated GIS Databese development
- Production and distribution of Maps and reports to 70 communities in Bergen County
- Community Outreach and Technical Support to NJDEP

The Client's Need:

New Jersey Department of Environmental Protection (NJDEP) requires transitioning their Cooperative Technical Partner (CTP) program to Risk Mapping, Assessment, and Planning (Risk MAP) for the entire State of New Jersey. AECOM is providing professional technical services to address the floodplain mapping and Hydrologic & Hydraulic (H&H) analyses needs under a 3-year base term contract that spans multiple work orders. The NJDEP received USACE funding for this effort and the project included work at Pompton Dam, a USACE project.

Approach:

AECOM processed approximately 800 square miles of detailed LiDAR data in preparation for the H&H analyses. The work entailed performing detailed H&H modeling for 109 miles of stream and 30 miles of limited detailed H&H modeling in the Hackensack-Passaic River basin. This effort resulted in the need for field data collection of over 40 cross sections and 250 structures.

One of the most significant aspects of this project was the analysis of the operation of the Pompton Lake Dam floodgates and its influence on the occurrence of downstream flooding. An existing HEC HMS model was calibrated to four storm events using Storm Precipitation Analysis System (SPAS) data and used as the input into a 6 mile reach of stream that was studied upstream and downstream of the dam with an unsteady HEC-RAS model. Due to the high public interest in the Pompton Lake Dam floodgate study, AECOM supported NJDEP during several phases of public outreach efforts.

AECOM is also producing non-regulatory Risk MAP flood risk datasets for the Hackensack-Passaic River basin to assist state and community officials with flood risk identification, communication and public outreach efforts as well as production of flood risk GIS datasets.

Benefits to the Client:

The client benefitted from AECOM's depth of capability, including ability to provide specific analyses to support planning efforts such as the work at Pompton Dam. Our capability to provide H&H analyses, coupled with dam safety and engineering expertise, resulted in effective community outreach for a project with high public interest.

Meadowlands Wetland Mitigation Banking in the Hackensack (Evergreen) 4

Firm
HDR, Inc.

Location
Hackensack Meadowlands, NJ

Reference
Evergreen Environmental, LLC
Mark Renna, VP
Evergreen Environmental, LLC
121 Carol Place
Wayne, NJ 07470
P: 973-305-0643

Services
Design, Permitting, Construction Support, and Post-Construction Monitoring

Project Value
$ Confidential

Dates
MRI-3 Mitigation Bank (2011 – 2016)
Hackensack River Mitigation Bank (2008 – 2010)
Mill Creek Point Mitigation Bank (2013 – 2015)

Relevance to TC-001 / P1131-00
- Reconstruction
- Architectural Restoration
- Permitting
- Stakeholder Coordination

Proposed Staff Involved on this Project
- Werner Mueller
- Jennifer Curran
- John Roebig
- Patricia Parvis
- Mark Korpus

PROJECT DESCRIPTION

Since 2008, HDR has been assisting Evergreen Environmental, LLC to develop mitigation banks in the Hackensack Meadowlands. To date, three sites totaling about 135 acres have been studied to determine the feasibility of developing economically-viable mitigation banks.

Evergreen Hackensack River Mitigation Bank

In 2008, Evergreen entered into an agreement with the owner of a 45-acre degraded wetland and upland parcel located in Ridgefield New Jersey to develop the "Evergreen Hackensack River Mitigation Bank" on the lot. The site is located adjacent to the Hackensack River. To characterize the site, HDR delineated the existing wetlands and ecological communities, developed and implemented a sediment characterization program, and conducted a tidal hydrology analysis including a biological benchmarking study. HDR prepared a briefing report and Prospectus for the Meadowlands Interagency Mitigation Advisory Committee, the Interagency Review Team (IRT) for the project in accordance with the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE) Compensatory Mitigation for Losses of Aquatic Resources; Final Rule, dated April 10, 2008 (33 CFR Parts 325 and 332; 40 CFR Part 230).

The presence of high levels of mercury and lead deep within the soils represented the largest project constraint. HDR assisted Evergreen to conduct an ecological risk assessment by collecting and analyzing metal concentrations in fish tissues, surface waters and sediments. The results were used to estimate the current bioavailability of these metals, and to assess potential risks to fish and wildlife that may have resulted from the proposed restoration project. Results indicated that the metals were not accumulating in the fish tissues or present in the water column. However, prior to approving the bank the MIMAC required a commitment to over-excavate the site and place one foot of sand as topsoil. Evergreen determined that the expense associated with material removal and the purchase of sand would have exceeded the profitability of the mitigation bank and ultimately decided to abandon the project.

Evergreen MRI3 Mitigation Bank and Global Container Terminal Expansion Project Mitigation

IIn 2010, Evergreen entered into an agreement with the owner of a 67-7 acre parcel along the Hackensack River in Carlstadt, NJ to potentially develop the "Evergreen MRI3 Mitigation Bank" on the lot. HDR assisted Evergreen with all aspects of developing the mitigation bank in accordance with the USEPA and USACE Compensatory Mitigation for Losses of Aquatic Resources; Final

Rule, dated April 10, 2008 (33 CFR Parts 325 and 332; 40 CFR Part 230). HDR continued to provide assistance through construction and operation of the mitigation bank.

The site was historically connected to the Hackensack River, but a series of berms surrounding the site and a tide gate on Moonachie Creek were constructed in the early 20th century to restrict the flow. The site was vegetated predominantly with the invasive species *Phragmites australis*. The restoration plan included the removal of the tide gate and the breaching of the berm in order to reconnect the site with the Hackensack River and reestablish the native tidal salt marsh communities. The mitigation bank was designed to maximize ecological benefits to yield the greatest number of mitigation credits while maintaining cost-effectiveness. The mitigation bank now includes high marsh, low marsh, mudflat and upland habitat islands. The Hackensack River

Hackensack River Mitigation Bank, Ridgefield, NJ

adjacent to the proposed mitigation bank is brackish to low salinity. The planting plan was developed to discourage the re-colonization of the aggressive *Phragmites australis* by including a mixture of native species tolerant to varying levels of salinity. The area is periodically treated as part of the adaptive management plan to discourage *Phragmites australis* growth. Excess materials from the site were used to bring the marsh plain of the neighboring Lower Kane site up to an elevation where it could be planted with Spartina alterniflora.

MR13 Mitigation Bank, Carlstadt, NJ

A review was performed to determine potential impacts it may have on 100 year flood elevations within the Bashes Creek and Moonachie Creek watersheds. The analysis of the existing and post-project 100 year floodplain elevations was based on an assessment of existing topography within the watersheds, a conservative estimation of runoff that could result from a 100 year rainfall event, an evaluation of how the watershed areas north and south of the NJ Turnpike interact, and anticipated 100-year tidal elevations. The analysis was conducted using GIS methods and publicly available digital elevation data.

HDR assisted Evergreen to obtain New Jersey Department of Environmental Protection (NJDEP) Land Use Regulation Individual Flood Hazard Area and General Coastal Wetland and USACE Nationwide permits. We assisted with the preparation of the Prospectus and Mitigation Banking Instrument and prepared conceptual design plans and construction documents. HDR also prepared the Bergen County Soil Conservation District permit application materials.

HDR was responsible for collecting data and inventorying existing conditions on the site to support the design. Studies included ecological community mapping, soil characterization, and fish collection and tissue analysis. The project required extensive coordination with the NJDEP, the USACE, and the MIMAC. Mercury concentrations above

0.71 ppm, the Effects Range Median (ERM) concentration, were found in some of the sediment samples. This caused a concern for the MIMAC, but the elevated concentrations were found in only a portion of the samples. For this reason, Evergreen agreed to ensure that the surface sediment mercury concentrations were below the ERM following construction. Because the construction project could not be delayed by waiting for laboratory analysis, HDR conducted real-time sampling during construction with an Ohio Lumex Co. Portable Zeeman Mercury Analyzer to document that the surface sediments were below the ERM prior to the planting of native species. Construction was completed in July of 2012. HDR assisted with the preparation of As-Built reports for the MIMAC.

HDR continues to perform comprehensive post construction monitoring in compliance with NJDEP and USACE permit conditions. Each year, HDR conducted field analyses of vegetation, hydrology, and soil and sediments of the MRI3 Bank site. In addition, HDR conducts fish tissue analysis to monitor the mercury levels in fish in the two newly constructed tidal creeks and in the Hackensack River. Although the site was constructed in 2012, the bank is currently in compliance with its 5-year post construction permit conditions of greater than 85% cover of native vegetation and less than 10% coverage of invasive species and 85% percent survival. The bank HDR will continue its Mitigation Bank monitoring until 2017.

Evergreen Mill Creek Point Mitigation Bank

In 2013, Evergreen entered into an agreement with the owner of a 22-acre parcel in the Town of Secaucus to develop the "Evergreen Mill Creek Point Mitigation Bank". The site is located along Mill Creek, which is a tributary to the Hackensack River, and is vegetated with a monotypic stand of Phragmites australis. The hydrology of the site is somewhat restricted and it is not subject to twice daily flooding. HDR is currently assisting Evergreen with all aspects of developing the mitigation bank in accordance with the USEPA and USACE Compensatory Mitigation for Losses of Aquatic Resources; Final Rule, dated April 10, 2008 (33 CFR Parts 325 and 332; 40 CFR Part 230).

HDR has conducted baseline sediment sampling, delineated the wetlands and applied for a Jurisdictional Determination from the USACE, assisted with the preparation of the Prospectus and Draft Mitigation Banking Instrument, and prepared 50% conceptual design plans. We expect to submit USACE and NJDEP permit applications in the fall of 2015.

MR13 Mitigation Bank and the Lower Kane Site (at right), Carlstadt, NJ

Mill Creek Point Mitigation Bank Site Prior to Restoration, Secaucus, NJ

Hudson Raritan Estuary / Harbor Deepening Project

5

Firms
AECOM; AECOM(URS); and HDR.

Location
Hudson-Raritan Estuary, NJ & NY

Reference
Peter Weppler
Chief, Environmental Analysis
USACE New York District
Tel 917.790.8634

Services
Feasibility Studies/Report;
Environmental Assessment;
Ecosystem Restoration

Project Value
$ 1,404,583 (fee)

Dates
Multiple assignments from 1998 - 2001 and 2004 - present

Relevance to TC-001 / P1131-00
- Reconstruction
- Architectural Restoration
- Permitting
- Stakeholder Coordination

Proposed Staff Involved on this Project
- John Roebig
- Ray Hinkle
- John Dromsky-Reed
- Jennifer Curran
- Sherri Albrecht

PROJECT DESCRIPTION

AECOM and HDR have a long history of working together with the U.S. Army Corps of Engineers (USACE) New York District to help fulfill the USACE vision of creating a "World Class Harbor Estuary" that balances the economic interests of the Port of New York & New Jersey with the Environment and Public Safety. In the 1990's, HDR and AECOM (URS) formed a partnership to complete the National Environmental Policy Act requirements for the Deepening of New York and New Jersey Harbor navigation channels to about 50 feet below the Mean Low Water elevation to allow post-Panamax ships to call upon our Port. Our firms continue to work together on supplemental NEPA materials and aquatic sampling programs to monitoring pre-, during and post-construction conditions for the Harbor Deepening Project. In 2000, HDR and AECOM (URS) partnered again to assist the USACE with the Hudson-Raritan Estuary Ecosystem Restoration Study. This study includes developing a Comprehensive Restoration Plan for the degraded habitats in the Hudson-Raritan Estuary, public and stakeholder outreach, and the development of a Feasibility Study to evaluate the costs and benefits of the project alternatives.

NEW YORK AND NEW JERSEY HABOR DEEPENING PROJECT

The Port of New York and New Jersey is the largest port on the East Coast and provides over 270,000 jobs and is a critical part of the regional economy. The modernization of the Panama Canal allowed for the evolution of larger container ships that more efficiently transport cargo. These "post-Panamax" ships have a deeper draft and require deeper navigation channels than earlier container ships, which could navigate through 35-foot deep channels. To prepare for the call of post-Panamax ships to the Port of New York and New Jersey, the USACE New York District and its non-federal partners (New Jersey Maritime Resources, New York Empire State Development Corporation, and the Port Authority of New York & New Jersey) initiated the Harbor Deepening Feasibility Study with the goal of deepening critical navigation channels to 50 feet below the Mean Low Water depth to accommodate post-Panamax ships at the Harbor's port facilities. HDR and AECOM(URS) completed the following tasks in support of the Harbor Deepening Project.

Feasibility Study and Environmental Impact Statement (EIS) - HDR and AECOM(URS) performed a comprehensive study of potential navigation improvements to the New York and New Jersey Harbor. The Team evaluated the deepening of existing federal and non-federal navigation channels, berthing areas, and anchorages to 50 feet to meet current and future navigation needs. The team was under contract to the New York District and its non-federal partners (New Jersey Maritime Resources, NY Empire State Development Corporation, and the Port Authority of New York &

New Jersey) to prepare the Feasibility Study (FS) and EIS under USACE and NEPA guidelines for the deepening project. Project tasks included a harbor-wide reconnaissance survey, hydraulic and water quality modeling (see below) of existing and proposed future harbor conditions, infrastructure requirements, public and interagency scoping meetings, public involvement, plan formulation, identification of environmental data requirements, biological sampling, EIS preparation, and impact mitigation plans. Under subsequent contracts, HDR and AECOM(URS) continue with the following environmental monitoring and assessments (post FS/EIS).

Aquatic Biological Survey and Essential Fish Habitat (EFH) Enhancement Program - The primary program goal is to collect data on fish community structure, distribution patterns, and seasonal patterns of habitat use. In addition, the sampling program describes and evaluates habitat enhancement opportunities for American lobster and EFH species in the Hudson-Raritan River Estuary. HDR and AECOM(URS) conducted an annual seasonal sampling program using a 30' otter trawl to determine the potential biological impacts of deepening existing harbor navigation channels, anchorages, and berthing areas as well as collecting data to enhance knowledge of estuarine ecology. The Team also developed a Baseline Environmental Evaluation Report.

Harbor-wide Benthic Recovery Surveys – The Team has conducted benthic invertebrate surveys within the New York and New Jersey Harbor. An initial pre-dredging survey was conducted in 2005 to document existing communities. Subsequently, post-construction benthic surveys have been conducted over the last several years in the Navigation Channels. Benthic surveys are conducted using a Smith-Mac. HDR and AECOM(URS) planned and conducted the field sampling, analyzed the benthic samples in the laboratory and prepared an interpretive report.

Ambrose Obstruction Biological Survey - USACE has been requested to investigate if there is a Federal Action required regarding a reported obstruction to navigation located at the entrance to Ambrose Channel in a critical approach area for deep draft commercial vessel traffic. The objective of the biological field sampling program is to collect information that will be used to support an EFH assessment and NEPA EIS or EA as required for the Ambrose project. HDR's specific activities for this project were to develop an agency-approved site specific sampling plan and conduct a biological sampling program in the vicinity of the obstruction. Sampling has included a benthic invertebrate survey using a 0.1 m^2 Smith-McIntyre Dredge and fisheries surveys using fully rigged lobster/crab pots and fish traps. HDR's assignments also involve laboratory analysis of the benthic invertebrate samples, writing of summary reports of the field investigations at the Ambrose obstruction, and additional harborwide post-dredging benthic recovery surveys. HDR also provided Geographic Information System (GIS) support, develop an EFH assessment and provide NEPA and agency support for the Ambrose project.

Aquatic Resource Compliance Monitoring - HDR and AECOM(URS) assisted the NYD with the continued resource compliance monitoring program for the NY/NJ Harbor Deepening Project. HDR conducted benthic surveys to assess the post-dredging benthic community conditions, conducted migratory finfish surveys, and total suspended solids (TSS) monitoring. In addition to conducting the physical surveying and monitoring program in the harbor, the project team also developed a series of reports for each of the major project elements which included Benthic Recovery Monitoring Report, Migratory Finfish Report, and Far Field Total Suspended Solids Report as part of the development of a Programmatic Essential Fish Habitat (EFH) Assessment, which includes GIS analyses and QA/QC support. The project area encompasses the NY/NJ Harbor Deepening project area, including Ambrose, Raritan Bay, Anchorage, Newark Bay, Arthur Kill, Bay Ridge, and Port Jersey Channels and expanded to the New York Bight.

Benthic Underwater Video Survey - HDR conducted a benthic habitat assessment using underwater video camera at 11 channel and non-channel locations across Upper and Lower bay to characterize physical and biological features of the benthic habitat. A custom built, bottom contacting, towed sled was used to record approximately 30 minutes of footage at each location. In order to map observations, GPS positions were recorded and synced to the video. The videos were all reviewed for habitat types, and biological observations noted. The final products included GIS analysis, a highlight reel, and stills taken from the video. This project required a unique combination of skills and in-field solutions to conditions encountered. The video transect data provides additional insights into the habitats of the NY/NJ Harbor complex that can be used in tandem with other sources of data to better inform future dredging project management decisions.

Hoffman-Swinburne Islands EFH Enhancement Site Surveys - HDR characterized bottom sediments and hydrodynamics at potential lobster habitat/EFH enhancement sites within NY/NJ Harbor. Geotechnical and geophysical surveys were conducted to determine surface and sub-surface sediment conditions. In addition, ADCP surveys were conducted in order to assess hydrodynamics at the EFH enhancement sites. A shellfish survey was also conducted using a commercial-style crab dredge with a 60-in. tooth bar with 6-in. teeth and 2-inch stretch mesh. Underwater video transects were conducted to characterize benthic habitats at potential enhancement sites near Hoffman and Swinburne Islands.

Dredged Material Management Plan (DMMP) and Environmental Impact Statement - The development of a DMMP for New York and New Jersey Harbor was a long-term process that produced a management framework that has been integrated with many of the ongoing programs for navigation and environmental management in the Harbor. HDR has had ongoing involvement in these management programs.

HDR under contract to AECOM(URS) legacy firm, prepared a major portion of the Programmatic Environmental Impact Statement (PEIS) for the DMMP under contract with the New York District. The DMMP and the companion PEIS were developed simultaneously and interactively by the USACE and the cooperating agencies from New York, New Jersey and the federal regional offices, as well as representatives of state maritime agencies and the PANYNJ. HDR reviewed a vast array of dredged material placement options and prepared draft assessments, subject specific impact assessments for review by the Dredged Material Management Integration Work Group (DMMIWG) team. These draft assessments were presented and discussed at team meetings, at which time the dredged material placement options were refined and prioritized. HDR then revised the PDEIS to reflect these changing priorities and the ongoing analysis of dredged material placement options for NY/NJ Harbor.

The PDEIS followed NEPA Guidelines for programmatic EIS's and addressed all relevant state and federal regulations regarding the placement and beneficial use of dredged material at aquatic sites and in upland areas. Because the options included upland placement, the regulatory review included upland wildlife, habitats, and other non-aquatic considerations. The assessments also included air quality considerations related to the diesel powered marine equipment used in dredging and transport of dredged material, as well as the heavy equipment used for the processing and upland placement of dredged material. At the time of the initiation of the implementation of the

Deepening Project, HDR assisted the USACE with the finalization of the DMMP.

Numerical Modeling - HDR applied and calibrated a numerical model of the harbor (MIKE3, a three-dimensional finite difference model developed by the Danish Hydraulic Institute) to evaluate various channel, berthing, and anchorage deepening options. The model was applied to currents, water levels, salinity, temperature, TSS and other water quality parameters. The model domain extends from the ocean entrance to the Harbor to Troy dam on the Hudson River and includes all interconnected water bodies in NY and NJ. HydroQual (prior to their acquisition by HDR) served on a Blue Ribbon Panel convened by the New York District and the Port Authority of NY and NJ to evaluate the modeling work. This model was applied to Newark Bay to evaluate deepening effects on the RI/FS for the court ordered EA. The model remains as a tool for evaluating conditions in the Harbor over time.

Water Quality & TSS Monitoring – HDR and AECOM(URS) conducted Water Quality & Total Suspended Solids (WQ/TSS) Monitoring in NY/NJ Harbor. The work performed under this assignment demonstrated some of the unique personnel abilities and equipment resources HDR brought to the assistance of the New York District. The purpose of this assignment was to support and improve the robustness of the WQ/TSS monitoring program developed as part of the Harbor Deepening Project. HDR performed the following tasks: WQ/TSS sample collections in the Arthur Kill channel, WQ/TSS data processing, coordination of all work with NY District, USACE-Engineer Research and Development Center (ERDC) and the dredging contractors working in the channel, and preparation of technical reports and analyses of the data collected. HDR then analyzed data and prepared Water Quality & TSS Monitoring Reports.

HUDSON-RARITAN ESTUARY ECOSYSTEM RESTORATION STUDY

The Hudson-Raritan Estuary (HRE) is one of the most urbanized estuaries in the world. Centuries of urban and industrial land uses have resulted in severely degraded ecological conditions. The Estuary spans the boundaries of many municipalities within New York and New Jersey. Planning for restoration within such an ecologically and politically diverse system poses many challenges. The study

area for the HRE Ecosystem Restoration Study includes all the waters of New York and New Jersey Harbor, and the surrounding estuary. This study is the largest comprehensive restoration study ever conducted for the HRE. The project focuses on the full range of environmental problems and opportunities for ecological restoration, including both environmental restoration and protection of natural resources relating to habitat, sediment and water quality, issues of both technical and public interest. HDR, AECOM and AECOM(URS) are providing planning, NEPA and technical services.

Liberty State Park, Jersey City, NJ - The HRE Ecosystem Restoration Study originally included the development of the Comprehensive Restoration Plan, along with moving forward on specific restoration projects for which a local sponsor had been identified. Liberty State Park in Jersey City, New Jersey was the ideal project to evaluate because there was interest at a state level and there was expansive degraded area that could be restored to native maritime and estuarine habitats. **John Roebig** of HDR and **Ray Hinkle** of AECOM(URS) developed a restoration plan for coastal and freshwater wetlands and upland habitats within the 251-acre interior

of Liberty State Park in Jersey City. The study included a Hydrology and Hydraulics Report that was led by **John Dromsky-Reed** of AECOM(URS), a conceptual ecosystem restoration design, and the plans and construction specifications for the freshwater wetland improvements. The preparation of an Environmental Resource Inventory (ERI) was led by **Jennifer Curran** of HDR and **Sherri Albrecht** of AECOM(URS) The biological/ habitat assessment involved the delineation of ecological communities and wetlands, wildlife surveys, fisheries, and benthic macroinvertebrate surveys. The preferred plan includes removal of fill material to create a 45-acre tidal wetland; creation of grassland habitat; and creation of a freshwater wetland system to capture and treat stormwater runoff. The planning/ conceptual design process has utilized a functional assessment, a bio-benchmarking study, and an analysis of existing tidal data to arrive at the preferred design.

Hudson-Raritan Estuary Comprehensive Restoration Plan - To advance the development of an estuary-wide habitat restoration plan the HDR-AECOM(URS) Team assisted the New York District and its partner the PANYNJ to build consensus among the region's stakeholders on the restoration goals and targets. Using this information HDR developed a Comprehensive Restoration Plan (CRP) for the HRE, which is currently being finalized. The CRP represents the combined visions of 60+ stakeholder organizations and resource agencies and is a long-term, evolving approach to guide environmental improvements within the HRE.

Early in the planning process HDR assisted the NY District and the PANYNJ to engage the region's major stakeholders in the development of the plan. The restoration targets were developed through a series of workshops that were organized and attended by resource agencies, non-governmental organizations, and academia. These stakeholders agreed upon the CRP's goal, to create a mosaic of diverse habitats, and defined the Target Ecosystem Characteristics (TECs) for the region. The TECs address the restoration needs within the context of a physically altered and urbanized landscape. Stakeholder meetings are regularly held to ensure that the CRP remains a living document and continues to represent the unified plan for the region's stakeholders.

The planning efforts have resulted in broad support for new restoration initiatives including oyster reef creation, constructing habitat along hardened shorelines, dredging enclosed and confined waterways, and restoring fish passage. Developing the CRP required a collaborative process.

The HDR Team worked on the development and drafting of the CRP. Specific work tasks have included the development of the preliminary HRE mission statement, GIS habitat selection models, the public involvement plan, the monitoring plan, and preparing the text and graphics for the Draft CRP. Because the CRP will serve as the plan for the unified stakeholders of the HRE region, extensive coordination and outreach is required. The HDR Team developed and assisted with the implementation of the public outreach program, which will involve a series of public meetings, regulatory and technical workshops, the development of newsletters and brochures, and a project website. HDR is currently conducting the public outreach for the draft CRP report.

HDR and AECOM(URS) will now be working on NEPA documentation by preparing a Feasibility Report that includes conceptual restoration designs and cost estimates for publically-owned sites that were identified through the CRP process.

HRE and HRE-Lower Passaic River Ecosystem Restoration Feasibility Studies – To implement many of the sites identified in the CRP, AECOM is collaborating with e4sciences, LLC (e4) and The Louis Berger Group, Inc. (LBG) on the NY District's HRE and HRE-Lower Passaic River Ecosystem Restoration Feasibility Studies. The overall program involves feasibility studies for ecosystem restoration within the HRE, including eight separate

planning regions within an approximate 25-mile radius around the Statue of Liberty.

For the Bronx River planning region, AECOM and e4 assessed the existing conditions at ten separate proposed restoration sites using Evaluation of Planned Wetlands and Stream Visual Assessment Protocol, as well as completing general wetland delineations, habitat mapping, and stream channel and bank conditions mapping. Based on the existing conditions analyses, three alternative schematic restoration designs were developed for each site. The alternatives will be assessed using the EPW and SVAP, comparing the scores to baseline conditions to indicate the potential for future ecological uplift at the sites. Three of the ten sites required additional hydrologic & hydraulic data collection by e4 and analyses by AECOM.

For the Governors Island planning region, AECOM and e4 are working with the NY District and e4 to determine appropriate pilot sites within the New York Harbor for oyster reef restoration. Schematic designs will also be developed for these small-scale restoration sites. AECOM is working with the NY District to develop quantitative functional assessment metrics with which baseline and proposed conditions will be measured for ecological uplift.

After the site alternatives are established for both the Bronx River Governors Island regions, high-level construction costs will be determined. The NY District will use the cost estimates and the results of the EPW/SVAP scoring to complete a Cost Effective/Incremental Cost Analysis (CE/ICA) to determine a recommended alternative for each site. The team will recommend a Tentatively Selected Plan (TSP) for each site based on the CE/ICA results, as well as coordination with the local sponsors, New York State Department of Conservation, New York City Department of Parks & Recreation, New York City Department of Environmental Protection, Westchester County, New York Harbor Foundation, Hudson River Foundation, and NY/NJ Baykeeper.

Two of the planning regions, Flushing Creek and Jamaica Bay, already have TSPs prepared under previous HRE study work. AECOM will update costs for a total of seven sites between the two regions, to bring the estimates up to current pricing. NY District will then update the CE/ICA values to ensure the TSPs for these sites are the same as previously determined. TSPs for two other planning regions, Lower Passaic and Hackensack Meadowlands, are being developed by LBG using the same methodology as AECOM is using for Bronx River and Governors Island.

AECOM is leading the effort to prepare a Feasibility Report/Environmental Assessment (FR/EA), with contributions from LBG for their regions. The FR/EA will include evaluations of alternatives evaluation, NEPA, Essential Fish Habitat, Section 404(b)(1), Section 7 of the Endangered Species Act, and Coastal Zone Consistency. The FR/EA will recommend construction of the various TSPs for a subset of the overall HRE restoration opportunities, with the remaining restoration opportunities within each planning region recommended for further feasibility studies per the Civil Works Transformation Initiative under a separate contract. Various stand-alone appendices are required for the FR/EA, including an Engineering Appendix, Cost Appendix, Real Estate Plan, and HTRW/Geotechnical Reports.

Following the NY District's TSP approval process, the team will review the TSPs through a Value Engineering (VE) Study. Following the VE study, the final selected alternatives will be progressed in more detail with Microstation plans and construction cost estimates. AECOM will work with LBG and e4 to prepare the final FR/EA, compiling all data, recommendations, and selected alternative plans/cost estimates for sites recommended for near-term construction.

South Shore of Staten Island, Storm Damage Reduction Feasibility

6

Firms
AECOM and AECOM(URS).

Location
Richmond County, Staten Island, NY

Reference
Steve Couch
US Army Corps of Engineers
26 Federal Plaza
New York, NY 10278
Tel 917.790.8707

Services
Final Feasibility Level Planning; Engineering, Design; and Cost Estimating

Project Value
$ 1.8 million (study)
$300 million (construction)

Dates
Ongoing. Estimated Completion, 2018

Relevance to TC-001 / P1131-00
- Feasibility Level Planning, Designs, and Cost Estimates
- Storm Damage Reduction / Flood Mitigation
- Coastal Engineering
- Alternative Analysis
- Geotechnical, Structural Design, Drainage, Hydrology and Hydraulics
- Sandy Recovery Funding

PROJECT DESCRIPTION

As part of a joint venture, AECOM and AECOM(URS), are responsible for completing final feasibility level planning, design, and cost estimates for a storm damage reduction (i.e., flood mitigation) project along the south shore of Staten Island, NY. The project area covers 13 miles of coastline on Staten Island, from Fort Wadsworth to Tottenville, extending along lower New York Bay and Raritan Bay. The area has a long history of storm damages and has experienced major storm damages from various recent storm events, including the Northeaster of December 1992, the March 1993 storm, and Hurricane Sandy in October 2012. These storms caused flood damages, loss of structures, large scale evacuations and several deaths. The area is now increasingly vulnerable to severe damages even from moderate storms. The Alternatives Analysis selected a storm damage protection system providing a structural line of protection consisting of levees, floodwalls, and storm surge barriers, plus interior drainage facilities.

The Alternatives Analysis was prepared prior to Hurricane Sandy. Several seawall designs were included to ensure that the structures could be integrated into the existing landscape and shoreline access. The project team prepared Technical Appendices detailing the Coastal Engineering design, Geotechnical and Structural design, Interior Drainage hydrology, hydraulics and planning, and the Economic Analysis including benefit and cost comparisons. This analysis identified the Reach from Fort Wadsworth to Oakwood Beach as an area of critical risk to be advanced as a separate project.

Following Hurricane Sandy the line of protection design, cost estimates and economics were updated to reflect changes in shoreline conditions, property acquisitions and revised flood frequency analyses. The seawall designs were modified to integrate the shoreline protection with rebuilding a more resilient promenade for shoreline access and the interior drainage was modified to incorporate additional flood storage at Oakwood Beach where over 200 damaged properties are being acquired and demolished with Sandy recovery funding.

The Joint Venture is responsible for developing and evaluating alternative plans, preparing documents and presentations for the alternative decision milestone, preparing design basis information including astronomic tides, tidal datums, sea level rise, currents, waves, storm stage, winds, shoreline characteristics, storm histories, geology, littoral materials, shoreline and volumetric changes, sediment budget, typical profiles, existing conditions storm-induced erosion, wave run-up, wave overtopping, and wave attack, geotechnical analyses including evaluation of structure stability.

In addition, the Team developed design criteria, preliminary and final designs, preferred plan selection, and plan optimization.

Sea level rise presents an important consideration in the design of any coastal protection project. As part of the plan optimization the Team investigated the impact of sea level rise on the alternative designs. The sea level rise analysis considered three future scenarios: a continuation of the historic rate of sea level rise; the NOAA low projection of sea level rise; and the NOAA high projection. The analysis considered a range of design storm surge levels and evaluated how each design would perform in each of the scenarios. This assessment reinforced the findings that the design must provide a high level of risk reduction and reliability.

The study was authorized by a resolution of the US House o Representatives Committee on Public Works and Transportation, adopted on May 13, 1993. The Disaster Relief Appropriations Act of 2013 was signed into law on January 29, 2013 as Public Law 113-2. The legislation provides supplemental appropriations to address damages caused by Hurricane Sandy and to reduce future flood risk in ways that will support the long-term sustainability of the coastal ecosystem and communities and reduce the economic costs and risks associated with large-scale flood and storm events.

More recently, the team has been performing additional engineering and plan formulation as part of the reevaluation of the existing Tentatively Selected Plan (TSP) by applying updated flooding risk information based on the latest FEMA stage frequency curves and post Hurricane Sandy LiDAR data in accordance with P.L. 113-2.

KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Christopher Benosky

TITLE Project Manager

FIRM AECOM

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Green Brook Flood Control Project, NJ; $10M fee	AECOM/ AECOM(URS)	Alternative development,hydrologic evaluations, and report preparation	Project Manager (AECOM)	28	10%	4/13 - Present	US Army Corps of Engineers-New York District; Kim Rightler, (917) 790-8722
NJDEP Floodplain Mapping Term Contract, NJ; $2.7M Fee	AECOM/ AECOM(URS)	Hydrologic & Hydraulic Analysis, Floodplain & Risk Mapping	Project Manager (AECOM)	51	5%	5/11 - Present	NJDEP; Joseph Ruggeri, (609) 292-2296
Hudson River Estuary Ecosystem Restoration Feasibility Studies, NY/NJ; $1M Fee	AECOM	Alternative development, formulation, optimization and preparation of Feasibility Report.	Project Principal (AECOM)	14	10%	6/14 - Present	US Army Corps of Engineers-New York District; Peter Wepplar, (917) 790-8634
South Shore of Staten Island Feasibility Study; $1.5M fee	AECOM/ AECOM(URS)	Formulation, optimization and preparation of Feasibility Report.	Project Principal (AECOM)	20	5%	12/13 - Present	US Army Corps of Engineers-New York District; Karen Ashton, (917) 790-8607
Sandy Hook to Barnegat Beach Erosion Control Project, $125M Construction	AECOM	Coastal & Hydrologic Study, Conceptual & Final Design, & Construction Administration	Project Principal	21	20%	11/13 - Present	US Army Corps of Engineers-New York District; Lynn Bocamazo, (917) 790-8396
NJTA Interchange 6to9 Widening Project, $2.5B Construction (est)	AECOM	Study, Conceptual & Final Design, Construction Administration & Management	Project Manager/ Resident Egineer	63	5%	5/10 - Present	NJTA; John Keller, (732) 750-5300 ext 8263
PSEG Estuary Enhancement Program, $60M Construciton (est)	AECOM/ AECOM(URS)	Study, Conceptual & Final Design, Construction Administration & Management	Project Engineer/ Resident Engineer	112	3%	11/93 - Present	PSEG; Brenda Evans, (856) 339-3923

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME John Dromsky-Reed, PE

TITLE Deputy Project Manager

FIRM AECOM (URS)

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Flood Data Analysis, under HMTAP; New York State; $6.6 million	AECOM(URS)	540 stream miles of detailed study; creation of 116 flood recovery maps for over 200 communities	Project Manager, QAQC	30 months	25%	Jun 2007 - Dec 2009	FEMA Region 2; Alan Springett, 212.680.8557
Floodplain Mapping; New Jersey; $1.4 million	AECOM(URS)	Detailed studies in the Hackensack-Passaic Basin; Bergen County NJ countywide DFIRM	Project Manager, QAQC	47 months	25%; 5%	Oct 2011-Dec 2013; Dec 2013 - present	NJDEP; Joseph Ruggeri, 609.292.2296
South River Flood Control Project; Middlesex County, NJ; $151 million	AECOM(URS)	Revalidation of project; updated project layout; updated cost estimate; interior drainage analysis	Project Manager	12 months; 14 months	80%; 20%	Jan 2001 - Dec 2001; Jun 2014 - present	USACE; Encer Shaffer, PE 917.790.8360
Hudson-Raritan Estuary (HRE); Ecosystem Restoration Study	AECOM (URS)	Managed multiple task orders for: field survey, H&H, designs, HTRW and Cult Res Analysis,	Project Manager	36 months; 44 months	10%; 5%	Jan 2005-Jan 2008; Jan 2012 - present	USACE; Lisa Barron, 917.790.8306
Green Brook Flood Risk Management Project; Somerset County, NJ; $17 & $4 million	AECOM(URS)	H&H Analyses; Plan formulation; Conceptual Plans	Project Engineer	192 months	5%	Jan 1999 - Jun 1014	USACE; Angelo Trotto, PE 917.790.8296
New York-New Jersey Harbor Deepening Study; $2 billion	AECOM(URS)	Plan formulation; Feasibility Study author	Project Engineer	13 months	100%	Nov 1998 - Jan 2000	USACE; Thomas Shea 917.790.8304
South Shore of Staten Island Feasibility Study; $1.5 million	AECOM (URS)	Coordinated and authored Cost Engineering Appendix for $590 million project	Project Engineer	8 months	10%	Nov 2014-Aug 2015	USACE; Karen Ashton, 917.790.8607

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Michael Cannon

TITLE Task Area Leader - Feasibility Study

FIRM AECOM (URS)

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South Shore of Staten Island Feasibility Study; $1.5 M fee	URS Corporation	Managed formulation, optimization and preparation of the Feasibility Report.	Feasibility Study Manager	80	20	2002-2005; 2012-ongoing	US Army Corps of Engineers-New York District; Karen Ashton, (917) 790-8607
Fire Island to Montauk Point Reformulation Study; $9.6 M fee	URS Corporation	Preparation of Feasibility Reports and NEPA Documents.	Project Manager	108	20	1999- 2006 (Plan Selection), 2012-2015 (Feasibility Rpt)	US Army Corps of Engineers-New York District; Stephen Couch, (917) 790-8707
Delaware River Interim Feasibility Study, NJ; $303 K fee	URS Corporation	Evaluation of flood risk, plan formulation and preparation of Feasibility Report	Project Manager	36	15	2009 -2014 (intermittent)	US Army Corps of Engineers - Philadelphia; Peter Blum, (215) 656-6696
Green Brook Flood Control Project, NJ; $10M fee	URS Corporation	Alternatives development and hydrologic, economic and risk analysis.	Planning Lead	60	50	1989-1996 (intermittent)	US Army Corps of Engineers-New York District; Angelo Trotto,(917) 790-8296
North Atlantic Coast (VA to ME) Comprehensive Study (NACCS); $1.5M fee	URS Corporation	Report preparation and development of risk management measures.	Deputy Project Manager	20	40	May 2013-Jan 2015	US Army Corps of Engineers -Baltimore; Dave Robbins, (410) 962-0685
Passaic River NJ Flood Risk Management Re-Evaluation; $1.2 M fee	URS Corporation	Update Economic Feasibility for Mainstem and Tidal areas.	Project Director	12	10	Sept 2014 - Current	US Army Corps of Engineers-New York District; Karen Ashton, (917) 790-8607
Blanchard River Feasibility Study, Hancock County, OH; $3M fee	URS Corporation	Managed Feasibility Scoping, Alternative Formulation and Plan Selection	Feasibility Study Manager	30	15	2011-2015 (Intermittent)	US Army Corps of Engineers-Buffalo; Mike Pniewsk, (716) 445-7262

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Angela M. Chaisson

TITLE Task Area Leader - NEPA EIS

FIRM AECOM

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PEIS and BE for NFIP Modifications $588,808	AECOM (legacy URS); subcontractor to Booz Allen Hamilton)	Prepare a Nationwide Programmatic Environmental Impact Statement and a Nationwide Biological Evaluation to address the impacts of the proposed modifications to the National Flood Insurance Program	Project Manager	25 months	25%	July 2013 - present	Booz Allen Hamilton, Jennifer Salerno, 703-242-3591
NEPA/NHPA Compliance for Reconstruction of 3 NJ USCG Stations $704,028	AECOM (legacy URS)	Prepare 3 Environmental Assessments, one Biological Assessment Multiple Cultural Resource documents including Memoranda of Agreement and HABS/HAER documentation, Coastal Zone Consistency Determinations, Essential Fish Habitat Assessments,	Project Manager	24	20%	September 2013-present	USCG Facilities Design & Construction Center Atlantic, James Smith (current COTR), 206-220-7402 Lynn Keller (COTR until May 2015) 216-544-2946
PEA for Federal Communication Commission's Antenna Registration Program $303,081	AECOM (legacy URS)	Prepare a Nationwide PEA to address the impacts of the ASR on migratory birds and threatened/endangered species	Assistant Project Manager	18 months	25%	September 2010-March 2012	FCC, Jeffrey Steinberg, 202-418-0896

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NAME Michael D. Smith

TITLE Task Area Leader - NEPA EIS

FIRM AECOM

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National Environmenta	AECOM	Training	Project Manage	Projects vary in len	Variable - but	2001-present	Jeff Stewart - (888-270-2157)
Sacramento Flood C	AECOM	NEPA Compliance	NEPA Compliar	6 months	20%	2014-present	Tim Washburn - (916-874-8732)
Tennessee Gas Pipeline	AECOM	FERC Resource Re	Cumulative Imp	9 months	10%	2015-present	Jacquelyne Rocan - (713-420-4544)
US Department of Trar	ICF International	Program Manageme	Program Manag	36 months	10%	2011-2013	Paul Valihura - (617-494-2918)
Federal Aviation Admi	ICF International	Program Manageme	Program Manag	60 months	15%	2008-2013	Dan Czelusniak - (202-267-5924)

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Brian Beckenbaugh, AICP

TITLE Task Area Leader - Public Outreach & Community Engagement

FIRM AECOM (URS)

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
NY Rising; $3.2 million	AECOM (URS)	Planning and project development for Sandy recovery	Lead Planner	9	100%	September 2013-May 2014	Governor's Office of Storm Recovery; Chris Gorman, (212) 480-7366
Fire Island to Montauk Point Reformulation Study; $9.6 million	AECOM (URS)	Feasibility study ; public outreach; environmental analysis	Project Planner	108	40%	January 1999-December 2008	USACE-New York District; Stephen Couch, (917) 790-8707
Delaware River Interim Feasibility Study for New Jersey; $400,000	AECOM (URS)	Feasibility study ; public outreach; environmental analysis	Project Manager	40	40%	March 2009-December 2014	USACE-Philadelphia District; Peter Blum, (215) 656-6696
Federal Emergency Management Agency-Public Assistance Program; $511 million	AECOM (URS)	Post-disaster recovery, damage identification, mitigation planning	Policy Advisor	32	100% when deployed	May 2003-September 2013	FEMA; Martin DiGregory, (301) 447-1203
South Shore of Staten Island Feasibility Study; $1.5 million	AECOM (URS)	Feasibility study ; public outreach; environmental analysis	Project Planner	18	35%	May 2001-November 2001; 2013-ongoing	USACE-New York District; Karen Ashton, (917) 790-8607
New York-New Jersey Harbor Deepening Study; $2 billion	URS Corporation	Environmental Justice analysis; GIS; economic analysis	Planner	13 months	20%	Nov 1998 - Jan 2000	USACE; Thomas Shea 917.790.8304
Hudson-Raritan Estuary (HRE); Ecosystem Restoration Study	AECOM (URS)	Developed GIS database of potential restoration sites	Project Planner	12 months	50%	March 2005-Jan 2006	USACE; Lisa Barron, 917.790.8306

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME John P. Bianco, P.E.

TITLE Task Area Leader - Flood Risk Mitigation Design

FIRM AECOM

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Passaic Valley Sewage Commission (PVSC) Ring Floodwalls, Newark, NJ , CWE ~ $ 75 million	AECOM| HDR JV - For PMO Conceptual Design	Technical design leader for 2 ring floodwalls protecting the Nation's 5th largest WWTP.	Floodwall Task Design Leader	8 Months	15 - 20%	March 2015-Present (Ongoing)	PVSC, Chief Engineer, John Rotolo, 973-344-1800
Northampton Levee/Floodwall Systems, Periodic Inspections & Risk Assessments, Fee = $ 175,000	AECOM	Providing technical advisory management oversight of technical memorandum & risk analysis of pump station,	Technical Advisory to AECOM Assessment Team	4 months	4 - 8 %	May 2015-Present (Ongoing)	Northampton City Engineer, James Laurila, 413-587-1570
Engineering Assessments - 4 Class B Dams in New York State	AECOM	Performing duties as the technical design manager for the development of 4 engineering assessments... geotechnical and structural stability of each dam, performing a hydraulic assessment of the hazard classification (dam break analysis)	Technical Design Manager	7 Months	15 - 20 %	March 2015 - Present (Ongoing)	NYCDEP, Lisette Gomez, Project Manager, 718-595-6217
Passaic River Flood Damage Reduction Project, Main Stem Project, Northern NJ; $2 billion	USACE - New York District	Technical design leader for over 26 Levee/Floodwall Systems & complementary Interior Drainage Facilities, deep underground diversion tunnels	Chief, Design Branch, Passaic River Division	78 Months	100%	1990-1997	now at USACE-IWR - Robert Pietrowsky, Director Institute of Water Resources 703-428-8015
Passaic River Flood Damage Reduction Project, Main Stem Project, Northern NJ; $2 billion	USACE - New York District	Regional Levee Safety Officer providing Technical Design oversight of the re-actived project including hydraulics, hydrology, coastal engineering, structural engineering and cost engineering.	Regional Levee Safety Officer (LSO), USACE North Atlantic Division	24 Months	5 - 10 %	2011-2013	USACE- NY, Chief Engineering Division, Arthur Connolly, 917-790-8300

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Eric Bodnar, PE

TITLE Civil Engineering Lead

FIRM AECOM (URS)

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I-95 Exp. - Somerset St Outfall Reloc., Phila., Pa.; $4.5 million	URS Corporation	Hydraulic analysis of ex. cmbd sewer. Design of sewer & CSO.	Lead Civil/Hydraulic Engineer	30 months	25%	Jan 2009 - August 2011	Philadelphia Water Department, Nikunj Karumsi, 215.685.6309
Replacement/Upgrade of CBS/PBS Tanks, Astoria, NY; $9.1 million	URS Corporation	Design of new chemical feed and storage systems for existing WWTP.	Lead Civil/Process Engineer	60 months	30%	Aug 2010 - Present	NYCDEP, Michael Dastparvardeh, 718.278.1758
Hackensack River Improvements, Clarkstown, NY; 3.5 million	McLaren Engineering Group	Study of appr. 2 mile of Hackensack R. Design of flood ctrl struct & levies.	Lead Civil/Hydraulic Engineer	24 months	25%	Sep 2006 - Feb 2008	Town of Clarkstown Highway Department, Charles Vezzetti, 845.638.5060
River Pk. Ctr. - Sawmill R. Daylight & Realmt, Yonkers, NY; $6.4 million	McLaren Engineering Group	Anlys of Sawmill River & watershed. Design of new rvr align. & flood control.	Lead Civil/Hydraulic Engineer	21 months	25%	July 2006 - April 2008	Struever Fidelco Cappelli LLC, Louis Cappelli, (917) 769-6500
Maxwell Place, Hoboken, NJ, $450,000 (fee)	McLaren Engineering Group	Design of waterfront park & pier. Design of utils. and site improvements.	Lead Civil Engineer	24 months	25%	March 2006 - March 2008	Toll Brothers City Living, Thomas Mulvey, 201.217.6626
Steele Pt. Harbor Redevelopment, Bridgeport, CT; $850,000 (fee)	McLaren Engineering Group	Urban Plng., Traffic Stdy., Util. & Site Improvmt Design, Waterfront Reconst.	Lead Civil Engineer	22 months	25%	March 2006 - Jan 2008	Bridgeport Landing Development LLC, Michael Stone, 203.330.8200
Wood-Ridge Recreation Facility, Wood-Ridge, NJ; $1.2 Million	Neglia Engineering Associates	Design of athletic facility & playground, utility, drainage & site improvements	Lead Civil Engineer	15 Months	25%	Dec 2003 - March 2005	Borough of Wood-Ridge, Mayor Paul Sarlo, 201.939.0202

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Murat Utku

TITLE Coastal Engineering & Resiliency Lead

FIRM AECOM

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South Shore of Staten Island Feasibility Study; $1.5M fee	AECOM/ AECOM(URS)	Formulation, optimization and preparation of Feasibility Report.	Coastal Engineering Lead (AECOM)	9	<10	2/14 - Present	US Army Corps of Engineers-New York District; Karen Ashton, (917) 790-8607
Scoping Study For Proposed Raised Seawall Around Governors Island Ventilation Building, MTA Bridges and Tunnels.	AECOM	Concept Design	Project Task Manager.	9	>25	Dec 2014- Present	John Hinge 646 252 7283
Sandy Hook to Barnegat Beach Erosion Control Project, $125M Construction	AECOM	Coastal & Hydrologic Study, Conceptual & Final Design, & Construction Administration	Coastal Engineering Lead	16	<10	2/14 - Present	US Army Corps of Engineers-New York District; Lynn Bocamazo, (917) 790-8396
National Institute Of Standards And Technology, NIST. Resilience in The Maritime Sector Codes	AECOM	Study	Marine Task Manager	6	<25	Jun 2014-Jan 2015	Alan Klindworth 978 905 2217
Federal Highway Administration. Climate Adaptation Study for Various Locations.	AECOM	Study	Marine Project Lead	18	<25	Dec 2014- Present	Matthew Sprung PANYNJ 973 578 4050

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Daniel McDaid

TITLE Cost Engineering Lead

FIRM AECOM (URS)

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Blanchard River Watershed Flood Control Project; Hancock County, OH, $120 million	AECOM(URS)	Supervised preparation of detailed MII cost estimate	Cost Estimating Team Lead	1 month	20%	July 2015 - ongoing	USACE; Michael D. Pniewski, PE, PS; (419) 726-9121
Green Brook Flood Risk Management Project; Somerset County, NJ; $17 & $4 million	AECOM(URS)	Preparation of detailed cost estimate using MII software	Cost Estimating Team Lead	2 months & 9 months	20%	June 2010- July 2010 & June 2013 - Feb 2014	USACE; Angelo Trotto, PE 917.790.8296
South River Flood Control Project; Middlesex County, NJ; $151 million	AECOM(URS)	Prepared detailed planning-level cost estimate using MII software; Prepared detailed construction schedule using Primavera software	Cost Estimating Team Lead	9 months	20%	Sept 2014 - June 2015	USACE; Encer Shaffer, PE 917.790.8360
Little Cuyahoga River Restoration; Akron, OH; $1.1 million	AECOM(URS)	Preparation of detailed cost estimate using MII software	Cost Estimating Team Lead	8 months	20%	April 2013 - Octoeber 2013; May 2015	USACE; Casimir Brzozowiec, PMP; 716.879.4232

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Richard Paupst, PE

TITLE Transportation Engineering Lead

FIRM AECOM

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2nd Avenue Subway, NYC, New York $4.2 Billion (Const.)	AECOM-Arup (JV)	EIS Support, Preliminary Design, Final Design, Cosntruction Support	Project Manager, Design Manager	168	100%	12/2001-5/2014	Anil Parikh MTACC (646) 252-3234
Penn Station NY Vison Study, NYC, New York $2 Million (fee)	AECOM	Master Plan, Conceptual Design	Project/Design Manager	25	15%	1/2012 - 2/2014	Lance Anderson LIRR PM (212) 643 5245
NJ Transit Metropark Station	AECOM	Alternative Analysis, Conceptual Design	Project/Design Manager	18	40%	2000-2001	PM Retired

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Jim Gilsenan, AIA, NCARB

TITLE Arhcitecture Lead

FIRM AECOM (URS)

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Green Brook, Flood Risk Management - Seg. B Pump Station,	STV/ AECOM(URS) JV	Design of New Stormwater PS and Control Building	Quality Control Reviewer for Control Building	3 mos.	5%	4/2010 thru 7/2010	USACE; Angelo Trotto, PE 917.790.8296
Green Brook Flood Risk Management, Seg T Pump Station Revision	AECOM(URS)	Design of Renovation to PS Control Building	Quality Control Reviewer for Control Building	2 mons.	5%	5/2014 thru 7/2014	USACE; Angelo Trotto, PE 917.790.8296
Underground Steam Pipe Rehab, West Point Military Academy, $12 M	AECOM(URS)	Planning, design and construction	Design Principal	12 mos.	15%	3/2010 thru 3/2011	USACE, Chris Neuzil, 402-293-2534
HSC Roof Deck Rehab, Stony Brook University Medical Center, $14.5 M	AECOM(URS)	Planning, design and construction administration	Project Principal	68 mos.	10%	1/2010 thru 8/2015	NYS University Construction Fund. Don Chester, 518-320-3234
E-85/Hydrogen Fueling Station, West Point Military Academy. $550K	AECOM(URS)	Planning and design	Project Principal	3 mos.	10%	4/2009 thru 7/2009	USMA, Peter McGaughran, 845-938-7653
Demolition Consult. Mult. Award Term Contract, various NJ locations, $230K	AECOM(URS)	Design and construction administration	Project Principal	18 mos.	5%	3/2014 thru 8/2015	NJ DPMC, Walter Fernandez, 609-575-2204
Queens 7 Garage Flooring, Queens, NY, $250,000	AECOM(URS)	Planning, design and construction administration	Project Principal	6 mos.	5%	4/2009 thru 6/2009 (design) 5/2014 thru 7/2014 (constr.)	NYC Dept. of Sanitation, Bruce Harmon 212.437.4550

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Jae Park

TITLE Benefit Cost Analysis Lead

FIRM AECOM

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AN PHONE NUMBER
FEMA BCA Training Task Order; contract amount -$1,385,372; Washington DC		The purpose of this Task Order is to provide benefit-cost analysis training to local, State, and Federal personnel who are using FEMA Mitigation Benefit-Cost Analysis toolkit. Also, this Task Order is to provide project reviews and technical assistance on the eligibility of project applications submitted under the Hazard Mitigation Assistance (HMA) grant programs for benefit cost analysis.	Project Manager and Trainer	26 months	30	26 months	Jody springer, FEMA; 202.646.3389
FEMA BCA Helpline; contract amount - $749,994; Washington DC		The puropose of this task order is to provide Benefit-Cost Analysis (BCA) technical assistances to local, State, and Federal personnel through e-mail and the toll-free telephone system.	Project Manager and SME	60 months (2008-2011, 2013)	20	60 months	Jody springer, FEMA; 202.646.3390
FEMA National Technical Review of Hazard Mitigaiton Assistance grant		Performed cost-effectiveness review of local and state grant applications under FEMa Hazard Mitigaiton Assistance Program for	BCA Lead	36 months	30	12 months	Jody springer, FEMA; 202.646.3391

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Sheldon Fialkoff

TITLE Transporation Planning Lead

FIRM AECOM

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
King of Prussia DEIS-Extension of Rail; King of Prussia, PA: Fee $3.4 Million		Study/Concept Engineering/ Environmental	Project Manager	40 months	50%	August, 2012 to Present	SEPTA; Elizabeth A. Smith, PE; (215) 589-7172
Amherst-Buffalo Extension of LRT, AA; Buffalo, NY; Fee $1.6 million		Study/Concept Engineering/ Environmental	Project Manager	26 months	25%	February 2013 to December 2015	NFTA; Robert Gower; (716) 855-7645
New York City Transit; 2nd Avenue Subway; Construction Cost-$3.5 Billion		Environmental Coordination and Real Property Management	Task Manager	17 months	100%	December 2011 to April 2013	NYCTA; Anil Parikh, PE; anparikh@nyct.com
Los Angeles County Metropolitan Transportation Authority, Los Angeles Metro Gold Line Eastside Extension, Phase II, Los Angeles, California; $750		Advanced Concept Engineering and Alternatives Analysis	Project Manager	12 months	100%	December 2008 to April 2009	LA Metro; Kimberly Yu; kimberly.yu@lacity.org

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Ignacio Bunster-Ossa

TITLE Urban Planning & Design Lead

FIRM AECOM

PROJECT TITLE .OCATION AND TOTAL :ONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRAC PERSON AND PHONE NUMBER
rinity River Corridor roject, Dallas, exas	CH2MHILL	STUDY (Design Guidelines) through to 35% design.	Lead Urban Designer and Landscape Architect	80	15%	2017-2014	City of Dallas, Sarah Standifer, Assistant Director. (214) 671-95
ieorgetown Vaterfront Park, Vashington, D.C.	Wallace Roberts & Todd, LLC	Master planning through design and construction	Principal-in-Charge	120	17%	2005-2015	National Park Service, Mational Capital Regio Peter May, (202)619-7025
nacostia Vaterfront Inititative AWI), Washington,).C.	Wallace Roberts & Todd, LLC	Study: Open space framework; environmental agenda	Lead Landscape Architect	20	20%	2000-2002	Patricia Zingsheim, District Office of Planning, (202)442-8965
arklands of Floyds ork, Louisville, KY	Wallace Roberts & Todd, LLC	Master Planning through design and construction	Principal-in-Charge through the Masster Plan; Design Adevisor through DD Phases	28	10%	2004-2008	Dan Jones, 21st centu Parks, (502)584-0350

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME William Soper

TITLE Hydrologic & Hydraulic Engineering Lead

FIRM AECOM (URS)

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Green Brook Flood Risk Mgmt Project; Middlesex & Somerset County, NJ; $17 & $4 million	AECOM(URS)	H&H Analyses, NJDEP FHA Permitting,	Sr.H & H Engineer	30	5%	Jan 2010 - Jun 2015 Intermittent	USACE; Angelo Trotto, PE 917.790.8296
South Shore of Staten Island Feasibility Study; $1.5 million	AECOM (URS)	Interior Drainage, Bypass Channel and Pump Station Analysis	Sr.H & H Engineer	8	10%	Nov 2014-Aug 2015	USACE; Karen Ashton, 917.790.8607
Blanchard River Feasibility Study, Hancock County, OH; $3M fee	AECOM (URS)	Feasibility Scoping, 9 Mile Diversion Channel Alternative Investigation & Cost Evaluation	Sr.H & H Engineer	5	20%	2013-2015 (Intermittent)	US Army Corps of Engineers-Buffalo; Mike Pniewsk, (716) 445-7262
South River Flood Control Project; Middlesex County, NJ; $151 million const	AECOM(URS)	Interior Drainage Analysis of South River through Sector Gates. updated cost estimate;	Sr.H & H Engineer	4	20%	Sept 2014 - Apr 2015	USACE; Encer Shaffer, PE 917.790.8360
West of Hudson Dam Break Analysis & Floodplain Mapping $840k fee	AECOM(URS)	H & H Dam Break analysis (Cannonsville, Downsville & Neversink) for 250 miles of Delaware River	Sr.H & H Engineer	9	60%	Apr 2012 toJuly 2013	NY City Environmental Protection:Thomas DeJohn, BWS, WOD Dam Safety 607 363-7004
Delaware River Interim Feasibility Study, NJ; $303 K fee	AECOM(URS)	H & H Interior Drainage analysis for streams through levee and floodwall system	Sr.H & H Engineer	6	40%	Apr 2014 to Oct 2014	US Army Corps of Engineers - Philadelphia; Peter Blum, (215) 656-6696
New Jersey American Water - Long Term Flood Protection; $70 million const.	AECOM (URS)	H&H Analyses & Reports for NJDEP FHA Permits and FEMA LOMR for Floodwall	Sr.H & H Engineer	12	10%	Sept 2014-Aug 2015	New Jersey American Water; Manoj Patel, 908.431.3264

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NAME Allan Klindworth

TITLE Sustainability Lead

FIRM AECOM

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Australian Government - Department of Environmer		Climate Risk Assessm	Project Manage	36	25%	Oct 2011-Dec 201	John Kerwan Director Estate Strategic Planning Estate Planning
Transport Resilience and Climatic Extremes Trainin		Climate Adaptation Pla	Project Manage	6	20%	July 2011 - Dec 20	Fiona Calvert, Director – Transport Energy, Sustainability and Location Infrastructure
Port Philip Bay Coastal Adaptation Pathways Projec		Climate Risk Assessm	Project Manage	12	20%	Sep 2011 - Aug 20	Ben Morris Policy Advisor - Energy and Waste Municipal Association
York Region Climate Change White Paper		Climate Risk Assessm	Project Manage	2	30%	Dec 2014 - Feb 20	Adrian Coombs, P. Eng. Project Manager Regional Municipality
Mildura Rural City Council Sustainability Strategy		Sustainability Strategy	Project Manage	3	30%	Feb 2012- May 20	Mark Jenkins Mildura Rural City Council 108-116 Madden

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NAME James Mansky

TITLE Permitting & Regulatory Compliance Lead

FIRM AECOM

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Meadowlands Mills, Secaucus, NJ, $500,000	AECOM	Preparation of wetlands mitigation design	Project Manager	100	20%	1991-2000	The Mills Corporation, acquired by Simon Property Group in 2007
Mt. Hope Pumped Storage Hydroelectric Project, Mt. Hope, NJ, $750,000	AECOM	Preparation of FERC License	Project Manager	80	20%	1988-1995 and 2000-2002	Halecrest Corporation,Richard Hale, 732-287-2353
Elizabeth River Viaduct, Elizabeth, NJ, $150,000	AECOM	Preparation of NJDEP tidal and freshwater wetlands permit applications	Task Manager	24	10%	1988-1989 and 2002-2003	NJDOT, Nancy Adrian, 6098-530-3469
Secaucus High School Wetland Mitigation, Secaucus, NJ, $100,000	AECOM	Preparation of wetlands mitigation design	Project Manager	24	20%	2000-2002	NJMC, Ken Scaretelli, 201-460-1700

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NAME John Rollino

TITLE Ecology & Biology Lead

FIRM AECOM

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Finderne Wetlands	AECOM	Wetland Delineation, Ecological Monitoring, and Restoration Design	Lead Scientist	48.00	5.00	2012-Present	Kim Rightler (Corps of Engineers) 917-790-8722
Astoria 316(b) Compliance $2M	AECOM	316(b) compliance, marine and thermodynamic studies, evaluation of mesh panels and potential impacts to marine life	Project Manager and Lead Scientist	18.00	45.00	2014-present	Natalia Hernandez (US PowerGen) (718) 204 3918
Bronx River Hudson River Ecosystem Restoration	AECOM	AECOM performed field investigations to assess wetlands and identify suitable	Technical Manager; lead ecologist	14	10	2014-present	Lisa Baron (Corps of Engineers) 917-790-8306
North Queens Pipeline Project $40k	AECOM	Stormwater Studies, SWPP preparation	Project Manager	13.00	5.00	2014-present	Adam Yablonsky (National Grid) 516-545-2581
North Queens Urban Forestry 40K	AECOM	Urban Tree Survey and Permit Preparation and Acquisition	Project Manager and Lead Scientist	6.00	10.00	2014.00	Linda Schmidt (Woodard & Curran) 800-675-2756
Sea Girt Ecological Survey $200K	AECOM	Endangered Species, predatory mammal and radio telemetry study	Project Manager and Lead Scientist	24.00	20.00	2012-2014	Harry Strano (Amy S. Greene Environmental Consultants, Inc.) (908) 788-9676

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NAME Brian Stobbie

TITLE Structural Engineering Lead

FIRM AECOM

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	OM	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Governor's Island Ventilation Building- Estimated Construction cost $40 MM	AECOM	Study	Quality Assurance and Quality Control	8	500%	January 2015 - October 2015	MTA Bridges and Tunnels, John B. Hinge, P.E. (646)252-7283
Port Algoma, Ontario Construction Costs (Estimate $150 MM US)	AECOM	Concept design	Task lead for Marine Structures	18	1000%	February 2015 to march 2016	Corporation of the City of Sault Ste. Marie, Mr. Jerry Dolcetti
Port Newark Container Terminal - Phase II Expansion Estimated construction costs $50 MM	AECOM	concept through construction documents	Structural Dept. Manager	12	1000%	`April 2015 - March 2016	Ports of America, Javier Itriago, (510) 825-5690
Sandy Hook to Barnegat Beach Erosion Control Project, $125M Construction	AECOM	Coastal & Hydrologic Study, Conceptual & Final Design, & Construction Administration	QC for marine structural	8	5%	February 2015 to June 2015	US Army Corps of Engineers-New York District; Lynn Bocamazo, (917) 790-8396
Howland hook Intermodal Facility	AECOM	Contract documents	PM for PANYNJ	12	4000%	2005	Port Authority of New York and New Jersey, Mr. Vinny Antes

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NAME James Heeren, PE, ENV SP

TITLE Deputy Project Manager

FIRM Dewberry

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
RBD: Hudson River Project Hudson County, NJ $230M (const.)	Dewberry	Feasibility Study, NEPA EIS	Quality Reviewer	18	<5%	6/2015-12/2016	NJDEP Dennis Reinknecht 609.292.1976
I-295/I-76/Rt. 42 Direct Connection Camden County, NJ $900M (constr.)	Dewberry	Feasibility, NEPA EIS, Design, Construction Administration	Environmental Lead	162 months to date	25%	3/2002-present	NJDOT Jo Ann Asadpour 609.530.3021
Rt. 3 over Passaic River Bergen & Passaic Cos., $159M (const.)	Dewberry	Final scope development, NEPA EA, Design, Construction Admin.	Senior Environmental Engineer	20	15%	3/2002-4/2014, not contiguous	NJDOT Christopher Manz 609.530.2511
Route 7 Wittpenn Bridge, Kearny & Jersey City, NJ $730M (const.)	Jacobs	NEPA EA, Site Remediation	Senior Environmental Engineer	80	15%	1/2004-1/2014, not contiguous	NJDOT Mahesh Patel 609.530.3513
Post-Sandy Waterway Debris Removal, Statewide, $157M (program cost)	Dewberry	Project Management, including federal environmental compliance	Environmental and Historic Preservation Lead	7	25%	3/2013-10-2013	NJDEP Suzanne Dietrick 609.633.6801
Route 17 Corridor Bottleneck Alleviation, Bergen Co., NJ $200M (const. est.)	HNTB	NEPA Technical Environmental Studies, Public Outreach	Dewberry Project Manager	53 months	10%	5/2009-8/2013	Bergen County Donna Orbach 201.336.6438
Fenimore Landfill Closure, Morris Co., Remediation IDIQ, $130,000 (fee)	Louis Berger Group	Design, Permitting, Construction Administration	Dewberry Project Manager	21	15%	8/2013-5/2015	NJDEP Robert Hayton 609.633.0744

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NAME Jack Kanarek

TITLE Transit Planning Lead

FIRM Dewberry

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Monmouth Ocean Middlesex Rail Restoration Environmental Impact Statement	NJ TRANSIT	NEPA EIS	Transit Planner	48	25%	1/2002 - 12/2006	NJ TRANSIT Tom Clark 973.491.8080
Lackawanna Cut-off Rail Restoration Environmental Assessment	NJ TRANSIT	NEPA EA	Transit Planner	41	20%	1/2005 - 5/2009	NJ TRANSIT Richard Roberts 973.491.7624
Railroad Infrastructure and Capacity Improvement Planning	NJ TRANSIT	Study	Transit Planner	413	30%	1/1984 - 5/2009	NJ TRANSIT Richard Roberts 973.491.7624
Passenger Facility Projects Multiple Locations	NJ TRANSIT	Study	Transit Planner	377	20%	1/1977 - 5/2009	NJ TRANSIT Richard Roberts 973.491.7624
Bus Service Improvements	NJ TRANSIT	Study	Transit Planner	180	5%	1/1993 - 1/2008	NJ TRANSIT Richard Roberts 973.491.7624
Transit Oriented Development and Land Use Planning	NJ TRANSIT	Studies	Transit Planner	180	5%	1/1993 - 1/2008	NJ TRANSIT Richard Roberts 973.491.7624
Evaluation of Next Generation Bus Rapid Transit (BRT)	Systra	Study and Outreach	Transit Planner	24	10%	1/2012-6/2013	North Jersey Transportation Planning Auth. Lois Goldman 973.639.8413

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Jeff Gangai, EIT, CFM

TITLE Coastal Modeling Lead

FIRM Dewberry

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RBD: Hudson River Project Hudson County, NJ $230M (const.)	Dewberry	Feasibility Study, NEPA EIS	Coastal Engineer	2 months to date	10%	6/2015-12/2016	NJDEP Dennis Reinknecht 609.292.1976
NJDEP Floodplain Study Mapping Services Flood Risk MAP $114K (fee)	Dewberry	HAZUS-based Risk Assessment	Senior Coastal Engineer	10	1%	6/2013-8/2014	NJDEP Joseph Ruggeri 609.292.2296
FEMA Risk MAP Production and Technical Services Contract $250M (fee)	Dewberry	Flood Insurance Studies, Mapping, H&H, Hazard Risk Assessment	Senior Coastal Technical Lead	59	15%	9/2010-present	FEMA Doug Bellomo 202.616.2903
Northwest Florida Water Mgmt. Dist. CTP Storm Surge Study $35,000 (fee)	Dewberry	Storm Surge Modeling	Project Manager	18	6%	7/2009-1/2011	NWFWMD Jerrick Saquibal 850.569.5999
North Carolina Floodplain Mapping Program $20M (fee)	Dewberry	Program Development, QA/QC Review, Mapping, Outreach	Senior Coastal Technical Lead	81	2%	12/2006-8/2013	NCFMP John Dorman 919.825.2296
FEMA Hawaiian Islands Hurricane Storm Surge Study $50M (fee)	Dewberry	Coastal Flood Hazard Modeling/Mapping	Senior Coastal Engineer and Technical Lead	36	20%	10/2005-9/2008	FEMA Region IX Eric Simmons 510.627.7029

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME **Michael Murphy, PE**

TITLE Deputy Project Manager

FIRM HDR

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
USACE New York District: NY/NJ Harbor Navigation Study - Fee: $6M	HDR - JV partner with Moffat & Nichol Engineers and URS	Study	Senior Civil Engineer/ CADD & GIS Manager	12	35	1999-2001	USACE New York District: Eugene Brickman; 917.790.8701
National Park Service: Sandy Hook Dispatch Center at Fort Wadsworth, Park Wide Telecommunications, Radio and Data Systems, Staten Island, NY - Fee: $98K	HDR - Prime	Study, Design	Project Manager / Senior Civil Engineer	6	25	2014-2015	National Park Service Denver Service Center: Rick Rampi; 303.969.2554
National Park Service: Fort Hancock Sandy Hook, Jersey City - Fee: $ 200K	HDR - Prime	Study, Design	Project Manager / Senior Civil Engineer	9	25	2014	National Park Service Denver Service Center: Daryl Lindeman;
USMA Multi Purpose Academic Center (MPAC), West Point New York - Fee: $150K	HDR - Prime	Study	Project Manager / Senior Civil Engineer	6	25	2014	USMA West Point: Stephanie Shapiro; 845.938.4129
National Park Service: Capital Region Levee Improvement & Flood Plan Strategy Assessment - Fee: $248K to date	HDR - Prime	Study	Senior Civil Engineer	4	20	2014- 2015	Nation Park Service: Mark Baker; 303.969.2921
NAVFAC: Walter Reed National Navy Medical Center Alterations/Additions P130, Bethesda, MD - Fee: $206K	HDR - Prime	Study, Design	Senior Civil Engineer	18	50	2012-2013	Naval Facilities Engineering Command (NAVFAC): Heidi Chen; 202.685.3028

KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME **Jennifer Curran**

TITLE Task Area Leader - Ecosystem Restoration Design

FIRM HDR

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USACE New York District: Hudson-Raritan Estuary Ecosystem Restoration Study – Comprehensive Restoration Plan, NY/NJ - Fee: $2M	HDR - Prime	Study	Project Manager	136	15	2004 to present	USACE New York District: Peter Weppler, Chief, Environmental Analysis; 917.790.8634
Evergreen Environmental, LLC, Evergreen MRI3 Mitigation Bank and Global Terminal Expansion Project Mitigation, Carlstadt, NJ - Fee: Confidential	HDR - Prime	Study, Schematic, Construction Administration	Project Manager	66	15	2010 to present	Evergreen Environmental, LLC: Mark Renna, Vice President; 973.305.0643
Evergreen Mill Creek Point Mitigation Bank, Secaucus, NJ - Fee: Confidential	HDR - Prime	Study, Schematic	Program/Client Manager	5	2	2014 to present	Evergreen Environmental, LLC: Mark Renna, Vice President; 973.305.0643
Evergreen Environmental – Evergreen Hackensack River Mitigation Bank Development, Ridgefield, NJ - Fee: Confidential	HDR - Prime	Study, Schematic	Project Manager	12	30	2008 to 2010	Evergreen Environmental, LLC: Mark Renna, Vice President; 973.305.0643
New York City Economic Development Corporation - Coney Island Creek Tidal Barrier and Wetlands Feasibility Study, Brooklyn, NY - Fee: $150K	HDR - Subcontractor to Arcadis	Study	Ecological Lead	9	2	2014 to present	NYCEDC: Elijah Hutchinson, Vice President; 212.312.3782
USACE New York District, Wreck Pond Coastal Restoration Feasibility Study, Spring Lake, NJ - Fee $1M	HDR - Subcontractor to Princeton Hydro	Study	Ecological Lead	10	1	2014 to present	USACE New York District: Jason Shea; 917.790.8727

* A KEY TEAM MEMBER IS A TECHNICAL OR MANAGEMENT PERSON DEVOTING 20% OR MORE OF THEIR TIME TO ANY PHASE OF THE PROJECT

KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME **John Roebig, PhD, RLA**

TITLE Ecosystem Restoration Lead

FIRM HDR

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Evergreen Environmental, LLC, Evergreen MRI3 Mitigation Bank and Global Terminal Expansion Project Mitigation, Carlstadt, NJ - Fee: Confidential	HDR - Prime	Study	Chief Designer and Wetland Ecologist	24	30%	2010-2013	Evergreen Environmental, LLC: Marl Renna, Vice President; 973.305.0643
Evergreen Mill Creek Point Mitigation Bank, Secaucus, NJ - Fee: Confidential	HDR - Prime	Study, Schematic	Lead Wetland Scientist	2	10%	2015 - Present	Evergreen Environmental, LLC: Marl Renna, Vice President; 973.305.0643
Evergreen Environmental – Evergreen Hackensack River Mitigation Bank Development, Ridgefield, NJ - Fee: Confidential	HDR - Prime	Study, Schematic	Lead Wetland Scientist	5	20%	2014-2015	Evergreen Environmental, LLC: Marl Renna, Vice President; 973.305.0643
Port Authority of New York & New Jersey (PANYNJ), Feasibility Investigation and Pilot Project for Forested Wetland Restoration in the New Jersey Meadowlands - Fee: $150K	HDR - Prime	Study, Schematic, Construction Administration	Lead Wetland Scientist and Habitat Designer	12	5%	2014-Present	Port Authority of NY & NJ - Engineering Dept.: Marc Hellman; 212.435.5749
USACE Kansas City District/USEPA Region 2, Imperial Oil Superfund Site - Fee: $1.5M construction	HDR - Prime	Study, Schematic	Landscape Architect and Wetlands Designer	2	5%	2012	USACE Kansas City District: Todd Daniels; 816.389.3584
Middlesex County, New Brunswick Landing Wetland Mitigation, Middlesex County, NJ - Fee: $2.2M	HDR - Prime	Study, Schematic, Construction Administration	Lead Environmental Scientist	50	50%	2004 - 2007	County of Middlesex Dept. of Parks and Recreation: Rick Lear; 732.745.5988
USACE New York District, Hudson-Raritan Estuary Restoration - Liberty State Park Restoration - Fee: $1M est	HDR / URS Joint	Study, Schematic	Environmental Task Leader	12	35%	2003 - 2006	USACE, New York District: Peter Weppler, Chief, Environmental Analysis; 917.790.8634

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME **Patricia Parvis, LSRP**

TITLE Site Remediation Leader

FIRM HDR

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Port Authority of New York/New Jersey (PANYNJ): Comprehensive Port Improvement Plan, NY/NJ Harbor -	HDR - Prime	Study	Task Leader	24	20	2002 - 2004	PANYNJ: William Glynn; 973.792.4302
Evergreen Environmental, LLC.: MRI-3 Mitigation Bank, Carlstadt, NJ - Fee: Confidential	HDR - Prime	Study	Task Leader	66	10	2010 -current	Evergreen Environmental, LLC: Mark Renna, Vice
Evergreen Environmental, LLC: Evergreen Hackensack River Mitigation Bank, Bergen County, NJ - Fee:	HDR - Prime	Study	Task Leader	5	10	2014 - current	Evergreen Environmental, LLC: Mark Renna, Vice
USEPA Region 2: Remedial Action Contract - Combe Fill South Landfill Superfund Site, Morris County, NJ - Fee:	HDR - Prime	Study	Project Manager	60	20	2010 - current	USEPA Region 2: Pamela Baxter; 212.637.4416
PANYNJ: Goethals Bridge Site Acquisition Due Diligence - Fee: $240K	HDR - Prime	Study	Project Manager	3	25	2013	PANYNJ: Ed Aldrich; 516.580.5883
USACE New York District: Design & Environmental Services for Packaging, Handling, Shipping & Transportation Center, Picatinny Arsenal, Rockaway Township, NJ - Fee: $224K	HDR - Prime	Study	Project Manager	24	25	2007-2008	USACE New York District: Rodney Abrams; 917.790.8289
Neptune Regional Transmission System - Remedial Investigation and Interim Remedial Measures, Permitting, Sayreville, NJ - Fee: $425K	HDR - Prime	Study	Project Manager	36	10	2013 - current	PowerBridge: Christopher Hocker; 203.416.5590

KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME **Robin Miller**

TITLE Water Quality & Sediment Modeling Lead

FIRM HDR

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
Model to Evaluate and Manage Contaminants in Water Sediment and Biota in the NY/NJ Harbor Estuary - Fee: $2.3M	HDR - Subconsultant to Hudson River Foundation	Study	Project Director	72	100	2001 - 2007	Port Authority of NY/NJ & NJ DOT Office of Maritime
Evaluation of the Effect of Sussex Borough STP on Water Quality in Clove Brook and Papakeeting Creek, NJ - Fee: ~ < $100K	HDR - Subconsultant to Canger and Cassera	Study	Lead Modeler	~ 6	50	Before 1995	Sussex Borough, NJ: Contact no longer available
USEPA Region 2: Tech Transfer of NY/NJ Harbor Water Quality Models - Fee: $33K	HDR - Prime	Study	Project Director	16	20	2013 - 2014	USEPA Region 2: Antony Tseng;
Sampling and Analytical Plan Development for the Lower Passaic River and Newark Bay near, Newark, NJ - Fee: ~ $60K	HDR - Subconsultant to Malcolm Pirnie, Inc.	Study	Lead Author	14	30	2008 - 2009	USEPA Region 2: Alice Yeh; 212.637.4427
System-Wide Eutrophication Model, NY/NJ Harbor - Fee: ~$5M	HDR - Subconsultant to Greeley & Hansen	Study	Project Engineer and Project Manager	144	50	1993 - 2004	NYCDEP: Keith Mahoney; 347.461.7399
TMDL/WLA Development in the NY/NJ Harbor and Long Island Sound - Fee: > $1M	HDR - Subconsultant to Hudson River Foundation & New England Interstate Water Pollution Control	Study	Project Manager	96	50	2003-2010	USEPA Region 2: Robert Nyman; 212.637.3809
Port Jersey Channel Navigation Improvement Project - Fee: ~$150K	HDR - Subconsultant to Barry Vittor and Associates	Study	Project Manager	~ 9	75	early 2000's	USACE: Mr. Bryce Wisemiller;

KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME **Marc Korpus**

TITLE GIS Lead

FIRM HDR

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTACT PERSON AND PHONE NUMBER
Evergreen Environmental, LLC, Evergreen MRI3 Mitigation Bank and Global Terminal Expansion Project Mitigation, Carlstadt, NJ Fee: Confidential	HDR - Prime	Study	Lead GIS Analyst	3	10	2010 to present	Evergreen Environmental, LLC: Mark Renna, Vice President; 973.305.0643
USACE Hudson Raritan Estuary Ecosystem Restoration Study. Fee: $2M est	HDR - Prime	Study	Lead GIS Analyst	8	20	2004 to present	USACE New York District: Peter Weppler, Chief, Environmental Analysis; 917.790.8634
Norfolk Southern Corporation, Capital Region Intermodal Facility, Mechanicville, NY - Fee: $325k	HDR - Prime	Design	Lead GIS Analyst	6	15	2009	Norfolk Southern Corp: David Becker, Assistant Chief; 404.529.1221
NYCDEP Office of Green Infrastructure, Capital Project No. WP-169, Queens, NY - Fee: $125k est	HDR - Prime	Conceptual Design	GIS Analyst	4	12	2008-2009	Nancy Doon, Technical Director; 646.388.9755
US Army Garrison at West Point, Storm Water Control Plan, West Point, NY - Fee: $379k	HDR - Prime	Study, Conceptual Design	Lead GIS Analyst	8	20	2013	National Guard Bureau: Robert Mitchell; 217.757.1729
Westchester County Public Water Supply Systems Spatial Database, Westchester County, NY - Fee: $150k	HDR - Prime	GIS Compilation	GIS Analyst	9	25	2009	Westchester Count: Sam Wear, Asst CIO; 914.995.3047

KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME **Julie Stein. ENV SP, LEED BD+C AP**

TITLE Green Infrastructure Lead

FIRM HDR

PROJECT TITLE LOCATION AND OTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
lew York City: Coney Island Creek Barrier and Wetland easibility Study - Fee: $150K	HDR - Subconsultant to Arcadis	Study	Deputy Project Manager	12	30	2014 - 2015	Northeast Ohio Regional Sewer Dist: Lita Laven, Project Manager; 216.881.6600
lortheast Ohio Regional Sewer District: Green Infrastructure Co-Benefits Analysis, OH - Fee: 350K	HDR - Prime	Study	Project Manager	12	40	2014 - 2015	Northeast Ohio Regional Sewer Dist: Lita Laven, Project Manager; 216.881.6601
lorthwest Ohio Regional Sewer District: Woodland Hills Green nfrastructure Planning, OH - Fee: 400K	HDR - Prime	Study	Project Manager	12	30	2014	Northeast Ohio Regional Sewer Dist: Lita Laven, Project Manager; 216.881.6602
Seattle Public Utilities: Ballard Natural Drainage Solutions 2015 nalysis, WA - Fee: $ 1.1M to late	HDR - Prime	Study	Task Lead: Green Infrastructure	12	5	2013 - 2019 est	Seattle Public Utilities: Tracy Tackett; 914.995.8113
JS Military Academy: West Point Stormwater Master Plan and LID Design, NY - Fee: $ 411K	HDR - Prime	Study	Project Manager	24	40	2013-2015	National Guard Bureau: Robert Mitchell; 217.757.1355
Westchester County: Pump Stations and Overflow Facilities lood Assessments, NY - Fee: 140K	HDR - Prime	Study	Technical Manager	12	10	2014	Westchester County Department of Public Works: Angelo Sgobbo; 914.995.8113
NYCDEP: Green Infrastructure lan Development and mplementation, NY - Fee: $187M rogram funds/3 yrs	Work completed prior to joining HDR	Study	Program Director	24	100	2009-2013	New York City Department of Environmental Protection: Angela Licata; 718.595.4398

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KEY TEAM MEMBER PROJECT EXPERIENCE DATA SHEET

NAME Donald Heck, PE

TITLE Geotechnical Engineering Lead

FIRM Matrix New World Enginering, Inc

PROJECT TITLE LOCATION AND TOTAL CONSTRUCTION COST OR FEE	A/E OF RECORD FOR THIS REFERENCED PROJECT	SPECIFIC TYPE OF WORK EXPERIENCE (STUDY, SCHEMATIC, CONSTRUCTION ADMINISTRATION)	TEAM MEMBERS SPECIFIC ROLE OR TITLE ON THE REFERENCED PROJECT	DURATION OF TEAM MEMBER'S INVOLVEMENT OF THE REFERENCED PROJECT (IN MONTHS)	% OF TIME DURING DURATION BASED UPON A 40 HOUR WEEK	DATES OF THE TEAM MEMBER'S INVOLVEMENT IN THE REFERENCED PROJECT	CLIENT NAME CONTRACT PERSON AND PHONE NUMBER
NJ Transit, County Yard Improvement Program, New Brunswick and North Brunswick, NJ (Matrix Fee $705,394)	NJ Transit (sub to Jacobs)	Subsurface Investigation Program and supervision of the field inspectors. The County Yard Train Storage Yard	Geotechnical Task Leader	6	15%	2015 - Ongoing	Jacobs Engineering, Christopher Ellis, PE, 973-267-8830
NJ Transit, Meadows Maintenance Complex, Mason / Building 9 Substations, Reconstruction / Replacement Project	NJ Transit (sub to Jacobs)	Geotechnical engineering services to investigate subsurface conditions beneath the site and evaluate the suitability of on-site soils for proposed transformer platforms and flood wall locations.	Geotechnical Project Leader	6	15%	2015 - Ongoing	Jacobs Engineering, James Homoki, PE, 862-242-7294
NJ Transit, West Summit Interlocking, Summit, NJ (Matrix Fee $130,000)	NJ Transit (sub to Jacobs)	Geotechnical engineering services to investigate subsurface conditions beneath the site and evaluate the suitability of on-site soils	Geotechnical Project Leader	20	15%	2013 - Ongoing	Jacobs Engineering, Inc., Richard Sirabian, PE, 973-267-8830
NJ Transit, Sandy Hardening, Various Locations, NJ (Matrix Fee $270,000)	NJ Transit (sub to Systra)	Geotechnical engineering study related to Sandy Recovery efforts for the proposed design of hardening systems for track roadbed at various locations on the North Jersey Coast Line and the Atlantic City Line.	Geotechnical Project Leader	6	5%	2014 - Ongoing	Systra, Ben Malamed, 646-264-2546
New York City Housing Authority, Gravesend Houses Development, Brooklyn, NY (Matrix Fee $99,360)	New York City Housing Authority (sub to HAKS)	Geotechnical engineering services to investigate subsurface conditions beneath the site and evaluate the suitability of on-site soils for the construction of annexes	Geotechnical Project Leader	5	15%	2015	HAKS, Manuel Millan, 212-747-1997

3 Technical Approach

AECOM's approach to delivering the Feasibility Study, Environmental Impact Statement, Design and Construction Administration Services, is based on proven performance by proven experts who will use a comprehensive, coordinated, all encompassing, and streamlined approach that few firms other than AECOM can provide.

PROJECT UNDERSTANDING

Introduction

The State of New Jersey through the Rebuild by Design competition is the beneficiary of a $150 million Community Development Block Grant- Disaster Recovery (CDBG-DR) award from HUD. DPMC/DEP is seeking to select a consultant for a Term Contract to further investigate and refine the conceptual plans developed for the competition and to conduct a full feasibility study to determine the best implementable solution in a pilot area that will meet the principles of the design competition concepts within the financial limits of the available CDBG-DR grant. The team has reviewed the conceptual plans for the New Meadowlands with its concept to Protect, Connect and Grow using a design integration principle to bring opportunities for flood protection and stormwater systems together with opportunities for greater connectivity, ecological enhancement, and economic development.

The design competition vision is to create a *Meadowband* that would consist of a berm or multi-use levee that provides flood protection to Meadowland communities whiles also serving as a primary regional connector tying together communities, generating economic opportunity and integrating ecological enhancement and restoration efforts. Integral to the *Meadowband* will be the implementation of green infrastructure initiatives to reduce the stormwater runoff, the source of the localized urban flooding. Ecological benefits would be generated through connection of past, current and future marshland restoration into a regional wildlife refuge termed as the *Meadowpark* by the design competition team. The design competition team estimated that development of the plan in its entirety would cost almost $3.5 billion and have a benefit to cost ratio of 2.

A LINKED AND SYNERGISTIC APPROACH TO FEASIBILITY AND NEPA ANALYSIS

The New Meadowlands concept recognizes the area's vulnerabilities, its importance to the region as a transportation and industrial hub, and prominent role in the region's resilience. The Feasibility Study and EIS will be conducted concurrently, with the AECOM Team leading both processes and sharing information in order to develop alternatives and mitigation measures to address adverse impacts. This dynamic approach leverages the NEPA process and the feasibility analysis to develop the best possible alternatives and, ultimately, an implementable, environmentally sound, protection plan for the communities in Pilot Area 1 in order to create a resilient place with public benefits and opportunities to grow.

Development of Implementation Plan and Schedule

One of the first tasks that should be considered by the State is to have the primary consultant create an Implementation Plan and Schedule to serve as a road map forward through to the end of the Feasibility/ NEPA EIS phase of the project. AECOM has performed document research and prepared the implementation plans and schedules for several of the region's largest projects. Known by the USACE as Project Management Plans or Program Management Plans depending on the stage of the investigation, the plans are designed to layout the tasks that are required, the funding stream, and project schedule. Working for the New York District, AECOM (URS) has developed similar plans for the entire South River Flood Risk Management project and for segments CHBD of the Green Brook. The initial step in the process is to prepare a Baseline Report to identify data gaps. Inputs to the Baseline Report require the identification and collection of available exiting data. This can include surveys, LiDAR, topography, borings, known areas of contamination, etc. The AECOM Team being comprised of local firms are familiar with the various data sources which will facilitate our ability to identify data sources and to collect the data. For example in the late 1990s working under an AECOM legacy company contract, the USACE surveyed a large number of the drainage control structures in the meadowlands. Knowing of its existence and being able to access it will reduce the overall time needed for survey services. As another example we understand that recent LiDAR data exists for the Meadowlands. These facts would be confirmed at the onset of developing the Implementation Plan and be taken into consideration when developing the schedule.

The AECOM Team also has a great deal of experience in collecting data that serve as inputs to the NEPA documentation. Through our work on the Evergreen project, team member HDR has collected a great deal of data the extent of wetlands, and endangered species that inhabit the area and are knowledgeable on the types of endangered species surveys that may be required. Meetings will also take place with the NJ Sports and Exposition Authority staff and the local communities to obtain their zoning requirements, master plans and if they exist the Comprehensive Economic Development (CEDs) Plan, as well as demographic data on each community with an eye toward addressing the requirements of Executive Order 12898 in the NEPA process. At the same we will have initial conversations with local municipalities and staff from the NJ Sports and Exposition Authority to discuss their long-term goals and outlook for land use, economic development, and growth for the future.

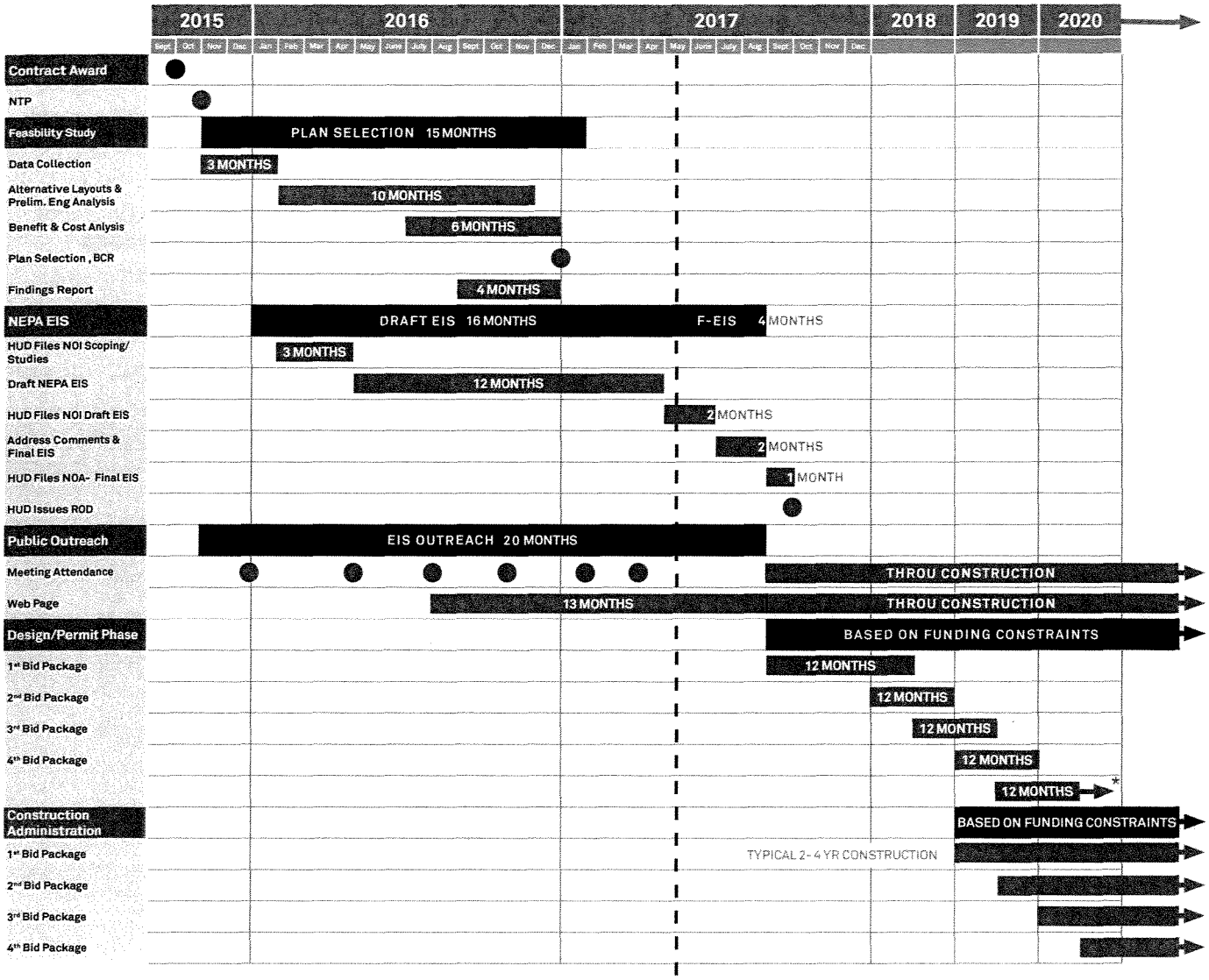
Once the baseline data is established AECOM will prepare the project schedule. AECOM uses Microsoft Project software for preparing the project schedule. The Implementation Plan will be detailed for the near term horizon of 10 to 12 months, but less detailed beyond that point showing just broad task requirements, since further refinement would likely change as more information becomes known. The plan should be considered a living document with periodic updates being required to assure it is representative of the present reality. Due to space limitations, below is a simplified schedule that does address some of the main tasks that will be needed to accomplish the feasibility level study and NEPA EIS and shows how we anticipate design and construction phases will be implemented. A much more detailed schedule with several more subtasks and budget estimates would be prepared as part of a scope of services to create an Implementation Plan for the project through the Feasibility/EIS stage of the project.

We have included a simplified schedule for this project on the next page.

Feasibility Study

It is clear that the primary purpose of this project being led by DPMC/DEP is to develop and construct a first phase that can serve as a springboard for future efforts towards the New Meadowlands vision. We believe that this first phase of the New Meadowlands needs to also serve as a showcase for the New Meadowlands vision so that it can be used to attract future funding and private development.

A Vision of Integrating the Meadowlands into the Ecological and Urban Fabric of the World's leading City, Tempered by Fiscal & Regulatory Reality Leading to an Implementable Plan to Provide Low and Modern Income Residents with critical flood protection and resiliency measures

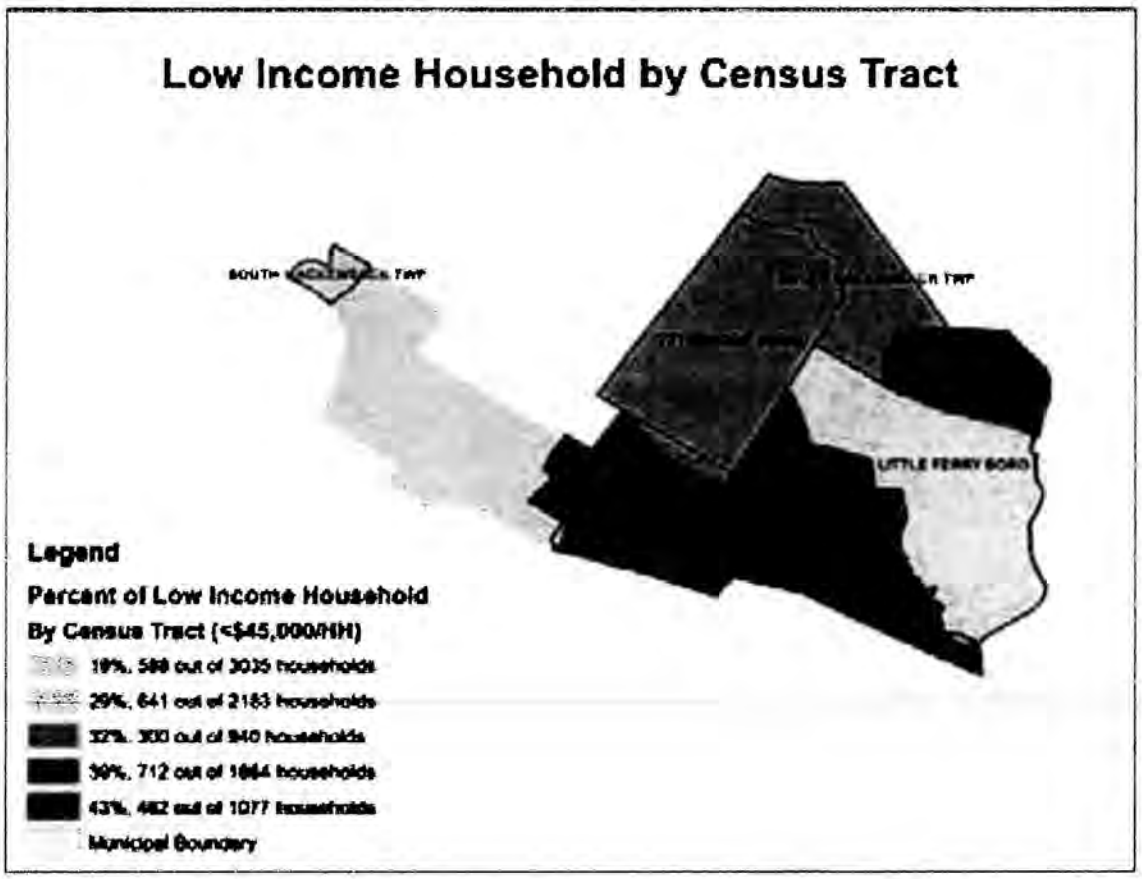


NOTE: * Total number of Bid Packages will be Dictated by Funding Stream, State's Oversight Ability and Size of Contractor to be Targeted by the Bid

The heart of the pilot project needs to be the implementation of the first phase of the Meadowband and Meadowpark concept that meets the primary objective of protecting the existing community including low and moderate income households from future flood threats. While we will focus on meeting the flood protection objective with the funds that are currently available, we will also retain a focus of holistically looking at the project as a means to enhance the economic, social and ecological fabric of the community using a phased approach that embraces the ability to expand the project as funds become available to provide opportunities for expanding open space/recreation areas that can possibly double as elements in the Green Infrastructure to reduce flooding from urban drainage and fluvial runoff; developing a network of local streets and bus rapid transit lines and encouraging up-density zoning to promote private investment into the area.

The aspiration of the Rebuild By Design "New Meadowlands" concept allows for critical flood protection and resiliency measures to protect against future storm surges, but given sufficient funding it's true potential allows for a re-integration of the Meadowlands into the ecological and urban fabric of the New York/New Jersey Metropolitan region. Through the AECOM Team's staged approach, we can help the state to realize the full value of this feasibility study by understanding, and designing towards, a New Meadowlands that over time and with added influx of funding becomes a "front door" to residents and visitors of the region. Only a team with the depth of resources and intimate understanding of the New York/New Jersey urban context can deliver on the full promise that the initial concept lays out but with a vision tempered by fiscal reality. The funding available through HUD requires a staged approach to avoid having funding constraints prevent the implementation of the objective to address one of the primary needs of existing low and middle income residents.

Exhibit 3.1



North Side Piers Waterfront Promenade

These needs include flood relief from future coastal storms and routine urban and fluvial flooding. The urban design and planning approach seeks to create a dynamic public realm and redevelopment fabric for the New Meadowlands that includes the necessary flood protection infrastructure in a way that can be leveraged for successful urban social, environmental, and economic development for a diverse and vibrant community of stakeholders.

Specifically, our approach to the urban design and planning for the "New Meadowlands – Protect, Connect, Grow" concept feasibility study and EIS is based on our experience with a range of complex urban infrastructure and resiliency projects, public space and park / greenway design. As the feasibility study and EIS builds on an existing concept design, our approach is based on an understanding of the Rebuild by Design competition, existing conditions in the Meadowlands, and the goals and proposed designs in the New Meadowlands concept. This will provide a full view of the complex coastal conditions including environmental and development context, flooding vulnerabilities and risks, including both coastal surge and urban drainage and social and economic factors that exist in the Meadowlands today, as well as how the New Meadowlands concept addresses those issues. This understanding will feed the feasibility study and concurrent EIS with scenarios to be investigated, alternatives to develop, and mitigation measures to pursue.

Exploring the New Meadowlands – Protect, Connect, Grow

The New Meadowlands flood risk management project components conceptually consists of a system of berms and marshes that protect against ocean surges, collect rainfall, and reduce storm sewer overflows. The design aims to use a system of green and gray infrastructure with the "Meadowpark" and the "Meadowband". The Meadowpark is to be a large natural reserve along the Hackensack River, which will connect and expand marshland, offering views and recreational opportunities. Around and across Meadowpark, the raised berm, or Meadowband, defines the edge of the Meadowpark. The berm's flood protection incorporates connections to towns and wetlands. As proposed, the Meadowband consists of a street, Bus Rapid Transit line, and a series of public spaces, recreation zones, and access points to Meadowpark. Integral to the protection from coastal storm surge afforded by the Meadowband is the need to address localized urban flooding and to address "interior drainage"; drainage trapped on the protected side of the line-of-protection. This interior drainage issue is often either overlooked or improperly addressed and can result in unanticipated residual flooding. The AECOM Team is particularly well versed in evaluating the right level of investment to handle this residual flooding, balancing incremental cost against a reduction in residual flood damages. Many times costs can be controlled by isolating drainage from higher properties to permit the use of gravity pressure lines to reduce the amount of drainage area trapped on the protected side of the project.

Pilot Area 1, including sections of Little Ferry, Moonachie, Carlstadt, Teterboro, and South Hackensack, is the first of three pilot areas to be funded and the focus of the Feasibility Study and EIS.

AECOM works Diligently to Integrate the latest Technologies and concepts into our designs. In Seattle we created over a 1000 rain gardens as a low cost "Green" Mitigation Technique to Reduce Urban Runoff. We Designed Manhattan's Largest Green Roof, 109,000 SF, USPS Morgan Building.

The feasibility study in concert with the NEPA EIS findings will ultimately determine what types of measure can be designed and constructed. The core of our urban design and planning and landscape design team's contribution to the Feasibility Study and EIS will revolve around how to design and implement the vision of the Meadowpark, the Meadowband, increased recreational opportunities, and create development opportunities that arise from the concept's protection and connection of the Meadowlands Pilot Area 1 with the most public amenities.

While the vision put forward in the conceptual plans identify commendable goals that can enrich the lives of those living there, and stimulate development activity, these added features add costs to the main objective stemming from Superstorm Sandy, *flood relief*. They will require added real estate acquisition and additional permitting issues both of which are long lead items in getting to project implementation which is the end goal of this contract. While there maybe multiple funding streams, such as Green Acres for park development/detention, and DOT funds for transit improvements, and private funding if the zoning is up scaled to higher density, these added funds likely will not be in place when the project gets underway, so it is essential to develop the feasibility plans to meet the primary objective of flood relief first, and evaluate the additional elements as future increments to the project looking at their added costs and benefits as an addition to the base flood relief project. Additionally, it appears that some if not the majority of the benefits associated with the additional elements are future benefits based on projected growth; the "build it and they will come" concept.

Through years of experience creating flood protection systems in the State of New Jersey, our project team understands how the objective of flood protection can be met while addressing the challenges that these projects face including funding constraints, real estate acquisition costs, hazardous waste / brownfield issues and other state environmental regulations and objectives. Through a phased project approach as proposed by the AECOM Team, issues like the timing of real estate acquisition can be managed, project features can be added as additional funding streams are identified, and the smaller bid packages can provide greater opportunities for a more competitive bidding environment by a greater pool of bidders. We also have direct experience developing ecosystem restoration projects directly in the New Meadowlands Pilot area 1 and we know how to create thriving marshland that exceeds the performance expectations of the Meadowlands Interagency Mitigation Advisory Committee (MIMAC) despite the regional challenges such as aggressive invasive vegetation and mercury contamination in the sediments. This will be a key issue in obtaining the regulatory approvals.

AECOM(URS), using the TransCAD modeling package, created a transportation-planning model for NJMC for use in evaluating development projects.

Additionally, the AECOM Team is well positioned to isolate and assist in quantifying the transportation benefits and impacts to the immediate and regional transit corridors and up-density zoning because we developed the transportation-planning model for the New Jersey Meadowlands Commission (NJMC), now the Sports Exhibition Authority. This model while consistent with the regional planning effort performed by other agencies uses a detailed parcel-level database to estimate trip generation so it capable of evaluating transportation impacts on a relatively micro scale. Our team also regularly identifies alternative funding sources that can be integrated into the objective including Green Acres for park development and detention, DOT funds for transportation improvements, and private funding attracted by zoning changes.

In developing our feasibility plans we will be cognizant of the requirement in HUD's final Affirmatively Furthering Fair

Housing (AFFH) rule, that all HUD funds include an analysis on the impact of the expenditures to promoting the goals of the Fair Housing Act. Non-housing dollars are included in the new final rule. The basic thrust is to either improve in place census tracts that have high poverty areas made up of racial and ethnic minorities or offer relocation efforts. In this case, that would be looking at income levels of areas impacted and determine how the funding would impact any of these type neighborhoods. Early in the NEPA process, we will identify the low and moderate income neighborhoods within the project area and as we formulate alternative solutions we will consider how the solutions impact on these neighborhoods.

In summary while we will take into consideration the conceptual plans and vision developed for the New Meadowlands our project approach will be to define a cost effective implementable solution to the flood risk for the area, that will potentially provide a spring board for additional development, and will evaluate the additional planning considerations identified in the "New Meadowlands" on their own merit while endeavoring to quantify the added costs and benefits to each element.

ALTERNATIVES ANALYSIS

As part of any good feasibility study the first step is to use a screening level of analysis to identify the alternatives, conceptually develop plans, determine if they present an institutionally viable solution, prepare preliminary level life cycle costs, determine the benefits derived including losses prevented, social, and environmental gains and potential revenues generated. The intent is to select a group of solutions that will meet the goals and objectives of the New Meadowlands concept of resiliency to the people, the environment and the region as a whole. From the screening level analysis we will identify a small subset of the best solutions for further refinement and ultimately for alternative recommendation taking into account all aspects of the project, not just the quantifiable benefit cost ratio.

COASTAL ENGINEERING/MODELING

The first step in this process is to quantify the risks. The Pilot Area is vulnerable to two interconnected types of flooding: systemic inland flooding from medium and high intensity rainfall/runoff events (fluvial flooding), and coastal flooding from storm surges and abnormally high tides.

- Rainfall-induced flash flooding occurs with significantly greater frequency than coastal flooding, and is caused in large part by the characteristics of the Pilot Area's topography and land use patterns as well as the physical constraints of the existing infrastructure.
- Coastal flooding happens with much less frequency, but has the potential to cause significantly more widespread flooding.

During Superstorm Sandy, the Pilot Area was flooded from coastal storm surge only. If Superstorm Sandy was accompanied with high intensity and longer duration rainfall, then the flooding and damage to properties within the Pilot Area would have increased. The flooding risk assessment will thus consider the combined effects of coastal storm surge and rainfall-induced surface runoff flooding, and consider historical data to determine the dependence/independence of these events occurring simultaneously. For example while Superstorm Sandy caused minimal fluvial flooding, but major tidal surge flooding; Hurricane Floyd resulted in minimal tidal surge flooding, but significant fluvial flooding. Understanding the interrelationship between the threats of tidal and fluvial flooding becomes significant when considering the types of facilities to build to address fluvial flow through the proposed line of protection and whether storage or pumping is required.

In 2013, an AECOM(URS)/DEI Joint Venture, known as RAMPP under contract with Federal Emergency Management Agency (FEMA) conducted a comprehensive coastal storm surge study to evaluate the extent of the coastal flooding within the study area (except the NJ Meadowlands Commission). A review of the 2013 preliminary FEMA maps reveals that the wave action zone, as designated by a VE Zone, on the FEMA maps terminates near the Pulaski skyway south of the project site, so the design for Pilot Area 1 will primarily be concerned with coastal storm surge and minimal wave

Exhibit 3.1 - Preliminary FEMA Floodplain Map at Pilot Area 1

action due to the limited fetch for wave set up. **Exhibit 3.1** shows the FEMA floodplain map at Pilot Area 1. As seen from **Exhibit 3.1**, all but a few locations, as shown in brown, are within the 100-year floodplain. Generally these areas north of the Pulaski Skyway are located in a coastal AE Zone with a flood elevation of approximately 8 feet NAVD 88.

In order for the residents to lower their flood insurance premiums and reduce building restrictions, the flood protection component of the project will need to meet or exceed the FEMA criteria for accreditation as coastal levee system as described in section 44 CFR 65 of the Federal Register. However, as a lessoned learned from Hurricane Katrina in New Orleans, once life safety issues and the potential for catastrophic failure due to overtopping are considered the FEMA criteria will represent the minimum Design Flood Elevation considered. Residual flooding from fluvial events behind the line of protection is to be mapped and structures determined to be within the 1% floodplain will still be subject to FEMA rules. The Federal Register requires FEMA to evaluate the design flood elevation for the proposed coastal levees/flood risk management system for the following four cases:

Exhibit 3.2 - Evaluation Cases Pursuant to Federal Register's 44 CFR 65.10	
Case 1	Height of 1% wave + 100-year stillwater elevation + 1 feet freeboard
Case 2	Height of maximum wave run up + 100-year stillwater elevation + 1 feet freeboard
Case 3	100-year stillwater elevation + 2 feet freeboard
Case 4	100-year stillwater elevation + crest freeboard to minimize wave overtopping

The maximum elevation obtained from the four cases above will be used as the minimum standard for the Design Flood Elevation (DFE) of the proposed coastal flood risk management system. It should be noted that these four cases as defined by the Federal Register do not take into account effects of Sea Level Rise (SLR), however our final design height will, or there will be a provision in the design to allow the flood protection works to be raised in the future depending on the decision of the state.

The coastal engineering analysis will evaluate the following criteria:

- Design Flood Elevation (DFE) of the proposed coastal flood risk management system, with and without Sea Level Rise (SLR)
- Run-up heights and overtopping quantities
- Level of Reduction in 100-year floodplain area

The choice of appropriate design criteria that is acceptable to federal, state, and municipal regulatory agencies will be critical during the development of coastal flood risk management alternatives. Additionally, it is imperative to include the National Oceanic and Atmospheric Administration's (NOAA's) projected SLR as part of the design criteria. For the coastal modeling we will consider the use of an integrated model using Danish Hydraulic Institute's (DHI's) "MIKE" modeling system to develop the flooding extents under existing conditions from coastal storm surge and fluvial events; and then evaluate the impact of each

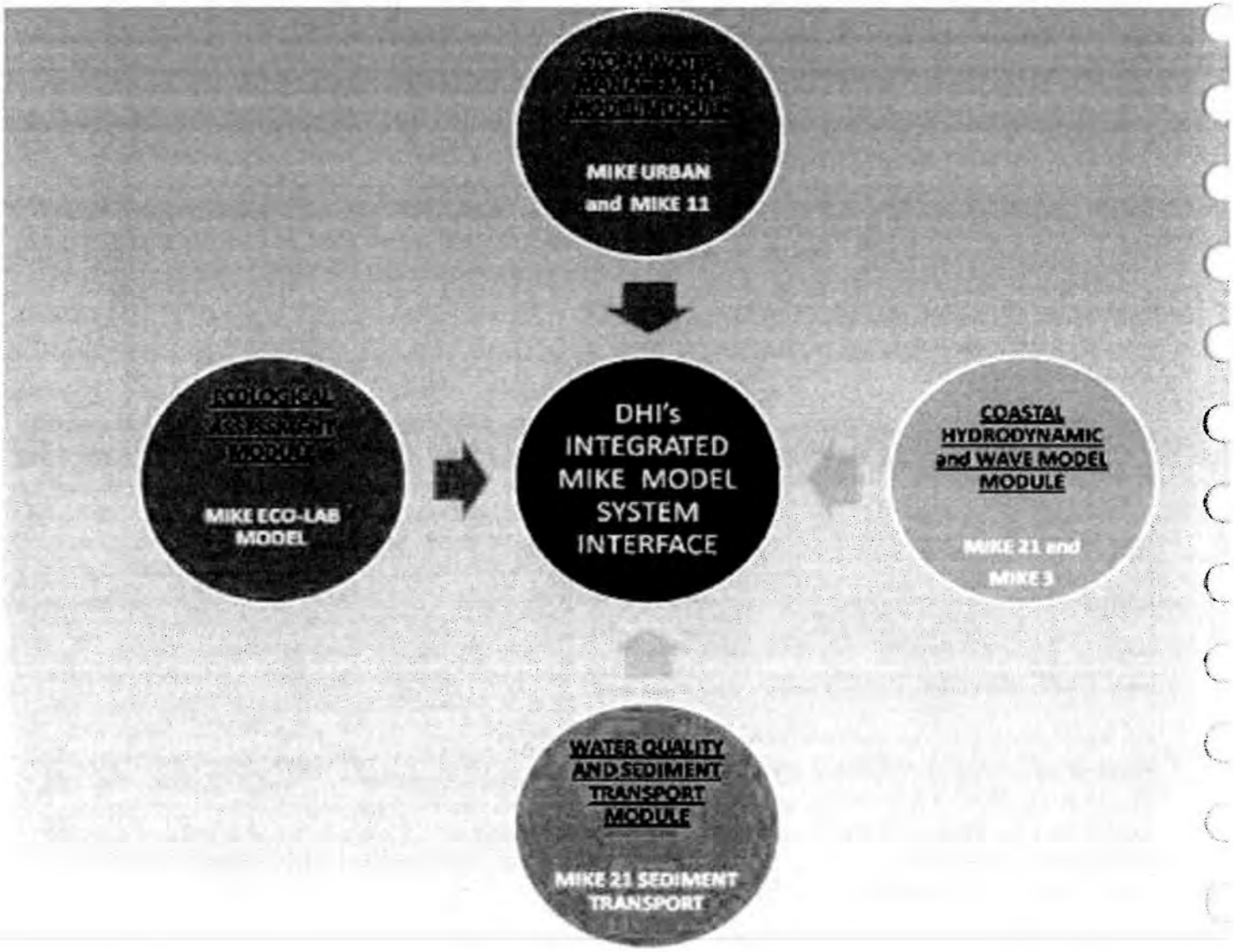
FEDERAL FLOOD RISK MANAGEMENT STANDARD

On January 30, 2015, the President signed Executive Order (E.O.) 13690, establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, which amended E.O. 11988, Floodplain Management, issued in 1977. Once implemented by Federal agencies, the Federal Flood Risk Management Standard (FFRMS) will reduce the risk and cost of future flood disasters by ensuring that Federal investments in and affecting floodplains are constructed to better withstand the impacts of flooding. The FFRMS will apply to Hazard Mitigation Assistance Grants, the Public Assistance Program, and any other FEMA grants when they fund construction activities in or affecting a floodplain.

proposed alternative on coastal hydrodynamics and interior drainage.

This integrated modeling system allows engineers and scientists to use various modules within DHI's MIKE system to simultaneously create models to simulate stormwater, coastal hydrodynamic, water quality, and ecological processes for each alternative (as shown in **Exhibit 3.2** graphic below).

Exhibit 3.2 - DHI's Integrated MIKE Model System



We will convert FEMA's existing 2-D ADvanced CIRCulation model (ADCIRC) model mesh as shown in **Exhibit 3.3** into the MIKE 21 coastal model mesh.

Exhibit 3.3 - FEMA's ADCRIC Model Mesh in the Vicinity of the Study Area

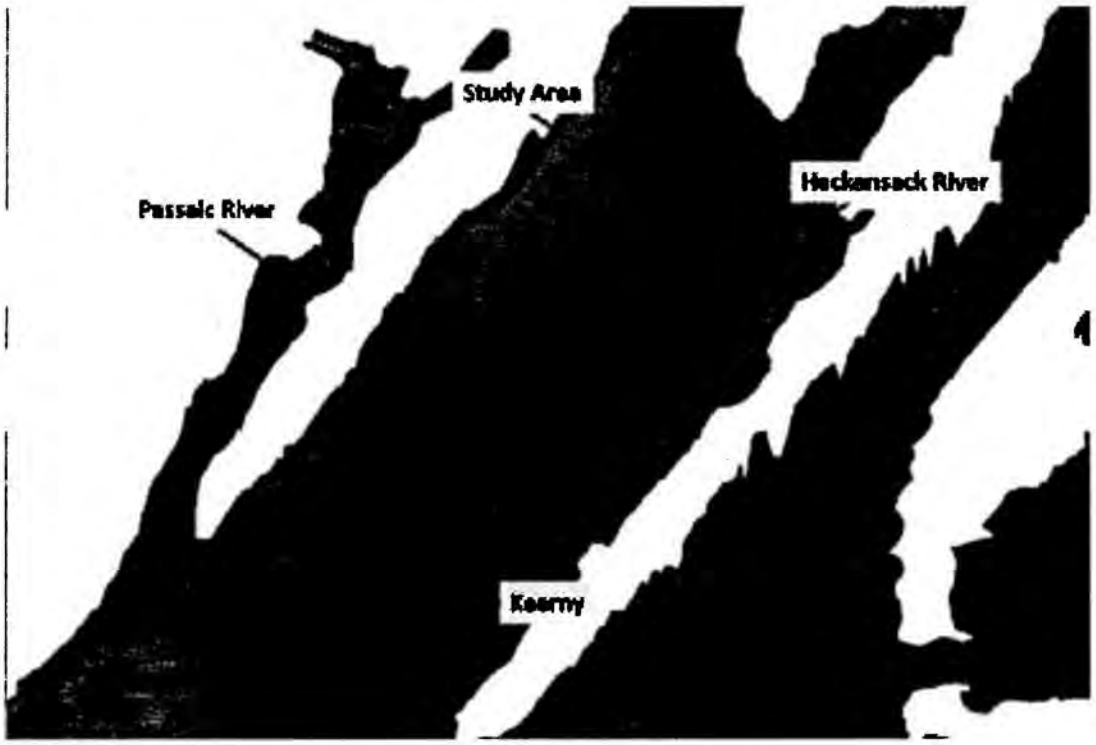
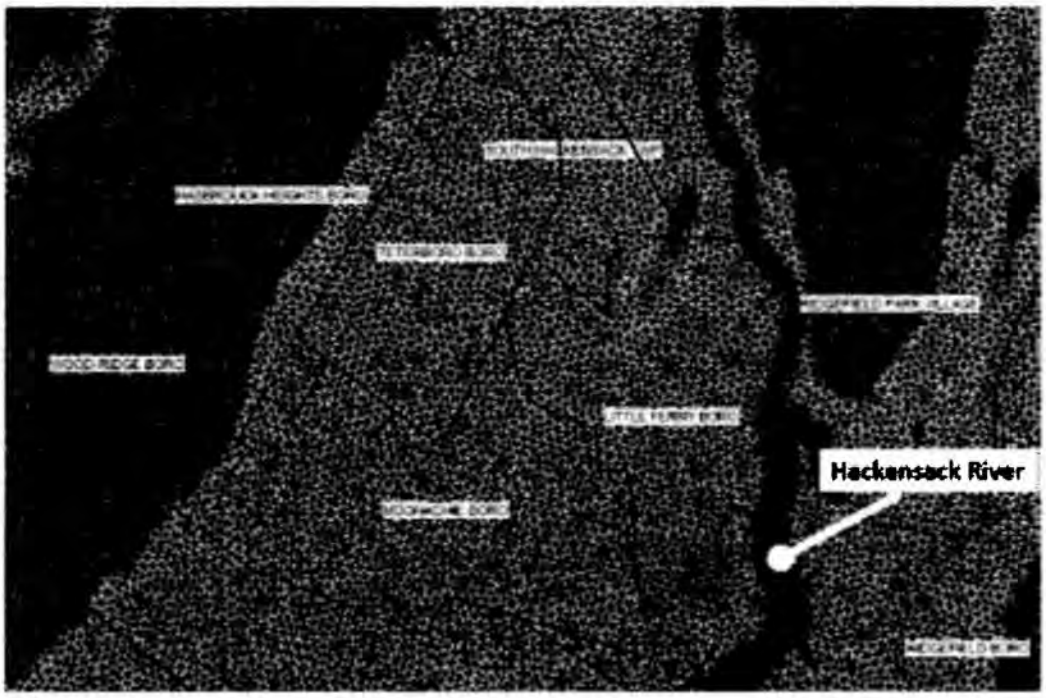
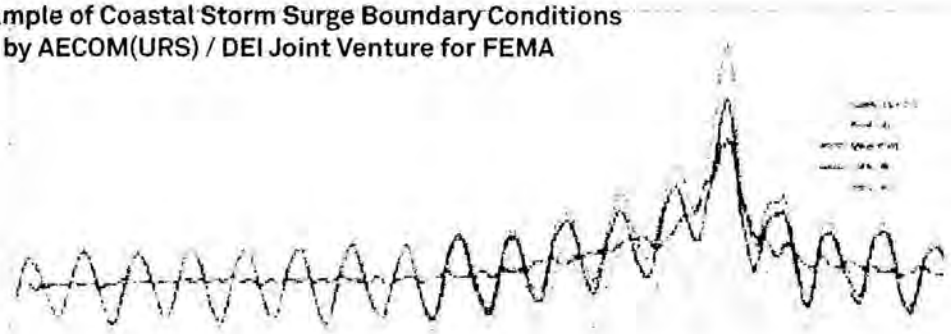


Exhibit 3.4 - Preliminary DHI's MIKE 21 Model Mesh for the Study



For **Exhibit 3.5**, we created a preliminary mesh of the study area using DHI's MIKE 21 coastal model. This preliminary mesh will be updated with additional details such as topography and bathymetry to represent current ground conditions. FEMA's recent coastal storm surge study for the New York and New Jersey area, completed by the AECOM(URS)/DEI Joint Venture, will provide us with boundary conditions for various storm surge events for the 2-D coastal hydrodynamic model (see **Exhibit 3.6**). We will utilize these boundary conditions as needed for the coastal hydrodynamic model simulations.

Exhibit 3.6 - Example of Coastal Storm Surge Boundary Conditions developed by AECOM(URS) / DEI Joint Venture for FEMA



Our climate change experts will consider the various SLR projection tools, develop some scenarios, and make a recommendation for consideration by the State and other stakeholders. The appropriate SLR condition will be incorporated into coastal storm surge boundary conditions.

Prior to evaluating hypothetical storm events we will first calibrate the model against Superstorm Sandy gage and observed elevations a means of ground truthing the model. Actual wind field data from Newark Airport and runoff data from river gages will be obtained and utilized in the calibration process.

Exhibit 3.7 below, presents a non-exhaustive list of proposed combinations of coastal boundary conditions and corresponding hydrologic events to be simulated with the numerical models. The actual conditions to be simulated with the models will be decided after discussion with the applicable federal, state, and municipal agencies.

Exhibit 3.7 - Example of Event Combinanations to be simulated with the Numerical Models

Model Run	Coastal Boundary Conditions	Corresponding Hydrologic Event
1	Observed Tide	Observed Flow (if available)
2	MHHW + Sea Level Rise	5-year Rainfall Runoff Flow
3	MHHW + Sea Level Rise	10-year Rainfall Runoff Flow
4	MHHW + Sea Level Rise	100-year Rainfall Runoff Flow
5	10-year Water Level	10-year Rainfall Runoff Flow
6	50-year Water Level	10-year Rainfall Runoff Flow
7	100-year Water Level	10-year Rainfall Runoff Flow
8	500-year Water Level	10-year Rainfall Runoff Flow

We will setup and execute the coastal hydrodynamic model using DHI's MIKE 21 model with the appropriate coastal boundary conditions to simulate coastal flooding in existing conditions. For varying levels of coastal storm surge conditions, the existing conditions MIKE 21 model will provide locations along with water depths for potential intrusion of coastal storm surge into the study area. This information will be used by the design team to develop alternatives to prevent the intrusion of coastal storm surge into the study area. An example of MIKE 21 coastal model results in the study area is shown in Exhibit 3.8.

Exhibit 3.8 - Example of MIKE 21 Coastal Model's Results in the Study Area (depths are in feet)

Since a critical project goal is to protect the study area from coastal storm surge, the flood risk management system will be designed to withstand the forces induced by coastal storm surge, wave action, and hurricane force winds. When the waves induced by hurricane force winds break at a flood risk management structure, the wave energy is dissipated at the structure in the form of water sliding up along the flood structure (also referred to as wave run up) as shown in adjacent photograph in **Exhibit 3.9.**

Exhibit 3.9 - Photo Showing wave overtopping action at waterfront structure (courtesy of FEMA)

If the flood risk management system is not designed to take into account wave run up, the flood water will overtop the structure (referred to as wave overtopping) and may induce flooding on the landward side of the structure. An appropriate drainage system will be required on the landward side to allow for the water that is overtopping the structure as well as local drainage and seepage to be collected and conveyed through the line of protection system.

The maximum flood level during the 100-year or 1% annual chance recurrence interval storm event at Pilot Area 1 is controlled by tidal surge; however, Pilot Area 1 is far enough upstream along the Hackensack River that wave run-up and overtopping is not anticipated to be a major concern. If needed our coastal engineering analysis will include effects from wave overtopping to develop an appropriate DFE for the coastal flood risk management system. Once we identify the alignment of the coastal flood risk management system, we will develop the appropriate DFE for that alignment. An analysis of wave run up and overtopping will be conducted using the latest empirical formulations from the EurOtop Overtopping Manual and the USACE. The wave run up and overtopping assessment will provide for additional design guidance on the type of flood risk management system that would be required, and whether additional armoring or risk reduction is needed as part of the design. Alternatives will be evaluated for two SLR scenarios quantifying the level of risk reduction required with incremental costs. Together with the DPMC/DEP and stakeholders, we will identify these two SLR scenarios. Further, we will update the existing conditions coastal hydrodynamic model to reflect the proposed system in the model.

Based on output from the 2-D coastal modeling and wave run up and overtopping analyses, initial design criteria will be established to further assess the feasibility of each alternative. Current velocities, wave forces, and overtopping flow rates will be utilized for evaluating design components, the need for scour protection, structure crest features, and additional landward protection. Material selection and sizing requirements will be determined for the design of the coastal structure.

Once the risk is quantified the next step is to develop a plan that will best address the problem within the context of the social, environmental, regulatory and fiscal constraints. The following outlines some of the features in the tool box that will be considered in the feasibility phase of this project.

FLOOD MITIGATION FEATURES

Features normally used to address flooding issues fall into two categories, structural and non-structural improvements, the latter being a bit of a misnomer as it still involves

structural modification to the existing structure. Non-structural improvements include buying-out/demolishing properties; elevating structures on site, relocating the structure and flood proofing the structure. Structural features include levees, floodwalls, closure gates and the associated infrastructure including drainage swales, ponding areas and pump stations.

For structural improvements when considering alternatives at the feasibility level the key issues include establishing the most efficient implementable line of protection alignment; and establishing the Design Flood Elevation and quantifying major cost items such as contaminated soils that can significantly alter costs and decisions. Project alignment alternatives will consider the linear length of the line of protection and the added potential benefits derived, the ability to potentially reduce the interior drainage area balancing the costs of gates and pumps verses tie back lines of protection, the aerial extent of the protected area and the impacts to initial construction cost and the life cycle operational and maintenance costs.

The selected design flood elevation will include key factors such as the storm frequency of the exterior flood stage to protect against, expected climate change (extent, size, scope and duration of future storms through multiple tide cycles), sea level change, storm surge, wind and wave run-up analyses, life safety issues, regulatory requirements and potential project impacts. Minimizing the size of and frequency of use of the closure facilities (i.e., the setting of gate sill elevations) and pumping station(s) considered integral to the line-of-protection will also serve to reduce operational complexities, issues and cost.

BERMS/LEVEES AND FLOODWALLS: LINE-OF-PROTECTION ELEMENTS

The Team has extensive experience leading comprehensive programs associated with levee studies, evaluations and analysis and levee improvement activities. Design services will be adapted to be fully comprehensive to include the full range of analysis and disciplines or limited to only specific assistance depending on delivery order desires. In a number of the comprehensive studies the Team has provided program management; project management; engineering analysis and design across the various technical disciplines including hydrology and hydraulics, coastal, geotechnical, geology, structural, mechanical and electrical engineering, civil engineering, cost engineering analysis, chemistry, surveying and CADD capability.

The Team has also provided detailed planning services that have included environmental analyses and engineering, biology, ecology, economic analysis associated with plan formulation, optimization and alternative design analysis, wetland studies and permitting. A number of these projects have included engineering and technical services associated with construction management for entire systems, selected segments within a system or an individual project element.

Exhibit 3.11 - Flood Wall Middlesex, NJ - Designed by AECOM(URS)

Furthermore, the Team has the technical experience in supporting the recent effort by USACE's and FEMA's to simplify and systematically link together the inspection and evaluation process for Public Law 84□99 programmatic inclusion and FEMA's levee certification and accreditation processes associated with the National Flood Insurance Program (NFIP). The Team has performed studies and evaluations that have been specifically intended to determine levee performance by exploring the site surface and subsurface conditions to assess seepage, erosion, slope

stability, design event freeboard, and other conditions in an effort to establish the preliminary scope and estimated cost of levee improvements necessary to achieve their desired level of flood protection.

The planning and design of floodwalls, levees and appurtenant structures requires a complete understanding of flood mitigation regulations and/or design guidance are these documents are critical to properly sizing individual project features when working together as a system. The Team has an intimate working knowledge of regulatory guidance related to design of levee/floodwall projects and recognizes that risk will be an integral part of design. The Team's engineers and designers specialize in taking preliminary engineering designs and developing bid□ready design drawings and specifications for flood damage reduction projects.

Recently completed efforts on levee assessments and designs include:

- Erosion remediation design for several levee systems
- Design of levee modifications
- Inspections of miles of levees and floodwalls throughout the Northeastern US
- Remediation designs for levee sections including armoring for slope protection

CLOSURE STRUCTURES

Gate closures are typically required to close openings that remain in the line of protection after construction has been completed. Gate closures can occur at locations where railroads, high use roadways or major commercial or industrial complexes need direct access to their sites during normal non-flooding conditions. Our Team is very familiar and experienced with the design of a variety of gates for feasibility, project design and the issuance of plans and specifications. Supporting details are typically expanded as design progresses prior to construction. During the normal design progression, the preliminary gate closure locations, size and type are reviewed and updated based on any changed field conditions or changes in use of facility requiring the gate.

In general, these gate closure elements are designed in accordance with USACE's ETL 1110-2-584, EM 1110-2-1705, and other pertinent local guidance and standards. Closure gate heights will be based upon field requirements but in general sill elevation shall be set as high as possible (based on field geometry) to avoid frequent closures thus creating obstructions to traffic flow.

Three (3) gate types are anticipated to be evaluated as options that include swing gates, a roller gates, and in less dynamic locations an automatic, self-rising gate. The automated gate will be a manufactured item and the location of these gates will be determined by limitations from the manufacturer. Design details will be expanded as the phase of effort progresses. Drawings for each alternative will include an elevation and plan view of the gate and its foundation, and typical sections as needed to determine comparative quantities and costs of the closure structures. Construction and operability recommendations shall be included in any Design Report prepared and all drawings shall be CAD compliant as required.

INTERIOR DRAINAGE FACILITIES

On the protected side of the line of protection the area is still subject to fluvial flooding resulting from water courses and storm water conveyance systems that can either not drain against the tidal tail water or are simply undersized for the contributory drainage area. The area presently has several areas of chronic fluvial flooding. Recently in Little Ferry when they removed the Route 46 traffic circle a new storm water pump station was installed in an effort to alleviate some the drainage issues at that location. Additionally implementation of the project will intercept overland flow that would have naturally drained to the River and this flow too needs to be addressed. The Team will develop the conceptual or final storm water mitigation/ interior drainage system plan based upon any selected berm/levee/floodwall alignment, elevation and tie-back components as determined in the task above and for the appropriate phase of study. Floods risks within the Meadowlands region can occur from a storm surge/tidally driven event, from an independent localized rainfall event, or from a coincidental tide surge/ rainfall event. In compliance with 44 CFR 65 regulations,

Exhibit 3.12 - 80 ft. by 7 ft. high swing gate across NJ Transit Rail Lines, Bound Brook, NJ-Designed by AECOM(URS)

Exhibit 3.13 - 60 ft. by 17 ft. High Roller Gate South Main Street Bound

the first step in determining the most appropriate tailwater condition to use is to perform a joint probability of rainfall event happening simultaneously during the 1% annual chance (100-year) coastal storm surge event in accordance with USACE Engineering Manual (EM) 1110-2-1413. The EM-1110-2-1413 requires a data analysis of the correlation, dependence, and coincidence of the interior (rainfall) and exterior (storm surge) relationship.

We will obtain historical rainfall records from the rainfall gages and historical tide levels from tide gages located near to the study area. Based on our preliminary analysis, the rainfall gage at Teterboro Airport and the tide gage at Battery, NY, may have sufficient historical rainfall and tide data for the EM-1110-2-1413 analysis. The results from this analysis will be discussed with NJDEP and FEMA to verify that the appropriate rainfall-tidal relationship is used for selecting the interior drainage facilities necessary to meet the objective of the project and for mapping the residual flood risks from fluvial events behind the proposed line of coastal protection.

The interior drainage system design will focus on the most appropriate hydrologic/hydraulic combinations to be considered to ensure project viability and technical feasibility while considering the overall costs.

The line-of-protection is intended to remove the exterior flooding source from reaching the damage locations within the protected area. While beneficial, the line-of-protections could potentially worsen the interior flooding relationships due to the impeding or blocking flow that could drain directly into the Meadowlands area. Our interior drainage analysis will evaluate facilities that are adjacent to, part of or remote from the line-of-protection. Facilities adjacent to or part of the line-of-protection could include gravity drains or pipes, ponding areas, exterior flap gates, positive closure sluice gates and pumping stations. Remote facilities require elevated land areas to be effective and drainage areas behind any proposed line-of-protection will be evaluated to see if these facilities are feasible. Remote facilities, if utilized, can significantly reduce the interior runoff volumes that become trapped behind the line of protection. The Team's evaluation could include upstream retention/

detention areas, pressure conduits, diversion structures, tunnels, inverted siphons or underground storage.

Exhibit 3.14 - 100 cfs Storm Water Pump Station Middlesex, NJ, Designed by AECOM(URS)

The delineation of interior sub-basins (drainage areas contributing to the area behind the line-of-protection) will be required to properly determine the magnitude of the interior rainfall/runoff produced. Hydrologic sub-basins will be delineated based upon available LIDAR data (topographic data used for overland flow) as well as a review of existing storm drainage system and flow paths (where appropriate). In areas serviced by separate stormwater drainage systems or where separate systems are a viable solution, upland or remote line-of-protection facilities will be considered by further refining the interior sub-basins at key collector/ diverting sites where structures could be placed.

A hydrologic runoff model, using either DHI's MIKE storm water modules, MIKE Urban & MIKE 11 or the more traditional USACE's HEC-HMS software, will be utilized to transform interior area rainfall into runoff. Existing State of NJ land use shape files, NOAA rainfall data and coincident exterior coastal stage hydrographs (for use with historical storms) will be collected for use within the hydrologic model. Hypothetical storm frequency-depth-duration curves (rainfall amounts) for up to 48 hours will be developed and used to adequately model a full range of hypothetical flood events. Localized significant historical rainfall events and coincident tidal elevation data will be identified and used as required.

Appropriate hydrologic methods will be used the delineate catchments (basins), and estimate hydrologic parameters such as time of concentration, curve numbers, basin slope, and other charateristics. We will utilize FEMA approved hydrologic modeling methods within the MIKE URBAN model such as SCS Unit Hydrograph and SCS Curve Number method to convert the rainfall into runoff volume within the study area. The MIKE URBAN model can simulate the storm system consisting of catch basins, manholes, pipes, pumps, regulators, weirs, and others that typically exist within the study area's built environment. The MIKE 11 model can simulate the flow of open channel systems, such as canals and rivers, that receive stormwater runoff from the subsurface stormwater system. If required, the MIKE URBAN and MIKE 11 model systems can be integrated into the MIKE 21 coastal model system to develop a three-way integrated model system to simulate storm surge, interior river/canals, and interior subsurface stormwater management systems.

For feasibility and design purposes, the stormwater mitigation strategies will be accordingly sized. The residual flooding and the resulting damages that remain will form the economic justification to enhance the interior drainage system. Analysis will seek to evaluate cost effective alternatives to lower the residual flooding within the protected area. Depending on storm water flow complexity, the sub-basin runoff locations, analysis could include:

- Evaluation of enlarged gravity outlet plans;
- Evaluation of remote facilities for upstream diversion to minimize incoming flows;
- Evaluation of ponding areas, locations, spatial extent and potential storage volumes;
- Evaluation of pumping facilities, if required, for a range of pump size capacities.

Furthermore, the interior/exterior coincident flooding scenario analysis will be utilized to establish the interior stage frequency curves since the sub-basin interior drainage areas are relatively small. For the most likely flooding scenarios, interior storm events will be initially routed against a series of stationary tide levels, as a conservative approach, with subsequent evaluations including the unsteady tidal flow fluctuations that typically occur. Final interior stage frequencies will be determined by considering

both "blocked" and "unblocked" conditions with combined probabilities at a given stage to determine the resultant with project interior stage frequency curves.

Enlargement of these interior drainage components shall be evaluated based upon the residual damages remaining. Stage-damage curves will be developed to screen the larger interior facilities with benefits and costs annualized over the estimated project life (50 to 100 years).

GREEN INFRASTRUCTURE

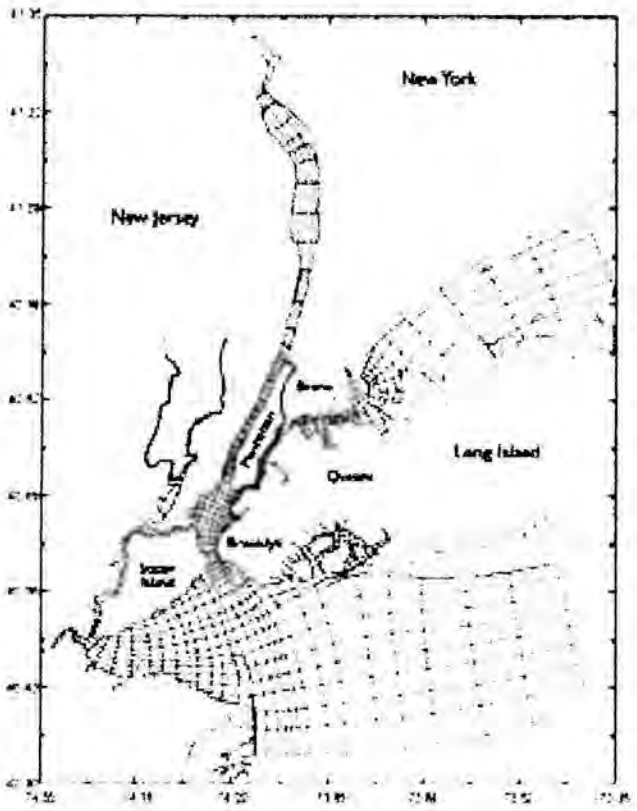
The Meadowlands functions today as one of the most significant green infrastructure systems in the region. Wetlands within the Meadowlands capture, store and clean "freshwater" inputs from its tributary area, attenuate wave energy, provide salt and freshwater habitat for a diversity of bird, mammal and fish species, and provide a heat sink that moderates the surrounding urban heat island. All of these ecosystem benefits help make the area more resilient, but during coastal storms like Hurricane Sandy, additional protection is needed and would be provided with the construction of the Meadowband. As previously discussed developing a berm to protect from tidal storm surge can trap stormwater within the interior. Green Infrastructure can be used to capture and treat stormwater from the communities within the band. The New Meadowlands Project is big and bold; green infrastructure concepts identified by our team as cost-effective will be equally as creative. However, we believe there may be tangible benefits for the project to standardize green infrastructure applications as part of design. We can develop standard green designs that can be incorporated into the overall design and construction of the project. Green infrastructure can fit into densely developed areas behind the Meadowband to store water, mitigate future development and create community connections. For these areas, our team will apply our direct analyses of green infrastructure co-benefits to leverage these opportunities and provide amenities to the communities most affected by the construction and operation of the New Meadowlands Project.

WATER QUALITY

One of the main constraints on the New Meadowlands project will be water quality. Already impaired because of land-use changes throughout the watershed, the elimination of historic wetlands, and hazardous waste contamination, water quality cannot be worsened by the construction of new resiliency infrastructure. Our team will help NJDEP understand these limitations, the costs of mitigation, and other design parameters.

The AECOM Team includes numerous water quality modelers and water quality specialists who have evaluated water quality in the metropolitan region (including Newark Bay and its tributaries) for decades. The Team includes HDR staff (formerly HydroQual staff) that developed the System-Wide Eutrophication Model (SWEM), which consists of two sub-models, a hydrodynamic model and a water quality model. The model grid spans the Hudson-Raritan Estuary, and includes Newark Bay, Lower Bay, Upper Bay and their tributaries, as well as the Hudson River, Western Long Island Sound, and Jamaica Bay. The SWEM is a complex estuarine water quality model that addresses a variety of water quality parameters including nutrients (N, P, Si), phytoplankton (C and chlorophyll-a), the dissolved oxygen balance (DO, SOD, BOD5), coliform bacteria, and toxic metals (Cu, Hg, Ni, Pb, Ag, As, Cd, Zn). Our expertise in developing and applying these models is derived from a mature career staff trained in and dedicated to the furtherance of water quality modeling. The SWEM model can be used to predict future conditions resulting from project components.

In addition to applying existing models, the AECOM Team is experienced in developing water quality models for estuarine systems. As noted above and will be noted below in the following sections, HDR has more than twenty years of experience in the development of water quality models for estuarine systems, locally and around the world, for a variety of water quality parameters. The ability to develop models enables our team to expeditiously refine and enhance existing models as will be required to assess the feasibility of this project and to prepare for permitting any new infrastructure.



System-Wide Eutrophication Model (SWEM) Model Grid

NON-STRUCTURAL FLOOD PROOFING SOLUTIONS

As additional options, the Team is thoroughly familiar with and has exercised technical management oversight over a number of various types of non-structural flood proofing options available. Typical nonstructural flood proofing includes:

- Flood proofing at the structure level;
- Elevating the structure (raising);
- Relocation (involves moving the structure to another location away from flood hazards and is a very dependable method of protection and provides the benefit of use of the evacuated floodplain);
- Buyout/acquisition.

Traditionally for any Flood Risk Management projects NEPA guide lines require that a non-structural solution be considered as it often has the least impacts though is most often not well received by local residents. To evaluate these alternatives AECOM(URS) working for the Corps of Engineers has developed algorithms that allow us to rapidly screen large populations of structures to identify the cost effective alternative to consider at each building based on the depth of flooding, the replacement value of the structure, the type of foundation (slab of grade, full basement, crawl space etc. This AECOM(URS) developed software will allow us to very efficiently develop the non-structural plan for the project area.

A few of these practices will be further described in subsequent practices.

FLOOD PROOFING ALTERNATIVE

Our Team has designed components for the flood proofing of residential or commercial properties. In practice, flood proofing can include the placement of walls or levees around individual buildings; elevating structures in-place; placing buildings on fill, posts, piers, walls, or pilings; anchoring buildings to resist floatation and lateral movement; incorporating watertight closures for doors and windows; reinforcing walls to resist water pressure and floating debris; use of paints, membranes, and other sealants to reduce seepage, installation of check valves to prevent floodwaters from entering at utility and sewer connections (wall penetrations); and locating electrical components, circuits and mechanical equipment above expected flood levels. From a flood insurance perspective FEMA only recognizes elevation and not true flood proofing of the building, however it is recognized for non-residential facilities and is certainly an option for some of the warehouses in the area. AECOM(URS) has designed and implemented flood proofing for the Civic Center is West Virginia using a small ring wall and stop log gates across pedestrian entrances.

ELEVATING/RAISING ALTERNATIVES

This practice consists of elevating structures in place by placing buildings on fill, posts, piers, raised foundation walls, or pilings The Team also has experience with some of

the most common methods of retrofitting homes as well as the actual raising requirements raising them to a required or desired Flood Protection Elevation (FPE). This option is considered a viable option if the residential structure is relatively close to the perimeter of the floodplain and high velocity flow or long durations of flooding would not leave the home isolated for extended periods of time.

Federal guidelines generally require that for a home to be raised it should be elevated above the 100- year elevation resulting in the living area above all but the very unusual events. In New Jersey the requirement is an additional foot and in some localities two feet based on local ordinance. Various elevation techniques are available and generally include the lifting the house in place and reconstructing or adding to the foundation below. Another technique, providing the foundation and basement walls can withstand the hydraulic loading, would be to leave the house in place and either build an elevated floor within the house or add a new upper story. The foundation walls then must be retrofit to provide for water to enter and drain from the foundation to equalize hydrostatic pressure on the foundation walls. AECOM normally uses products such as Smart Vent to achieve this requirement.

Federal processes further describe these procedures as follows:

During the elevation process, most frame, masonry veneer, and masonry houses are separated from their foundations, raised on hydraulic jacks, and held by temporary supports while a new or extended foundation is constructed below. The living area is raised and only the foundation remains exposed to flooding. This technique works well for houses originally built on basement, crawlspace, and open foundations. When houses are lifted with this technique, the new or extended foundation can consist of either continuous walls or separate piers, posts, columns, or pilings. Masonry houses are more difficult to lift, primarily because of their design, construction, and weight, but lifting these homes is possible. In fact, numerous contractors throughout the United States regularly perform this work.

Under the New York City Build It Back Program, AECOM prepared plans to raise approximately 600 structures.

A variation of this technique is used for frame, masonry veneer, and masonry houses on slab-on-grade foundations. In these houses, the slab forms both the floor of the house and either all or a major part of the foundation. Elevating these houses is easier if the house is left attached to the slab and both are lifted together. After the house and slab are lifted, a new foundation is constructed below the slab.

For masonry houses on slab-on-grade foundations, some homeowners find it easier to use one of two alternative elevation techniques, in which the house is left on its original foundation. One technique is to remove the roof, extend the walls of the house upward, replace the roof, and then build a new elevated living area inside. The second is to abandon the existing lower enclosed area (the level with the slab floor) and move the living space to an existing or newly constructed upper floor. The abandoned lower enclosed area is then used only for parking, storage, and access to the house.

As part of the NY City Build it Back Program for the Department of Building and Construction AECOM prepared plans to raise approximately 600 structures.

BUYOUT/ACQUISITION ALTERNATIVES

This method involves the purchase of and elimination of flood damageable structures, allowing for inhabitants to relocate to locations away from flood hazards. These plans generally target the homes/other structures that are most frequently flooded and therefore highly likely to have been damaged from prior flooding events.

Within New Jersey, the Passaic River Basin adjacent to the Hackensack River-Meadowlands area already has an active Flood Management (Floodway Buy-out) Program in place. The program was initiated as flooding has long been a problem within that river basin. As described on the USACE New York District Fact Sheet, the program involves the acquisition and removal from the State defined Floodway of approximately 800 homes in the municipalities of Fairfield, Lincoln Park, Wayne, Pompton Lakes, Montville, East Hanover, Pequannock, Little Falls, and Riverdale with the State of New Jersey through the NJDEP as the non-

Federal sponsor. These homes are subject to frequent flood damages as documented in the draft Floodway Buy-out Study prepared by the USACE in October 1995 and purchases can be made as willing sellers and funding permit. Our team has the experience to transport a program such as this, if warranted, as AECOM staff was involved in the development of these processes for implementation.

Under the present DPMC contracts that AECOM(URS) and DEI hold, we have recently prepared the demolition plans, and performed the HUD requisite environmental studies for over 50 homes.

Under the DPMC contract held by AECOM(URS) and Dewberry, we have prepared the plans for demolition, and completed the HUD requisite environmental studies for over 50 homes.

SITE REMEDIATION

Pilot Area 1 contains vast wetland and upland habitats and development with varying levels of contamination. The expansive marsh complexes in southeastern Carlstadt generally have low concentrations of metals that do not exceed the Effects Range Median (ERM) concentrations known to have ecological effects in estuarine environments. The only exception is that sediments within the tidal marsh complex portion of Pilot Area 1 contain concentrations of Mercury above the ERM level of 0.71 parts per million in many areas. However, it is important to note that the upland soil remediation standard is more than one order of magnitude higher than the ERM for Mercury, and that concentrations above upland soil remediation standards are rare in these marshes. Handling and disposing of materials from this portion of the Pilot Area 1 will likely not require remedial activities.

The western portion of Pilot Area 1 contains legacy contamination, including Upper Berry's Creek which was the site of the former Ventron/Velsicol chemical processing facility, and is located within the Berry's Creek Study Area for the USEPA Superfund Program. Mercury and other contaminants have been detected at concentrations orders of magnitude higher than the clean up criteria. Sediments and soils in this portion of the Pilot Area 1 will require special handling and disposal.

If the plan calls for the construction activities and/or disturbance to the sediments in the western portion of the Pilot Area, the AECOM Team is fully equipped to provide remedial services. Our team includes over 20 NJDEP Licensed Site Remediation Professionals (LSRPs) that are fully trained and experienced with the Site Remediation Reform Act process (SRRA; N.J.S.A. 58:10C-1 et seq.).

ECOSYSTEM RESTORATION DESIGN

An integral element of the New Meadowlands will be the Meadowpark which in part will be the enhanced by the biodiversity that will be created by the ecosystem restoration projects that will be constructed to offset the impacts of the berm/ levee construction features. The AECOM Team takes a unique approach to designing ecosystems in the Hackensack Meadowlands. Care must be taken to design systems capable of thriving within this altered environment. The vegetation, tidal hydrology, and substrate have all been altered significantly over the years from development, urbanization and industrialization, and restoring healthy ecosystems within this region can be challenging. For example, understanding the tidal regime in such a complex environment can be tricky when restoring tidal marshes. In many cases, habitat restoration in the Meadowlands includes reintroducing tidal flooding to a site that had been historically disconnected to the tidal influence of the Hackensack River. Grading is often required to establish the appropriate vegetation zonation. It is critical to obtain and understand accurate tidal datum and take into account settlement and potential subsidence of the substrate, sustainable ecosystem restoration may not be achieved. Design elevations need to take into account potential competition from invasive species.

The first step in ecosystem restoration design is to understand the historic and existing conditions. Historic tidal geometry is particularly important when designing a tidal system. Historic geometry along with selecting reference wetlands nearby to the project site can be used to assist in developing design guidelines for hydraulic channel

geometry data, grading, and vegetation zone elevations. An understanding of hydrologic and physical (geomorphological) conditions in natural wetlands can serve as an important guideline to salt marsh restoration design. The physical characteristics of channel length, channel width and wetland area create the physical salt marsh environment to which the vegetation and wildlife must adapt. This can be used for developing design guidance for determining the most stable and suitable channel configurations for a restored marsh.

Understanding the existing conditions of the site and surrounding areas is critical to identifying opportunities and constraints to restoration. Vegetation surveys, wetland delineation, soil characterization (for contamination, texture and nutrients), hydrology analyses, and a review of adjacent land uses all feed into the restoration design. A review of local wildlife species, in particular rare species can be used to create habitats for desired species.

Potential constraints to restoring tidal and/or freshwater wetland habitats in the Meadowlands include:

1. The proximity of Teterboro Airport, and the Federal Aviation Administration position on attracting nuisance wildlife within 5,000 feet of airport facilities,
2. Mercury contamination is pervasive in the region, and sediments often exceed the National Oceanic and Atmospheric Administration's Effects Range Low (ERL) and sometimes the Effects Range Median (ERM) standards for estuarine life,
3. The presence of monotypic stands of Phragmites australis throughout the region that threatens the viability of native plantings,
4. Low levels of salinity in the Hackensack River surface waters allows Phragmites to thrive and potentially outcompete Spartina alterniflora,
5. Surrounding industrial land uses and abundant surface water discharges,
6. Numerous functional and dilapidated tide gates, culverts and berms that disrupt natural tidal hydrology,
7. Adequate area for wetland retreat in response to Sea Level Rise

When developing a restoration plan it is important to determine what functions and values would be desired for the restored wetlands through coordination with the NJDEP and stakeholders. Flood storage, wave attenuation, and improving water quality are all functions that could be enhanced in the Hackensack Meadowlands. Restored wildlife habitat, especially for rare species would also benefit the ecology of the region (as long as it is in balance with public safety and contamination concerns).

The following analyses are conducted prior to developing the conceptual design for Tidal Wetlands:

1. Wetland Delineation,
2. Conduct a Tidal Hydrology Analysis by installing as tide gauges for a minimum of one (but preferably more) lunar cycle to determine local tidal daturns,
3. Biobenchmarking Study - Survey the waterward and landward elevations of saltmarsh communities (low marsh, high marsh, scrub shrub) in nearby reference marshes,
4. Collect data from reference wetlands on tidal channel geometry,
5. Measure salinity levels in the adjacent waterbodies,
6. Soil Characterization Program to characterize pre- and post-project elevations (based on the results of the tidal hydrology and biobenchmarking studies)
7. In higher energy environments a wave analysis should be conducted to determine if design features should be included to attenuate wave energy
8. Numerous functional and dilapidated tide gates, culverts and berms that disrupt natural tidal hydrology,

Although the Hackensack Meadowlands are known primarily for the expansive tidal salt marshes, there are many forested and emergent wetlands that would benefit from enhancement and/or expansion. The following analyses are

conducted prior to developing the conceptual design for Freshwater Wetlands:

1. Wetland Delineation
2. Determine the Hydrologic (Water) Budget by analyzing rainfall and snowmelt data
3. Determine seasonal depths of groundwater by installing and monitoring piezometers for a minimum of a year
4. Soil Characterization Program to characterize pre- and post-project elevations (based on the results of the tidal hydrology and biobenchmarking studies)
5. Determine ground water quality

Once the goals and targets of the restoration plan have been determined, constraints have been identified and the data has been gathered and analyzed, the conceptual design phase can be initiated. Using information on the design criteria obtained during the previous phases and coordination with the stakeholders and the NJDEP, the AECOM Team would initiate the design. Cost effectiveness and ecological enhancement will be the basis of design considerations. The costs associated with material handling and/or offsite disposal are often among the most expensive elements of tidal wetland restoration, and the AECOM Team strives to find creative and inexpensive solutions to material placement.

The AECOM Team would develop alternative ecological restoration concepts for presentation to and discussion with the NJDEP and/or project stakeholders. Through careful collaboration with these interested parties the design will advance to final construction documents.

East Midtown Waterfront Esplanade, NYC

Bush Terminal Waterfront Park, Brooklyn, NY

URBAN DESIGN AND PLANNING IN THE CONTEXT OF FLOOD PROTECTION AND RESILIENCY

Our Team will review the existing proposed development plans within the immediate area, in light of New Meadowlands – Protect, Connect, Grow conceptual plan, in order to lay out a direction for obtaining public and private approvals for the proposed changes. The alternatives considered in the feasibility study will be evaluated and compared against successful mixed use marshland and riverfront developments of similar scale, scope and quality to this project. Recommendations will be made for improvements to the existing plan to improve feasibility and the value of the overall plan while exceeding standard environmental targets and ultimately creating a world class project that leverages every dollar spent on infrastructure to increase quality life with flood-resistant urban land coupled with access to a healthy pubic landscape that offers high quality recreation. Issues for consideration include:

- Existing Land Use, Zoning, and Ownership patterns
- Density and Massing
- Historic and Cultural Resources
- Community Facilities
- Open Space and Public Realm
- Sustainable Development and Environmental Objectives
- Green infrastructure and stormwater management
- Community Resiliency Design and Planning
- Water Dependent Uses – Commercial, Industrial and Recreational
- Urban design and landscape characteristics
- Civic /Public Space and Parks Design

Protection and connection of the Meadowlands and added value of the Meadowpark's views and recreational offerings will lead to opportunities to pursue redevelopment in the newly protected areas. In order to facilitate the redevelopment envisioned by the New Meadowlands concept, re-zoning and up-zoning will need to occur in the area via regional coordination with municipalities and the New Jersey Sports and Exposition Authority. The urban design and planning and landscape design analysis will address existing and future zoning and land uses for the plan. The existing zoning is shown on the next page, **Exhibit 3.15.**

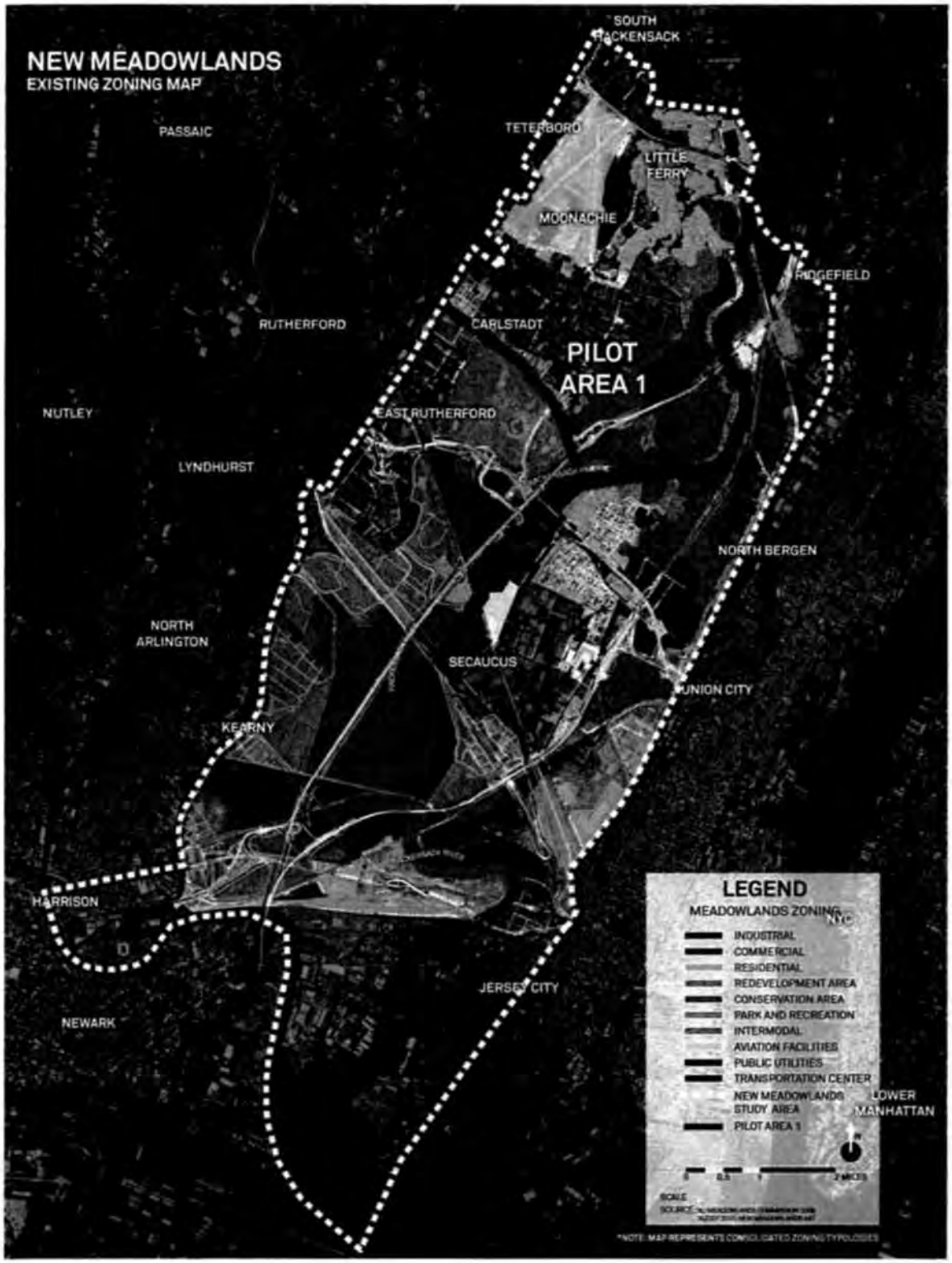
As part of the zoning and land use assessment within the redevelopment nodes, it is necessary to assess locations for types of existing land uses and proposed redevelopment (residential, retail, commercial, industrial/warehousing) and their relationship to transportation (public transit, roadways, multi-modal connections, parking), recreation, public space amenities, and protection infrastructure. For example, Pilot Area 1 proposes changes to the warehouse district in Little Ferry/Moonachie as well as to add residential and some retail development in other locations. Land ownership at potential berm locations will be identified. In addition, energy generation and cost efficient redundancy systems will be explored. When considering land uses, the team will ensure critical infrastructure and facilities are factored into the feasibility analysis.

MAPPING AND ILLUSTRATIVE CONCEPTS

The AECOM Team will prepare a consolidated base map to include the entirety of Pilot Area 1 and surrounding communities. Individual maps will be prepared to better document specific conditions within the study area, and detailed maps will identify specific conditions needed to inform the feasibility study. The team will develop a range of illustratively rich concept plans for consideration in

East Midtown Waterfront Esplanade, NYC

Exhibit 3.15 - Existing Zoning Map



the feasibility study and to enhance communication with stakeholders, such as neighborhood residents and workers. Such conceptual plans will include massing and engineering diagrams of sufficient detail to advance assumptions for determining feasibility, and to prepare a benefit cost analysis.

The urban design and planning team has a unique set of skills and brings a great depth and breadth of experience to provide innovate solutions for creating a dynamic public realm as well as having all of the technical knowledge and skills to assess the feasibility of the required flood protection infrastructure and its integration with the public realm, park, and greenway design and planning, and redevelopment opportunities. AECOM's urban designers and planners utilize design to transform environments through engineering and create world-class public landscapes and places for people.

Establish Future Urban Design Strategies

In coordination with results of the financial viability analysis, the team will identify strategies for how and when plan elements are to be implemented by public and private sources; and identify which parties, public or private, will be responsible for maintenance of various plan elements. The team will lay out a roadmap for suggested urban design standards and phasing of urban design elements of future development scenarios for both short (less than 3 years) and long term strategies.

Financial Viability (Economic Impact)

The Team will start with an assessment of market conditions by completing a market scan to inform our projection of the revenue generation potential for various uses that could be built on newly created waterfront parcels. Our analysis will draw upon both public and proprietary databases as well as conversations with market experts to determine prevailing construction costs, current financing conditions, rents, sale prices, operating costs, vacancy rates, as-of-right and discretionary development incentives and other key assumptions for potential waterfront uses. We will also review the historic velocity of absorption and development in order to project a reasonable rate of absorption for new newly flood resistant areas.

Once we have compiled all relevant market assumptions, we will build multi-year discounted cash flows in order to project reasonable land value ranges associated with each potential waterfront use. Our model will also project real estate and parking taxes that could be generated by new development and will contemplate various PILOT mechanisms that could be employed to redirect a portion of real estate taxes to cover project infrastructure costs.

The team will project a consider build outs for the site that reflects a market-feasible mix of uses, a reasonable distribution of density, infrastructure and open space, and a reasonable development timeframe.

The team will create a multi-phase project feasibility model in order to compare project revenues and costs over time and determine at a conceptual level, the degree to which the project could be self-funding or generate excess funds to support resiliency improvements elsewhere. The model will estimate revenues over time using the team's projections of land values and tax revenues from various uses, the team's development program and the team's projection of the speed at which development could be absorbed over time. The model will compare project revenues to the phased infrastructure cost schedule developed by the team to determine the relative financial feasibility of the project in present value terms.

Given the importance of revenues from real estate development to the project's financial feasibility, the project's infrastructure improvements will likely need to be broken into multiple phases that can be built in line with the absorption of new development parcels. The Team will utilize its project feasibility model to craft an infrastructure phasing plan that aligns revenues from development with upfront costs, ensuring that infrastructure costs are distributed across time in line with incremental revenue generation.

Using the projected preliminary development program, assumed land uses, density, and high-level construction cost estimates and input/output multipliers from federal, state and local sources by industry, we will estimate the economic impacts of the total project. Further, we will estimate likely local and regional economic impacts at build-out:

construction and permanent employment, direct, indirect and induced income.

Benefit Cost Analysis

AECOM is a recognized expert if the analysis of coastal storm damages prevented (benefits). AECOM(URS) Mr. Michael Cannon our Feasibility Area Task Lead has directed our performance in doing the Benefit Cost Analysis for nearly every coastal protection study conducted by the USACE from Manasquan Inlet to Sandy Hook , along the Raritan Bay Shore, the South Shore of Long island and onto the North Shore. There are few companies that can come even close to our resume for conducting traditional BCR computations. Additionally we wrote the book on the use of HAZUS the FEMA Benefit-Cost Analysis (BCA) software. AECOM(URS) worked closely with the Federal Emergency Management Agency (FEMA) to develop and update their Benefit-Cost Analysis (BCA) software to evaluate cost-effectiveness of hazard mitigation projects that are designed to substantially reduce injuries, loss of life, the risk of future damages and economic losses. In addition to development and testing of the software, AECOM supported FEMA in developing default data entry values and the bi-annual versions of the BCA Toolkit consists of the methodologies, software, guidance on the use of standard values, quantification of standard and non-standard benefits and damages, guidance documents, training modules, programmatic requirements, BCA user guidance and manuals, analyst tools, replication of identified software issues, and oversight of beta testing of updated software.

The BCA Toolkit covered major natural hazards including:

- Flood (Riverine, Coastal Zone A, Coastal Zone V)
- Hurricane Wind
- Hurricane Safe Room
- Damage-Frequency Assessment (for unknown hazard frequencies)
- Tornado Safe Room
- Earthquake
- Wildfire

Since 2003, AECOM delivered more than 320 nationwide interactive BCA trainings lasting from 0.5 To 4 days for states, communities, and consultants in 50 States, Territories and Indian Tribes. AECOM also supported the FEMA BC Helpline for 8 years for inquiries and responses involving states, communities, consultants, and residents via email and toll-free telephone systems. Between 2003 and 2014, we responded to over 6,500 inquiries with minimal client oversight about the software installation and use, hazard analyses, FEMA BCA policies, user identified software issues, and event frequency analyses. Finally we have conducted cost-effectiveness reviews for over 4,000 Hazard Mitigation Assistance (HMA) funding applications for every natural hazard and mitigation project type and in every State and the five U.S. territories.

- Value of Lost Time
- Traffic Delays for Roads and Bridges
- Displacement Time and Cost
- Life Safety
- Loss of Fire Station Services
- Loss of Emergency Medical Services
- Loss of Hospital Services
- Loss of Police Services
- Loss of Electric Services
- Loss of Wastewater Services
- Loss of Water Services

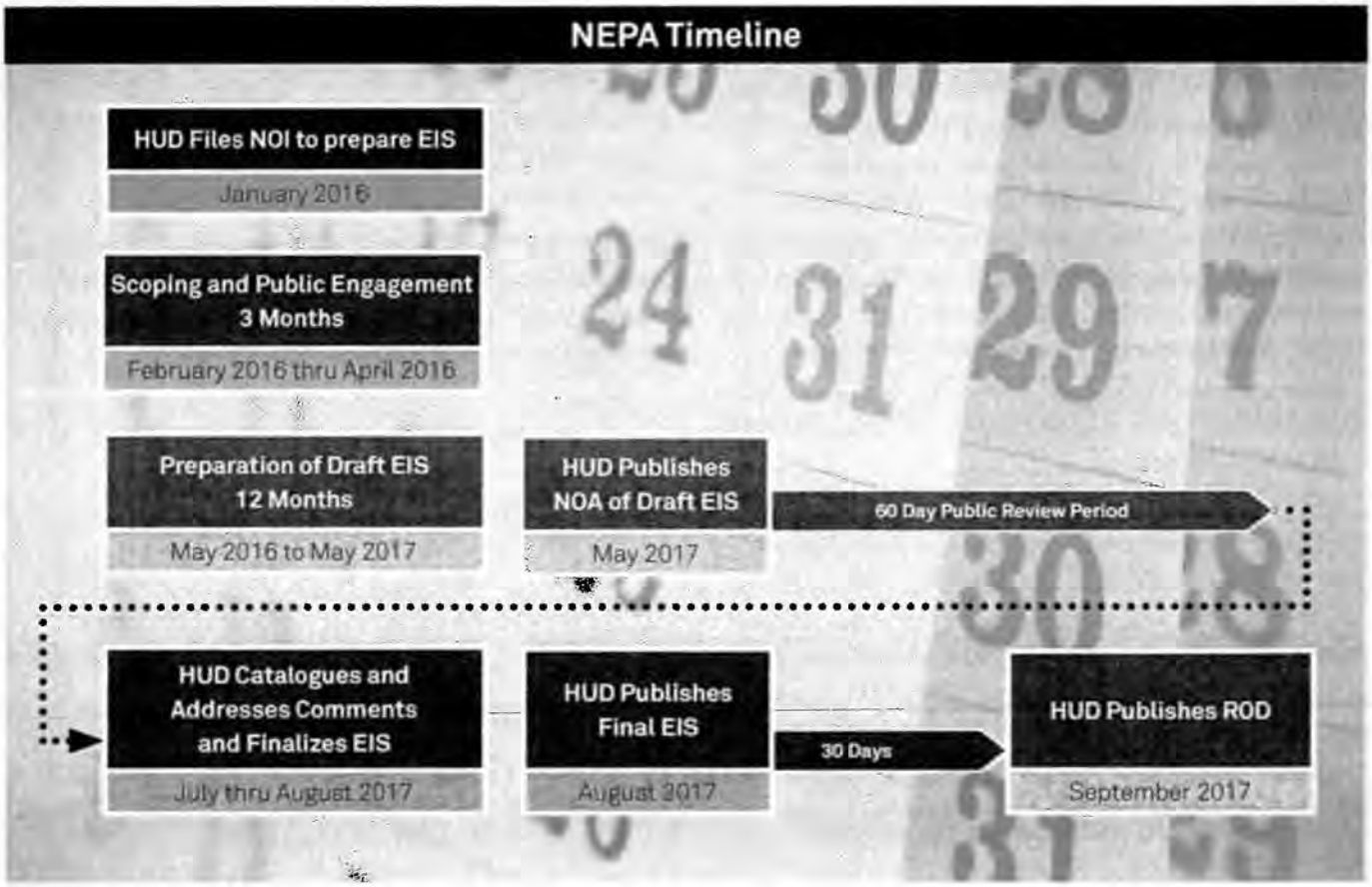
Also current BCA software (v5.1) includes following benefits:

- Sea level rise
- Mental stress
- Volunteers time value
- NFIP insurance program management savings

NEPA EIS/ PUBLIC OUTREACH

A parallel action to the Feasibility Study and of equal importance will be the timely development of the Draft NEPA EIS. We have assembled a project team to meet the goal of preparing a Draft EIS no later than May 30, 2017 and a subsequent FEIS and ROD that selects the preferred alternative based on a robust and defensible environmental assessment and public review process. Our project team has demonstrated experience in successfully completing the Feasibility Study and EIS process concurrently, particularly for major flood mitigation and similarly complex projects. Our approach has been founded on integrating Feasibility Study and NEPA task teams, particularly key project leadership and technical staff who are identifying and evaluating recommended project alternatives, and a highly coordinated public outreach and environmental review process that takes advantage of key project developments to educate and inform the public when screening alternative concepts for design and construction feasibility.

Working with NJDEP and HUD's Office of Environment and Energy, we will prepare a NEPA Scoping Plan that will recommend a scoping strategy and schedule, recognize anticipated/projected interested parties (e.g., federal, state, local and tribal governmental agencies and private individuals and organizations), recommend appropriate methods to initiate contacts and facilitate comments, and identify venues for public meetings and other strategic communications. The Implementation Plan and Schedule will be prepared with particular attention to the EIS scoping and public outreach requirements under NEPA and HUD regulations implementing NEPA (24 CFR Parts 50 & 58). The NEPA scoping process will also be integrated into the overall Citizen Participation Plan applicable to CDBG-DR funded projects and the proposed Citizen Outreach Plan, including the anticipated outreach and public involvement activities identified in Action Plan Amendment Number 12.



Specific community and stakeholder outreach objectives for the RBD New Meadowlands project scoping include the following:

1. Help the public and agencies gain a clear understanding of the purpose of and need for the proposed action(s) and the alternatives being reviewed and developed for future mitigation;
2. Promote a broad understanding of the Feasibility Study and NEPA process;
3. Develop two-way communication methods with interested public to facilitate information sharing; and
4. Clearly communicate the public's role in the planning process and clarify the type of public input that will be most relevant and useful.
5. Comply fully with NEPA (42 USC § 4321), HUD regulations for implementing NEPA (24 CFR Parts 50 & 58) and other applicable requirements in the project Statement of Assurances throughout the planning and EIS process.

The Scoping Plan will build upon the collaborative planning and community outreach conducted during the earlier RBD competition, capitalizing on what went well and learning from lessons that require improvement. The Scoping Plan will form the basis of the NEPA scoping effort and establish the schedule needed to move forward with EIS process. Our intimate knowledge of local issues, particularly as related to existing natural resources and infrastructure, will allow us to develop a comprehensive and inclusive list of interested parties, while recognizing key individuals and organizations with specific interests.

The CEQ under the National Environmental Protection Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) defines scoping as an "early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). The objectives of the scoping process are to:

- Identify and engage potentially interested parties;
- Identify and convey public and agency concerns;
- Identify a range of feasible flood mitigation alternatives that suite Pilot Area 1; and
- Establish a public record.

Our past experience on projects of similar scale and complexity in the Metropolitan area, such as the New York/ New Jersey Harbor Navigation Improvement Study EIS (for the USACE – New York District), the Comprehensive Port Improvement Plan (CPIP) EIS (for the EPA) and the Hudson Raritan Estuary Comprehensive Restoration Plan (for the USACE – New York District), will allow us to recommend proven scoping strategies and communication methods that have been well-received by local agencies and organizations.

Examples of these strategies include:

- One-on-one meetings with elected officials, with DPMC/ DEP HUD coordination;
- Interagency work groups on key issues (e.g. MIMAC for Wetland Mitigation);
- Technical working groups and public input groups in conjunction with NEPA;
- Citizens advisory committees; and
- Focus group discussions on specific areas of concern or perceived risks (e.g., effect of climate change on design-storm standards).

We are familiar with the stakeholder groups and milestones established by NJDEP and Dewberry on the RBD Hudson River (Hoboken) Project, and will work with NJDEP to tailor this framework to suit RBD New Meadowlands.

The Scoping Plan will identify the purpose and need of the action – to implement the first phase of the flood mitigation project in Pilot Area 1 – a description of the action and project attributes to be considered, and a description of the impact evaluation methodologies. The Scoping Plan will be the blueprint to the scoping process and provide the basis of the NEPA public outreach. We will prepare and publish the Notice of Intent (NOI) to prepare an EIS.

Using the information identified during Task 1 and 2 and other recent flood mitigation and infrastructure EIS's we will prepare a Draft EIS, Final EIS and ROD that provides comprehensible and defensible information sufficient to support NEPA document requirements for review and approval. The DEIS/ FEIS will address social, economic and environmental issues in accordance with HUD and CEQ guidance and applicable laws for review by all involved parties. Individual DEIS/ FEIS chapters will include detailed descriptions and analyses of the alternatives as necessary, while certain sections will also summarize and highlight information contained in the technical supplemental reports prepared for each area of impact analysis.

PROJECT DESIGN

Once the Feasibility Study and EIS are approved and upon issuance of a Work Order for Design Services, the Project Manager will assemble a design team from our vast resources. The AECOM team recognizes there are unique differences between the design of successful Ecosystem Restoration Projects and Flood Control / Urban Design Projects, and have embraced that difference in selecting two separate Task Area Leaders for the Design Phase of this project; a Flood Risk Mitigation Design lead and an Ecosystem Restoration Design Lead.

Design efforts will incorporate any changes in the field, review and updating of design criteria/guidance and be reflective of general agreements made between stakeholders with regard to project features. In general, design efforts will include:

- Finalizing coastal modeling, hydrographic and hydraulic analyses;
- Obtaining additional soil borings (via geotechnical effort), bathymetric and topographic surveys as required;
- Conducting intrusive site investigations for any properties suspected of containing contaminants
- Drafting a specifications list for major items;
- Draft list of drawings
- Preparing coastal, hydrologic and hydraulic geotechnical, structural, mechanical, electrical, hazard mitigation and corrosion reports as necessary
- Developing the design drawings – including analysis from the key disciplines (coastal, geotechnical and structural) ;
- Civil layout of the proposed features including plan and profile of the line of protection features and utility relocations, grading for ecosystem restoration plans etc;
- Permitting;
- Specification Preparation
- Coordination with public utilities, resource and transportation agencies;
- Performing value engineering;
- Constructability review

To promote an aggressive bidding atmosphere, to meet funding stream constraints and to allow parallel contracts to proceed simultaneously, provided they are not fiscally constrained, we envision multiple bid packages for this project. We see levees, floodwalls, drainage, pump stations and closure gates to be the primary elements of the flood mitigation project though building buyouts or raising of outlier properties may be shown during the feasibility phase to be the cost effective alternative. Green infrastructure will be included into the design to address the overall resiliency of the project by reducing urban runoff, including such features as the development of rain gardens; and through our Urban Planners parks that serve as points of destination while doubling as storm water detention and recharge areas during times of storm events; ecosystem restoration sites that serve to reduce runoff, provide bio-diversity, and filter runoff pollutants. The construction of these added elements can also be used to foster the cleanup of some contaminated sites. Integrated in a phased approach will be remainder of the "Meadowband" vision, the berm portion of the levee, which is to create a transit corridor for bus or possibly light

rail service that could extend into Hackensack where it could eventually link with the proposed extension of the Bayonne-Jersey City light rail system; providing access to many of the commercial and job centers in the region. The AECOM team has the demonstrated experience in all these areas to be able to design a world class resiliency project that will protect and connect the area in a manner that will provide the economic stimulus for the area to grow. Our Urban Planners are available to meet with the local communities and New Jersey Sports and Exposition Authority (formerly the New Jersey Meadowlands Commission) to solicit their input and to craft a vison and provide suggested ordinance and master plan revisions that would facilitate the region meeting its full potential.

As provided by the examples shown above in the feasibility phase discussion our design team has performed similar flood relief design services both locally and nationwide including for 25 miles of levee repairs following Hurricane Katrina, and recently for nearly $60 million in construction in New Jersey for the USACE as part of the Green Brook Flood Risk Management Project. Additionally, we are presently providing design services for resiliency projects in Bridgewater New Jersey for American Water New Jersey at their Raritan River Plant and for Passaic Valley Sewage Commission at their Newark Facility one of the largest Wastewater treatment facilities in the State.

With regard to the ecosystem restoration elements of this project both as mitigation and for ecosystem enhancement as part of building a resilient community we have demonstrated throughout this package our ability to design successful ecosystem restoration projects. The AECOM Team takes a unique approach to designing ecosystems in the Hackensack Meadowlands. Care must be taken to design systems capable of thriving within this altered environment. The vegetation, tidal hydrology, and substrate have all been altered significantly over the years from development, urbanization and industrialization, and restoring healthy ecosystems within this region can be challenging. For example, understanding the tidal regime in this environment can be complex when restoring tidal marshes. In many cases, habitat restoration in the Meadowlands includes reintroducing tidal flooding to a site that had been historically disconnected to the tidal influence of the Hackensack River. Grading is often required to establish the appropriate vegetation zonation. It is critical to obtain and understand accurate tidal datum and take into account settlement and potential subsidence of the substrate, sustainable ecosystem restoration may not be achieved. Design elevations need to take into account potential competition from invasive species. Marsh sediments contaminated with mercury and/or dioxin are also an important consideration when restoring wetlands in the Meadowlands.

Permitting

Permitting and regulatory requirements will be a major consideration during the Feasibility Study and the NEPA EIS. Preparation of the actual permit applications will occur coincident with the initiation of project design. Preparation of the actual permit applications will occur coincident with the initiation of project design. Pilot Area 1 is located within the Hackensack Meadowlands District (District) that extends from Kearny and Jersey City in the South to Ridgefield, Little Ferry, and Teterboro in North. The District is unique in that land development is governed by the New Jersey Meadowlands Commission, which is now part of the New Jersey Sport and Exposition Authority (NJSEA). In addition to having a separate governing body for land development, the District is unique because it contains vast expanses of densely developed urban areas interspersed with vast areas of vital natural resources including tracts of contiguous tidal wetlands and waterways, and habitat for hundreds of plant and animal species such as migratory birds and fish. The proposed route of the Pilot Area 1 berm, along its eastern and southern boundaries in particular, is located along tidal and freshwater resources; most notably, it borders the Richard P. Kane Natural Area, a nearly 600-acre tract of protected tidal wetlands that border the Hackensack River.

The AECOM Team understands that natural resources in the District are vital to the area and are strictly protected through federal, state and local regulatory programs. Therefore, our approach to permitting Pilot Area 1 would be to perform a desktop analysis to identify and map potential developmental constraints such as wetlands, floodplains, streams and threatened and endangered species habitat prior to project design. The constraints map would then be

used to guide project design in order to reduce impacts to natural resources.

As the project design develops, the permitting approach would include a thorough investigation of all regulatory programs applicable to the development of Pilot Area 1. These programs include the Federal Clean Water and Rivers and Harbors Acts (regulated by the U.S. Army Corps of Engineers); the New Jersey Department of Environmental Protection (NJDEP) Freshwater Wetland Protection, Flood Hazard Area, Coastal Zone Management and Waterfront Development and Water Quality Programs; the New Jersey Sports Exposition Authority land use regulations; and, the coordination with the Bergen County Soil Conservation District. A description of the regulatory programs and the potential permits and approvals required for the development of Pilot Area 1 are provided below.

Federal Permits and Approvals

The US Army Corps of Engineers (USACE), under Section 404 of the Clean Water Act and a 1993 Memorandum of Agreement (MOA), has jurisdiction over tidal wetlands, navigable waters and wetlands located within 1,000 feet inland of navigable waterways in the State of New Jersey. In order to determine the extent of wetlands in the vicinity of Pilot Area 1 a wetland delineation would be performed and a USACE Jurisdictional Determination would be obtained from USACE. Depending on the extent of fill and/or excavation activities within wetlands associated with the development of Pilot Area 1, a USACE Nationwide Permit, General Permit or an Individual Permit would be required. An Individual Permit application requires a Public Notice and potentially a public hearing. The timeline for approval can be a year or more.

State Permits and Approvals

In New Jersey, Wetlands and watercourses are generally regulated by NJDEP under the Freshwater Wetlands Protection Program for wetlands located landward of the Upper Wetland Boundary (UWB) and the Coastal Area Management Program for tidal wetlands located waterward of the UWB. Most of the wetlands mapped by NJDEP along the proposed route of the Pilot Area 1 berm are located waterward of the UWB. Any regulated activities within these wetlands would require a coastal wetlands permit. Additionally, activities within wetlands located landward of the UWB would require a Letter of Interpretation (LOI) to verify the location and extent of the freshwater wetlands and potentially a freshwater wetlands permit. Depending on the extent and nature of activities within freshwater wetlands, a general or individual permit would be required. Individual permits may require public hearing. The timeline for approval of a complete application is 180 days.

The flood hazard area floodplain is regulated under the Flood Hazard Area Program. Development within the flood hazard are would require an individual flood hazard area permit from NJDEP. The timeline for approval of a complete application is approximately 90 days. If a public hearing is required the timeline may be extended. A water quality certification from NJDEP would also be required to support a permit application submitted to USACE under the Section 404 of the Clean Water Act.

Local Permits and Approvals

The NJSEA is the development approval authority within the District. Any development requiring site improvements (including the placement of fill) would require Zoning Certificate approval. In addition, certification of a SESCP would be required from the Bergen County Soil Conservation District to obtain authorization under the NJDEP Stormwater Construction General Permit (5G3).

Pre-Application Meetings

Pre-application meetings with the regulatory agencies are always useful early in the planning process for any project that has the potential to encroach upon protected resources. At the conceptual design phase, the regulators can often work with the project proponents to steer the development away from triggers that could cause project delays or lengthy review periods. For projects within the Flood Hazard Area these meetings are particularly useful as the NJDEP Engineers will discuss required stability analyses and analyses to ensure that projects will not cause flooding issues elsewhere, particularly in fluvial systems.

Development of permit application materials would begin early on in the design process. Initial data gathering and formation regarding the existing conditions would be the primary step. As the design advances and 50% design drawings are available, the remaining portions of the applications can be developed. Because the AECOM Team believes that the best approach is a design based permit application, a more comprehensive application package will be prepared with each phase of design (50%, 95% and 100%). Based on the timelines of the permit approval processes outline above, it is anticipated that permit applications would be prepared and submitted approximately one year prior to the anticipated start of construction to ensure all required approvals would be obtained when construction commences.

CONSTRUCTION ADMINISTRATION

The final phase of the overall contract is performing construction administration support services for the various phased bid packages. AECOM understands there will be a separate award to provide CM/PM services and that the AECOM role is limited to the construction administration services. This phase, which comprises the construction support to DPMC/DEP begins at the completion of the plans and specifications, will require a series of well managed tasks that require interface with DPMC and the Awarded Contractor. These tasks include: Bid Support and Pre-Construction Assistance; Responding to RFIs, Periodic Inspection/ Technical Support to Construction Management Firm.

The AECOM Construction Administration Team's work flow in this phase of the project is highlighted in **Exhibit 3.16** to the right.

Bid Support and Pre-Construction Assistance

This task consists of activities associated with the bidding and contract negotiation process. AECOM understands that the construction contracts will be advertised for bid by DPMC/DEP based on the plans and specifications provided by the design team identified above, and awarded to the lowest responsible bidder. Having prepared the

Exhibit 3.16

Construction Administration Work Flow

plans and specifications, during this selection process AECOM will attend any pre-bid meetings, respond to questions from bidders, review the bids received, including the apparent lowest responsible bidder, and provide a Recommendation of Award to the DPMC/DEP Project Manager.

AECOM recommends implementation of a bid process that begins with bid package development based on the most feasible, acceptable and suitable packaging of project sites on a geographic basis. The package should be large enough to encourage local competition with competitive bids, yet of a size that it is not too large for a single contractor to handle. AECOM will assist DPMC/DEP with contract negotiations as needed. In addition, AECOM's corporate legal staff is available to conduct a Risk Analysis of the contract language and make recommendations to DPMC/DEP for strengthening of your position.

Following the bid award AECOM will assist during pre-construction activities with the following:

- AECOM will attend and assist DPMC/DEP and the CM/PM Contractor, as requested, in conducting the pre-construction or partnering meeting with the Awarded Contractor to familiarize them with the following items:
  - The interrelationship between DPMC/DEP, the CM/PM contractor, Awarded Contractor and its subcontractors, and other agencies and/or public or private entities as well as the role of AECOM.
  - The CM/PM contractor will address:
    - The Project Control and Scheduling system established for the project.
    - The basis for reporting, preparing and processing progress payments and monitoring continuous coordination of construction activities.
    - DPMC/DEP procedures which the Awarded Contractor is to follow during the course of their contract.
    - EHS requirements

Construction Phase

AECOM's role during the construction phase will be primarily limited to supporting the CM/PM contractor whom will be responsible for oversight of the project. AECOM will address RFIs requested by CM/PM contractor and review shop drawing submissions they deem to be best addressed by the Design Engineer. Additionally, AECOM will perform in a periodic inspection role when specific issues arise that are best addressed by the Design team.

Potential Challenges

We have identified for this project a number of key challenges that may affect the performance of the project; and have developed effective mitigation strategies based on our experience with similar programs. Provided below is a summary of program challenges and mitigation strategies to support program success.

Exhibit 3.2 - Potential Challenges and Mitigation Measures

CHALLENGE	MITIGATION MEASURES
Maintaining/Meeting the Schedule As indicated in the Federal Register notice, the Disaster Relief Appropriations Act(Public L. 113-2) requires that funds be obligated not later than September 30, 2017 and is tied to approval of a CDBG-DR Action Plan Amendment that can only be completed after the Draft NEPA EIS is complete, setting a deadline for the Draft EIS by May 30, 2017. If the schedule is not met the funding may not be provided. Major factors that could impact the schedule include: • Staffing • Permitting Process (State and Federal approvals required to conduct soil borings and other investigations during the design phase) • Property Access Rights	AECOM has managed staffing scale up for similar programs by assigning the experienced core management team including Deputy Project Managers and a Project Executive Committee that know how to effectively coordinate and engage hundreds of employees from multiple offices for seamless and timely project execution. In addition, the AECOM team will identify all potential permits early on in the planning phase and begin processing as soon as practicable. AECOM's' extensive experience with local, state and federal permitting will mitigate this factor. Property Access rights can often times be the critical path to obtain field data including wetland delineation, survey and borings. Since the early stages of this project are Feasibility Level design, LiDAR data and Aerial photography could be used which eliminates most of the survey issues associated with access. Preferred boring locations can most often be shifted to avoid a hostile property owner and we will obtain existing data to the extent possible. If wetland delineation is an issue for the feasibility stage of study NJ Land Use Maps and USFWS NWI can be used.
Contaminated Soils and Structures AECOM anticipates that several of the properties along the project alignment will be contaminated. If any structures are to be demolished pursuant to HUD requirements, lead based paint risks must be identified and addressed. Other types of contamination could also be present. The presence of contaminated soils and any structures that might need demolition could have a significant impact on cost and schedule. Throughout this region there is also significant concern among the resource agencies about mercury concentrations deep in the marsh sediments, and the effects of mercury on the estuarine organisms and wildlife. Attractive nuisance issues and sediment contamination must be addressed as a part of any wetland mitigation or ecosystem restoration plan.	AECOM has addressed similar issues on several USACE flood control projects. Our Approach is first to avoid, second minimize and finally mitigate/remediate. To initially identify potential sites of concern, AECOM's Cathy Bryant, LSRP will conduct a Phase I corridor investigation using ASTM 1527-13 guidance including Federal (e.g., NPL, CERCLIS, RCRA, ERNS, etc.) and State (e.g., UST, LUST, SHWS, NJ Spills, etc.) database reviews, site reconnaissance and a historical review (e.g., Sanborn maps, USGS maps, and aerial photographs). In addition, where avoidance is not viable, AECOM's extensive experience in the environmental field will allow us to address this challenge effectively. Additional Site Investigations (SI) and Remedial Investigation (RI)

Exhibit 3.2 - Potential Challenges and Mitigation Measures (continued)

CHALLENGE	MITIGATION MEASURES
Contaminated Soils and Structures (continued)	Based on the Phase I review some properties may require additional environmental services to include Phase II site investigations and remedial investigations to confirm the presence and extent of contamination. AECOM's team of environmental professionals to perform these services include over 20 New Jersey Licensed Site Remediation Professionals (LSRPs) available to support the projects. The SI and RI phases could include the following, as required based on the site conditions: ▪ soil borings ▪ surface and subsurface soil sampling; ▪ groundwater well installation ▪ groundwater sampling; ▪ sampling of any other potentially impacted media ▪ evaluation of groundwater flow; ▪ evaluation of risks and potential impacts ▪ preparation of investigation reports. From results a feasibility level remediation plan will be developed and incorporated into feasibility cost estimate and eventually into the bid documents. Implementation of the plan should be closely monitored during the construction oversight phase by Construction Management Firm assigning inspectors under the CM/PM contract to these special cases with a mix of environmental and construction management experience.
Poor Soil Conditions In many areas it can be expected that the levee or berm as it is referred to will be founded on Meadow mat, consisting of fibrous organic peat and silt, 4 feet thick or more. This presents a stability and settlement concern and may require the use of special construction equipment or protocols.	AECOM and Matrix (SBE) have extensive geotechnical experience with the design and construction of levees and embankments on soft ground. Several of our geotechnical staff has also worked on projects founded on the silt and peat soils of the Meadowlands including landfills, highway embankments, and retaining structures among other facilities. Our staff will use that experience to overcome this challenge.

Exhibit 3.2 - Potential Challenges and Mitigation Measures (continued)

CHALLENGE	MITIGATION MEASURES
Poor Soil Conditions (continued)	Following the proper field and laboratory characterization of the underlying soil conditions, the appropriate construction methods will be identified and confirmed with seepage/slope stability modeling and analysis. Such methods may include preloading/ staged construction with instrumentation monitoring of the soil strengthening and settlement progress and/or the use of various ground improvement methods such as stone columns, sand/wick drains, cement-soil mixing, reinforced-concrete shear pins, high-strength geotextiles as base reinforcement, and reinforced slope and retaining wall design. Following Hurricane Katrina, our geotechnical staff had worked on similar levee construction in the Louisiana area For example, in Louisiana they designed and reconstructed 25 miles of levees and employed various ground improvement methods to accelerate construction. Such methods included wick drains, high-strength geotextiles, and deep mixing methods for ground improvement. The existing levees were raised approximately four to seven feet with a protected side raise on virgin ground. The new levee construction required embankment construction in two stages to heights of 18 to 22 feet above the existing grades of the tidal marsh. The raises were accomplished with the use of stability berms, wick drains and high-strength geotextiles. Soil-cement mixing (deep mixing) was also utilized under the drainage structures and pump station. The design methodology and analyses for the above project included: a SEEP/W finite-element seepage analysis to design the drainage blanket and wick drains; a fully instrumented test embankment with three wick drain spacing (3 ft., 5 f.t, and 7 ft.) to optimize the wick drain design; slope stability analyses with high-strength geotextiles; site characterization of soft clays with triaxial shear UU testing, cone-penetrometer testing, and vane shear testing; and stability analyses of soil mixing panels under drainage structures. Using similar design techniques our staff can overcome the challenge of poor soil conditions.

Exhibit 3.2 - Potential Challenges and Mitigation Measures (continued)

CHALLENGE	MITIGATION MEASURES
Permitting Constraints and Mitigation Requirements This project will have to go through a number of permitting hurdles and will be required to provide mitigation for project impacts. There are several State and Federally regulated resources that could be impacted by the development of the berm. The USACE, under Section 404 of the Clean Water Act and a 1993 Memorandum of Agreement (MOA), has jurisdiction over tidal wetlands, navigable waters and wetlands located within 1,000 feet inland of navigable waterways in the State of New Jersey. Wetlands and watercourses are also regulated by NJDEP under the Freshwater Wetlands Protection Program for wetlands located landward of the Upper Wetland Boundary (UWB) and the Coastal Area Management Program for tidal wetlands located waterward of the UWB. Lands within the 100-year floodplain are regulated under the Flood Hazard Area Program. While "net fill" requirements will not come into play as this is a flood control project in a tidal area, a rise in the fluvial water surface will be scrutinized. The flood control structure will affect stormwater drainage and a demonstration of post project conditions will be required. The project has the potential to result in a significant amount of wetlands impact that will be required to have mitigation constructed to offset the impact. While there are expansive opportunities to construct mitigation projects in the Meadowlands, mitigation can be costly.	The AECOM team is familiar with these challenges, and have worked through them on other flood control projects. For the Green Brook flood control project for example AECOM(URS) obtained four different Flood Hazard Area permits and two individual Wetland permits from NJDEP LURP. As part of the permit approval process AECOM has been involved in the monitoring and adaptive management of the 179 Acre Finderne Farm Wetland, a mitigation site being constructed to offset impacts of the initial phases of the project's construction. Additionally our sub-consultant HDR who is leading our ecosystem restoration efforts on this project, has been assisting Evergreen Environmental, LLC to develop mitigation banks in the Hackensack Meadowlands. To date, three sites totaling about 135 acres have been studied to determine the feasibility of developing economically-viable mitigation banks. HDR assisted Evergreen to obtain NJDEP Land Use Regulation Individual Flood Hazard Area and General Coastal Wetland and USACE Nationwide permits for those sites that have moved forward and expects to do so this fall for the latest 22 acre parcel. HDR also recently permitted and designed a forested freshwater wetland project in the Meadowlands for the Port Authority of New York and New Jersey. In selecting project alignments we will set the line of protection away from the river/stream corridors to the extent practicable, to minimize encroachment on the water courses and will look to minimize impacts to the wetlands, but as demonstrated above we have the ability to design mitigation sites to overcome the permitting challenge.

A - DYNAMIC CONSULTANT'S PROCEDURES IN COMPLETING ASSIGNMENTS UNDER THIS TERM CONTRACT, INCLUDING APPROACHES USED ON SIMILAR CONTRACTS OR PROJECTS

Based on experience gained from working on numerous Indefinite Delivery Term Type contracts a key to successfully managing and performing on a Term contract, where multiple task orders are issued, is to be able to expand and reduce staff to meet the ever changing demands of the contract and to bring the right resources to bear as the project progresses. With more than 100 staff identified for this project backed by a team of over 100,000, the AECOM Team has the depth and breadth of staff to meet these requirements.

Delivery Orders: Timely and successful delivery order completion will require ongoing coordination among DPMC/DEP, the AECOM Project Manager, the team's Deputy Project Managers, the Task Area Leaders and the technical resources assigned to direct each aspect of a delivery order. We will institute the following coordination measures.

- A standardized delivery order format will be developed in collaboration with DPMC/DEP at the inception of the project to ensure consistency and completeness. These formats will cover technical, administrative, logistic and other procedural matters, and will be disseminated to each project management team involved in this contract. These formats will be updated by AECOM as part of our continuous improvement program and as agreed to by DPMC/DEP.
- Monthly progress reports will be prepared by the Project Manager and review by the Project Executive, then delivered to the DPMC/DEP Project Manager to keep him/her apprised of the project.
- Each assignment received from DPMC/DEP will be received by the Project Manager who will meet with the Deputy Project Managers and appropriate Task Area Leader(s) to discuss the technical leads for the assignment based on experience level and work load. Each deliverable defined by the Work Order Statement of Services will be assigned a technical lead, who will be the most competent individual available and who will report up to their Task Area Lead and office Deputy Manager to the Project Manager. This person will act in a technical capacity as well as a management capacity for the technical activity statement task and will be directly responsible to the office Deputy Manager for all matters relating to technical, cost and schedule performance for that deliverable. The discipline manager/ technical lead will report weekly to the Task Area Leader and Deputy Project Manager, as appropriate, to review performance and to suggest any changes deemed necessary. Project status and any changes will then be discussed by the management team during their weekly telephone calls and, if deemed appropriate by the Project Manager, with the DPMC/DEP Point of Contact for that particular delivery order. If changes require additional resources beyond the dedicated team, the Project Executive will be consulted to bring corporate resources to bear on the issue.
- Special Problem Reports, though rare, will be prepared for any difficulty or unanticipated event that may jeopardize a delivery order's technical quality, schedule or, rarely, budget. Each SPR will document the nature and size or extent of the problem and a proposed course of action. Should the proposed course of action involve a change in work scope, the AECOM Project Executive will immediately advise the DPMC/DEP Project Contact to discuss appropriate corrective actions. If a change in work scope is not judged appropriate, we will adjust our approach internally to resolve the problem.

Individual Delivery Order Accomplishment

Identifying technical resources for individual delivery orders will be done quickly, typically with no more than two days needed to assemble a team. If appropriate, the AECOM Project Executive and Project Manager will meet with DPMC/DEP staff to discuss the delivery order assignment. Such a discussion may be helpful in further determining specific requirements of the assignment, identifying available data, and assessing explicit concerns that may not have been described in full detail in the initial scope of services related to the assignment. Exhibit 3-2 illustrates the delivery order process.

Each delivery order will be managed as follows:

- Management Team comprised of the Project Manager, and Deputy Project Managers assigns delivery order technical resources and resource leads from the team; considering work load, and type and level of resources required. While AECOM as the prime is responsible for the final work products on all task orders, typically, a specific task order or significant task within a task order will be assigned to either AECOM or one of the primary subconsultants or small business enterprises in its entirety to perform the work in order to minimize coordination and facilitate production. On occasion the work will be divided across two or more of the team members where it is deemed in the best interest of the state in providing a quality on time deliverable. When this is the case an AECOM staff member will lead the task order effort. Since the vast majority of all anticipated work will be performed by the team's NJ staff coordination between team members is minimized.
- Meet with DPMC/DEP if necessary to clarify Statement of Work (SOW)
- The Project Manager, working with the Deputy Manager(s), Task Area Leaders and Discipline Leads, completes the work plan and prepares the delivery-order fee proposal. The proposal may include costs and supporting information from proposed sub-consultants. The Project Executive will review the proposal before its submission to DPMC/DEP. The Project Executive and Project Manager will discuss the proposal and SOW with DPMC/DEP as necessary to reach a mutually agreeable position.
- Beyond the distribution of work between AECOM and its primary subconsultants the Project Manager will consider the need to use local specialty sub-consultants to meet the needs of the SOW and to meet our Small Business Objectives. If additional services such as drillers, laboratory services, etc. not already considered in the "all inclusive labor rates" are deemed necessary or to be in DPMC/DEP's best interest, AECOM has a FAR-compliant procurement system in place to bring on the necessary local or specialty sub-consultants to provide DPMC/DEP with cost-effective specialized experience by scoping the needed services, soliciting three bids and analyzing the bids to assure the state the best value.
- After appropriate DPMC/DEP personnel approve the technical resource needs for each delivery order, an internal "kick-off" meeting will be held for the assigned technical team. The delivery order specific PMP including: reporting chains, document controls, guideline and specification standards, abbreviated Scope of Services, budgets, deliverable schedules and Quality Management requirements will be presented.
- Throughout the duration of each delivery order, the Project Executive and Project Manager will be responsible for final product quality within the contractual time and budget requirements. Using our computerized cost and control system, the Technical Lead and the Project Manager will have access to a weekly breakdown of current and cumulative costs and labor hours by category (direct labor), travel and other direct costs - a proven vehicle for maintaining project control.
- Deliverables as defined by the task order and other documents required under the provisions of the delivery order will be submitted to DPMC/DEP only after detailed checking and Internal Independent Technical Review in accordance with the QC program as described in Section 3D.
- The AECOM-assigned Quality Assurance Officer, Mr. Ed Sullivan, PE, will periodically conduct Quality Assurance Audits, to assure adherence to the Quality Control Plan procedures.

The final step of each delivery order is the team's demobilization and debriefing. Each debriefing will consist of two parts:

- **First, DPMC/DEP and the AECOM Team staff will hold a debriefing.** Frank and open discussions will be held with the entire team, and suggestions will be made as to where and how team performance could have been improved and initial submissions strengthened. These debriefings should help determine if delivery order requirements were met, and, of equal importance, if the Term Contract Selected Service Performance Area goals and objectives were met. If not, the debriefing will be a mechanism to sharpen the team's skills and the DPMC/DEP interaction and help AECOM better understand the state's requirements for future delivery orders as part of our continual improvement process.
- **The second stage of a debriefing will take place between the DPMC/DEP Manger and the AECOM Quality Assurance lead.** Again, the purpose of this debriefing will be to improve future assignments. We have found that clients are often more open and frank with regard to their likes and dislikes of how the delivery order was accomplished when speaking to the QA Director, who is outside of the project production team. We will use feedback from these sessions to improve our performance on future assignments.

We believe that our straightforward organizational structure and clearly delineated responsibilities will yield maximum value to DPMC/DEP. We have a strong commitment and dedication to ensuring our DPMC/DEP projects are successful, and feel that our submitted Qualifications, in combination with our clear-cut management staffing plan for conducting Delivery Order assignments, demonstrate our ability to perform these services in an effective manner.

Delivery Order Cost and Schedule Management

As a public company, AECOM places strong emphasis on tracking cost, schedule and performance metrics on a weekly/monthly schedule, and we receive outside audits for compliance with this program, ensuring effective delivery order cost monitoring and providing early feedback to AECOM management on impending variances. When actual costs differ from those planned in excess of delivery order-established allowable variances, the Project Manager and Technical Leads develop a corrective action plan to bring cost back in line with expectations. Deviations from schedule or estimated cost overruns trigger the Project Executive and Project Manager to implement the identified corrective actions.

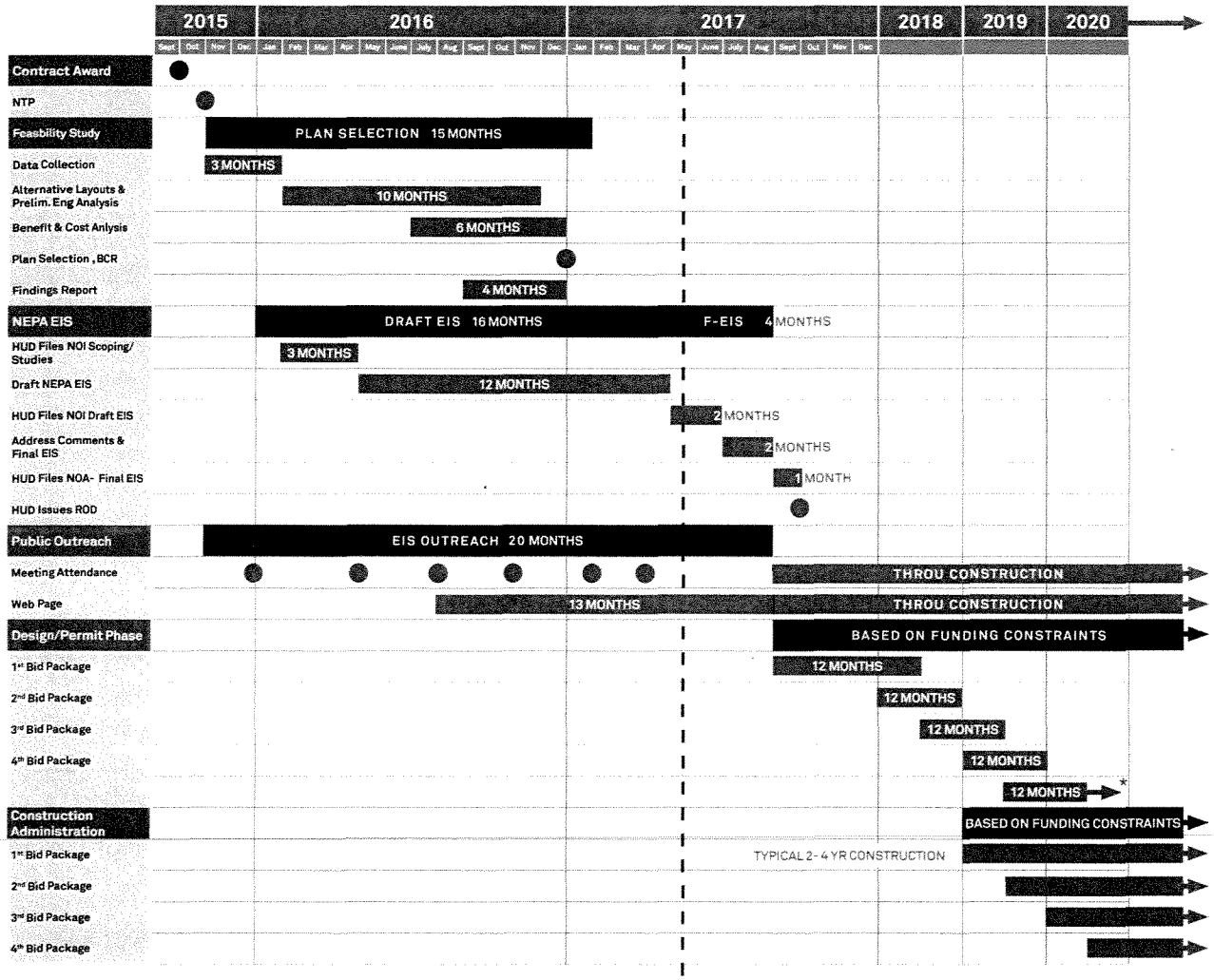
From experience gained on existing IDIQ contracts with USACE on similar type projects, AECOM is able estimate of the hours required to conduct the types of tasks expected to stem from this project. AECOM builds all delivery order costs by determining time needed to perform the task, then applying contracted rates by employee level category converted to a lump sum cost to be approved by DPMC/DEP. If aerial survey, borings, laboratory work etc. is needed and for reproduction costs associated with major deliverables and distribution an allowance outside the lump sum will be computed once the scope is determined. An important aspect of our cost management is assigning the appropriate staff for each delivery order - not untrained staff and not overqualified and costly staff. Where appropriate we also make effective use of local staff and sub-consultants to minimize costs.

AECOM also has experience developing realistic schedules for completion of delivery orders. We know that often, the delays in projects are the result of delays in obtaining information from others, so the data and source are identified during the scoping process, and potential delays are identified and mitigated whenever possible. **Exhibit 3-17** shows the typical expedited schedule for a project of this nature, but is dependent on obtaining access rights for field work such as survey and borings and timely reviews by DPMC/DEP. A typical feasibility study of this size would normally take 18 to 24 months allowing for review periods and public feedback, but can be reasonably completed in 15 months as indicated on the draft project schedule if not constrained by funding streams and third party delays. While the Scoping studies and research for the NEPA EIS can begin soon after the feasibility study begins, as well as the preparation of some of the EIS general background text, the project must be defined before the final impacts can be identified and addressed, thus the Drat EIS must lag the completion of the feasibility study development by a few months. After the Draft EIS is completed a great deal of

the schedule is fixed by statutory notice and review period requirements that add an additional five months to the process, but per the attached schedule the Draft EIS will be completed prior to the May 30, 2017 deadline and the final EIS by the end of September. Over the course of developing the NEPA EIS a number of public outreach meetings are included in the schedule. They are timed to keep the public informed and to solicit feedback at key milestones in the process and to meet the NEPA requirements for public participation. We have also indicated a scheduled meeting early on in the study process to introduce the team to the stakeholders and to solicit input on how they perceive the conceptual plans that were put forth for the grant application. At the discretion of the State consideration might be given to establishing a steering committee of stakeholders that would meet monthly as the project progresses. Often the use of such stakeholder groups are good means of gaining local support as they are able to provide input at key decision points in the process.

While at this point it is not possible to determine how the project funds will be available for design and construction, based on our history with other projects of this nature we foresee a staged approach to the design and construction breaking the project into several bid packages. This results in smaller bid packages that allow for participation of small business contractors and will provide the opportunity for more firms to bid on the project resulting in a more competitive bid environment and potentially lower costs to the State. Additionally the conceptual plans for the

Exhibit 3.17 - Project Schedule



NOTE: * Total number of Bid Packages will be Dictated by Funding Stream, State's Oversight Ability and Size of Contractor to be Targeted by the Bid

Meadowband and Meadow Park envision a very ambitious project addressing multiple facets from flood protection to community connectivity to growth stimulus through enhanced transportation including possibly the addition of transit to the plan and improved quality of life by the addition of parks to absorb runoff. While these are commendable goals that very well will enrich the lives of those living there, and will likely stimulate development activity, these added features add costs to the main objective of flood relief and the added funding may not be in place when the project gets underway. With the phased construction scheduling project features can be added as additional funding streams are identified.

Financial Management

AECOM's cost management system is built upon a cohesive set of tools, with all data centralized in one database, guaranteeing the seamless integration of cost information from timecard entries through reports and invoices. It ensures our project managers and customers have consistent, accurate, and timely accounting, reporting, invoicing, and other information at their fingertips. These tools are used today on numerous programs throughout AECOM, providing the backbone of our DCAA-approved cost accounting system.

All AECOM offices use our the same Oracle based accounting system which is a fully integrated financial management solution with built-in applications providing powerful project and organizational accounting features, including general ledger, accounts payable, accounts receivable, purchasing (including subcontractor purchase orders), fixed assets, travel, timesheets, payroll, human resources, and materials management.

Contract financial measurement is a key component of the AECOM's Oracle based financial management system. As a publicly traded company, AECOM must maintain the highest standards to tracking and reporting and an EVMS is used to track every project, regardless of client or size.

AECOM managers use the system on a weekly basis to track financial performance, and to make monthly financial projections of "estimated costs at completion" (EACs). If the EAC shows projections above prescribed variances in budget, corrective actions are taken.

The **estimated cost is compared to the actual costs entered into our accounting system, to arrive at a current level of performance and to assign actual percentage of completion for lump sum progress each month**. Using our delivery order schedule and data from our Oracle based systems, the AECOM Team collects and reports performance data monthly (or more frequently, if required) against baselines that are established during the planning phase of each delivery order. Project level earned value data is consolidated to provide earned value data at the delivery order level.

For subconsultants, the schedule is monitored on a weekly basis and costs are measured by a progress report each month (built from the individual company's standard accounting system and practices) that accompanies their invoice. AECOM reviews and approves the progress prior to invoicing DPMC/DEP per an agreed payment schedule established at the start of the delivery order.

Schedule Management

AECOM will use MS Project to develop and track schedules. The Program Manager will monitor a master schedule with a roll-up of individual delivery order schedules, and review the monthly reports. The AECOM has found that a detailed MS Project schedule that splits the work structure into smaller elements is the most effective tool for managing delivery order schedules.

Continual Improvement

An important part of a performance-based organization is continual improvement, and the use of the Plan, Do, Check, Improve concept. The AECOM Team continually reviews lessons learned and then develops and updates standard operating procedures. AECOM's continued investment in technology upgrades to improve internal processes and employee training and development is also an important part of continual improvement.

The result of continual improvement is higher quality and lower costs, which is often rewarded with more work. We believe AECOM's continued relationship with DPMC/

DEP contracts is proof of the success of our continual improvement efforts. Additional information on our continual improvement process is included in *Section 3D*.

B - IDENTIFICATION OF INDIVIDUALS AND SUBCONSULTANTS ON THE TEAM WHO WILL BE RESPONSIBLE FOR VARIOUS TASKS, INCLUDING WHO WILL OVERSEE THE WORK, SERVE AS THE LIAISON WITH THE STATE AND PROCEDURES FOR SELECTING AND MANAGING SUBCONSULTANTS

The key to successfully executing the New Meadowlands project for the state will be the expertise embedded within the chosen project team and how it's managed and utilized effectively throughout the duration of the project. Our Project Manager, Mr. Benosky, will manage our team and he will serve as the direct liaison with the state throughout all phases of the Term Contract.

The organization structure that we've developed to support Mr. Benosky is shown in **Exhibit 1.3**. You'll notice in this figure that our team is organized into four distinct levels:

- Project Management & Leadership,
- Quality Assurance,
- Technical Management, and
- Technical Support Teams.

These levels were established to create an efficient communication protocol, a system of checks and balances, and a seamless transition of knowledge and data across offices and companies that will allow us to ensure the successful completion of the New Meadowlands project for the state.

The roles and responsibilities of the four levels are described below.

Project Management & Leadership

The Project Management & Leadership level consists of our Project Executive, Mr. MacAllen, and Project Manager, Mr. Benosky, our Deputy Project Managers, Mr. Dromsky-Reed (AECOM), Mr. Murphy (HDR), and Mr. Heeren (DEI), along with an Executive Committee made up of Mr. Mueller of HDR and Mr. Boule of DEI. The individuals in this level of our team have the experience and corporate support to draw from whatever disciplines are required (from within their respective companies) to successfully execute this project.

At this level, as previously stated, our Project Manager will serve as the liaison to the state and he will draw on the resources of his Project Management and Leadership team to properly execute the work for the state.

Quality Assurance

At the Quality Assurance level, we have our Small Business Liaison, Mr. Raichle of Matrix, Health and Safety Manager, Mr. Gregory of AECOM, and Quality Assurance Officer, Mr. Sullivan of AECOM. This is an important level that interfaces between our Project Management & Leadership team and our Technical Management teams. The Quality Assurance team will ensure that our small business goals are being met, that we adhere to a strict Health and Safety plan in everything we do, and that the product that we deliver to the state meets or exceeds industry standards.

Technical Management

Within the Technical Management level we have our Task Area Leaders for the primary tasks that we anticipate for the New Meadowlands project. Specifically: Feasibility Study, led by Mr. Cannon of AECOM(URS); NEPA EIS, led by Ms. Chaisson of AECOM (URS) and Mr. Smith of AECOM Public Outreach and Community Involvement, led by Mr. Beckenbaugh of AECOM(URS); Flood risk management Design, led by Mr. Bianco, PE of AECOM; Ecosystem Restoration Design, led by Ms. Curran of HDR, and Construction Administration, led by our Project Manager, Mr. Benosky. This group will be responsible for leading their specific tasks within the overall project framework, reporting to the Project Management & Leadership Team (and more specifically to our Project Manager) and directing the

Discipline Leads for the individual components within the individual tasks assigned.

There are a couple things that should be noted in this level; first, we have chosen to have our Project Manager to be responsible for the Construction Administration phase of the project. Not only because of his background in construction administration and management, but because at the point in the project where it will start to phase into construction, Mr. Benosky will have the greatest knowledge of all the different technical aspects of the project. This will allow Mr. Benosky to be the most efficient at delegating the Requests-For-Information (RFI's), shop drawings, and project submittals to the appropriate Discipline Leader for review and comment/ approval. Of course, Mr. Benosky will continue to be supported by his Deputy Project Managers throughout the construction phases and the execution of this task.

Secondly, we have chosen to have a dual lead for the NEPA EIS portion of the project. We realize that this is the most critical path item in this project and the one task that has the most potential to get "hung up" in regulatory "red tape". For this reason we have put our two top NEPA experts in as the leads, Ms. Chaisson and Mr. Smith . Mr. Smith is nationally-recognized leader and trainer in NEPA and associated environmental law compliance and Ms. Chaisson is our local NEPA and EIS expert who is currently managing the NEPA compliance for Hurricane Sandy Recapitalization Projects throughout New Jersey for the U.S. Coast Guard. Ms. Chaisson and Mr. Smith will be supported by a team of experts on the NEPA task including Ms. Ivanciu of Dewberry who is currently managing the Hudson River Project: Resist, Delay, Store, Discharge NEPA EIS for the state and Mr. Mansky and Mr. Rollino of AECOM who recently completed the Meadowlands Mills preliminary draft NEPA EIS and environmental studies for a 600-acre mixed-use development in Secaucus, New Jersey. We are confident that this NEPA team will ensure that the NEPA and EIS tasks do not impact the critical path schedule of this project.

Embedded in the Technical Management Level we have a team of Technical Advisors who are all experts in their respective fields. This team is made up of our "best and brightest" minds from each of our respective firms. Each person in this Technical Advisor team is not only familiar with the project and project area, but in most cases is a national or global expert in their respective fields. The Technical Advisors will be available as resource to the Task Area Leaders and will perform Quality Control functions and Independent Technical Reviews of the work where necessary and appropriate.

Technical Support Teams

To support the work tasks we anticipate coming out of the New Meadowlands project we have assembled a collection of Technical Support Teams. These teams represent the key disciplines that we believe will be required to support the Feasibility Study, EIS, Design and Construction Administration portions of the project. The teams are made up of a Discipline Lead and key support staff team.

Based on the technical expertise of the staff within our company team members (AECOM, AECOM(URS), HDR, DEI, Matrix, Stevens, Robinson, HR&A, RFI, and Remora) we assigned leadership of a Technical Support Team and associated discipline to a specific company where the most applicable staff expertise resides. To ensure that we (AECOM) as the Prime on this contract stay involved and help manage the sub-led disciplines we have assigned an AECOM staff member, with expertise in their respective discipline, to our team members discipline key support staff team, where appropriate. This will help ensure that work assignments aren't just "dumped off" on our team members and that the work is coordinated across companies.

The Technical Support Teams will be called into action by the Task Area Leaders and the entire process will be overseen by our Project Manager and his Project Management and Leadership Team.

How will this all work?

As we discussed previously, each assignment received from NJDEP/DPMC will be received by the Project Manager who will meet with the Deputy Project Managers and appropriate Task Area Leader(s) to discuss the Technical Support Teams and Discipline Leads for the assignment based on experience level and work load. Each deliverable defined by the Work Order Statement of Services will be assigned the appropriate Discipline Lead. The Discipline

lead will report up to their Task Area Lead and company Deputy Project Manager to the overall Project Manager. The Discipline Lead will act in a technical capacity as well as a management capacity for the technical task and will be directly responsible to their Deputy Manager for all matters relating to technical, cost, and schedule performance for that deliverable. The Discipline Lead will report weekly to the Task Area Leader and Deputy Project Manager, as appropriate, to review performance and to suggest any changes deemed necessary. Project status and any changes will then be discussed by the management team during their weekly telephone calls and, if deemed appropriate by the Project Manager, with the DPMC/DEP Point of Contact for that particular delivery order. If changes require additional resources beyond the dedicated team, the Project Executive, and Executive Committee if necessary, will be consulted to bring the necessary corporate resources to bear on the issue.

We are confident that the team organization and management approach that we've developed will lead to the successful execution of the Feasibility Study, EIS, Design and Construction Administration of the New Meadowlands project for the state in its mission to "Protect, Connect, and Grow" the communities in the Phase I pilot area and beyond.

C - THE CONSULTANT'S CONTINGENCY PLANS FOR DEALING WITH PROBLEMS AND CORRECTING ERRORS THAT OCCUR

While the AECOM Team prides itself in problem avoidance through the use of experienced highly trained managers, automated tools and formal quality control procedures, we also realize that problems or unanticipated events may occur that could affect a Work Order's technical quality, schedule or, budget. For those situations, we have established contingency procedures and protocols in place to handle these.

AECOM approaches assignments in the spirit of partnering and believe transparency in dealing with problems is the first step to success. If and when a problem is discovered, the AECOM Project Manager will immediately contact the DPMC/DEP Program Manager, and if appropriate the Project Executive will immediately advise the DPMC/DEP Project Contact, to discuss appropriate corrective actions.

Through continual monitoring of the schedule and budget, we are able to take corrective actions before they become insurmountable and impact product deliverables.

As part of our contingency plan, we have structured the team such that when a divergence is noted, AECOM has the depth and breadth of resources to make staffing adjustments to take corrective actions. In addition, we have included multiple firms on our team each capable of fielding unanticipated problems, and meet the demands of multiple simultaneous assignments. Similarly, we have duplication in engineering staff to allow the team to adjust resources to meet schedule requirements. Where technical or procedural errors are detected, either through our detailed checking process or Internal Independent Technical Reviews corrective action will be taken.

If at any point during the execution of work on this contract, it is indicated that the AECOM Team is not meeting expectations, either through feedback from internal or external QC checking results, the Work Order feedback process, or as a result of progress reports, we will go through an internal problem-solving process to identify our shortfalls and document appropriate changes in either a Process Improvement Plan or a Corrective Action Plan. Process improvement plans will be used to document changes to established procedures that are not meeting expectations. Corrective action plans will be used when the problem is not the established procedures, but the execution of these procedures and policies. The first step in this process will be a root cause analysis. The Project Executive, Project Manager and Deputy Project Managers will research the issues with the appropriate technical leads to determine if the problem is systemic or simply a failure of execution of procedures and policies. Our senior managers will review the types and source of errors to determine if they indicate an error trend, which may require follow-up activities such as a topic specific training session, process improvement/ documentation, or staff reassignment. Once the root cause is determined, solutions will be brainstormed. The Project Manager will meet with the Deputy Project Managers,

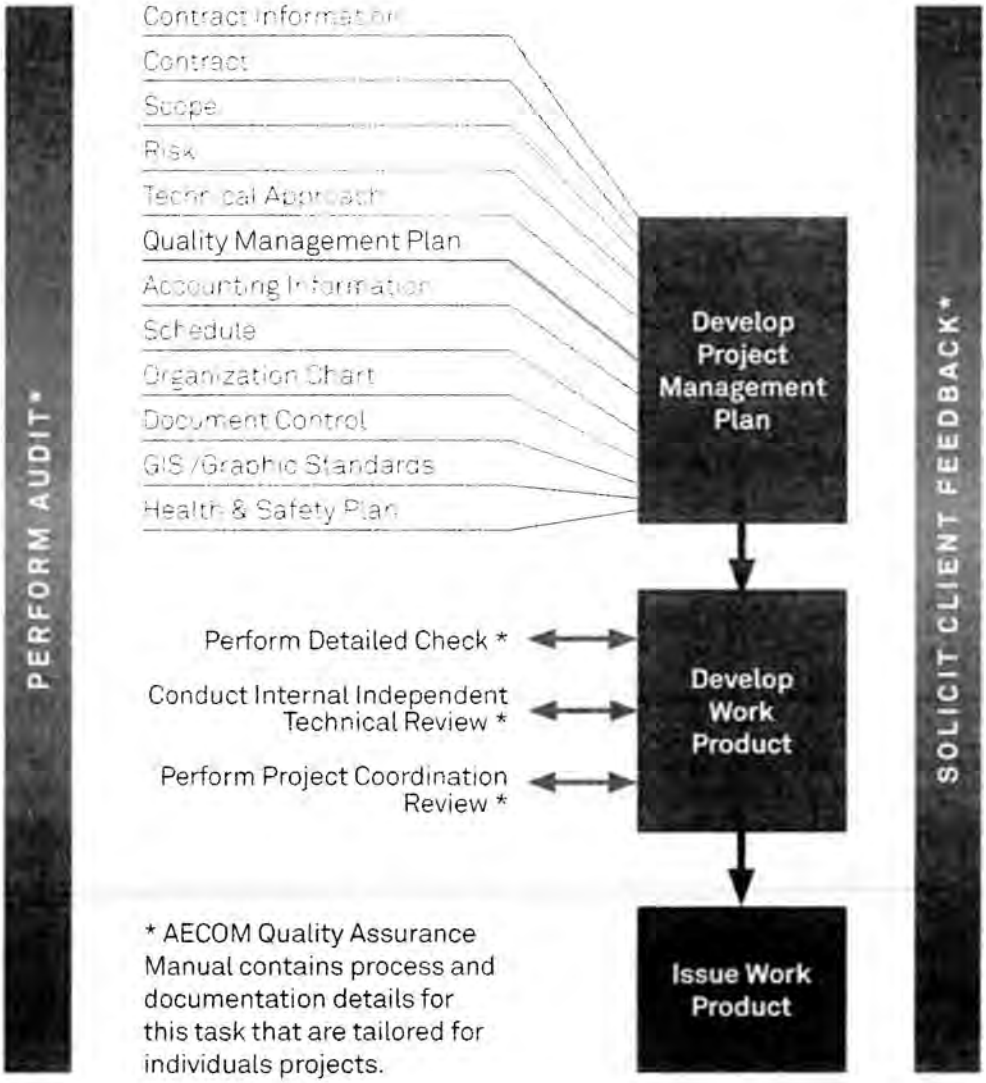
and if necessary, the Project Executive to formulate the appropriate corrective course of action. The proposed action will be discussed with DPMC/DEP. Once a viable solution is selected, it will be implemented and the success/effectiveness of this solution will be monitored to assure the issue/problem has been completely resolved.

Formal process improvement/corrective action plans will be prepared to document and communicate these activities. These plans will be distributed internally to all AECOM Team members.

D - THE CONSULTANT'S POLICIES AND PROCEDURES FOR MAINTAINING QUALITY CONTROL AND CONDUCTING INSPECTIONS AND OVERSIGHT OF THE WORK

AECOM's Quality Management Approach is founded in continual process improvement concept of PLAN, DO, CHECK, IMPROVE, and the empowerment of project staff at all levels of the project team. AECOM has a long-standing

Quality Management Audit Chart



corporate culture that emphasizes our commitment to quality. We embrace the principles of ISO 9001:2008, and have applied them to all our major government contracts. For each project undertaken, corporate policy requires AECOM to:

- Develop a Project Specific Project Management Plan, which incorporates a Quality Assurance Plan that defines the project-specific quality standards and all processes at project inception.
- Adjust the Project Specific Plans, as necessary to incorporate delivery order-specific requirements, such as milestone reviews, to identify the need and resources for special technical reviews, and to establish delivery order specific QC schedules and budgets.
- Perform detailed checks of all computations and work using existing checklists established for our NFIP related work.
- Conduct Internal (before NSP) Independent Technical Reviews (IITR) to validate compliance with standards and processes to ensure defect-free deliverables.
- Conduct quality assurance audits on each project to ensure that quality assurance processes are being fully adhered to and that they are meeting the goals and objectives of both the client and AECOM.
- Apply metrics-based continual process improvement systems to meet or exceed all performance goals.

Quality Assurance is an integrated part of the AECOM culture with a robust Corporate Quality Assurance Manual and Program. AECOM's QA/QC program ensures the quality of all aspects of our work meets our clients' technical and contractual requirements and objectives. QA/QC of work items are performed in accordance with contract and delivery order- specific requirements and approved Project Specific QA/QC plan. The AECOM QC program includes the following elements:

- Quality Culture that emphasizes and follows a Continual Quality Improvement philosophy. The Project Executive will assist DPMC/DEP through formal and informal partnering concepts and in the review and improvement of all processes affected by the contract. Our Project Executive e and Project Manager will meet with DPMC regularly to ensure that the project teams are meeting or exceeding expectations.
- A QA/QC organization staffed with experienced personnel, with reporting lines independent of the project structure to ensure an unbiased review of each work element. As part of our Internal Independent Technical Review (IITR) process, peer reviewers are assigned to each project based on their professional expertise and the nature of the work to be performed. IITRs are conducted in addition to detailed checking and play a somewhat different role in the QC process in that they are intended to verify overall contract and standards compliance and provide a broad review of technical approach as opposed validation of actual calculations which are the purview of detailed checking.
- A Corporate and Project-specific QA manual and standard operating procedures that contain comprehensive guidance to our technical staff on all aspects of a project and the QA/QC process.
- The AECOM Delivery Order-specific Project Management Plan, specifying the roles and responsibilities of each staff member assigned to the delivery order, budgeted hours, peer review procedures, schedules, communications procedures, and other project requirements. The Project Management Plan is updated as necessary throughout the life of the project and has been used effectively to guide the QA/QC program on AECOM State projects. One component of this Project Management Plan is the QA/QC Plan.
- The management team will monitor contract performance and is dedicated to continual improvement by listening closely to the needs of our Client. To assist the management team in completing its mission and delivering high-quality services, each member has full access to and online training in the AECOM management and performance control systems.

In addition to ongoing quarterly review meetings throughout the contract and periodic "how are we doing" calls from our QA Officer and management team, the final step in our Quality Management process is to obtain client feedback to enhance our continual improvement cycle. At least annually, DPMC will be solicited feedback regarding our performance which will include a brief questionnaire geared to illicit responses targeting project specific areas for potential improvement. The results of the questionnaire will be fed back to the project team as part of AECOM's continual improvement process.

E - THE CONSULTANT'S UNDERSTANDING AND KNOWLEDGE OF DPMC AND NJDEP PROCEDURES AND PROCESSES

AECOM has held several past and ongoing Term Contracts with the Division of Property Management and Construction (DPMC) for projects with the New Jersey Department of Environmental Protection (NJDEP) and are quite familiar with the contracting protocols, reporting procedures, invoicing processes and forms. Presently AECOM, AECOM(URS) and DEI all are performing on a similar DPMC/DEP Term Contract (DPMC Project P1066-00) entitled "**TC-007 Floodplain Mapping Multiple Award Term Contract**" in which we are performing surveying servicex's, hydraulic and hydrologic services and preparing floodplain mapping depicting flood risk. Additionally, AECOM(URS) and DEI are performing on the **Demolition Consultant Multiple Award Term Contract TC-008** – DPMC Project P1103-00, where they are providing construction administration services among many other services. These ongoing experiences with DPMC/DEP projects demonstrates our experience with the agencies contracting procedures and the interrelationship between DPMC the State's contracting agent and NJDEP the contracts end user.

The AECOM team selected for this project is familiar with the procurement, design, code review, and construction policies and procedures that DPMC employs. Our team's knowledge of the specific forms, meetings and other requirements will help streamline our work under this contract.

We are familiar with the standard DPMC processes and requirements for a typical design, bid, and construct project, including the design and permit submission requirements, bidding and award procedures (including the consultant's responsibility for items such as pre-proposal meetings, and recommendations for award). We also routinely work with various departments within NJDEP including Division of Land Use Regulations and Bureau of Dam Safety and Flood Control. Since NJDEP are the local sponsors on the New Jersey Flood Risk Management Projects we do with the USACE we routinely interface with their staff as well as for the floodplain mapping project. On the Green Brook Flood Risk Management Project until recently AECOM(URS) staff had been meeting monthly with NJDEP staff as part of the Project Delivery Team (PDT) for the project. As a large firm we are often representing clients with LURP permit applications for Flood Hazard Area Permits and General and Individual Wetland Permits. Recently as part of a resiliency project for American Water in Bridgewater, New Jersey we secured permits to increase the height of their levee systems and were able to secure a Letter of Map Amendment from FEMA. Closer to the project site within the last year AECOM(URS) working with the Federal Aviation Agency secured the Flood Hazard Area permit for a new control tower that includes a new bridge crossing for access. In connection with this permit AECOM(URS) has designed an offsite wetland mitigation project. Our familiarity with the departments procedures and staff will enable us to hold open and frank discussions during pre-application meetings which will allow us to address concerns early and expedite the permitting process.

In addition, AECOM's legacy companies have had a continued presence in New Jersey since the early 1960's and has participated in the environmental programs since the days of the Clean Air Act (1970), Clean Water Act (1972) and the RCRA (1976) programs. In the State of New Jersey, AECOM has worked under the various site cleanup programs such as Environmental Cleanup Responsibility Act (ECRA) and subsequently the Industrial Site Recovery Act (ISRA). Our team's local environmental professionals, **including over 20 Licensed Site Remediation Professionals (LSRPs)**, have gained their expertise not only through our project work, but also through a long history of working with the New Jersey Department of Environmental Protection (NJDEP). AECOM(URS) is a leading firm in New Jersey for performing groundwater and soil remediation assessments and obtaining NJDEP approval of remedial investigation work plans, remedial action workplans, and all associated permitting.

Through these various contracts and many years of working with DPMC and NJDEP on various programs the AECOM team has an excellent understanding and Knowledge of DPMC and NJDEP Procedures and Processes.

F - THE CONSULTANT'S KNOWLEDGE AND FAMILIARITY WITH HUD REQUIREMENTS NOTED IN SECTION 2.0 IN THE STATEMENT OF ASSURANCES FOR THE REBUILD BY DESIGN - NEW MEADOWLANDS PROJECT

With the 10 year anniversary of Hurricane Katrina upon us, the AECOM Team understands the importance of compliance with HUD rules. Recent news reports remind everyone of the HUD OIG 2013 report that found that $698.5 million in CDBG –DR funds were unaccounted for by Louisiana—a significant potential repayment. Our commitment to the State of New Jersey is to avoid HUD program findings to limit any chance of repayment requests. Even with AECOM's long history of working with Federal funds, because of the complexity of HUD Sandy CDBG-DR funding, our team includes a HUD Grant Compliance Lead to work closely with the necessary Departments of New Jersey Government.

Kevin Hamby, of Remora Consulting, is our designated lead and has 10 years direct experience with CDBG-DR funding in both the public and private sector. As the former General Counsel for the Texas Department of Housing and Community Affairs, Kevin developed the Texas CDBG-DR Program from its inception working with state agencies, local subrecipients, HUD, program management consultants, non-profit organizations, and Fair Housing Advocates to **implement over $3B in CDBG-DR funds**. His experience also includes providing guidance under the Sandy Congressional enabling legislation and the subsequent HUD Notice of Funding published March 5, 2013. Kevin has worked with federal grant funds and the requirements related to procurement to ensure cross cutting federal requirements like insurance, bonds, conflict of interest, lobbying and other requirements are included in sub-contracts and followed. The AECOM Team will also provide an aggressive program for Section 3, Small MWBE, and ensure HUD targets are tracked, and where possible are met. We have already reviewed the New Jersey Section 3 plan for Sandy and will meet its standards. Also, the AECOM team has significant experience with Davis Bacon reporting and will provide either full reports or full access to New Jersey personnel to ensure that HUD's Davis Bacon requirements are met, whichever is your preference.

In addition, members of the AECOM Team has worked to develop plans to meet the affirmatively furthering fair housing (AFFH) rules required for HUD grants. HUD recently adopted an AFFH Final Rule that applies to Sandy CDBG-DR infrastructure and other non-housing programs. Our compliance lead has direct experience with the major components of the final rule through work on other programs monitored by civil rights groups and HUD FHEO. We will work with New Jersey to address the impediments identified in the State of New Jersey Analysis of Impediments to Fair Housing and as necessary relate them to this project to prevent complaints from being filed by civil rights groups or HUD FHEO.

In addition to Mr. Hamby who will serve to audit and assist AECOM's performance in meeting AECOM and its AECOM(URS) family in their own right have performed on several CDBG-DR HUD funded grant projects for DPMC/ DEP including as one of six Program Manager Contractors and Environmental Field Contractors for Environmental and Historic Preservation Reviews, contract A84676, as well as performing services as the Demolition Consultant under TC-008. Under A84676 AECOM(URS) has demonstrated their knowledge of HUD standards for environmental review in order to facilitate the distribution of HUD CDBG funds on 215 Task Orders totaling approximately $6.5 million in fees through May 2015. The AECOM(URS) team has extensive knowledge of the HUD CDBG regulations NJDEP required, specifically those at 24 CFR Parts 55 and 58 and the NEPA requirements for environmental assessments. In this ongoing effort, the programmatic alternatives assessed by AECOM(URS) to date include the rehabilitation, elevation and/or demolition and reconstruction of over one thousand impacted residential homes, rental buildings and businesses within the disaster area. For this project, AECOM(URS) has created a very cost-efficient, technology driven process for environmental data collection and reviews that allows for

easy audit by NJDEP, HUD and the state OIG; and through which AECOM(URS) has been able to support NJDEP in its disaster recovery mission in a rapid yet very cost effective way. The contract requires evaluating the properties of grant applicants for the presence of historic/archeological features; Threatened and Endangered Species; Wetlands; Environmental contamination from petroleum products or other chemicals; and proximity to floodways. AECOM(URS) has completed over 6,000 Historic/Environmental Reviews so far.

4 Rate Schedule

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TC 001 TERM CONTRACT RATE SCHEDULE
BY PERSONNEL LEVEL

NAME OF FIRM: AECOM Technical Services, Inc.

INSTRUCTIONS

Provide a LOADED hourly rate ($ per hour; no cents please) below for all Personnel included in each of the Levels listed. Please refer to the RFP for a description of each of the personnel types by level. Your proposal may be considered unresponsive if you leave blanks.

PERSONNEL TYPE/DISCIPLINE	TERM CONTRACT HOURLY RATES PER CONTRACT PERIOD		
	BASE (3 YEARS)	EXTENSION OPTION – YRS 4/5	EXTENSION OPTION – YR 6
LEVEL 7	$ 200	$ 215	$ 222
LEVEL 6	$ 185	$ 199	$ 205
LEVEL 5	$ 165	$ 178	$ 183
LEVEL 4	$ 135	$ 145	$ 150
LEVEL 3	$ 100	$ 108	$ 111
LEVEL 2	$ 80	$ 86	$ 89
LEVEL1	$ 55	$ 59	$ 61
AVERAGE RATE (ALL LEVELS) Please calculate for Levels 7 -1	$ 131	$ 142	$ 146

Authorized Signature: _____

RETURN THIS COMPLETED DOCUMENT TO DPMC

5 Consultant Affidavit

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TC - 001
REBUILD BY DESIGN TERM CONTRACT
NEW MEADOWLANDS PROJECT

Consultant AFFIDAVIT

IMPORTANT - PLEASE READ, SIGN AND PROVIDE INFORMATION REQUESTED BELOW

Affidavit: I, being duly sworn upon my oath, hereby represent and state the foregoing information contained in the Term contract Proposal and any attachments thereto the best of my knowledge are true and complete. I acknowledge that the State of New Jersey (Owner) is relying on the information contained herein and thereby acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contracts with the Owner, or its contractors, to notify the Owner in writing of any changes to the answers or information contained herein. I acknowledge that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I recognize that I am subject to criminal prosecution under the law and that it will also constitute a material breach of my agreements(s) with the Owner and that the Owner, at its option, may declare any contract(s) or sub-contract(s) resulting from this certification void and unenforceable.

Signature of the Consultant below attests that the Consultant has read, understands and agrees to all terms, conditions and specifications set forth and referenced in the TC – 001 Term Contract Request for Proposal (RFP) including the Statement of Assurances for Rebuild by Design TC – 001, Consultant Agreement & General Conditions to the Rebuild By Design Term Contract TC-001. Signature of the Consultant signifies that a contract is established immediately upon notice of award by the State of New Jersey for any or all of the items and the length of time indicated in the proposal. Failure to accept a contract award, to hold prices or to meet any other terms or conditions as defined in the Request for Proposal and subsequently the Notice of Award, during the term of the contract, shall constitute a breach of contract and may result in termination, suspension or debarment from further contractual agreements with the Owner.

Signature and Title of Principle or Individual of the firm authorized to sign contractual documents:

Firm Name:

Signature: _____ Print Name: Paul Storella

Title: Vice President Date: 9/1/15

ATTESTED: Sworn and subscribed to before me on the 1st day of Sept, ~~1998.~~ 2015

Signature: _____
(Notary Public-Not an Officer of the Firm)

EILEEN KARKIS
Notary Public, State of New York
No. 01KA6003420
Qualified in Kings County
Commission Expires April 10, 2018

RETURN THIS COMPLETED DOCUMENT TO DPMC