



## Liza Grudin, PE, ME, ENV SP

*President*

### Professional Experience

Ms. Grudin is a licensed Professional Engineer with over 25 years of permitting, management and design experience in environmental consulting on bulk fuel facilities, retail stations, industrial and commercial properties impacted by petroleum constituents, chlorinated solvents, pesticides and metals. Ms. Grudin is adept at management of large portfolios with multiple, upper level and political stakeholders. She has provided supervisory and engineering support for large permits, remediation design, system construction, and operation and monitoring of federal and state funded, privately funded and consent order sites for multiple Fortune 500 clients.

### Representative Project Experience

**United States Department of Agriculture, ARS Sugarcane Field Station, Canal Point, Palm Beach County:** Project Manager and Engineer-of-Record for expedited removal of two 2,000-gallon ASTs along with the containment wall and stairs. Five soil borings and one temporary monitor well were installed to assess petroleum impacts in the vicinity of the ASTs. Prior to the intrusive field activities, a site walk was conducted with key onsite staff to determine utility and other underground hazards. Electro-magnetic (EM) and Real-Time Ground Penetrating Radar (GPR) Locating equipment was employed to locate and mark all facilities in the work area. Soil samples and groundwater samples were collected pursuant to regulatory guidelines. Based on the field screening and laboratory analysis, no further assessment was requested in a formal regulatory Tank Closure Report submittal. The report was approved with no comments from the local regulatory agency.

While tank removal and assessment activities were ongoing, Ms. Grudin was spearheading the effort to get a replacement tank onsite. The Sugarcane Field Station relies on the tanks to fuel their onsite equipment. Removal of the tanks created a requirement for offsite procurement of fuel reducing site

#### EDUCATION:

- MS | Environmental Engineering focus on Sustainability | USF, Tampa, FL
- BS | Environmental Engineering | UCF, Orlando, FL

#### CERTIFICATIONS | REGISTRATIONS:

- Professional Engineer: Alabama, Delaware, Florida, Georgia, Louisiana, New Jersey, Texas
- NCEES Record Holder
- Envision® Sustainability Professional (ENV SP)
- Stormwater and Erosion Control Inspector
- URS Project Manager Certification
- Transportation Worker Identification Credential (TWIC)

#### TRAINING:

- 40-Hour OSHA Health and Safety Training, Refresher Training (annually)
- 8-Hour OSHA Site Supervisor Training
- 8-Hour Loss Prevention System (LPS) Training
- American Petroleum Institute (API) Service Station Contractor Safety Key
- BP Safety Passport and MITT Training
- PSI's Phase I ESA Training
- Florida RNA Seminar
- Smith Defense Driving Course
- URS Defensive Driving Course
- URS Quality Workshop

#### PRESENTATIONS | PUBLICATIONS:

- REMTEC National Driller Workshop, March 2017, Envision™ Sonic: A Case Study Evaluation for Sustainability, Denver, CO
- Florida Remediation Conference, October 2015, Moderator, Sustainability Panel: Debunking the Myths of Sustainability, Orlando, FL
- HSE News, May 2015, PEECO: Port Everglades, Pier 1, Berths 9 and 10
- HCR Happenings, December 2011, Tips for a Sustainable Holiday
- Florida Remediation Conference, October 2011, Sustainability and Operations, Lunch Presentation, Orlando, FL
- BP IT Conference, May 2002, Oxygen-Injection System Operations and Lessons Learned, Naperville, IL

#### AFFILIATIONS | VOLUNTEER:

- Society of American Military Engineers (SAME) Sustaining Member, Tampa Bay and Jacksonville Posts, Membership Committee, Vice-Chair for Strategic Alliances K-12 STEM Outreach Committee
- Florida Association of Environmental Professionals (Tampa Bay Chapter), Women in STEM Committee
- Sustainable Remediation Forum (SURF)
- Land Use Appeals Board, Hillsborough County, 2016-2019
- Mentor, Hillsborough Education Foundation (HEF), 2015-2018



operational efficiency. Dedicated resources to the procurement effort allowed for delivery of the replacement tank within 52 days of Notice to Proceed.

**United States Coast Guard Station, Fort Myers Beach, Lee County:** Project manager for removal of aboveground storage tank (AST) and replacement activities. Provided oversight for all field activities, coordinated the field schedule, and completed all report documents. The scope of work included the removal, cleaning and proper disposal of a 150-gallon diesel AST providing fuel for the onsite generator. Scheduling was conducted during non-hurricane season in conjunction with USCG personnel. A 100 KW generator was rented to provide backup power in case of emergency. The existing tank slab was removed and properly disposed. A crane was utilized to set the new 250-gallon Convault AST. The scope of work also included installation of all components, and startup and load testing. All site activities were conducted within limited spacing in close proximity to the existing building and seawall.

**Gordon W. Ivey Power Plant, Homestead, Miami-Dade County:** Ms. Grudin applied for and managed the NPDES permit for this municipal power plant for eight years. She coordinated with the client and FDEP on permit specifications and requirements to allow for discharge of the once through cooling water from the power plant. Ms. Grudin was also the Project Manager for the Consumptive Water Use Permit application for this municipal power plant. She negotiated with the client and SFWMD on permit specifications and requirements. A digital model was constructed to simulate the impacts on surrounding users and wetlands from the drawdown in the Biscayne aquifer at the site. Her client was granted a 20-year permit for water use in a once through cooling system for the power plant as a second permit issuance. Evaluations included use of effluent from municipal wastewater plant for the once-through cooling water. This option was excluded due to current cost but placed on the municipal planning agenda for the City of Homestead for future implementation. Ms. Grudin prepared groundwater monitoring reports for the municipal power plant. Activities included evaluation of natural attenuation indicators to provide support for bioremediation of petroleum impacts in conjunction with free product recovery efforts.

**Citrus Combined Cycle Plant, Duke Energy, Crystal River, Florida:** Ms. Grudin prepared the initial Best Management Practices/Pollution Prevention Plan (BMP3 Plan) for stormwater controls at this newly activated energy plant. The CCC is a natural gas-fired, combined cycle combustion turbine generator (CTG) facility with a total of 1,640 Megawatt (MW) electrical power generating capacity. Four stormwater detention ponds, surrounding the main buildings, are utilized to collect and treat stormwater runoff. An Industrial Wastewater (IWW) Percolation Pond is located northwest of the combined cycle power blocks. Process IWW is treated by an oil/water separator system prior to discharge to the percolation pond. Domestic Wastewater (DWW) is also processed and sent via sumps to the percolation pond. The IWW Percolation Pond contains an emergency overflow structure to isolated wetlands. The percolation pond is designed to contain permitted wastewater flows plus rainfall generated by a 25-year/24-hour storm event. Overall onsite activities encompass approximately 193 acres of the property with the remainder as undeveloped land. The purpose for the development of this BMP3 Plan was to maintain and monitor stormwater discharges at the CCC Station and minimize potential adverse impacts to the onsite and surrounding soil, surface water, groundwater, and ecosystems. This BMP3 Plan consisted of the



development and implementation of best management practices, and the establishment of provisions, protocols, and responsibilities for maintaining and monitoring the stormwater at the CCC Station. Ms. Grudin was the Engineer-of-record for the BMP3 Plan and prepared training materials to accompany the new Plan.

**21<sup>st</sup> Avenue Remediation Project, Tampa, Hillsborough County:** NovelE is a sub-consultant on this four-year contract with Hillsborough Area Regional Transit (HART). Liza Grudin, PE serves as the Engineer-of-Record, Remediation Lead and Sustainability Lead for the contract providing management and completion of comprehensive environmental assessment and remediation activities. The contract, valued at over \$1.7 million, is the largest procured by HART for these services. Ms. Grudin provides hand-in-hand consulting on key environmental aspects for this ISO 14001 certified facility. In this role, she works with the client reviewing third-party contractor reports and plans, and developing internal BMPs, SOPs and Work Instructions for HART procedures. HART provided Ms. Grudin with Proxy access and a physical desk in their Ybor office to facilitate these efforts.

Ms. Grudin completed a cumulative site history for the facility's operations dating back to 1983 identifying discharges and related closures and allowing for identification of "phantom" wells at the site for use in assessment or abandonment. The site history is also being utilized to track eligible and non-eligible discharges in coordination with the Environmental Protection Commission of Hillsborough County (EPCHC). Assessment and remediation activities to date include soil boring and monitor well installation and abandonment, soil and groundwater sampling, closure of an onsite oil/water separator, and free product identification and recovery. One of three primary Areas of Concern (AOCs) has been closed via a Site Rehabilitation Completion Order (SRCO). Based on the comprehensive file review, an error was found on the regulatory document summarizing closure requirements and detailing the conditions of the closure. EPCHC is currently reviewing procedures to re-issue the SRCO correctly. Ms. Grudin provides overall sustainability management of the project developing Work Plans in coordination with the Prime Contractor, EPCHC, and the client, HART. Advance work planning allows for streamlined site assessments with a reduced environmental footprint. A streamlined life cycle assessment approach is utilized.

Documents drafts completed to date include a Spill Prevention Countermeasure and Control (SPCC) Plan, a Stormwater Pollution Prevention Plan (SWPPP), a Waste Management Plan, a Spill Response Plan, a Waste Minimization and Recycling Objectives, Targets and Programs Action Plan, and Tank Inspection SOP. Ms. Grudin updated Tank Inspection forms to meet the requirements of the Local Compliance authority when the existing forms were deemed non-compliant. She then collected input from staff on the use and implementation of the forms followed by training for Facilities Maintenance staff. Additional forms drafted by Ms. Grudin include an updated HART Spill Report Form and RCRA Weekly Inspection Log.

After a January 2017 discharge of approximately 500 gallons of diesel fuel at the facility, NovelE provided initial consulting for regulatory discharge reporting compliance and emergency source removal activities. NovelE personnel conducted a third-party audit of the discharge leading the interviews, root cause analysis, and compiling the Corrective Action Analysis Report. NovelE is currently working with HART's Maintenance



Facilities Department, Environmental Department, and Procurement and Contracts Administration Department to evaluate the corrective actions for implementation. Additionally, NovelE worked with the Procurement and Contracts Administration Department to update the Fuel Delivery Standard Operating Procedure (SOP) and Diesel Fuel Delivery Work Instructions (WIs) documents HART uses routinely to aid in spill prevention.

Ms. Grudin acted as the Team Leader for an in-house Environmental Compliance Audit conducted for the Maintenance Facility including the heavy maintenance, preventative maintenance, and bus washing areas. A comprehensive checklist was utilized for the audit and then reported during HART's ISO 14001 formal annual audit. Since the audits, NovelE has been working directly with HART staff to implement corrective actions related to the Opportunities for Improvement (OFIs) identified.

Ms. Grudin is in the process of reviewing HART-owned properties for compliance with regulatory requirements including Environmental Resource Permitting. HART properties have various forms of ownership and legal responsibilities. Ms. Grudin identifies potential issues through file reviews, interviews and consultation with regulatory agencies, and review of HART's internal files. NovelE staff works directly with HART's Environmental, Facilities Maintenance, and Project Management Office conducting meetings with former consultants, Hillsborough County and the Southwest Florida Water Management District (SWFWMD) as needed to facilitate the process and work on getting each of the properties into regulatory compliance. Additionally, NovelE works with the Prime Contractor on permitting issues and submittals related to the HART properties.

**Port Everglades, Pier 1, Berths 12 and 13, Hollywood, Broward County:** Ms. Grudin was the Project Manager and Engineer of Record for environmental petroleum cleanup activities for the Port Everglades Environmental Corporation (PEECO) from May 2011 through December 2014. Environmental issues associated with the common area are coordinated by PEECO. PEECO is a non-profit organization, comprised of the terminal property owners at the Port (e.g., Chevron, Motiva, TransMontaigne, etc.), acting as the primary contact for historical petroleum releases at the common areas of Port Everglades. The common area is described as Berths 1 through 27 and the pipeline rights-of-way from the common berths to individual company property lines. PEECO works closely with the property owner's representatives, the Broward County Port Everglades Department, and the regulatory lead, FDEP, for this high-profile site. Staff from Broward County Environmental Protection and Growth Management Department provide oversight for field activities at a local level.

Two free product recovery systems were installed and began operation in 2008. Product recovery at Berth 12 and 13 was ongoing with a total of thirty-six recovery wells equipped with QED Passive Skimmers. The Selective Oil Skimmers (SOS) recovery product utilizing two Ingersoll Rand air compressors and seven QED programmable air controllers housed in two equipment buildings rated for Class 1, Division II conditions. Ms. Grudin was instrumental in equipment modifications to the systems increasing free product recovery and decreasing water intake. Aging Passive Skimmers (SPG) were identified as a source of water and



replaced with onsite SOS skimmers in key wells to increase free product capture. Ms. Grudin obtained funding from FDEP to double the frequency of maintenance visits in order to protect the inland waterways.

**Port Everglades, Slip 2 Assessment, Fort Lauderdale, Broward County:** Ms. Grudin conducted a preliminary investigation of the proposed excavation area at Slip 2 for the presence of petroleum-impacted soils. The initial Slip 2 Lengthening, proposed under the Port Everglades Master/Vision Plan, included lengthening approximately one-half of the slip width by 250 feet. Working with the Port Everglades Department of Broward County and her client, PEECO, a larger area was evaluated for environmental impacts and the anticipated lengthening was widened to include the entire slip width allowing for the berthing of more vessels and increased revenues by Broward County. Ms. Grudin worked closely with the Assistant to the Port Director, Port staff, and ongoing concurrent operations at Slip 2 to minimize impacts to ongoing Port operations and keep a tight project schedule.

**Pier 1, Pier 2, Slip 1, Fort Lauderdale and Hollywood, Broward County:** At the request of the Port Everglades Department of Broward County, remediation systems formerly utilized to collect free product on Piers 1 and 2 and Slip 1 were abandoned utilizing funding provided by FDEP and PEECO in a cost share agreement under the Preapproved Advanced Cleanup Program (PAC). Thirty-five remediation wells were abandoned pursuant to SFWMD guidelines, removed entirely, and then backfilled to Port Engineering requirements with pumpable, excavatable, flowable fill. Existing, non-operable lines for the former remediation systems were vacuum extracted to remove product and capped in place. Ms. Grudin coordinated with Port personnel and each individual stakeholder representing the major oil companies that work at the Port to determine the scope of work. The scope of work was modified on an ongoing basis to meet the needs and requirements of each stakeholder. Decommissioning activities also included the removal of system equipment, compound fencing, traffic bollards and concrete pads as indicated and approved by Port personnel.

In preparation for future free product recovery efforts in advance of the sea wall construction activities, five remediation well locations were excavated to the water table and left open for a minimum of 48 hours. Maintenance-of-Traffic (MOT) requirements were discussed and arranged in advance for these locations. Locations were selected to minimize impacts to concurrent operations at the Port; however, due to 24-7-365 work activities on the Port extreme care was taken to protect staff from the open excavations. Data collected from these locations was utilized to determine future locations for recovery at Berths 9 and 10 (see below).

**Port Everglades, Pier 1, Berths 9 and 10, Hollywood, Broward County:** Ms. Grudin designed a recovery system with underground free product recovery trenches utilizing Large Diameter Filter Scavengers for free product recovery at Pier 1, Berths 9 and 10. Free product recovery was implemented in anticipation of the slip-widening and sea wall construction activities proposed under Broward County's Port Everglades Master/Vision Plan with funding provided by the FDEP Free Product Recovery Initiative (FPRI). Ms. Grudin worked closely with the Licensed General Contractor to develop the scope of work and methodology for free product recovery, which is currently ongoing prior to projected Port Everglades expansion



activities. Reducing the contaminant mass will assist in maintaining the Broward County's project schedules, and reduce worker health and safety exposure issues during construction activities. With the limited timeframe available for free product removal and high priority for Port expansion projects, fast-tracking conception and implementation was of great importance. Ms. Grudin worked closely with the site owner's representative, the Assistant to the Port Director, responsible parties, client and funding agency to meet their distinct and individual cleanup and construction requirements. Due to the high profile of this facility, the Director of the Division of Waste Management of FDEP, Jorge Caspary, took the lead in initial planning, strategizing and approval of funding for this project. Various options, including open and closed trenches utilizing Large Diameter Filter Scavengers with conventional electric or solar options were considered and negotiated between Broward County Port personnel, PEECO, and the FDEP. Solar options were ultimately ruled out due to the high cost of retrofitting the panel's inverter to accommodate the Class 1, Division 2 requirements on the Pier for explosion-proof (XP) rated components.

Due to the aforementioned constraints and limited regulatory timeframe, Ms. Grudin worked closely with the licensed General Contractor and the FDEP site manager, Mr. Matt McCoy, to effectively negotiate approximately \$680,000 in contracts in a few week timeframe. Ms. Grudin worked with Port personnel and the licensed General Contractor to obtain permits from the City of Hollywood in an expedited manner. Prior to construction, her team met with each of the major oil companies with pipelines in the area of construction to review the Ground Penetrating Radar (GPR) markings and update maps with current and strategic pipeline data. During construction activities, Ms. Grudin worked with the Construction Manager, Project Foreman, and Assistant to the Port Director to maintain the project schedule under unique site conditions. Construction activities took place in a secure area of the Pier where bulk fuel is offloaded. As ships enter Port waters and take berth, site activities were limited and dependent upon the owner of the vessel in Port. Since ship schedules changed hourly, a dynamic scope of work was required wherein the crew maintained flexibility and handled changes in a professional and innovative manner. Ultimately, the work was completed ahead of schedule and below the anticipated budget.

As a further complication to the project scope, fuel distribution lines from six major oil companies at Pier 1 run underground to each of the individual terminal property boundaries. During excavation of the free product recovery trenches, soil was removed in one-foot lifts and utility locating equipment was utilized between lifts to screen the trench limits. Fuel pipelines were safely exposed as necessary to maintain safe working conditions for construction and Port personnel and to protect the environment from petroleum releases. Since free product often uses these utility corridors as preferential pathways, it was important to keep the recovery trenches in close proximity to the underground lines and easements, while maintaining strict health and safety regulations. Based upon the success of the design and implementation of this free product recovery system, FDEP is evaluating Ms. Grudin's design for use on other sites within the Port.

**Berths 16 through 18, Hollywood, Broward County:** The last full assessment of the Port Everglades Common Areas occurred in the mid-1990's. During discussions regarding the Pier 1 Port expansion activities, the Director of the Division of Waste Management expressed concern over the lack of recent data. Ms. Grudin provided a list of potential areas for current assessment to PEECO and the Assistant to the Port Director.



At the latter's request, investigations were initiated along the pier of Berths 16 through 18. Existing monitor wells installed in the initial assessment were located and free product measurements were collected. Due to several layers of paving activities, five wells were located at an approximate depth of 5 inches below grade. These damaged monitor wells were repaired as needed. Soil boring locations were evaluated based on historical maps from the original Contamination Assessment Report, using Google Maps and current Port maps to determine matching areas of former free product. These maps were then compared to current pipeline drawings to evaluate safe areas for the installations. Approximately twenty soil borings were installed to evaluate the extent of current free product in this area of the Port. Access to this secure area was obtained and arranged around cruise terminal entry, loading and departure.

**Port Everglades, Fort Lauderdale and Hollywood, Broward County:** Project manager providing for a detailed scope of services on the Geographic Information System (GIS) mapping project for Port Everglades. Ms. Grudin worked with the multiple entities representing PEECO and Port Everglades Department of Broward County personnel to create a one-of-a-kind interactive map. Utilizing ArcMap 10.0 in conjunction with Adobe Illustrator, an interactive map of the Port Everglades Common Areas was prepared. The map allows for a user-friendly format capable of display of its layers in any combination, all together, and in any order. The layers represented include historical petroleum impacts including free product, contaminated soils and dissolved phase constituents, current free product plumes, and footprints of Port development projects. Port Everglades Department of Broward County, PEECO and FDEP will utilize the GIS map to plan remediation efforts in advance of Port expansion under the Port Everglades Master / Vision Plan and provide information to Contractors with proposed construction activities at the Port including existing and proposed underground utilities and pipelines.

**Motiva Port Tampa Terminal, Tampa, Hillsborough County:** Consultant to Motiva for implementation of a risk assessment at the Motiva Terminal at Port Tampa. Ms. Grudin acted as client liaison for review of reports and provided guidance to their contracted consulting firm, Groundwater and Environmental Services, Inc. (GES), on the required fieldwork and reporting procedures. She attended site walkthroughs and client meetings to educate the contracted consulting firm on risk based closure options. Ms. Grudin was recommended for this role through the upper management and technical teams of BP due to her expertise in risk management regulations in the State of Florida.

**Motiva Port Everglades South Terminal and Motiva Port Everglades East Terminal, Fort Lauderdale and Hollywood, Broward County:** Ms. Grudin acted as the consultant to Motiva for implementation of risk assessments at the two Shell Terminals at Port Everglades. She provided client support for review of reports, and guidance to their contracted firm, GES, on the required fieldwork and reporting procedures. Ms. Grudin provided consultation on the Site Rehabilitation Funding Agreement (SRFA) applicability to risk based closure and the guidelines for the application. She conducted a review of the Risk Assessment Justification (RA/J) for the PEECO Common Areas as it applied to individual terminal operations and facilities. Ms. Grudin provided guidance to Motiva regarding risk assessment protocols pursuant to the established RA/J, which she later used as a framework for future negotiations with FDEP and the Port on behalf of PEECO (see above).



**Port of Tampa, BP Terminal, Tampa, Hillsborough County:** As Southwest Area Manager, Ms. Grudin was the Project Manager for emergency response, source removal and assessment activities for two petroleum releases at the active BP Terminal. Initial remedial actions included soil excavation and vacuum extraction of soils and product. Both discharges were granted a No Further Action without Conditions status once site assessment and additional excavation of petroleum-impacted soils was completed.

Regulatory review conducted by Hillsborough County Environmental Protection Commission (EPC) revealed two ineligible discharges with the potential for Consent Order issues at the terminal facility. One old ineligible discharge was evaluated under the Risk Assessment criteria at the BP Terminal. Although Hillsborough County had not adopted rules under former code Chapter 62-770.650 Risk Assessment, Ms. Grudin sought permission from the FDEP and was granted its use as applicable for this discharge. It was agreed that upon completion of passive free product recovery, one year of monitoring would be conducted to evaluate the site under Level II Risk Management Options. After considerable regulatory negotiations, the second ineligible discharge at the BP Terminal was granted No Further Assessment status based upon a commingled plume with an eligible discharge.

As the Engineer of Record, Ms. Grudin certified the Release Prevention Barrier utilized for secondary containment for regulatory compliance under Chapter 62-762, FAC.

**Former BP Terminal, Tampa, Hillsborough County:** Ms. Grudin coordinated the site assessment for BP Oil Company's terminal closure at Port Tampa, including tank removal, cone penetrometer testing, soil boring and monitor well installation, and groundwater sampling. She prepared the Tank Closure Report for closure of aboveground storage tanks (ASTs), underground storage tanks (USTs), and oil / water separators and submittal to the regulatory agency. Ms. Grudin performed an Exposure Assessment for the BP Oil Company terminal subsequent to closure activities. She implemented Risk-based Corrective Action (RBCA) evaluations using the client's proprietary guidance manual and standard practices and procedures for site characterization, exposure assessments, and risk assessment evaluations, which required a thorough knowledge of the ASTM tiered risk assessment approach, Environmental Protection Agency (EPA) Risk Assessment Guidance for Superfund Sites, and the FDEP RBCA Program. She assisted with general cleanup of the facility in conjunction with evaluation of divestment options.

**Fruitville Brownfields Area, Sarasota, Sarasota County:** Ms. Grudin conducted operations, maintenance, and troubleshooting evaluations on groundwater and soil remediation systems for a Brownfields site in Sarasota County contaminated with chlorinated solvents. The two dual phase remediation systems were designed with a packed stripping tower and low profile air stripper, respectively, to remediate tetrachloroethylene (PCE), trichloroethene (TCE), 1,2-dichloroethylene (1,2-DCE), and vinyl chloride. Ms. Grudin conducted groundwater sampling activities inside the active commercial building on a quarterly basis. She later installed an AS curtain just above the clay layer to prevent migration of contaminants onto adjacent properties. The Brownfields site is currently developed with a Lowe's Plaza and Harley Davidson retail establishment.





**Lift Station 53 Upgrade, West Palm Beach, Palm Beach County, Florida:** Ms. Grudin provided all environmental permitting services including Water Use, Environmental Resource and Industrial Wastewater permitting. Liza developed all Best Management Practices (BMPs) and corresponding documents for the permitting and associated construction activities. The site was located in a residential community in close proximity to private property. The existing collection system was continuously receiving sewer flows, which was continuously and reliably bypassed for the duration of construction.

**Beverage Station, Fort Pierce, Florida.** Project Manager and Engineer of Record for environmental cleanup of this retail petroleum station with petroleum-impacted soil and groundwater above the State Cleanup Target Levels eligible for funding under the Petroleum Restoration Program (PRP). Engineer of Record for Remedial Action Plan Modification (RAPM) designing air sparging (AS) and soil vapor extraction (SVE) system with National Pollutant Discharge Elimination System (NPDES) permitting. Ms. Grudin was responsible for negotiations with the FDEP to enlarge the original system design completed by a previous consulting firm. A shallow clay layer at the site was not taken into account during the original design and the well spacing did not conform to the Remedial Action Initiative (RAI) requirements. The number of AS wells was increased by approximately 120 percent in the RAPM submittal. Ms. Grudin developed the construction drawings and provided oversight to the in-house construction crew certifying that the methodology and construction met the permitted drawings with as-built documentation. This project required permitting with the North St Lucie Water Control District, coordination with the District consultant AECOM, and FDEP for access and groundwater discharge under the NPDES permit. Ms. Grudin provided engineering support to the Fort Pierce Utilities Authority and licensed electrician to provide underground power from across a neighboring street to the remediation system trailer. Project manager and engineer of record for continued operation and maintenance (O&M) pursuant to the approved RAPM.

**Days Inn, Altamonte Springs, Seminole County:** Liza Grudin, PE serves as the Engineer-of-Record providing comprehensive environmental consulting activities for the site. Petroleum impacts at the site have migrated through the adjacent roadway and onto a neighboring commercial parcel currently operating as a hotel. Two chase pipes with eight (8) remediation lines currently cross Wymore Road from a previous remediation system. The engineer-of-record for this project contacted FDOT to determine the schedule for roadwork and let all involved parties including FDOT, Seminole County, and the contractors, SGL and RS&H, Inc., know that two chase pipes currently cross Wymore Road and contain remediation piping. Updated CAD files were requested, and assessment activities were also coordinated with the road closure. Key contacts in this process included Seminole County, the COS Roadway Compliance Engineer for the I-4 Ultimate Project, the I-4 Ultimate Construction Program Manager for FDOT, SGL Constructors Area 4 Project Manager, Project Utilities Coordinator, and Utility Relocation Manager, the Transportation Engineer for RS&H, Inc.

During this timeframe, Ms. Grudin was also working on remediating the petroleum impacts onsite and developing a plan for future remediation in the roadway and offsite. Historically, a remediation system utilizing air sparging combined with soil vapor extraction (AS/SVE) and groundwater recovery was operated



onsite from May 2009 to July 2013. Due to several factors including a high design AS flow rate, improper sizing of the SVE system, and inadequate spacing of the remediation wells, the remediation system was ineffective in remediating the site. A modification to the remedial design was requested by NovelE to address the petroleum-impacted soil and groundwater remaining at the site. Based on assessment activities conducted to date and the large design ROI from the original RAP and RAPM documents, pockets of petroleum impacts may remain not illustrated fully by the monitoring well layout, spacing and well locations. A Level 2 Remedial Action Plan Modification (RAPM) was submitted to the local program, Orange County Environmental Protection Division, and approved with no comments. The Level 2 RAPM recommended limited remediation in the source area while roadway activities were ongoing.

Monthly episodic events are used to evaluate the feasibility and effectiveness of AS/SVE technology at the site. Based upon initial screening of site conditions, AS/SVE was determined to be an effective remediation method for contaminated groundwater due to the lack of free product, unconfined aquifer, anticipated soil permeability, and biodegradability of the petroleum constituents. The episodic events provide data for the design of the site-specific, full-scale remediation system. The objective is to evaluate the proper installation depth of future air sparging wells, minimum radial influence of each AS and SVE remediation well, and design air flow rate and pressure for each technology. The episodic data will be utilized to optimize the efficiency of future system operation and design.

**P&B Sales & Service, Brooksville, Hernando County:** Liza Grudin, PE serves as the Engineer-of-Record providing management and completion of comprehensive environmental assessment and remediation activities for the facility. The lithology in Hernando County, especially Brooksville, is variable consisting of a tight formation of clays and clayey sands. This type of lithology is typically difficult to remediate, and site-specific conditions should be taken into account whenever possible. In addition, the presence of the abandoned in place underground storage tanks (USTs) factors into the radius of influence, flow rate and ultimate vacuum required for remediation. For these reasons, NovelE recommended that a pilot test be conducted at the site to determine the feasibility of multi-phase extraction.

Ms. Grudin prepared a signed and sealed Pilot Test Plan outlining the proposed testing of a multi-phase extraction system (MPE), which was approved by the Pinellas County Health Department with no comments. Although MPE is particularly effective in low permeability soils, it was expected that some areas of petroleum-impacted soil and groundwater may not be effectively remediated with this technology. The pilot test confirmed that the radius of influence for the system was limited to the underground storage tank (UST) area and surrounding non-native lithology. A Pilot Test Report was submitted summarizing the site activities and recommendations and approved with no regulatory comments.

Liza Grudin, PE prepared a Level 2 Remedial Action Plan (RAP) for site cleanup in accordance with Chapter 62-780, Florida Administrative Code (FAC). The proposed remedial action for the site included extraction of groundwater and vapors from three (3) vertical dual phase wells across the site (DP-1 through DP-3); treatment of the extracted soil vapor stream with vapor phase granular activated carbon (GAC); and treatment of the extracted groundwater with an air stripper prior to onsite disposal to an infiltration gallery.



The RAP was approved by the Pinellas County Department of Health with no comments. Construction Drawings were prepared by NovelE in sufficient detail to be used for bidding of the construction and installation portion of the project. The Construction Drawings were submitted to the Pinellas County Department of Health and approved with no comments.

Liza Grudin, PE, worked with the University of South Florida's Green Engineering Spring 2017 semester class on a volunteer basis. NovelE provided technical information to the undergraduate team for evaluation of bioremediation design options. The opportunity provided a chance for the team to learn the difference between the classroom setting and a real-world application for their remediation solutions. The USF Team presented a remediation strategy of phytoremediation as the preferred option for cleanup.

**Interim Energy Operating, LLC, Formerly Sample Road Marathon, Pompano Beach, Broward County:** Ms. Grudin was the Project Manager and Engineer of Record for environmental cleanup activities at this active retail gasoline station eligible for funding under the PRP. She began work on this project at the close of active remediation via an AS and SVE system. Upon completion of full-scale remediation, polynuclear aromatic hydrocarbons (PAHs) remained in one well on the northern property boundary. Ms. Grudin implemented a limited Remedial Action Plan (RAP) for episodic AS and initiated long-term post remediation monitoring of key site monitor wells. Constituents of concern rebounded above the Natural Attenuation Default Concentrations (NADCs) for volatile organic compounds (VOCs), such as benzene, in shallow and vertical extent wells. Ms. Grudin elevated the level of concern citing the possibility of offsite impacts and noting the presence of three Large Public Supply Wells, withdrawing greater than 150,000 gallons per day (gpd), within approximately 1,122 feet of the site. Ms. Grudin worked hand in hand with the local Broward County Environmental Protection and Growth Management Department representatives to obtain over \$24,000 in funding from FDEP for additional assessment, offsite notifications, and a Remedial Action Plan Modification (RAPM) report submittal. This funding allocation was obtained during transitioning of the FDEP PreApproval Program to the Petroleum Restoration Program, requiring the signature of both the Bureau Chief and Division of Waste Management Director, and therefore additional historical research, documentation and liaison was required.

**119<sup>th</sup> St, Miami, Miami-Dade County:** Ms. Grudin was the Project Manager and Engineer of Record for environmental cleanup activities at this active retail gasoline station. She managed this project from the Remedial Action Construction (RAC) phase to the Post Active Remediation Monitoring (PARM) phase. The approved RAP completed by a previous consultant for AS combined with SVE was modified by Ms. Grudin during preparation of the Construction Drawings. Ms. Grudin obtained the construction permits, provided engineering oversight of the construction activities and prepared the as-built documentation for this facility. When issues arose with permitting in Dade County, she worked with the inspector and licensed electrical subcontractor by attending person-to-person meetings to resolve issues with the electrical drawings submitted for permitting. The remediation system operated for one year bringing the site below the Florida State Criteria, Groundwater Cleanup Target Levels (GCTLs) specified in Chapter 62-777, FAC, for constituents of concern including the traditionally difficult to remediate contaminant isopropylbenzene.



**Private Golf Course Maintenance Facility, Boca Raton, Palm Beach County:** Ms. Grudin was the site safety office and Project Manager responsible for assessment and monitoring of this approximate one-acre former golf course maintenance area with arsenic-impacted soil and groundwater. Comprehensive investigations for pesticides, herbicides and associated arsenics were conducted to assess soil and groundwater horizontally and vertically. She coordinated access to the adjacent property and provided oversight for night drilling on the Putting Greens and Fairways of one of the nation's largest private residential country club golf courses. Sampling of monitor wells was complicated by the active golf course with some wells located in and adjacent to Water Hazards.

**Grand Isles I & II, Punta Gorda, Lee County:** Ms. Grudin was the Project Manager for the discharge reporting, assessment and site closure activities related to the discharge of diesel fuel from an onsite 1,000-gallon diesel Convault aboveground storage tank (AST) associated with the fuel system for a generator. Major stakeholders included Prosperity Point Gateway Management Board of Directors and personnel, Lee County, FDEP South District, and Charlotte County. Regulatory interpretation was required to determine the agency responsible for direction of cleanup activities as neither Lee, nor Charlotte County sought involvement in the discharge reporting or closure. The initial evaluation projected the removal of one 55-gallon drum of petroleum-impacted soils, which soon escalated to the excavation and proper transportation and disposal of 101.41 tons of soils and vacuum extraction of 510 gallons of light non-aqueous phase liquids (LNAPL). Demolition activities included the removal of the fuel room wall, diesel AST and a 6' by 12' hole in the fuel room floor. Confirmatory soil and groundwater analysis was below the respective cleanup target levels and the site was issued a Site Rehabilitation Completion Order without comments or the need for further monitoring.

**Phase I and Phase II Environmental Site Assessments, Multiple sites:** Ms. Grudin has performed numerous Phase I and Phase II ESAs of industrial manufacturing and commercial parcels, residential developments, vacant parcels, and undeveloped hunting and farming parcels. ESAs were conducted in general conformance with the current ASTM Standard E1527 and commercial lending guidelines. Major clients include government agencies, financial institutions, insurance companies, law firms, property management companies, and a variety of industrial and commercial companies. Limited and full scope Phase I and/or Phase II ESAs were conducted in Orange, Seminole, Lee, Dade, Broward, Brevard, St. John's, Flagler, Lake, Polk, Volusia, and Palm Beach counties. She has performed ESAs for greater than one thousand acre properties in Hendry, Collier, Osceola, and Flagler counties for private clients, SFWMD and SJWMD. A few sites outlining the scope and breadth of Phase I/II ESA work are provided below for reference:

**Twin Eagles Phases I, II, III and IV, Naples, Collier County:** This 2,334-acre parcel consisted of developed land and undeveloped land. The developed land consisted of a golf course and single family homes and lots. Based on Ms. Grudin's large parcel experience, she directed the Phase I ESA scope and breadth for a project manager at her Fortune 500 firm. Investigations included a flyover of the subject property due to dense vegetation. A commercial helicopter was chartered to further search the property for solid waste dumping and debris. Phase II activities were not recommended for this subject property.



**Micco Dairy Cattle Dipping Vat (CDV), Okeechobee County:** Ms. Grudin evaluated conditional closure/risk based options for this cattle dipping vat utilizing deed restrictions, current site conditions, and future site use. She was responsible for the overall approach and the individual groundwater modeling conducted as part of the report submittal. The No Further Action with Conditions proposal was conducted using the Groundwater Natural Attenuation Model (GNAM), part of the Natural Attenuation Toolkit for the Florida Petroleum Cleanup Program (the RNA Tool Kit). GNAM is a groundwater transport model adapted, with permission, from BIOSCREEN, a simple screening tool for natural attenuation in groundwater. BIOSCREEN and GNAM are based on the Domenico analytical solute transport model and can simulate advection, dispersion, adsorption, and aerobic decay as well as anaerobic reactions. Ms. Grudin gathered site-specific data through aquifer testing, analysis of hydrologic processes and laboratory analysis, technical papers and engineering literature, then modeled the information utilizing the Domenico Model. Using the Kissimmee River as a point of compliance, fate and transport for 4,4-DDD, 4,4-DDE, alpha-BHC, beta-BHC, delta-BHC, and gamma-BHC constituents were modeled. Based on the GNAM results, it was determined that concentrations of 4,4-DDD and 4,4-DDE would not migrate to the Kissimmee River in excess of the Surface Water Criteria (Chapter 62-302.530, F.A.C.) for the 1,000-year, steady state, modeled timeframe. Additionally, it was determined that concentrations of each BHC constituent observed in groundwater at these locations would not migrate to the Kissimmee River in excess of their FDEP Groundwater Cleanup Target Levels (Chapter 62-777, Florida Administrative Code (F.A.C.) or Surface Water Criteria (Chapter 62-302.530, F.A.C.) for the 1,000-year, steady state, modeled timeframe. Based on a first order decay rate, alpha-BHC would meet the GCTL at the source area within the first 100-year timeframe. Based on a first order decay rate, beta-BHC would meet the GCTL at the source area at a timeframe between 100 and 200 years.

**Berry LaBelle-Congen Grove Everglades Restoration Project, Hendry County:** Ms. Grudin provided supervisory field management support for Phase II Environmental Site Assessment (ESA) activities on an 8,682-acre Orange Grove. She evaluated data collected each day and provided plans to sampling personnel for the next day of work using aerial maps and GPS locations along with onsite tracking of activities. She performed surface water and sediment sampling from a small boat in the industrial ponds utilized in the orange processing plant. Oversight of the field activities required constant manipulation of data, research on site operations, and coordination with the property owner and South Florida Water Management District (SFWMD) personnel. The Phase I evaluation followed by Phase II activities resulted in the identification of an onsite landfill with multiple 55-gallon drums buried in the former wetland area. The abandoned waste was properly profiled and transported offsite for disposal.

**Crew Lands – Tract No. 004-037, Collier County:** Ms. Grudin assisted with proposal preparation and field coordination of technicians and subcontractors for assessment activities including: a soil vapor survey and soil boring and monitor well installation in conjunction with soil and groundwater analysis of petroleum constituents, metals, pesticides, and herbicides. Ms. Grudin collected two sediment samples on the south side of the canal for profiling and analysis of pesticides by EPA Method 8081, Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8100, and for total and dissolved arsenic. Removal of an onsite cattle dipping vat was conducted through excavation. Upon completion, a 5,000-gallon above ground storage



tank (AST) was erected complete with a geotextile base and interior liner for containment of groundwater removed from the vat area. Ms. Grudin supervised recovery of approximately 4,000 gallons of groundwater recovered from a 15-foot deep recovery well installed in the vicinity of the cattle dip vat. Ms. Grudin compiled the assessment data referenced above and wrote the Corrective Action Report recommending monitoring of alpha-BHC, beta-BHC, 4,4-DDD, 4,4-DDT and total and dissolved arsenic in groundwater. Concentrations of contaminants of potential concern (COPCs) in the surficial, surface and subsurface soils met the Residential Restricted I Direct Exposure and Leachability based on Groundwater Criteria Soil Cleanup Target Levels (SCTLs) for the COPCs.

**Sarasota Commons, Sarasota, Sarasota County:** Ms. Grudin was the Project Manager for this active dry cleaning facility. She provided oversight of one of the first well installations with a sonic drilling rig in the State of Florida to investigate the vertical extent of volatile organic halogens (VOHs) in groundwater beneath this dry cleaning site. Ms. Grudin conducted O&M, provided oversight for monitor well abandonment activities, and compiled reports documenting field activities for regulatory submittal. She compiled data and performed modeling to request No Further Action (NFA) with Conditions for chlorinated solvents using a modified BIOCHLOR software program. Ms. Grudin evaluated conditional closure/risk based options for this dry cleaning site utilizing deed restrictions, current site conditions, and future site use. She was responsible for the overall approach and the individual groundwater modeling conducted as part of the report submittal. Ms. Grudin gathered site-specific data through analysis of hydrologic processes and laboratory analysis, then modeled the information utilizing the Domenico Models.

**Petroleum Stations, Multiple sites:** From 1998 to 2011, Ms. Grudin provided support to the BP contract as Staff Engineer, Project Engineer, and Senior Project and Area Manager for the Southwest Florida Division of BP. Ms. Grudin was responsible for project management of BP-owned and divested properties where BP retained their environmental liability. Her team of staff worked on over one hundred sites during this timeframe. A few sites outlining the scope and breadth of BP work are provided below for reference:

**Former Amoco 146, Sarasota, Sarasota County:** Project manager for closure and removal of three 10,000-gallon underground storage tanks (USTs) and dispensers in conjunction with site remediation activities. Ms. Grudin negotiated with Sarasota County Department of Health to fund UST removal through the FDEP Petroleum PreApproval Program (PAP). The USTs were put out of service and the product was removed, the interior of tanks were cleaned using a pressure washer, and the tanks were inerted with dry ice to removed explosive gases. The lower explosive limit (LEL) and percent oxygen were monitored closely with an explosimeter periodically throughout the duration of the removal. The tanks were rendered useless by cutting holes in each end and upon County inspection were loaded onto a truck and transported offsite for proper disposal. All tanks and product pipe removal activities were performed in accordance with standards set forth in the American Petroleum Institute recommended practices and Chapter 62-761, FAC. Approximately 751.35 tons of petroleum-impacted soils was removed and transported offsite for proper disposal. Prior to backfilling, pen-hole sparging was conducted through the installation of eight wells installed at approximate 20-foot centers in the excavation over a 5-day period. Remediation activities resulted in the site entering the monitoring only phase.



**Former Amoco 2093, Sanford, Seminole County:** Ms. Grudin was the Project Manager responsible for implementation, permitting, construction, O&M, and reporting for environmental petroleum remediation at this Former Amoco site. Due to offsite impacts, angled AS wells were installed under the roadway, remediation points were required in the median of Lake Mary Boulevard, and remediation points and angled AS wells were installed on an offsite property utilized as a shopping plaza. A total of two remediation systems utilizing AS and SVE were installed connecting the remediation points. An existing 8-inch conduit was located in the field and utilized to provide a tie in for the median remediation wells. Due to the high level of traffic in the roadway, three weeks of construction was conducted at night with lane closures and appropriate MOT. Ms. Grudin worked with staff to maintain a high level of safety and address fatigue concerns associated with prolonged night work. All Florida Department of Transportation (FDOT) requirements were completed successfully, including implementation of the MOT, compaction testing of soils and replacement of the entire median, neighboring sidewalk and driveway. Ms. Grudin worked closely with the licensed General Contractor, Engineer of Record, Seminole County, the responsible party, BP, and each of the site owners to minimize impacts to vehicular and pedestrian traffic on the CVS Pharmacy property, within the FDOT right-of-way, and on the adjacent shopping center parking lot. During construction, a high water table was encountered on the offsite property. Since this condition was not anticipated, construction activities were modified to account for floating piping and health and safety issues with the standing water. A remediation trailer capable of handling the additional water was located, exchanged for the originally slated equipment, and mobilized to the site. SVE wells were modified to dual phase wells in the field with the approval of Seminole County. A NPDES permit was obtained and the effluent was routed to a storm sewer with the associated and required tie-in.

**Former Amoco 6221, Tampa, Florida.** Ms. Grudin was the Project Manager for site assessment, pilot testing and RAP submittals. She prepared the construction drawings and provided construction oversight for the installation of an AS and SVE system, groundwater and soil remediation system for BP. Ms. Grudin oversaw the construction of the remediation system installation by an in-house construction crew assuring that the construction activities met the engineering requirements outlined in the permitted construction drawings. She was the Project manager and engineering support for O&M and associated groundwater monitoring.

**Former BP 24573, LaBelle, Hendry County:** Ms. Grudin managed cleanup activities at this site from assessment through site closure. She provided oversight for the installation of soil boring and monitor wells for horizontal and vertical assessment of petroleum impacts. She also provided oversight for the system design, drilling of remediation wells, pilot testing of a dual phase extraction technology utilizing field measurements and a data logger, and construction activities. She utilized geotechnical sampling results and the Florida RNA software for a fate and transport study and to develop site-specific alternate Soil Cleanup Target Levels (aSCTLs) for soil. When the effectiveness of the dual phase system diminished, angled AS wells were installed in the right-of-way to address impacts under State Road 80 that remained after historical road widening. Site cleanup progressed smoothly from this point allowing for issuance of a Site Rehabilitation Completion Order (SRCO).



**BP 24657, Panama City, Bay County:** Ms. Grudin performed vapor intrusion sampling for petroleum and related constituents in accordance with BP standard practices and procedures. She developed a site-specific protocol for vapor implant installation and sampling techniques. She conducted risk analysis through the use of the BP Risc software to evaluate site-specific hazards and potential pathways based on laboratory analytical results for this site. Ms. Grudin performed quarterly and semi-annual groundwater monitoring at this facility as part of a privately funded environmental investigation and mitigation effort by BP. Upon the discovery of chlorinated solvents at the facility, Ms. Grudin negotiated the terms and implementation of a Consent Order between BP and the Northwest District of FDEP. The source of chlorinated solvents was determined to be a Kerosene Heating Oil UST located onsite. Since the constituents of concern in groundwater are not associated with kerosene storage, the lines were traced ultimately revealing that solvents utilized in the service bay of the facility were drained into piping that led to this UST. Conditions of the Consent Order were maintained during the site investigation and ultimate closure.

**Former BP 24694, Silver Springs, Marion County:** Ms. Grudin managed cleanup activities at this site from assessment through site closure. She provided oversight for drilling, construction and site closure activities. She conducted a root cause analysis for utility line damage during site activities and obtained state funding for the damage once the analysis revealed that all site activities were conducted in accordance with Occupational Safety and Health Administration (OSHA) regulations and standard construction practices. Once asymptotic results were realized from the initial AS and SVE system, Ms. Grudin negotiated funding for additional assessment activities inside of the service station and discovered a residual source of petroleum-impacted soils. A modified remediation system was installed and site closure was achieved.

**Former BP 24730 (Exxon Siffords), Vero Beach, Indian River County, Florida:** Ms. Grudin provides environmental consulting services on this former service station slated for development as a Verizon Wireless. Key stakeholders include the Florida Department of Environmental Protection (FDEP) and Brevard County Natural Resources Management Department for the eligible discharge and the Crum & Forster insurance company and their consultant Vertex Companies, Inc for covered releases. The stakeholders also include the former property owner, developer/owner and Verizon Wireless. Liza Grudin, PE serves as the Engineer-of-Record for this fast-tracked site rehabilitation in advance of site development. Three (3) 10,000-gallon underground storage tanks (UST)s storing unleaded fuel taken out of service March 2018 and removed from the site along with three (3) dispenser islands and product transfer piping. One 550-gallon UST, located behind the service bay to the east of the building, was also removed in June 2019. NovelE prepared the scope of services for the removal of the USTs, dispenser islands, and associated piping. The scope of services for construction and tank removal was prepared with sufficient detail to provide for fair and competitive bids from licensed Pollutant Storage System Contractors (PSSCs). All tank removal activities were performed in accordance with standards set forth in the American Petroleum Institute (API) recommended practices and Chapter 62-761, FAC.

Site activities included soil boring installation, monitor well installation, soil excavation, tank removal, and vacuum extraction as an interim remedial action. Staff members Liza Grudin, PE used her prior experience





with the site dating back to 2001 to manage the multiple discharges and evaluate the site history during the assessment and remediation progress. Throughout the project, Liza determined cost allocations between FDEP funding, developer/owner costs, and items that were related to the three open insurance claims for the April 2016 discharge. After review of the insurance correspondence to the new owner, Liza identified a data gap that ultimately led to coverage of a new release on the property. Upon discovery of a new discharge, Ms. Grudin coordinated all discharge reporting, interim source removal and assessment activities and activation of the insurance claim.

**WaWa Site Various, Florida:** Ms. Grudin was the Engineer-of-Record for the Notice of Dewatering / Dewatering Plans for the installation of underground storage tanks (USTs) during construction of several WaWa facilities. Dewatering was proposed for the duration of the UST installation to lower the water table and facilitate the installation. A series of well points were proposed for installation around the perimeter of the UST area, then groundwater was removed using a suction pump that generates vacuum at the well points. The dewatering plan included details of the well points, turbidity control, fail safes, and flow measurement.

**Keystone Civic Association, Odessa, Pasco County, Florida:** NovelEolutions, Inc. (NovelE) was contracted to the Keystone Civic Association (KCI) for environmental consulting services. Liza Grudin, PE served as the Engineer-of-Record. NovelE was tasked with reviewing the laboratory analytical report for soil and surface water samples collected by Florida Department of Environmental Protection (FDEP) personnel based on shooting range operations on a neighboring property. Sampling activities were performed by FDEP personnel in February 2018 and the samples collected were submitted and analyzed by FDEP's Central Laboratory located in Tallahassee, Florida. NovelE was authorized by the client, the President of the Keystone Civic Association, to perform interpretation and analysis of the provided chemical analytical report and to submit to the client a Letter Report Summary of the sample collection and analysis.

**Risk Assessments, Multiple sites:** Ms. Grudin prepared characterization assessments and risk assessment reports for two former petroleum retail and service stations located in South Florida and Northwest Florida, which included evaluation of current and future human health and potential ecological risks and required thorough knowledge of the ASTM Risk-Based Corrective Action process, including integration with FDEP's Risk-Based Corrective Action Program.

She initiated a risk-based corrective action evaluation program for 46 former petroleum sites across the State of Florida, in accordance with a BP's internal risk-based corrective action policy. She implemented RBCA evaluations using the client's proprietary guidance manual and standard practices and procedures for site characterization, exposure assessments, and risk assessment evaluations, which required a thorough knowledge of the ASTM tiered risk assessment approach, EPA Risk Assessment Guidance for Superfund Sites, and the FDEP Risk-Based Corrective Action Program.

Ms. Grudin performed eight (8) Risk Assessments in accordance with former Chapter 62-770.650, FAC, at active petroleum retail and service stations located in Dade, Broward, Bay, Volusia and Palm Beach



counties. She worked with BP to implement their risk software under the current regulatory requirements. She compared FDEP regulations to BP's standard procedures and practices to insure that the strictest risk assessment guidelines were followed for soil, subsurface soil, groundwater, surface water, sediments, and vapor pathways. She developed a template for BP to use in all risk assessments within their retail station sites. Based upon these efforts, Ms. Grudin was contacted by Motiva on the recommendation of BP staff to provide similar services.

**Private Client, Port Tampa Bay Industrial Property Phase I and Phase II Environmental Site Assessments, Tampa, Hillsborough County, Florida:** Ms. Grudin provided project management for a Phase I Environmental Site Assessment (ESA) on this 7-acre property originally developed in the 1960's. Former uses of the property included bulk fuel storage and truck maintenance. A Site Conceptual Model for a Phase II ESA was developed and fieldwork was conducted to evaluate onsite RECs including the service bays, truck wash area, oil/water separator, and septic tank. Remediation alternatives included Initial Remedial Actions using source removal with closure using Risk Management Option II with engineering and institutional controls. Funding mechanisms for cleanup activities included application of the Brownfields Tax Credit and State of Florida Low-Scored Site Initiative (LSSI). Initial Brownfields meetings were held with the City of Tampa and the site was determined to be a good candidate. Additional work is on hold pending developer interests in the property.

**South Florida Water Management District (SFWMD) Multiple sites:** Ms. Grudin has evaluated conditional closure/risk-based options for cattle dipping vats utilizing deed restrictions, current site conditions, and future site use. She was responsible for the overall approach and the individual groundwater modeling conducted as part of the report submittal. Ms. Grudin is proficient in use of the FDEP approved Florida RNA ToolKit and BIOCHLOR computer models for use in fate and transport modeling. Ms. Grudin has gathered site-specific data through aquifer testing, analysis of hydrologic processes and laboratory analysis, then modeled the information utilizing each of the Domenico Models. The results were utilized to request risk based monitoring as a remediation option and /or conditional closure under applicable regulatory guidelines. She was responsible for cleanup of sites contaminated with arsenic and pesticides under this contract. BIOCHLOR was modified to include 4,4-DDD, alpha-BHC, beta-BHC, delta-BHC, and gamma-BHC constituents on cattle dipping vat properties. A few sites outlining the scope and breadth of District work are provided below for reference:

**NEPA Compliance:** Ms. Grudin served as the Environmental Manager responsible for National Environmental Policy Act (NEPA) compliance on a large contract of Florida telecommunications projects. In this role, Ms. Grudin reviewed regulatory requirements and established internal guidance utilized on the current and future projects conducted with this work scope. Her responsibilities included review and implementation of activities to meet Federal guidelines, subcontractor coordination, regulatory reviews, field documentation, client communications, report writing, and project management. Major clients included in the contracts managed by Ms. Grudin included M/A-COM, SBA Communications, and AT&T. She performed numerous Phase I Environmental Site Assessments (ESAs), NEPA evaluations, Section 106 consultations, and Environmental Assessments in accordance with FCC regulations 47 CFR - § 1.1307, Parts



A and B. ESAs were conducted in general conformance with American Society for Testing and Materials (ASTM) Standard E 1527, and commercial lending and telecommunication guidelines. Along with her team, she established internal guidance and communications with appropriate personnel within the Florida offices of the United States Fish and Wildlife, Bureau of Indian Affairs, Tribal Historic Preservation Officers of local and state tribes, and the Florida State Historic Preservation Office.

**Geothermal Consulting:** Ms. Grudin served as the Engineer-of-Record for geothermal consulting on several Suncoast Credit Union bank facilities. The scope of work included an evaluation of site-specific lithology, well capacity and water quality for the installation of geothermal air conditioning and heating systems at new branch locations. The geothermal systems draw cool water from wells below the building. A heat pump draws off cooling temperatures from the water, then returns the water back to the aquifer below. Recommendations were provided for well depth, screening and locations for the withdrawal and injection wells.