



PROFESSIONAL PROFILE



Michael Gonshor, PG, LSRP

Principal Hydrogeologist

EXPERIENCE SUMMARY

Thirty-nine years of experience: Principal Hydrogeologist at Roux; previously Senior Hydrogeologist/Head of Hydrogeology at RT Environmental Services, Senior Hydrogeologist at Rare Earth Envirosiences; Project Geologist and Laboratory Analyst at BCM Engineers.

Project Principal/Project Manager for numerous state investigative and remedial projects in New Jersey (LSRP, ISRA, Spill Act and UST), Pennsylvania (Act 2, HSCA and Storage Tank programs), Maryland (MDE OPC and VCP), South Carolina (DHEC RCRA Program), as well as projects in Virginia, and other states. Also served as project manager and field team leader for several USEPA CERCLA RI/FS and RCRA RFI/CMS projects. Key involvement in several expert reports and litigation/mediation support cases.

CONTACT INFORMATION

Main: (856) 423-8800
Direct: (856) 832-3784
Email: mgonshor@rouxinc.com
Website: www.rouxinc.com

402 Heron Drive
Logan Township, NJ 08085

EDUCATION

BS, Earth Science, Specializing in Geosciences, The Pennsylvania State University, 1985. Senior Research Paper – *Ground Water Monitoring*.
Graduate Course: Modeling Ground Water Flow, Wright State University, 1994

PROFESSIONAL LICENSES

Registered/Licensed Professional Geologist: Pennsylvania, Delaware (inactive), Virginia, North Carolina, South Carolina, and Georgia
New Jersey Licensed Site Remediation Professional

TECHNICAL SPECIALTIES

Design, implementation, and management of environmental investigation and remediation projects with extensive experience in Brownfields redevelopment and real estate transaction projects as well as industrial and petroleum project sites; extensive experience in fractured and karst bedrock formations; preparation and review of expert reports in support of litigation/mediation; data evaluation, interpretation, and presentation for technical projects; evaluation of the fate and transport of constituents in soil and groundwater, including analytical and numerical groundwater flow and transport modeling; client, counsel, and regulatory agency interface; implementation and analysis of monitored natural attenuation projects; evaluation of potential Natural Resource Damages (NRDs) claims; preparation of requests for Classification Exception Areas (CEAs) in New Jersey and Non-Use Aquifer Determinations in Pennsylvania; and design and analysis of aquifer pumping tests.

REPRESENTATIVE PROJECTS

New Jersey/LSRP

- Principal Hydrogeologist/LSRP for a large ISRA/Brownfields redevelopment project in Sayreville, New Jersey. This project involved reviewing over 20 years of extensive historical investigation and remediation data in a short timeframe to understand the site and prepare appropriate investigation and remediation work plans. This project, comprising 440 acres, is one of the largest Brownfields projects in the State of New Jersey and involves overall project direction of engineering capping activities, groundwater remediation, soil remediation of multiple parcels and multiple areas of concern, and ecological evaluations. To date, work on this project has included numerous planning meetings with the client and Borough Engineer and multiple meetings with NJDEP personnel, including the Commissioner, Assistant Commissioner, Brownfields Development Area (BDA) personnel, Case Manager, Bureau of Environmental Radiation, and Office of Sediment and Dredging Technology. To date, multiple large-scale remedial investigation activities have been completed in a very short timeframe, and included completion of several hundred soil borings, groundwater sampling, wetlands sediment sampling, evaluation of the existing and new analytical results, and preparation of Remedial Action Work Plans.
- Principal Hydrogeologist for multiple TSCA PCB characterization and remediation projects in New Jersey under USEPA Region 2. Projects included detailed characterization, delineation, remediation, and preparation and submittal of Self Implementing Notifications under TSCA. Multiple remediation approaches were used and approved by the USEPA, including excavation and off-site disposal, relocation/consolidation within the TSCA regulated unit, relocation/consolidation of PCB-containing material between TSCA regulated units, and

capping. Currently pursuing a risk-based cleanup approach, which would substantially reduce costs associated with excavation and off-site disposal and relocation/consolidation.

- Principal Hydrogeologist/LSRP for an ISRA site in northern Sussex County New Jersey. Groundwater beneath the site occurs within the fractured bedrock across three formations, including the Losee Metamorphic Suite, the Leithsville Formation, and the Hardyston Formation with flow and transport generally following bedrock strike. Groundwater conditions at the site were investigated by others for over 14 years, during over 30 separate groundwater monitoring events. Previous reports by others suggested the results did not indicate a decrease in COC concentrations. However, based on a more thorough evaluation of historical trends, Roux Associates determined that there were long-term decreasing trends. Based on our evaluation of this extensive historical data, supplemented by strategic additional groundwater monitoring well installation and sampling, it was demonstrated that the CVOCs in bedrock groundwater were limited to the site and could be addressed by natural remediation and establishing a CEA for case closure. Work on this project also included preparing a three-dimensional groundwater flow model to evaluate the regional effects on water levels due to planned future quarry dewatering.
- Principal Hydrogeologist/LSRP for a dry cleaner site Bergen County, New Jersey. Investigation and remediation activities were required to be conducted expeditiously to facility property reconfiguration and re-use plans. To accomplish that objective, site investigation and remedial investigation activities, consisting of soil, groundwater and vapor intrusion investigations, and the remedial investigation report and remedial action work plans were completed in less than one year. Remedial actions consist of soil excavation and off-site disposal and monitored natural attenuation for groundwater. Roux successfully applied the brand new NJDEP guidance using the Synthetic Precipitation Leaching Procedure (SPLP) testing for dry cleaning solvents to develop site specific migration to groundwater soil remediation standards. These increased site-specific standards reduced the extent of soil investigation and soil remediation required, thus in turn substantially reducing remedial costs. Soil remediation activities have been completed and groundwater investigation, including investigation within fractured bedrock, is ongoing.
- Principal Hydrogeologist/LSRP for a dry cleaner site Cherry Hill, New Jersey. This project involves soil and vapor intrusion investigation activities, development of site-specific migration to groundwater standards, groundwater investigation, and installation and operation of a vapor intrusion mitigation system. With regard to soil investigation, Roux Associates used the SESOIL model to develop site specific migration to groundwater standards, which substantially reduced overall soil investigation costs. Based on the soil investigation and SESOIL model findings, a groundwater investigation was subsequently implemented and is in progress. This project also involved a vapor intrusion investigation consisting of sub-slab soil gas sampling and indoor air sampling. The indoor air sampling showed that the indoor air exceedances were due, at least in part, to ambient conditions and not solely due to vapor intrusion. A plan was then developed and implemented to eliminate the ambient conditions which successfully reduced the vapor intrusion issue to a "Vapor Concern" condition rather than an "Immediate Environmental Concern" condition. Based on the vapor concern condition, a sub-slab depressurization system was installed which successfully mitigated the vapor intrusion pathway. Planned remediation includes capping of soil by existing buildings and paving, monitored natural attenuation for groundwater, and institution of a Deed Notice for soil and a CEA for groundwater.
- Principal Hydrogeologist for an ISRA soil and groundwater investigation and remediation at an industrial site in central New Jersey. Trichloroethene (TCE) and other chlorinated volatile organic compounds (CVOCs) were released to the surface during historical site operations. Source-area TCE concentrations ranged from 5,000 to 9,000 µg/l within the weathered bedrock of the Passaic Formation. Roux Associates work included evaluation of approximately 8 years of historical soil and groundwater data, installation, and sampling of wells in both the weathered and competent bedrock, and bedrock coring to determine rock quality/extent of the weathered bedrock zone. Key findings of the geologic/hydrogeologic evaluation were that CVOCs were found to occur at the highest concentration within the weathered bedrock. Groundwater yield in the weathered bedrock zone was very low (<1 gpm) and flow and transport direction follows the bedrock topography. Project objectives were to re-establish a working and improved relation with the NJDEP, evaluate and use all existing data as a whole and to establish a cost-effective technically sound strategy for the site. The findings and recommended work plan were presented to the NJDEP case management team. Based on existing site data, it was determined that we will use a combined remedial approach consisting of in-situ active source area treatment with the remaining downgradient groundwater remedy constituting natural attenuation. The NJDEP acceptance of natural attenuation for groundwater substantially decreased project costs.
- Principal Hydrogeologist/LSRP for an ISRA site Clarke, New Jersey. Project work included conducting a Preliminary Assessment, Site Investigation, Remedial Investigation, and Remedial Action at a former paper manufacturing facility undergoing site redevelopment for commercial and/or

residential redevelopment. The investigation included evaluation of 11 potential areas of concern including transformers (potentially PCB containing), trenches and sumps associated with industrial operations, and a background evaluation associated with naturally occurring metals in soil and groundwater and impact from upgradient CERCLA and ISRA sites to site groundwater. An unconditional Response Action Outcome (RAO) was issued for the Site in 2013. Work on this project also included preparation of a work plan for sampling and management of certain building materials (e.g., concrete, block, brick and stone). The findings of the building material sampling were used to identify which of these materials could remain on site and reused as fill beneath roads, filling of subgrade portions of the facility, etc., which substantially decreased concrete disposal and client fill importation costs. Site redevelopment as a retail shopping center was completed in 2015.

- Principal Hydrogeologist/LSRP for a redevelopment project in Camden, New Jersey related to acquisition and sale of eight separate, contiguous properties. Roux provided site investigation and remedial investigation activities to address impact to soil and groundwater related to multiple former industrial operations and unregulated underground storage tanks. Services to date also included development of alternative soil remediation standards used to limit the soil remediation area and reduce costs, remedial action work plan preparation, preparing detailed remedial cost estimates, technical reporting, and participation in multiple meetings with the developer and their environmental counsel.
- Principal Hydrogeologist/LSRP for NJ Transit Big Tree Bus Garage in Nutley, New Jersey. Remedial Investigation activities were completed at the site which included a total of 12 AOCs. Interim LNAPL response measures consisted of periodic bailing and use of oil absorbent socks to address LNAPL. These IRMs showed that LNAPL was stable and not affecting potential off-site receptors. Appropriate LNAPL and Receptor evaluation forms and the LNAPL IRM Report were prepared and submitted to the NJDEP. RI activities incorporated results from past activities supplemented by additional soil and groundwater investigation needed to delineate the extent of impacted soil, groundwater and LNAPL at 4 for the AOCs. Groundwater RI activities included installation of several additional wells, including two shallow wells which were installed at a 45-degree angle. This allowed delineation to be considered complete while avoiding the need for off-site access on residential or municipal properties. RI activities have been completed and the RIR, which included a CEA, was prepared and submitted to the NJDEP. The next steps for this site will be to prepare and implement a RAWP, which is anticipated to consist of focused LNAPL recovery, capping of soil by existing buildings/paving

and institution of a Deed Notice, and monitored natural attenuation for groundwater.

- Principal Hydrogeologist for an ISRA groundwater investigation and remediation project for a chemical company in northern New Jersey. Tertiary butyl alcohol (TBA) was found in groundwater at and downgradient of the site as a result of periodic ongoing discharges from an above ground tank farm. Reviewed and evaluated over 15 years of historical groundwater monitoring data to develop a thorough understanding of site conditions and fate and transport of TBA in groundwater. Due to its solubility, the TBA plume was over 1.5 miles in length and approximately 1 square mile in area. A significant issue was the impact of the TBA on two municipal well fields. One was impacted to the extent it had to be taken out of service. A three-dimensional groundwater flow and transport model was constructed and calibrated for the region to be used for multiple purposes, including designing a groundwater recovery system to remediate the plume, evaluate if the second municipal well field may be impacted above state standards in the future, evaluate the remedial timeframe and time it would take to restore the first municipal well field. The model was successfully calibrated to simulate flow and transport and achieve its stated objectives. Also assisted client with evaluation of potential NRD issues related to groundwater.
- Principal Hydrogeologist/LSRP for an unleaded gasoline UST closure project in Somerdale, New Jersey. The project includes investigation and remediation of unleaded gasoline constituents in groundwater, including MTBE. Plume delineation was initially estimated using an analytical fate and transport model, followed by installation of wells at the predicted extent of the plume. This approach successfully delineated the downgradient, off-site extent of MTBE in groundwater and minimized the number of permanent monitoring wells, thus reducing project costs. Groundwater remediation was accomplished using source area in-situ treatment (using ORC) and monitored natural attenuation. Evaluation of pre- and post-remediation monitoring results demonstrated that in-situ injections reduced source-area concentrations and that MNA is an appropriate and effective method to address remaining MTBE and BTEX in groundwater. It was also demonstrated that TBA in groundwater downgradient of the former UST area is due to degradation of MTBE, as such, further investigation and remediation with respect to TBA was not required. Ongoing activities include a CEA and associated long term monitoring and biennial certifications.

Pennsylvania/PG

- Project Principal for an Act 2 soil and groundwater remediation project at a Southeastern Pennsylvania rail yard. Constituents of concern (COCs) included LNAPL on groundwater and volatile

organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and metals in soil and groundwater. Groundwater results and fate and transport modeling conducted by Roux Associates showed that ongoing monitoring (no active remediation) of groundwater was sufficient to demonstrate attainment of Act 2 standards. Releases of Liability for soils and groundwater were received for the site from the PADEP. LNAPL recovery pilot tests were conducted and, based on the pilot test results, an LNAPL remediation plan was prepared. This plan consisted of using high-vacuum, hot-spot LNAPL recovery on a periodic basis, followed by both manual recovery/bailing and a belt skimmer. This remediation approach reduced LNAPL remediation costs by \$200,000 to \$400,000 compared to a permanently installed, continuously operating LNAPL recovery system recommended by the previous consultant. To date, 10 of the 12 wells which originally contained LNAPL have met the PADEP-approved LNAPL recovery endpoint criteria for the site.

- Project Principal/Project Manager for an Act 2 soil and groundwater investigation at a 388-acre former limestone quarry in Southeastern Pennsylvania. As part of the terms of the property transaction and site redevelopment activities, the seller was required to obtain site closure for soils and groundwater in a limited timeframe. This project involved an expedited review and evaluation of extensive existing soil data, review regional geologic and hydrogeologic data, multiple client and regulatory agency meetings, meeting with the USGS to evaluate regional geologic and hydrogeologic conditions, and implementing soil and groundwater investigative activities. One major complexity to this project was that the groundwater, which occurs within the fractured and karstic limestone bedrock, is known to be regionally impacted with chlorinated VOCs from multiple sites. This regional impact, in conjunction with the complex nature of groundwater flow within limestone bedrock, presented a challenge to thoroughly understand regional flow and transport of chlorinated VOCs. Roux Associates designed and evaluated Electrical Resistivity Imaging (ERI) surveys which successfully identified water-bearing faults and fractures to target for deep bedrock well installation. This saved considerable time and expense in well installation activities. The PADEP approved Releases of Liability for soil and groundwater and redevelopment has been completed.
- Project Principal/Principal Hydrogeologist for the Millennium Center Brownfields redevelopment project in Conshohocken, Pennsylvania. This redevelopment project encompasses over 26 acres on multiple parcels of land. The project area consisted of multiple heavy industrial operations since the turn of the early 1900s, including foundries, steel fabrication, battery manufacturing, coal gas manufacturing, machinery repair, and

concrete production. Redevelopment consists of mixed commercial, residential, and recreational uses. Constituents of concern included metals, PAHs, PCBs and chlorinated solvents, as well as asbestos containing materials and abandoned drums. Cooperation with Federal, State and Local agencies helped secure grants and loans for investigation and remediation activities. Pennsylvania's Act 2 Statewide Health, Site-Specific, Background and Special Industrial Area Standards were applied as appropriate to reduce overall investigation and remediation costs. In addition, capping of soils was incorporated into site development plans to further limit the extent of required soil remediation. Incorporating development plans as capping resulted in over \$200,000 savings in soil remediation costs for two parcels.

- Principal Hydrogeologist/PG for a HSCA project for a manufacturing facility in southeastern Pennsylvania. Constituents of concern included chlorinated VOCs in soil and in groundwater within bedrock beneath and downgradient of the site. In addition, chlorinated VOCs in groundwater downgradient of the site were shown by Roux to be comingled with chlorinated VOCs from a second facility in the area of the site. Determination and support of the comingled plume was complicated by several factors, including multiple groundwater flow directions and preferential flow and transport pathways within the fractured bedrock. Roux used multiple lines of evidence and technical approaches to support the occurrence of a comingled plume, including constructing a conceptual site model, compilation and evaluation of groundwater elevation and chemical data in monitoring wells and private wells in the site area, conducting a fracture trace analysis, conducting surface and downhole geophysics, and conducting multi-point VOC ratio analysis. Work on this project also included multiple technical meetings with the PADEP and the responsible party for the off-site source as well as participation in a public meeting with the PADEP.
- Project Principal for a large UST closure project at a former manufacturing facility in Philadelphia, Pennsylvania. Due to the presence of regulated and unregulated USTs, the PADEP requested the site be entered into the Storage Tank Program rather than the Act 2 program. However, all Act 2 guidance was followed to work toward case closure. USTs were closed at four areas of the site and at one currently operating, multi-UST area. LNAPL associated with a waste oil/waste solvent UST was the primary area of concern prompting LNAPL recovery activities and ground-water monitoring. Fate and transport modeling was conducted to support a request for a non-use aquifer (NUA) determination. The successful application of NUA and site-specific standards for this project substantially reduced remediation costs.

- Principal Hydrogeologist for a former gasoline service station project in Bucks County, Pennsylvania conducted under the PADEP's Act 2 program. The primary constituents of concern in groundwater include MTBE and benzene. Source area remediation consisting of ozone injections were historically conducted at the site by others; however, minimal follow-up testing was conducted. Roux subsequently took over the project to implement post-remedial monitoring and reporting. Detailed data evaluation conducted by Roux demonstrated that the ozone injection successfully reduced source area concentrations and that MNA was appropriate to address remaining concentrations. Roux obtained PADEP approval of MNA for the site and obtained PADEP approval of a non-use aquifer determination. Roux also that the MTBE in groundwater was due to an off-site upgradient source. The above activities and findings resulted in substantial cost savings and being in a position to obtain a Release of Liability from the PADEP.
- Principal Hydrogeologist for an unleaded gasoline UST closure project in Montgomery County, Pennsylvania conducted under the PADEP's Storage Tank Program (Act 32). The primary constituents of concern in groundwater include MTBE, BTEX, and trimethylbenzenes. This project included completing source area investigation within the overburden soil and weathered bedrock. Source area remediation pilot testing consisted of in-situ chemical oxidation injections. A complicating factor was that groundwater occurred within the weathered bedrock and injection points could not be advanced directly into this zone. To reduce costs versus drilling into bedrock, pilot testing was conducted which included injecting at the top of the weathered zone and evaluating oxidant distribution. This method successfully demonstrated that chemical oxidants quickly migrated into the saturated weathered bedrock zone, which substantially reduces remedial costs versus bedrock drilling for injection point installation. Another complicating factor for this site was the presence of operating gasoline USTs by the current operator.
- Project Principal for an Act 2 soil and groundwater investigation and remediation project at a former metal fabricating facility. The project involved soil and groundwater investigations targeting the former septic system which was determined to be the source of TCE in soil and groundwater. Focused remedial investigations showed that the source area was limited to the overburden at the top of the competent bedrock with lower concentrations in the shallow fractured bedrock aquifer. Several remedial technologies were evaluated including in-situ chemical oxidation, enhanced biodegradation, and air sparging. Chemical oxidation was identified as the most cost-effective technology to clean up the source area within the required schedule for our client to achieve their business objectives. The chemical oxidation technology was implemented and has successfully reduced TCE concentrations from over 40,000 µg/l in the source area to non-detect. This was accomplished in one injection event which was based on bench scale treatability work and limited pilot testing. Six months after remediation, concentration rebound was minimal, rebounding to under 50 µg/l in the source area. Natural attenuation was accepted to address bedrock groundwater. The remedial action plan and request for a non-use aquifer determination for the site was approved by the PADEP and the PADEP approved a Release of Liability for site soil and groundwater.
- Senior Hydrogeologist/Project Manager at a former industrial facility in Philadelphia for which an Act 2 Release of Liability has been granted. The facility was closed and demolished in the 1980s and a shopping center currently exists on site. As part of refinancing, the lender required a Phase I ESA, which identified several potential areas of concern, and therefore would not loan on the property until a Release of Liability was granted. The investigation included soil sampling and groundwater monitoring. Chlorinated VOCs were detected in groundwater above standards due to background/area-wide conditions and historical on-site sources. A pathway elimination analysis and receptor survey were completed, and site-specific standards were developed. This allowed the site to receive a Release of Liability for groundwater without active remediation.
- Senior Hydrogeologist/Project Manager of Property Transfer Site Investigation (SI) at a large as part of a Brownfield redevelopment of a former paper manufacturing facility in southeastern Pennsylvania. The comprehensive SI included the review of extensive environmental-related historical site data, files, and reports, a facility inspection, and development and implementation of an investigation work plan. The SI consisted of soil, sediment, and surface water sampling, groundwater monitoring well installation and sampling, a lead-based paint survey, and sampling oil-stained interior building surfaces for PCBs. The sampling plan was developed, implemented, and the SI report was completed within 60 days to keep within the due-diligence timeframe stipulated in the agreement of sale. Based on the findings of the Phase I and II activates, it was determined that entry of the site into the PADEP's Act 2 program was not warranted, thus saving the client substantial additional costs for demonstration of attainment sampling, Act 2 reporting, and associated Act 2 procedural requirements and fees.
- Senior Hydrogeologist/Project Manager for an Act 2 soil and groundwater investigation and remediation project at a fertilizer and pesticide facility in Lebanon County, Pennsylvania. This project involved a site-wide soil and groundwater investigation and groundwater remediation for chlorobenzene in the overburden and fractured bedrock formations. Remediation consisted of installation and

operation of a two-phase vacuum extraction system in the overburden groundwater for source removal and natural attenuation for the bedrock groundwater. The groundwater treatment system consisted of an air stripper and treated groundwater was then used for plant process water. A remedial investigation report, including a risk assessment was prepared and submitted to and approved by the PADEP. This project included participation in meetings and telephone conference calls with PADEP personnel to present project work plans and results.

Other States, Expert Reports, Modeling

- Senior Hydrogeologist with primary responsibility for constructing and calibrating a three-dimensional groundwater flow model using MODFLOW and geologic/hydrogeologic interpretations for support of CERCLA cost recovery project for an NPL Site in central New Jersey associated with TCE in groundwater. The groundwater-flow model and site investigation activities demonstrated that our client's site operations were not the cause of the extensive plume of chlorinated VOCs in groundwater at and near the site. Also reviewed, evaluated, and commented on the plaintiff's consultant's technical reports and groundwater flow model. Additional project activities included the planning and oversight of remedial investigations to identify the source and fate and transport of chlorinated VOCs in soil and groundwater, and review of published regional geologic and hydrogeologic information. The results of the groundwater flow and fate and transport modeling and geologic/hydrogeologic interpretations were presented to the NJDEP, attorneys, and consultants for the opposing party.
- Senior Hydrogeologist/Project Manager for a New Jersey Superfund Site remediation cost-recovery mediation/ litigation case on behalf of insurance companies to help demonstrate the in-appropriate/over designed groundwater recovery system implemented by the USEPA related to two adjacent dry cleaning facilities. Reviewed and evaluated extensive documentation regarding the investigations and the USEPA's remedial design, to determine practicability and cost-effectiveness of the design. Used USEPA's groundwater flow model to design a more effective and efficient groundwater recovery scenario for the site. Prepared and presented Expert Reports which were used in a mediation case on behalf of insurance companies to help demonstrate the in-appropriate/over designed groundwater recovery system implemented by the USEPA, which reduced claims to the insurance companies by several million dollars.
- Senior Hydrogeologist/Project Manager for a soil and groundwater investigation and remediation project in Southington, Connecticut involving chlorinated VOCs, primarily TCE, in overburden and fractured bedrock. The overburden consisted of approximately 10 feet of silty clay with a very low yield. Bedrock beneath the site consisted of the New Haven Arkose, part of the Newark Supergroup (referred to as the Newark Basin in New Jersey), which is similar to the Brunswick Group in New Jersey. Site investigation activities consisted of overburden and bedrock well installation and sampling, and deep bedrock coring to identify site-specific strike, dip, and fracture frequency and orientation. This information, along with the observed distribution of CVOCs in the bedrock was used to optimize the groundwater recovery system and increase mass removal rates while decreasing the total pumping rate needed to capture the plume. The remediation system included recovery from an overburden recovery trench and source area bedrock recovery wells. Reduced long-term costs through optimization of existing remedial systems and the implementation of additional remedial technologies.
- Principal Hydrogeologist/PG for a Resource Conservation and Recovery Act (RCRA) corrective action and post-closure care activities at a 40-acre metal finishing and manufacturing facility located in Florence, South Carolina. The facility Solid Waste Management Units (SWMUs) include two Waste Management Areas (WMAs) that are regulated as RCRA land disposal units and two SWMUs that are regulated under RCRA as areas that are not linked to WMAs. Both the USEPA Region IV and the South Carolina Department of Health and Environmental Control (SCDHEC) direct the RCRA program. Key activities included evaluation groundwater delineation and source area investigation activities; development and implementation of Interim Corrective Measures (ICMs); and overall supervision of operation and monitoring of the groundwater extraction system and system optimization. Constituents of concern at the site include chlorinated volatile organic compounds (VOCs) and metals. The USEPA and SCDHEC approved the permanent shutdown of the extraction well system being replaced by ZVI.
- Principal Hydrogeologist for a groundwater investigation and preparation of an Expert Report for a release of gasoline at a major petroleum company service station in Fallston, Maryland. Responsibilities included design and supervision of an aquifer pumping test, analyzed aquifer-test data sets to determine flow characteristics, conducted a detailed analysis of site and regional hydrogeology and fate and transport analysis of gasoline constituents in groundwater. Worked closely with the client and counsel throughout the project and prepared an Expert Report on the remedial investigation activities and fate and transport analysis. The key objectives of the fate and transport analysis and hydrogeologic evaluation were to evaluate the potential impact of the release on area supply wells and other regional groundwater sources.
- Senior Hydrogeologist in charge of interpreting and presenting hydrogeologic information for a permit to deepen a large

quarry in Pennsylvania. Interpreted regional geologic and hydrogeologic conditions, and evaluated how increased dewatering due to deepening would potentially affect regional groundwater elevations. Of particular concern was if the increased regional cone of depression may induce flow of contaminated groundwater from area CERCLIS Sites into the quarry. Also presented findings to the Township's Environmental Advisory Council in a public meeting.

- Principal Hydrogeologist for site investigation and remediation activities at a former air compressor manufacturing facility in Walkersville, Maryland conducted under the MDE's VCP. The property consists of approximately 150 acres of undeveloped farmland and a 50 acre industrial facility. The Maryland VCP required all potential AOCs to be evaluated and investigated, if warranted. Roux Associates used existing data to limit additional work required to meet VCP requirements, thus reducing overall project costs. Known areas of concern consisted of VOCs in soil in two areas beneath the building and VOCs in groundwater. Soil gas surveys were conducted and used by Roux as a low cost method to evaluate the extent of soil source areas beneath the building and focus and limit the extent of soil boring and sampling activities, further reducing overall project costs. Groundwater investigation consisted of well installation and sampling and conducting automated continuous water level monitoring to evaluate interconnectivity of bedrock water-bearing zones.

PROFESSIONAL AFFILIATIONS

NJDEP Migration to Groundwater Guidance Document Committee Member – January 2013 to 2019. *Serves as one of the Stakeholder/LSRP representatives for revision of Migration to Groundwater guidance documents and development of new Migration to Groundwater guidance documents.*

PRESENTATIONS

Conceptual Site Models in New Jersey, July 23, 2020, Licensed Site Remediation Professionals Association (LSRPA)

Impact to Groundwater: Default Criteria and Alternative (Site-Specific) Remediation Standard Development, January 24, 2018, New Jersey Site Remediation Conference

NJDEP Training: Impact to Ground Water Pathway, July 2014

The ABCs of ISRA, LSRPs and the NJDEP, The 2013 New Jersey Environmental Seminar, March 2013

Sayreville, NJ Site Redevelopment: A Unique and Challenging Brownfields Project, Business of Brownfields Conference, April 20, 2010

Practical Application of the NJ Soil Cleanup Standards (SESOIL Modeling for Development of Site Specific Impact to Ground Water Standards for Soil), June 3, 2009, sponsored by the NJWEA

2002 National Brownfields Conference Poster Presentation – *Schuylkill Waterfront Redevelopment – A Success Story*

CONTINUING EDUCATION

Advances in Modeling Groundwater Flow and Transport with MODFLOW (USGS and USEPA) – February 2021

Remediation Management of Complex Sites (ITRC) – January 2021

Groundwater Statistics for Environmental Project Managers (ITRC) – November 2020

Groundwater Discharge to Surface Water Bodies (Geopractical) – April 2018

Essentials in Surface and Borehole Geophysics (PCPG) – April 2017

Groundwater in Fractured Bedrock (Rutgers) – March 2017

Practical Applications in Hydrogeology (Rutgers) – March 2016

Application of Thermal Remediation in New Jersey (LSRPA) – May 2015

Advanced Tools for In-Situ Remediation Workshop (LSRPA) January 2015

Introduction to Inorganic and Organic Geochemistry (PCPG) July 2014

Ecological Risk Assessment: Practice and Protocols (Rutgers) March 2013

Case Study Training for LSRPs (NJDEP) – October 2013

Structural and Hydro-Structural Geology: Theory and Applications for the Practicing Professional (PCPG) – June 2013

Practical Rock Slope Engineering (PCPG) – August 2012

NJDEP SRRA Implementation: the Final Rule Package (NJDEP) – June 2012

Geochemistry of Groundwater Remediation (PCPG) – March 25, 2011

Development of IGW SRS Using SESOIL and AT123D (Environmental Software Consultants) – March 2011

Surface Geophysics for Hydrogeological and Geotechnical Applications (PCPG) – October 12, 2010

Fate and Transport Analysis Using Quick Domenico, SW Load and PENTOXSD (PCPG) – March 2010

Applications of Monitored Natural Attenuation for Remediation of Petroleum and Chlorinated Hydrocarbons in Soil and Groundwater (EOS Alliance) – September 2009

Environmental Isotopes in Ground Water Resources and Contaminant Hydrogeology (NGWA) – September 2008

Fractured Rock Conference: State of the Science and Measuring Success in Remediation (NGWA/EPA) – September 2007

Borehole Geophysical Logging for Water Resources/Water Supply Applications (NGWA) – August 2000