

Michael A. Hansen, PE

Senior Engineer

Mr. Hansen is a licensed Professional Engineer and has more than 28 years of diverse experience in the areas of groundwater and soil remediation, including the conceptualization, design and implementation of hundreds of in-situ and ex-situ remediation systems. In addition, Mr. Hansen has extensive experience in project, program and client management for individual environmental projects as well as portfolios of projects/sites serving both private and public sector clients.

As part of the Corporate Remediation Strategies Group for a large, international environmental consulting, engineering firm and construction firm, Mr. Hansen was tasked with overall quality, consistency and technical innovation for hundreds of remediation projects across the United States and abroad. The primary mission of this group was to develop innovative approaches to assess, remediate and ultimately close these sites utilizing a broad base of conventional and cutting edge ex-situ and in-situ remediation technologies.

Sites in which Mr. Hansen was responsible for the environmental restoration/clean-up programs including a broad range of regulatory arenas such as Federal (CERCLA/NPL) and State Superfund, State Voluntary Clean-up, Resource Conservation and Recovery Act (RCRA), State underground storage tank and others. These sites also were affected by a diverse range of contaminants including metals, chlorinated solvents, petroleum hydrocarbons, light- and dense-non aqueous phase liquids (LNAPL and DNAPL), solid waste (landfills) as well as emerging contaminants such as radionuclides, perchlorate, explosives, methyl tertiary butyl ether (MtBE) and 1,4-dioxane.

At VERINA, Mr. Hansen is responsible for overall QA/QC of remediation projects. He also participates in marketing and business development to expand VERINA service offering and market penetration. Mr. Hansen also manages projects in environmental due diligence; engineering design of soil and groundwater remediation systems; site assessment; investigations, and remediation; and environmental permitting and compliance.

SELECTED PROJECTS

Former Specialty Chemical Manufacturing Site, Northern New Jersey – Served as technical adviser for an ongoing investigation and remediation project at a former specialty chemical manufacturing site in New Jersey under the NJDEP Site Remediation Reform Act (SRRA). Site

Education

B.S./Chemical Engineering
Clarkson University
Potsdam, New York
June 1990

Licenses/Certifications

Licensed Professional Engineer
(P.E.) in the States of Pennsylvania
and Indiana

The OSHA 40-Hour Training Course
in Hazardous Waste Operations and
Emergency Response (HAZWOPER
Certificate), required by OSHA 29
CFR 1910.120

US Army Corps of Engineers
Construction Quality Management
for Contractors (Certificate #784)

impacts included soils and groundwater impacted with the various chlorinated and fluorinated solvents, semi-volatile organic compounds and free phase product (DNAPL). Project highlights included the conceptualization, pilot testing and full-scale implementation of a multi-year in-situ groundwater remediation project utilizing activated sodium persulfate in-situ chemical oxidation (ISCO). Duties related to the ISCO remediation design included the process engineering to design an integrated chemical injection system to allow for mixing, injection and monitoring of the ISCO remediation chemicals at in a mobile injection trailer. Other project duties included coordination of a \$1,000,000+ annual budget along with annual reporting and updates to the board of directors of the party responsible for the remediation.

Former Chemical Manufacturing Site, Northern New Jersey – Served as project manager in support of a Brownfield redevelopment at a former manufacturing facility located in Northern New Jersey. As part of this integrated project tasks completed included support of building demolition activities, soil sampling, soil remediation, and regulatory interface un the SRRA program. Past activities at the site had resulted in the identification of over 150 Areas of Concern (AOCs), needing a formal Remedial Action Outcome (RAO) prior to property transfer and development. Of particular note for this project was use of the SESOIL Model to develop site-specific impact to groundwater soil remediation standards (IGWSRS), resulting in significant reduction of the extent of soil remediation areas and the costs for soil remediation. Upon completion of the soil remediation activities, an unrestricted RAO was issued for the on-site soils at the site and transfer of the property was completed in less than nine months from project initiation.

Former Electronic Manufacturing Sites, Binghamton and Kirkwood, New York – Served as technical adviser for an ongoing remediation activities at two former electronic manufacturing Sites in Binghamton and Kirkwood, New York. Historical activities have results in soil and groundwater impacted with tetrachlorothene and other chlorinated solvents at each site. Project highlights included the ongoing operations and maintenance of in-situ groundwater remediation project utilizing activated sodium permanganate in situ chemical oxidation along with attendant performance monitoring and reporting, along with implementation and operation and maintenance of vapor intrusion mitigation systems at each location.

Automotive Repair Facility, Hopatcong, New Jersey – Served as technical director for process engineering, detailed design and implementation of an active soil and groundwater remediation system at the site. The soils and groundwater were impacted by former gasoline underground storage tanks at the site. Site impacts included residual petroleum hydrocarbons and the potential for impacts to reach a local surface water body. The selected remediation approach included in-situ soil vapor extraction and air sparging. The system operated for over two years and has since been shut-down upon completion of clean-up objectives.

Confidential National Priorities List (NPL) Site, USEPA Region IX – Served as technical lead and project director for Fortune 500 Company National Priorities List (NPL) Site located in the Southwestern United States. Project highlights included directing a staff of 10+ full-time professionals working on all aspects of the project with an annual budget of over five million dollars per year. Initial technical activities included oversight and process engineering support for operation and maintenance of two large groundwater extraction and treatment systems (300 and 600 gallons per minute [gpm], respectively), implementation of a selective ion exchange treatment unit for perchlorate removal from extracted groundwater. The project was then expanded where process engineering, design, turn-key construction and start-up of two new groundwater extraction and treatment systems (500 and 1,000 gpm, respectively) was performed. Additional

work tasks included operation of a soil vapor extraction system, evaluation of in-situ treatment options and implementation of a nano-scale zero valent iron (nZVI) pilot study for in-situ chemical reduction of site impacts, a three year comprehensive groundwater investigation with installation of over 25 new monitoring wells, and numerous other support activities such as groundwater monitoring, reporting, etc. Worked closely with the finance and accounting groups within the customer organization to evaluate and predict environmental reserves for SEC reporting and also provided support to client tax and legal departments on the project.

Confidential Manufacturing Facility, Massachusetts – Served as technical director for implementation of a Guaranteed Fixed Price remediation contract entered into with a Fortune 500 Company who obtained the former manufacturing Site in an acquisition. Project highlights included operation and expansion of an existing groundwater extraction and treatment system used to protect a municipal water supply from TCE impacts at the Site, design and implementation of a new air stripping system for possible emergency treatment of the municipal water supply, and implementation of an in-situ groundwater treatment pilot test in the TCE source area using chemical reduction via injection of nZVI.

Environmental Restoration at Milan Army Ammunition Plant, Milan, Tennessee – Served as technical lead for ten-year 45+ million dollar firm, fixed price restoration contract at the US Army Ammunition Plant located in Milan, Tennessee. Project highlights included oversight and optimization of three operating groundwater extraction and treatments systems each operating at over 900 gallons per minute for the containment of dissolved explosive residuals in groundwater, and investigation and remediation of soil impacts at various 'load lines' or locations in which munitions were assembled. Soil remediation included a site specific composting process to naturally degrade the explosive residuals in soils.

Environmental Restoration of Camp Pedricktown BRAC Site, Pedricktown, New Jersey – Served as technical director for a multi-year, 2+ million dollar firm, fixed price restoration contract at the US Army Base Realignment and Closure (BRAC) Site in Pedricktown, New Jersey. This project was one of the first two pilot projects for Performance Based Contracting (PBC) that the Department of Defense entered into. Project highlights included implementation of 4,000+ cubic yard surface soil clean-up to address metal impacted soils including an innovative alternative disposal approval from NJDEP (used as landfill daily cover at local MSW landfill), asbestos abatement at several abandoned buildings, and implementation of integrated in-situ air sparging and natural remediation remedy for a plume of groundwater impacted with tetrachloroethene (PCE).

Environmental Restoration of Ft. Devens BRAC Site, Ayer, Massachusetts – Served as technical director for a seven-year, 6+ million dollar firm, fixed price restoration contract for Area of Concern (AOC) 50 at the US Army BRAC Site at Former Ft. Devens in Ayer, Massachusetts. Project highlights included completion the Final Feasibility Study (FS), Proposed Plan and Record of Decision (ROD) for the AOC 50 groundwater. The remedy was required to address the groundwater impacts at AOC 50, a plume of tetrachloroethene impacted groundwater extending almost 3,000 feet from the source area. During the project execution a remedial pilot study was performed to demonstrate the applicability of in-situ anaerobic biodegradation treatment of the PCE. Following successful implementation of the pilot test, the full-scale remediation approach was designed using multiple in-situ anaerobic treatment barriers arrayed across the plume, as

well as an in-situ groundwater recirculation well system at the 'toe' of the plume to provide physical removal of the PCE and protection of an adjacent surface water body.

Environmental Restoration, Sierra Army Depot, Herlong, California – Served as technical director, for a multi-year, 20+ million dollar firm, fixed price restoration contract at the active US Army Supply Depot located in Herlong, California. Project highlights included oversight and optimization of existing 200+ gpm groundwater extraction and treatment system followed by the ultimate shut-down and replacement of the system using alternative, in-situ technologies for treatment of TCE in the groundwater. In addition, remediation and closure of a lead impacted soil location and remediation and closure of UXO burn pit were completed during the contract period.

Industrial Site, Bristol, Pennsylvania – Served as technical director for investigation, remediation and risk based closure at a divested commercial laundry site in Bristol, Pennsylvania under the Pennsylvania Act 2 regulations. Site impacts included a 2,000+ foot long plume of groundwater impacted with PCCE as well as high levels of residual PCE in soils beneath the existing building. Project highlights included implementation, operation and ultimate closure of the soil impacts using a soil vapor extraction system, and implementation of an in-situ, anaerobic biodegradation reactive barrier to reduce on-site PCE concentrations to levels below site specific clean-up standards. The balance of the groundwater impacts were closed using a risked-based approach.

Petroleum Storage Site, Dinuba, California – Served as technical director for the development and implementation of an integrated groundwater remediation program at a former petroleum bulk storage facility located in the Central Valley region of California. Project highlights included implementation of a 300+ gallon per minute groundwater extraction and treatment system. The treatment system included use a high air to water ration air stripper for the removal of MtBE. In addition, the extraction and treatment system was augmented with an aerobic in-situ reactive zone approach in which dilute hydrogen peroxide was injected into the various aquifer units to enhance the natural aerobic degradation of the hydrocarbon impacts.

Petroleum Storage Site, Speedway, Indiana – Served as technical director to develop and implement an upgraded groundwater remediation program at an active petroleum bulk storage facility located outside of Indianapolis, Indiana. Project highlights included implementation of a new vacuum-enhanced pumping system for the containment and recovery of impacted groundwater and LNAPL present in the subsurface. The new system included installation of ten dual-pumping recovery wells for a total extraction flowrate of over 200 gpm, and the installation of a sedimentation basin to remove dissolved iron from the extracted groundwater to meet the total suspended solids (TSS) limitations for the National Pollution Discharge Elimination System (NPDES) approved discharge for the treated groundwater.

Petroleum Storage Site, Willow Springs, Illinois – Served as technical director to develop and implement an upgraded groundwater remediation program at an active petroleum bulk storage facility located outside of Chicago, Illinois. Project highlights included implementation new vacuum-enhanced pumping systems for the recovery of impacted groundwater and LNAPL present in the subsurface adjacent to a shipping canal. Prior to system start-up the impacts were creating a re-occurring sheen on the canal for a period of over ten years. Within one week of start-up the sheen was permanently abated and the remediation system achieved removal of the LNAPL and residual hydrocarbons in 11 months allowing for shut-down and closure of the system.

EMPLOYMENT HISTORY

- 2012 – Current Senior Engineer
Verina Consulting Group, LLC, Bridgewater, New Jersey
- 2008 – 2011 Director of Remediation
Matrix New World Engineering, East Hanover, New Jersey
- 1990 – 2008 Various Positions in Remediation and Client Management Services
ARCADIS US, Inc., Newtown, Pennsylvania

SELECTED PUBLICATIONS

Yuan, R., M. A. Hansen, D. R. Gan, and M. R. Fontana. March 16-18, 2015. In-situ Chemical Oxidation Application of High pH Activated Persulfate at a Challenging DNAPL Contaminated Site. Paper presented at the 2015 National Ground Water Association (NGWA) Groundwater Summit, San Antonio, Texas, March 16 -18, 2015.

Hansen, M. A. May 19, 2015. Environmental Strategy to Expedite Remediation at a Brownfield Site in New Jersey. Presentation at Central Jersey Branch of ASCE/OCSPE/MCSPE Joint Meeting, Belmar, New Jersey.