



PROFESSIONAL PROFILE



Paul Armstrong, PE, LSRP

Principal Engineer

EXPERIENCE SUMMARY

Fourteen years of experience: Principal Engineer, Project Engineer, and Staff Engineer at Roux.

TECHNICAL SPECIALTIES

Environmental Engineering specialties including remedial design, permitting, and construction. UST investigative and closure support including field oversight, sampling, and reporting. Remedial options/alternatives analysis and cost to closure estimating for various remedial technologies. Due Diligence supporting activities for real estate transactions. In situ chemical oxidation/reduction (ISCO/ISCR) injection project design and pilot testing, project management and full-scale applications.

REPRESENTATIVE PROJECTS

- Senior engineering manager for large-scale development project in Ramsey, New Jersey of former dry-cleaning property into fitness and spa center. Designed and oversaw installation of vapor intrusion control and mitigation measures including vapor barrier, subsurface vapor extraction piping and rooftop inline fan. Incorporated system design into new building construction plan. Provided vapor system setup and commission testing to meet current New Jersey Department of Environmental Protection (NJDEP) requirements.
- Large-scale cost estimating due diligence project to develop long term remedial operation and maintenance program for petroleum client. Used cost estimating and net present value calculations to prepare order of magnitude costing document.
- Project manager for in situ chemical oxidation (ISCO) pilot test at Pennsylvania gasoline station. Duties included project set-up, coordination with subcontractors, the collection of field verification parameters and interpretation of results. Prepared and submitted expanded ISCO plan to PADEP for approval. Plan approved by PADEP and included quarterly bioremediation injections for treatment of unleaded gasoline contamination and expanded groundwater monitoring plan.
- Large scale deep excavation project to address and remove mass of chlorinated Dense Non-Aqueous Phase Liquid source area (25 feet deep excavation utilizing slide-rail excavation procedures). Removed 500 tons of highly impacted hazardous soil. Project also included a structural engineering design and micro-pile supports for nearby occupied active shopping center building.
- Zero-Valent Iron (ZVI) in situ injections to target and treat a former dry-cleaning site. 100,000-lbs of ZVI and Emulsified Vegetable Oil (EVO) amendment mixed via an above-grade injection setup to target high levels of PCE and TCE chlorinated compounds in soil and groundwater. Injected 50,000-gallons of amendment mixture followed by performance monitoring sampling to evaluate geochemical parameters.
- Designed and installed large scale soil vapor extraction (SVE) system at active storage warehouse in Edison, New Jersey. The system involved the placement of 18 SVE wells under the existing concrete floor to depths of 25 feet below the surface. Used historical soil data and pilot test information to develop a radius of influence of 30 feet and incorporated calculations into the design.
- Senior engineer of an in situ Enhanced Reductive Dechlorination (ERD) injection event to treat chlorinated compounds in groundwater at a Vineland, New Jersey industrial facility. Project included completion of Discharge to Groundwater Permit-By-Rule Report, injection designs

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EDUCATION

BS, Drexel University,
Environmental Engineering,
2011

PROFESSIONAL LICENSES

NJDEP LSRP, No. 837964

PA PE, No. 087408

NJ PE, No. 24GE05405800

for dosage and implementation of direct push injections. Injected over 20,000 gallons of activated carbon slurry during two separate mobilizations at 48 separate injection points. Results indicated contaminated reductions in all site groundwater wells near the injection area and the Site is currently in the long-term monitoring phase.

- Project Manager of active large-scale petroleum facility. Managed and participated in the investigations of 150 open spill cases associated with historical releases of unleaded/leaded gasoline, diesel fuel, kerosene/jet fuel and trans mix throughout the site. Completed soil and groundwater delineation activities involving the installation of approximately 250 soil borings and 35 monitoring wells.
- Various Vapor Intrusion (VI) investigation and pre- and post-development construction evaluations and costing to support industrial warehouse builds. Prepare Order of Magnitude (OOM) estimate including passive and active system design options.
- Construction oversight for site-wide remedial capping activities and DNAPL excavation at a former compressed gas facility located in East Rutherford, New Jersey. Field activities included completion of daily field reports, inspections to confirm compliance with specifications and photo documentation. Follow up activities included report preparation of remediation including weight ticket review and compilation.
- Developed a bench study for to evaluate the feasibility of remediating hexavalent chromium via in situ treatment at an aluminum manufacturing facility. Hex Chrome concentrations are over 300 ug/l and extend to through multiple aquifers to depths greater than 150 feet below ground surface. The test was designed to evaluate the effectiveness of the remedy and to observe what breakdown products and geochemical parameters would persist in the groundwater aquifer so that the system can be scaled up to full scale implementation.
- Project manager on large scale Electrical Resistance Heating (ERH) project in Clarks Summit, Pennsylvania. Project involved removal of dissolved phase TCE from groundwater and bedrock matrix interface and included installment of 17 electrodes to 110 feet below ground surface. Oversaw project from start to completion and successfully applied 1,600,00 kWh of energy to the field over 90 days and removed 500 lbs. of TCE through granular activated carbon treatment process. Project received a no further action (NFA) from PADEP.
- Field team leader for construction oversight of large-scale excavation of TCE contaminated soils in Clarks Summit, Pennsylvania. Excavation involved structurally supporting adjacent building warehouse by use of soil nails and whaling system and successfully excavated soils down to top of bedrock (20 feet below ground surface). Through dewatering and soil disposal, 3,900 lbs. of TCE were remediated from the area.
- Managed ongoing groundwater remediation system support at gasoline station less than 50 feet from a sensitive receptor stream. Collected groundwater, surface water and remediation system data to facilitate efficient system operation. Reviewed data for compliance and submitted treated water discharge data to NJDEP for discharge monitoring reports. Planned and performed oversight for the installation of two bedrock monitoring wells at the site.
- Field leader of large scale SVE system located in a 0.3 square mile public park. Tasks included field gauging, enhanced fluid recovery activities and system maintenance and operations. Completion of a cost/benefit analysis for transferring system to granular activated carbon units. Knowledge of SVE programming procedures and system trouble shooting techniques were gained by conducting periodical field events.
- Preparation of numerous SPCC and SWPPP updates for clients in the transportation, chemical, and pharmaceutical industry. The Plans were prepared in accordance with the Federal Oil Pollution Prevention Regulation, Title 40 Code of Federal Regulations (40 CFR 112). Tasks conducted include site inspections and documentation culminating in report preparation and submittal.
- Project Manager of ISCO pilot test and expanded full-scale injection project at active retail gas station. Installation of 9 injection wells ranging from 20 feet below ground surface to 50 feet below ground surface. Successfully injected calculated target volume of 1500 gallons of ISCO reagent into subsurface and decreased concentrations by multiple orders of magnitude to achieve stable or decreasing trends for monitored natural attenuation.
- Construction oversight activities for multiple private residence underground storage tank removals involving excavation and load-out of contaminated soils. Completed soil delineation and temporary well installation for sample collection from residences throughout New Jersey. Preparation Remedial Action Work Plan Reports (RAWP) detailing site histories, construction activities, alternative measures, remediation options and analytical test results.
- Engineering Manager a pilot study and full-site remediation of gasoline constituents via dissolved oxygen bacteria and nutrient recirculation in the overburden soils at Branch Brook Park in Newark, NJ. Evaluated the efficiency of the existing activated carbon soil vapor extraction system and capabilities of the on-site wastewater treatment system. Manage the maintenance and operation of the soil vapor extraction system, which includes monthly site visits to replace/repair damaged



parts as well as optimize the system via real time observations. Completed the design for a transition from an activated carbon soil vapor extraction/wastewater treatment plant to an in situ biological recirculation system utilizing similar infrastructure with an overall objective of remediating dissolved phase constituents from groundwater.

- Environmental manager of active asphalt refinery in Savannah, Georgia. Tasks included updating hazardous waste handling training program, hazardous waste tracking procedures and modifications, onsite environmental investigations of groundwater for pump and treat remedial alternative and

weekly inspections of waste systems including onsite wastewater treatment system and NPDES permitted outfall.

PROFESSIONAL TRAININGS

DVSC Refinery Safety Trained

Transportation Worker Identification Credential (TWIC)

Operator Qualification Trained (OQ Training)

SPSA & LPS Trained

OSHA 40-Hour Health and Safety Trained

OSHA 8-Hour HAZWOPER Trained