



Principals' Letter

Happy Holidays to all of the friends and family of Gomez and Sullivan. We hope this annual newsletter finds you happy, healthy, and prosperous. 2013 was the year of milestones and celebrations at Gomez and Sullivan. February marked the anniversary of our twentieth year of business. In addition, we opened a new office (our fourth) in Albany, N.Y., and relocated our Williamsville, N.Y., office to new and upgraded facilities. At a personal level, we had a number of staff or relatives get married or have babies. Finally, we had a number of projects meet significant milestones this year making for happy clients and, in turn, a happy consulting firm. These milestones make a timeline that reflects just how fortunate we are.

The first milestone for the Gomez and Sullivan family actually happened in late December 2012 when Ryan Troy received his masters degree in civil engineering. Congratulations Ryan on a job well done.

February marked the twentieth anniversary of the founding of Gomez and Sullivan. February also saw the birth of Jerry and Pam's first granddaughter. Lydie joined her brothers and parents, Corey and Kristen Gomez, as well as her grandparents, who were thrilled to have a little girl in the family. An "old" friend and colleague, Craig Arnold, had a milestone birthday in February. Discretion prevents us from publishing Craig's age. Let's just say he may have seen the Beatle's first American performance—on the Ed Sullivan Show from his playpen.

February also saw the official opening of Gomez and Sullivan's Albany, N.Y., office. We finally got Michele Stottler in a work environment that wasn't her basement and she was joined by Matt Burak and Jeremy Belanger who had each previously worked in our Henniker, N.H., office. The Capital District is a great location for us in terms of serving our clients, whether they be state entities or have business with the State. The Albany

office also enhances our ability to attract employees to the firm.

The Albany folks almost immediately had an event to celebrate as Matt and Stacy Burak were married in March.

April saw the birth of Reilly to parents Tim and Misha Sullivan. Reilly is Tom and Jayne's first grandchild and she is the apple of her grandparents' eyes.

In May, Damian and Kim Gomez continued the new tradition of female grandchildren for Pam and Jerry with the birth of their daughter Madison. The month also marked the relocation of our Williamsville office to a new space. May marked a number of graduations involving the families of Williamsville folks. Marinda Frazier (Iona) and Katie Kooser (Kent State) both graduated from college, while Matthew Frazier graduated from Marine boot camp at Paris Island. Ben Sawyer, who interned in the Henniker office, graduated from UNH and accepted a full-time position with us in our Utica office.

In July, Brittany Barnes and Joe Meher welcomed their son Jackson into the world.

October was a big month for us. To celebrate our twentieth anniversary we threw ourselves a party! Our co-workers and families gathered on Cape Cod for a weekend of fun and remembrance. We had slide shows of Gomez and Sullivan through the years, played "match the staff picture from today with the picture from 20 years ago," and, generally enjoyed what Cape Cod has to offer. It was a wonderful weekend and tremendously fulfilling for the two of us. We can't begin to tell you how proud we are of all we have accomplished together as a firm or how grateful we are for a devoted client base. It was a great time to reflect not only on all we have accomplished, but to look at our younger staff and see them experience many of the great joys we have experienced in the past. Watching this next generation forge the bonds with each other that have been the strength of

our long-term staff over the years is very gratifying.

We are finishing the year with a flourish. In December, Mike Hoover and his wife Jill welcomed their first grandchild into the world, Maximiliano. Max was born to Jessie and Eddie Martinez. In addition, Dan and Amy Gonzalez have welcomed their first child, Tessa, into the world. Finally, old friend and colleague Matt Denno will be rejoining us in our Albany office.

Of course, the icing on the cake this year was the fact that the Red Sox won the World Series. As the dominant team in the twenty-first century (as opposed to the Yankees who had their day in the sun last century), we have become accustomed to their success. That being said, this year was special because of the tragic events relative to the Patriots Day bombing. There was an extra measure of pride for those of us with New England roots because of the way the city and region came together during and after that tragedy. The resiliency that was shown and the celebration that was the World Series is something we can all relate to and take to heart. It is with this same type of resiliency that we turn our attention to the next 20 years. We will stay the course of doing good work and providing responsive service as we move the ball forward in the water resources, energy, and environmental sectors. We look forward to working with all of you (clients and co-workers) to make this happen.

Enjoy your holidays and your families. Do good work and have a safe, healthy, and prosperous New Year.

- Tom and Jerry

Niagara Habitat Improvement Project Highlights

Dave Frazier

Gomez and Sullivan Engineers, P.C. is the New York Power Authority's prime Consultant tasked with managing the FERC license compliance for the Niagara Power Project. The Niagara Project, one of our nation's largest hydroelectric power plants, was relicensed in 2007. Among other things, the terms of the new license called for the implementation of eight habitat improvement projects and nine recreation enhancement projects. The implementation of all of these projects - including project design, permitting, contractor procurement, and construction management - is managed by Gomez and Sullivan and includes services from numerous subconsultants, vendors, and contractors. All of these projects are underway and many have been constructed. The highlights of this year's progress include encouraging results at the largest HIP - the creation of an 8-acre wetland at Beaver Island State Park - where Gomez and Sullivan's ecologists documented a substantial increase in



Strawberry Island, Frog Island, and Motor Island, from top.

native species biomass this year. Other HIP progress includes:

Motor, Frog and Strawberry Island HIPs: three islands located in the middle of the Niagara River near the southern tip of Grand Island, NY. Each island has its own unique contribution to the Greater Niagara ecology and all are located within

a NY State Significant Coastal Fish and Wildlife Habitat Area. Motor Island is an important colonial waterbird rookery; Frog Island is the location of a former mid-river emergent wetland; and Strawberry Island offers habitat for fisheries spawning and overwintering. As part of a relicensing settlement, the New York Power Authority opted to enhance these islands to benefit fish, wildlife and plant ecology.

The Motor Island project is the furthest along of the island HIPs. The shoreline at Motor Island was reconstructed to remove wooden cribbing and concrete blocks that acted as ecologic transitional barriers. Once removed, "soft shoreline" components i.e. shallow embayments protected by low profile off-shore berms were constructed to protect from erosion yet still provide a gradual transition from aquatic, wetland, riparian and upland areas. In 2013, 1000's of emergent and upland native plantings were placed and the entire site will be monitored in years to come to ensure the new conditions meet

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Design Work, Inspection Completed on Five-unit Taftville Intake Structure Site

Dave Robinson, P.E. & Craig Arnold, P.E., LEED AP

Gomez and Sullivan Engineers, P.C. was selected by FirstLight Power Resources to design and provide construction technical support for the replacement intake structure and head gates at the Taftville Hydroelectric Plant in Norwich, CT. The Taftville hydroelectric site consists of five units; four of the units are housed in the Ponemah Mills complex and the other unit is in a separate building adjacent to the canal. Taftville Station is a two-megawatt hydroelectric facility on the Shetucket River.

The original intake structure and head gates were constructed of wood and were in need of replacement. Many of the intake structure members had failed and the condition of the head gate was badly deteriorated.

The new intake gates were designed to withstand a full water load differential up to the maximum canal

elevation. The new intake structure was also designed to accommodate the existing trashracks and trash rake. The intake structure and replacement head gates were designed and constructed utilizing galvanized steel. A majority of the new structure was able to be fabricated outside of the canal to reduce the installation time. The project had a highly accelerated schedule which required all fabrication activities to be completed during July. All construction was done during a one-month station shutdown and canal dewatering during the month of August. Besides performing the design, Gomez and Sullivan provided FirstLight with construction phase services and on-site inspection during installation. This allowed the project to be completed on time, reduced downtime, and kept the project proceeding when questions arose at the site.



Above: Taftville Intake with trashracks installed.

Below: Taftville intake trashrack support structure.



Use of Computational Fluid Dynamics (CFD) Models Effective, Efficient

Damian Gomez, P.E., Gary Lemay, E.I.T.

Over the past three years, Gomez and Sullivan has been expanding our hydraulic modeling capabilities through the use of Computational Fluid Dynamics (CFD) models. CFD models can be used to evaluate two- and three-dimensional flow problems through the solution of the Navier-Stokes equations and typically have the ability to evaluate problems involving the flow of any fluid of known properties. These models have the ability to account for gravitational forces, viscosity, turbulence, waves, and the interaction of multiple fluids.

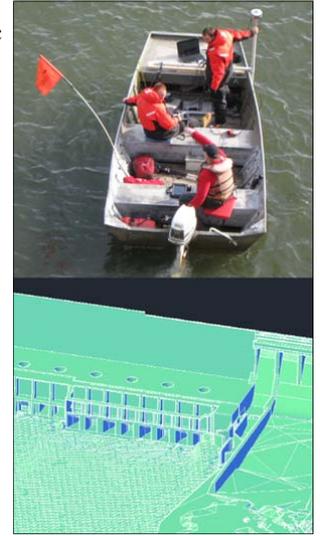
At Gomez and Sullivan, CFD models have been used to support a variety of projects including stability analyses, spillway rating analyses, scour analysis, spillway design, and fish lift design. These models have ranged in size from an area of approximately 160,000 square feet to approximately 1 square mile. For each of the project types, the CFD model provides different information necessary for the study. In the case of stability analyses, the CFD model is used to evaluate the pressures acting on spillway structures under different flow scenarios, which may serve to either stabilize or overturn a structure depending on the

spillway shape and flowrate. For spillway rating analyses and spillway designs, Gomez and Sullivan has utilized CFD models to augment traditional calculation methods for assessing the capacity of a spillway to pass flow at certain headwater elevations. These models are particularly useful in cases where the spillway involves complex geometries, unknown downstream constraints or many transitions in flow control. We have also utilized CFD models to extend the results of physical model studies to higher headwater levels or different operations; in these cases the physical model results have corroborated the CFD model results for the common conditions.

Given their ability to evaluate distribution of flow and velocities through complex terrain, Gomez and Sullivan has utilized CFD modeling to support scour analysis and rip-rap design within hydraulic structures, having used the models to evaluate the potential for hydraulic jump and its effect of bed velocities. This capability of CFD models also makes them well-suited for evaluating the attraction potential for fish transport structures, particularly when these structures are located in close proximity

to hydroelectric generating units. We have used CFD models to study fish passage attraction flow, fishway entrance design, zone of passage, and internal fish lift hydraulic design.

Gomez and Sullivan has experience with all stages of CFD development, starting with engineering and field data collection, including hydraulic computations and biological analyses of the results, all the way through model-assisted fishway design.



Above: Tim and Gary collect bathymetry data and model our Gomez and Sullivan cold-water safety suits (no, they don't come in fuchsia).

Below: Three-dimensional representation of a Project Powerhouse.

Albany Office Staff Participates in Hannacroix Creek Eel Counting Community Service

In May 2013, Michele Stottler, Matthew Burak, and Jeremy Belanger (Albany, NY, office) counted glass and elver phase American eels as they migrated up Hannacroix Creek, a tributary to the Hudson River just south of Coeymans, NY. Counting was conducted by first trapping the eels in a fyke net as they moved upstream, then carefully removing them from the net to assure no eel was left behind and subsequently counting them one by one. After being counted, the eels were carried upstream to aid in their migration to find suitable rearing habitat. This effort was in collaboration with the New York State Department of Environmental Conservation and numerous other volunteers to monitor the population status of American eels in the Hudson River estuary. A total of 43,129 eels were counted!



Clockwise from top-right: Jeremy and Michele help count eels. Matt collects eels in a bucket. Close-up of American eel.

GSE Expands Information Systems Services to Clients

Paul Breier

Gomez and Sullivan continues to develop and enhance Information Systems for the Energy Industry. Our Systems focus primarily on helping Utility Companies complete the FERC licensing and post-licensing process. We have developed Information Systems for many of our clients, including the New York Power Authority, Exelon Generation LLC, and FirstLight Power Resources LLC. Each of these Systems consists of a combination of web, database, and GIS technologies, all of which rest behind our secure Citrix portal. Users can log on to the portal using a simple web browser, making it possible for them to access our Information Systems anywhere internet is available.

Each Information System we design employs a set of core capabilities to meet our clients' needs which address communication, scheduling, document development and management, GIS data management and Cartography, including a variety of other aspects.

COMMUNICATION

Our Information Systems provide a comprehensive database of team members and outside contacts, e.g., regulatory agencies and stakeholders. The database is used to create mailing lists, and to assist in maintaining a list of project correspondences. The correspondence list is capable of tracking any form of communication, including telephone calls, emails, faxes, and physical mailings.

MEETINGS, CONFERENCE CALLS, AND SCHEDULING

Our customized meetings and conference calls solution organizes events and keeps the project team informed. Features include the ability to log meeting attendees, send email invitations, and establish workflows that help team members develop, review, and approve handouts. The solution also provides automation that reminds members to complete follow-up tasks and action items.

Other scheduling capabilities include provisions that help team members stay on top of complex regulatory compliance mandates. Managers can use the system to catalog each mandate, and then delegate corresponding tasks. Our solutions can handle one-time-only tasks, or regularly scheduled ones, e.g., the last Friday of every month. Tasks assigned to each user are displayed in the user's *My Page* space. This space offers a convenient way for each user to view and process scheduling items that relate to him or her only. If users do not complete the task within so many days of their deadline, the system automatically sends users a reminder email.

DOCUMENT DEVELOPMENT AND MANAGEMENT

Our Information Systems provide dedicated workspaces where team members can develop documents. The workspace offers templates for reports, letters, presentations, scopes of services, and other documents. The System allows multiple users to edit the same document simultaneously, allowing for real-time collaboration. When team members have finished a document, they can use simple tools to initiate review requests. Reviewers can add comments, make revisions, and then send return notification when finished. Our document management capabilities also include versioning. This allows authors to create a version for each major stage of a document's lifecycle. If need be, content from earlier versions can be easily reincorporated into the most current one.

Once a document has reached completion, team members can use the System to create a final PDF copy of it, and upload it to a document management library. The library holds a final copy of every document produced throughout the project. It can be easily searched using an interface similar to that of an internet search engine. The library also offers a link to the correspondence list so that team members can track instances where documents have been disseminated to outside agencies or stakeholders.

GEOGRAPHIC DATA AND CARTOGRAPHY

Geographic data are an indispensable part of nearly every Energy Industry project. The data may be related to transmission assets and their associate real estate properties, or to environmental, cultural, and socioeconomic studies. Our solutions incorporate ArcGIS geodatabase technology to address geographic data needs as diverse as these. Geodatabase technology provides a centralized workspace for storing and managing geographic data. It encourages a high level of collaboration, as it allows team members to view, analyze, and edit the same data concurrently. Our solution also incorporates mapping templates and other resources to help users create consistent, professional-quality figures. PDF copies of figures can be easily uploaded to document management workspaces where they can be linked to a study, report, or other type of document. Other GIS features include advanced analysis and reporting capabilities, particularly ones concerning project operation data, e.g., water levels, flow levels, temperature readings, etc.

RECENT ENHANCEMENTS

We have recently enhanced our core capabilities to include additional features. One major enhancement includes dedicated workspaces for construction projects. Each construction workspace has a dedicated event calendar, document development workspace, and lists for storing related resources such as contracts, budget items, correspondences, and construction site photos. The construction workspace also offers a place for contractors to submit information regarding resources and expenditures required to complete each phase of the project. Construction managers can review submissions, determine their feasibility, and then approve or reject as necessary.

Another System enhancement includes resources for implementing shoreline management. Our system integrates GIS and SharePoint technologies to create a

Employee News

NEW EMPLOYEES

UTICA, N.Y.

Benjamin Sawyer, E.I.T. **Civil/Structural Engineer**

Ben Sawyer joined our Utica, N.Y., office as a civil/structural engineer in June. Ben holds a B.S. in civil engineering from the University of New Hampshire. For his senior capstone project, he and his teammates researched, analyzed, and designed a parking garage for the University. They presented their project at UNH's Interdisciplinary Science & Engineering Symposium, and had the winning poster in their category: Civil/Environmental Engineering. His senior thesis focused on Shear Lag in Steel Connections. Prior to graduating, Ben held an internship position with GSE, during which he modeled project designs in AutoCAD and ArcGIS, aided with cost computation, and assisted with analyzing project data in the office and the field. In his free time, Ben enjoys reading and playing soccer and video games.



ALBANY, N.Y.

Jeremy Belanger, E.I.T. **Civil/Water Resources Engineer**

Jeremy holds a B.S. in civil engineering from the University of New Hampshire. Prior to coming on full-time in our Albany office, Jeremy worked for Gomez and Sullivan as an intern for several years in our Henniker office. When not at work, Jeremy enjoys outdoor activities such as hiking, camping, and snowboarding.



HENNIKER, N.H.

Aaron Rubin, E.I.T. **Water Resources Engineer**

Aaron Rubin joined our Henniker, N.H., office this December. Aaron earned his B.S. in civil and environmental engineering from the University of Massachusetts, Amherst. While there, he worked with a professor researching how altering reservoir operations based on general circulation models could affect crop production and power generation in the Sahel region of western Africa. Aaron enjoys running, biking, swimming, hiking, backpacking, traveling, and cooking.



CASUAL EMPLOYEES

Our team includes several accomplished professionals who, after successful careers in their respective fields, are now making their expertise available to Gomez and Sullivan as casual employees. Below are short descriptions of these employees and some of their recent projects with Gomez and Sullivan.

Dave Robinson, P.E. **Senior Civil/Structural Engineer**

Dave has over 40 years of experience in structural analysis and design at hydroelectric, nuclear, and fossil fuel generating facilities. For the past 25 years, he has worked almost exclusively at hydroelectric plants providing civil, structural, and hydraulic engineering for power plant components, hydraulic equipment, flow control gates, support structures, and dams. Dave also specializes in the design, construction, and biological evaluation of upstream and downstream fish passage facilities. His

fish passage experience includes development of new fish passage technologies and he holds a patent for a fish guiding device currently in use in the United States and Canada. He has served as an instructor for the United States Fish and Wildlife Service course *Fish Passageways and Diversion Structures* and as a guest lecturer for the Canadian Department of Fisheries and Oceans. In addition to his experience at electrical generating facilities, he was formerly the Chief Engineer at a steel fabrication facility and a project manager at a consulting engineering firm.

Alan Livingstone, P.E. **Senior Mechanical Engineer**

Alan has 40 years of mechanical engineering experience in the power industry. He has worked from both the consulting and the owner/operator's side of the industry on the design and operation of hydropower, oil, coal, and nuclear generating stations. For the past 20 years, Alan has worked on performance monitoring and improvement to hydroelectric and fossil fuel generating plants and systems. For the past 12 years, he has worked exclusively on hydroelectric generation, concentrating on performance monitoring and improvement of unit performance, station performance, and system performance levels including maximization of system revenue in the market environment.

Kevin McGrath **Senior Fisheries Biologist**

Kevin is a senior fisheries biologist and an expert in fish passage at hydropower projects, fish turbine survival, and development of artificial fish spawning beds. He has worked for over 40 years as a fisheries scientist and over 30 years in the hydropower industry. He has

Employee News

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particular expertise with American eel (*Anguilla rostrata*), but is also experienced with other migratory species such as lake sturgeon (*Acipenser fulvescens*), blueback herring (*Alosa aestivalis*), and walleye (*Sander vitreus*). Currently, Kevin provides Gomez and Sullivan with expertise and guidance on American eel passage issues in support of licensing activities for Exelon's Muddy Run Pumped Storage and Conowingo Hydroelectric Projects.

Tom Tatham Senior Licensing Specialist

Tom has over 40 years of experience in project development, licensing, and environmental research. His extensive expertise lies in project evaluation, regulatory processes, and management and preparation of environmental, economic, and engineering studies and licensing documents. For 23 years, he was responsible for development and licensing of the New York Power Authority's (NYPA) generation and transmission facilities as well as license compliance and implementation. Currently, Tom provides Gomez and Sullivan with expertise and guidance in support of licensing activities for Exelon's Muddy Run Pumped Storage and Conowingo Hydroelectric Projects.

Notable Projects in 2013

Brookfield Power—Deep Creek Tabletop Exercise

Gomez and Sullivan completed a tabletop exercise and report for Deep Creek Hydroelectric Project. The exercise was held at the hydroelectric facility to evaluate and review Brookfield's Emergency Action Plan. Local responders and Emergency Management Agencies participated in this exercise, Gomez and Sullivan facilitated the exercise and submitted a summary report on the exercise, including recommendations to improve the EAP to Brookfield.

Brookfield Power—Allens Fall Penstock Collapse Review

Gomez and Sullivan was called in after a 500± foot section of the Allens Falls penstock suffered a vacuum collapse during winter operations. Gomez and Sullivan provided services related to field inspection, review of record drawings and operating logs, and a transient analysis culminating in a report which analyzed the known conditions, data, and presented probable causes and recommendations.

Brookfield Power—Trenton Falls IDF and Stability Analyses

GSE performed a hazard assessment study which reduced the dam hazard from high to significant and reduced the IDF from the PMF to the 100-year flood. We subsequently performed sliding/overturning stability analyses to confirm adequate sliding safety factors under the IDF loading condition for water-retaining structures.

NYC DEP—Evaluation of Hydro Potential

GSE identified additional sites in the city's water and wastewater system with the greatest hydroelectric potential, employing both traditional hydropower and innovative technologies such as in-conduit turbines as well as channel and weir hydrokinetic technologies.

URS—Flanagan South MBTA Support

Gomez and Sullivan staff assisted with managing efforts to comply with the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and assisted with compliance with the Endangered Species Act, for a large oil pipeline proposed to run from Cushing, Oklahoma to Flanagan, Illinois.

City of Auburn—Mill Street Dam: Erosion Protection Evaluation

Gomez and Sullivan analyzed the current stone erosion protection downstream of an existing dam against the expected IDF tailwater conditions to assess the potential for erosion and need for additional protection.

Cardinal Cushings Center, Inc.—Tack Factory Dam Removal: Design Engineering Services

Gomez and Sullivan completed a feasibility study to consider dam removal. A second phase including engineering design plans and permitting assistance has been initiated.

New Office Opened in Loudonville, N.Y., Williamsville Office Relocated

This past March, Gomez and Sullivan opened a fourth office in Loudonville, N.Y. Its staff includes Water Resources Engineer Michele Stottler, P.E., Civil/Water Resources Engineer Jeremy Belanger, E.I.T., Environmental Scientist Matthew Burak, and Water Resources Engineer Matt Denno, P.E., CFM.

The projects undertaken by the Albany-area office include licensing, environmental, hydrology/hydraulics, and civil work. In May, they counted silver eels on Hanacroix Creek, a tributary of the Hudson River, for environmental stewardship.

Staff in the Williamsville office also got a change of scenery. They moved in May from their location at 5820 Main Street to 1961 Wehrle Drive in Williamsville. Staff at this office complete much of Gomez and Sullivan's Right-of-Way work for the New York Power Authority, as well as implementation for NYPA's license for the hydroelectric project. It also houses our network servers, integral to the clients using our information management services.



Above:
Loudonville
Office



Right:
Williamsville
Office

GSE Expands Information Systems Services to Clients

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comprehensive inventory of encroachments (docks, gazebos, retaining walls, etc.) along project shorelines. The GIS component defines the positions and attributes of encroachments, and stores information about the cadastral properties they intersect. SharePoint is used to store encroachment licenses, and to provide a system to track correspondences to encroachment owners.

ADDITIONAL CAPABILITIES

Our Information Systems also include capabilities to help Utility Companies manage data related to the maintenance and sustainability of their transmission assets. We have GIS tools, for instance, that help field crews perform vegetation inventories along Rights-of-Way (ROW) corridors. Crews can load the tools onto a

portable field computer and then collect data regarding vegetation conditions, land use/land cover, access roads, encroachments, foreign utilities, and special conditions. Our system supports exchanging data back and forth between field computers and a master geodatabase. This allows field crews to continue working at the same time office personnel post-process previously collected data.

In addition to vegetation inventories, our solutions support managing ROW real estate data. We use a combination of GIS and SharePoint technologies to create an application that allows users to track acquisitions, conveyances, permits, and other ROW property transactions. The application not only stores the geographic boundaries of each transaction, but also the related attributes and documents. The

documents, which are stored as PDF attachments, consist of property deeds, survey documentation, and landowner requests. We also incorporate geoprocessing models that combine historical acquisition and conveyance data to produce a coverage that reflects current ownership conditions.

CONCLUSION

Our Information Systems support the complex data management capabilities required by the Energy Industry. We are continually improving our Systems to broaden their capabilities and ensure they incorporate the latest technologies. We look forward to continued success in this area.

First Round of Bluestone Project Pipeline Work Completed

Jim Kooser

Almost every day we continue to read and hear stories about drilling and transporting oil and natural gas. Gomez and Sullivan is involved in oil and gas projects across the country. Our ecological staff have been assisting drilling and pipeline companies with various kinds of field and permitting services. We assisted a large pipeline company with a major project running from Oklahoma to Illinois. Senior Ecologist Jim Kooser managed efforts to coordinate project activities and permitting related to the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These acts protect all migratory birds in the US, and Bald and Golden Eagles in particular. Our staff analyzed project activities in relation to these two laws, worked with engineering staff to avoid and minimize impacts, and participated in negotiations with state and federal regulatory staff.

Since 2011, we've been assisting with the Bluestone Project, a "gathering" system pipeline in northern Pennsylvania and southern New York. This large gas line

collects gas from the Marcellus shale fields in northeastern Pennsylvania, and transports it to the very large Millennium Pipeline, which crosses through New York. Gomez and Sullivan staff surveyed the proposed rights-of-way for populations of 10 plants listed as threatened or endangered by the State of Pennsylvania. We developed an innovative mitigation plan that helped minimize and compensate for potential impacts to Marsh Bedstraw, a small wetland plant found in several wetlands being crossed by the project. This year, we completed the first round of post-construction monitoring to determine the success of mitigation efforts. This monitoring will continue for five years.

Northeastern Pennsylvania has, for the last several years, been the scene of much activity in natural gas extraction and transportation. Activity has also increased in Ohio. As the State of New York works to complete its regulatory package for natural gas drilling, we expect that activity will increase in our home state soon.



Restored wetland crossing.

Niagara Project Habitat Improvement Project 2013 Highlights

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the intended ecological enhancement objectives.

Frog Island is a mid-river shallow water knoll devoid of vegetation yet surrounded by lush submergent native plant beds highly regarded for fish ecology. Research has shown that the Frog Island area historically contained emergent vegetation which is now gone, likely due to natural and man-made erosive forces (i.e., wind, ice scour and boat wakes). The objective of this HIP is to create a protective low profile berm to surround the shallow water area and to re-establish native emergent species. Construction of the low profile berm was initiated this year and the bulk of the project (including emergent plantings) will be completed next year.

Strawberry Island is the final island HIP to be constructed per license commitments. A conceptual design was completed this year and has been accepted by regulators and local ecological non-governmental organizations. The concept design establishes approximately 5-acres of emergent wetland and enhances fisheries using shoreline features to interrupt strong river currents that pass the island. Construction at Strawberry Island is scheduled to begin in 2015.



Above: Frog Island during construction.

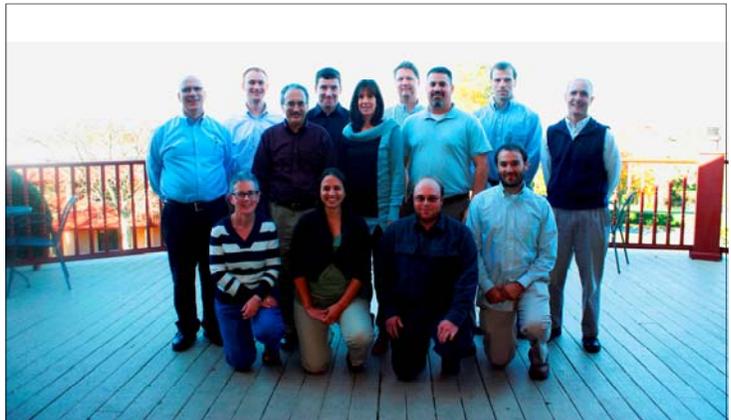


Right: Motor Island shoreline.

Gomez and Sullivan Office Staff



Clockwise from top-left: Utica, NY Office Staff; Williamsville, NY Office Staff; Henniker, NH Office Staff, Loudonville, NY Office Staff



Glendale Relicensing Project Comes Close to Completion

Craig Arnold, P.E., LEED AP

Gomez and Sullivan resumed work on the Glendale Bypass Minimum Flow Hydropower Project in the fall of 2013. The structural design of the powerhouse was started in 2010 by Gomez and Sullivan following FERC relicensing, in addition to a water quality study, a littoral and shoreline habitat survey, and an instream flow study of the Project's 2,500-foot bypassed reach. The project was issued a new license in 2009, and the development of the bypass powerhouse was a result of license requirements. Construction of a recreation trail and canoe portage around the Glendale Dam was completed by ENEL in 2011.

As a result of the project's relicensing, Gomez and Sullivan was retained and designed a new powerhouse for the Glendale Dam in Stockbridge, Massachusetts. The powerhouse project was halted just prior to completion of construction drawings in the summer of 2011. In the fall of 2013 Gomez and Sullivan was asked to move forward with completion of the structural drawings with a few modifications to the original design. The proposed powerhouse footprint and capacity remained the same as in the original design including the 165 kW turbine generator that had been previously purchased by ENEL. Changes that ENEL requested included that the unit be fed from the existing powerhouse canal. This flow will enter the forebay area by means of a newly designed gate instead of modifying the sluice gates just upstream of the proposed powerhouse.

Glendale currently operates as a run-of-river facility. The existing powerhouse contains four identical Kaplan turbines/generator units with a total hydraulic capacity of approximately 400 cfs for the project. Water discharged through the turbines enters the tailrace, and then re-enters the Housatonic River 2,500

feet downstream of the dam. Under the requirements of the project's new FERC license, the minimum flow requirement for the bypass reach below the dam has been increased from 10 cfs to 90 cfs or the inflow to the impoundment, whichever is less. The bypass flow is currently passed



Above: Preparation of walls of the powerhouse above intake level.



Side view of Glendale Dam and downstream reach.

over the length of the spillway crest. All inflow in excess of the project's generating capacity is passed over the dam when the inflow exceeds the generating capacity of the project.

Gomez and Sullivan originally designed and detailed the replacement of two existing wood sluice gates with new stainless steel slide gates. The design also included a one-inch-spaced bar rack to be

placed over the new slide gates for fish protection. Preliminary drawings were developed based on the best available information for inclusion in the licensing applications. Upon investigation, it was discovered that the existing sluice gates are completely submerged by silt and debris upstream of the gates. Further investigation showed removal of the silt from the upstream face of the dam to expose the sluice gates made the project economically unfeasible. The new design now provides for the forebay of the powerhouse being fed from the existing adjacent canal rather than through the sluice gates. The sluice gate openings are to be permanently sealed during the construction of the powerhouse.

The new concrete powerhouse structure is located just downstream of the dam between the existing canal wall and spillway abutment.

This structure will house the minimum flow generator and turbine. The unit will receive water from the forebay just downstream of the dam. To ensure that the flow continues to the bypass reach when the minimum flow turbine is not in use, an additional discharge gate will be installed in the south face of the forebay opposite the existing bypass canal wall.

The project is currently under construction and will be on line in 2014. After completion, the project will continue to operate in run-of-river mode using automatic pond level control. The increased minimum flow release of 90 cfs or inflow, whichever is less, will pass through the new turbine into the bypass channel below the project dam meeting requirements of the new license.

The addition of the new minimum flow turbine will increase the generating capacity of the site from the existing 1.140 MW to 1.305 MW.



GOMEZ AND SULLIVAN
Engineers, P.C.

288 Genesee Street
Utica, NY 13502
T: 315-724-4860
F: 315-724-4862

41 Liberty Hill Road, Building 1
P.O. Box 2179
Henniker, NH 03242
T: 603-428-4960
F: 603-428-3973

1961 Werhle Drive, Suite 12
Williamsville, NY 14221
T: 716-250-4960
F: 716-250-4965

399 Albany Shaker Road, Suite 203
Loudonville, NY 12211
T: 518-407-0050
F: 518-407-0053

Mail To:

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