



PREPARED FOR
West Virginia Department of
Environmental Protection

August 27, 2024

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WV PURCHASING
DIVISION



West Virginia Department of Environmental Protection

Methane Emission Quantification Services

Technical Proposal

CRFP 0313 DEP2500000001

WVDEP CRFP 25*01

Antea®Group

Understanding today.
Improving tomorrow.

PREPARED BY

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A handwritten signature in black ink, reading "Troy S. Bernal".

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Project # 2024-08-549796

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West Virginia Department of Environmental Protection

Methane Emission Quantification Technical Proposal

CRFP 0313 DEP2500000001

*WVDEP CRFP 25*01*

EXECUTIVE SUMMARY

Antea®Group proposes the following work plan to support the West Virginia Department Environmental Protection (WVDEP) evaluation of methane emissions at orphan oil and gas wells that are scheduled to be properly plugged and abandoned. Antea Group will provide methane emissions field monitoring and quantification of emissions rates, where applicable, pre- and post-plugging at 200 orphan well site locations. These activities will be performed by qualified measurement specialist in accordance with the “U.S. Department of the Interior, Orphaned Wells Program Office’s Assessing Methane Emissions from Orphaned Wells to Meet Reporting Requirements of the 2021 Infrastructure Investment and Jobs Act: Methane Measurement Guidelines, dated July 2023”. All data collected will be evaluated by specialists, entered into a database, and documented individual well reports.

1.0 INTRODUCTION

Antea Group is pleased to present this proposal to WVDEP in response to their request for methane emission quantifications services. Antea Group is a full-service, global consulting firm with 3,000 employees in North and South America and Europe. Our mission is to be a partner with our clients in the development and application of sustainable and integral solutions relating to our environment.

Antea Group’s North American Operations Business Group provides environmental, health, safety, and sustainability services to state, local governments and private sector clients through 30 offices nationwide. Our staff includes environmental, chemical, civil, and mechanical engineers, environmental scientists, air specialists, health and safety specialists, environmental management consultants, geologists, hydrogeologists, and toxicologists. Personnel in Antea Group’s Pittsburgh, PA, and Columbus, OH, have consulting experience working in West Virginia and are Licensed Remediation Specialists (LRS). Antea Group is pleased to have the opportunity to submit this technical proposal to WVDEP.

2.0 BACKGROUND AND EXPERIENCE

Antea Group has completed methane detection monitoring and emission quantification evaluations for Shell and ConocoPhillips, and most recently for New York State Department of Environmental Conservation (NYSDEC) and New York State Office of General Services (NYSOGS) at over 80 orphan oil and gas well locations. Antea Group was an integral part of establishing New York State’s methane detection and subsequent methane emission quantifications for their orphan well plug and abandonment program establishing field protocols and methodologies to ensure data collection in a safe, effective, and efficient processes. Furthermore, Antea Group, working with NYSDEC/NYSOGS, established a reporting framework and database to accurately document and subsequently present data to the Department of Interior in an easily useable format. Field assessments conducted during this program included multi-gas meter monitoring to evaluate workspace safety conditions, methane detection monitoring, quantification testing of methane emissions (both pre- and post-plugging),

photo documentation of the work area, well conditions, weather and atmospheric data documentation, and oversight of well plugging and abandonment activities. Additionally, Antea Group prepared well construction evaluations, plugging plan designs, air monitoring plans, and sensitive area protection plans. Also, Antea Group conducted contractor oversight and collaboration of quality assurance and quality control for successful well plugging completions, environmental impact oversight, tracking of project financials (burn rates), landowner outreach, and regulatory liaison.

Antea Group has experienced staff that meet the definition of a qualified measurement specialist. This definition, based on the federal guidelines, lays out considerations and responsibilities of the individual conducting the measurements. For accurate and repeatable measurements, this qualified person has experienced a minimum of 20 hours of direct field measurements utilizing the devices proposed in this document. Those qualified are trained and experienced in the identification of field conditions that affect measurement, infrastructure that may be present and its contributions to the assessment, and field conditions and safety-related hazards that can be encountered at remote oil and gas operation sites. Furthermore, Antea Group's staff are experiencing working with plug and abandonment contractors to schedule access to well sites safely and collect methane emission rate quantification data prior to and after oil and gas wells are plugged and abandoned.

3.0 PROJECT TEAM ORGANIZATION

The correct resources are the key to a successful project. We have provided an organizational chart and resumes of the proposed staff in **Appendix A**. The single point of contact and Project Director will be Troy Bernal. The project manager will be Dean Krebs. All staff professionals proposed for this project have worked on other methane emission projects. Antea Group is uniquely qualified and has the available resources necessary to complete this project on schedule while exceeding WVDEP's expectations.

4.0 PROJECT WORK PLAN

4.1 METHANE MONITORING FIELD WORK PLAN

Antea Group will provide methane quantification services pre- and post-plugging at orphan well locations in accordance with the U.S. Department of the Interior, Orphaned Wells Program Office's Assessing Methane Emissions from Orphaned Wells to Meet Reporting Requirements of the 2021 Infrastructure Investment and Jobs Act: Methane Measurement Guidelines, dated July 2023, and guidance issued from the American Carbon Registry, Methodology for the Quantification, Monitoring, Reporting and Verification of Greenhouse Gas Emissions Reductions and Removals from Plugging Orphaned Oil and Gas Wells in the U.S. and Canada, dated May 2023.

Following the DOI guidelines Antea Group will implement Part III "Optional Screening Protocol" to assess selected well sites to determine if methane is detected at the well site. Antea Group uses a sensitive binary measurement instrumentation, Remote Methane Leak Detector [(RMLD) (product sheet is provided in **Appendix B**)], to screen selected well sites to determine if the well, well equipment, or surrounding land surface is emitting methane concentrations above background. If methane is not detected above background, the rate of methane emissions is documented as less than 1 gram/hr. (g/hr.) and quantification of emissions rates is not required. Implementation of the Part III Screening Option can reduce field hours and save costs for the well abandonment program. However, if methane is detected during the screening phase, methane emissions will be quantified in accordance with Part IV of the DOI guidelines "Main Protocol: Quantifying Methane Emissions Rates."

The two primary methodologies currently recognized and approved for methane quantification are the static and dynamic chamber-based method and high-flow sampler method. Antea Group has experience with both methodologies but prefers using the high-flow sampling method due to effectiveness, efficiency, and safety. The chamber-based methods can create significant safety concerns, creating elevated methane conditions within the chambers up to and above the lower explosive limit (LEL) and increase costs due to extra expense and time manufacturing a variety of chambers for Type 2 (legacy infrastructure) and Type 3 (exceptional circumstances - infrastructure) well-type apparatus, as well as increased field personnel mobilization and chamber transportation costs. Antea Group will use a SEMTECH HI-Flow 2 sampler (product sheet is provided in **Appendix B**) that can collect and quantify methane emissions from leaking point sources instead of building confining chambers to collect methane concentrations and flow rates for methane emission rate quantification.

The following scope of work will be conducted by Antea Group personnel who meet training/experience requirements of a qualified measurement specialist to properly monitor and quantify methane emissions rates for selected well sites pre- and post-plugging and abandonment activities:

- Locate, identify, and assess wellhead equipment and condition, potential emission points on equipment, and surrounding land surface adjacent to the orphan gas well.
- Conduct initial screening of the well site with a RMLD. Prior to conducting the initial screening, a background level of methane will be established with the RMLD within the vicinity of the well site. Also, each staff member will be equipped with a personal multi-gas meter recording total volatile organic compounds (VOCs), hydrogen sulfide (H₂S), carbon monoxide (CO), oxygen (O₂) content and LEL of ambient air conditions surrounding the well to assess whether the breathing zone is safe to conduct methane detection and quantification testing without upgrading from standard Level D personal protective equipment (PPE). If conditions are unacceptable for testing, and the well will be identified as a Type 3 or Type 4 (exceptional circumstances - safety) well, the well site will be reevaluated with input from WVDEP prior to testing. If the well site is deemed safe to assess, the well bore, ancillary equipment, surrounding land surface will be screened for the presence of methane gas.
- Set up a portable weather station and collect current weather data including wind speed and direction, temperature, and barometric pressure (note methane measurements will not be collected during high wind, precipitation events, or snow/ice conditions that prevent accurate field measurements).
- Prepare for and conduct methane emission rate quantification if methane gas is detected during the screening phase outlined above. If methane gas is not detected, the well will be documented as a “non-detect” well with an emission rate of less than 1 g/hr. and not further evaluated for methane gas.
- Collect and document methane emission rates (concentrations and flow rates) using a high-flow sampling device (SEMTECH HI-FLOW 2). Per the U.S. Department of Interior protocols for equipment measuring methane emissions, the device detects methane emissions to 1 gram per hour or lower and within 30% or better quantitation range and accuracy. The high-flow sampling device proposed for this field effort has a documented precision and accuracy of 5%.
- Collect methane emissions with the SEMTECH HI-FLOW 2 sampler over a minimum 2-hour period to establish a mean concentration of stabilized methane emissions in accordance with the American Carbon Registry methodology. Emission rate stabilization will be verified by determining if emissions rates vary by a factor of 10 or less. This will be assessed by determining if the ratio of current measurement to the mean emission rate of at least two hours of sampling is less than 10. If emissions rate variability exceeds 10 over the two-hour period, additional measurements will be collected until the emission rate variability is less than 10.

- Measurement protocol will be repeated for well sites with multiple leak point sources identified in the screening phase, and the emissions results will be summed for the entire well site and recorded as the methane emission rate.
- Data collected during each emission quantification event is digitally stored on the SEMTECH HI-Flow 2 sampler and downloaded daily for assessment and backup storage. Additionally, the following data will be recorded for each well site assessed:
 - Date and time of the measurement(s).
 - Location of the well using mapping datum WGS84, with latitude and longitude recorded in decimal degrees (five - seven decimal places).
 - Administrative unit (e.g., national forest, park, refuge, Bureau of Land Management public land) on which the well is located or, if private land, the property owner.
 - Well serial number/information such as API or US Well ID.
 - Condition of the well, with digital photos taken from four directions and looking down from above, as possible.
 - Weather information including air temperature, most recent precipitation date and amount (inches), wind direction and speed, and barometric pressure.
 - Total methane emitted from the well over time. Units will be in g/hr. of methane.
 - Number of leaks, if multiple leaks are present, from a single well due to the presence of legacy infrastructure and/or soil emissions.
 - Any uncertainty in the measurement (e.g., by making multiple measurements at the site, including concerns related to site conditions).
 - Interval emission rates to ensure stable flow conditions to satisfy the factor of 10 for variability.
 - Equipment and techniques used.
 - Equipment calibration data.
- 5% of the orphan wells assessed will be randomly selected for a duplicate measurement to assess the precision of the field efforts.

4.2 VALUE ADDED SERVICES

4.2.1 WEST VIRGINIA RFP DIGITAL FIELD DATA COLLECTION

Antea Group's Digital Solutions team is a dedicated group with the experience and expertise to design a seamless digital path from field to desktop. Integrating digital collection at the point of entry allows data to be validated, organized, and formatted for seamless sharing to other internal and external platforms. Antea Group uses their Esri software platform to develop electronic forms for data entry, provide daily geographic information system (GIS) mapping updates, and provide a dashboard of collected data to the end users to allow for hands-on exploration. Antea Group proposes the use of a digital tablet for electronic form entry of sampling information and weather observations and access to the instrumentation log, digital photo collection, and Global Positioning System (GPS) coordinate capture for the wells and other features. Tablets will include a wireless hotspot to ensure adequate network connection for the uploading of daily logs.

Antea Group utilizes a Global Navigation Satellite System (GNSS) GPS device for field geospatial data collection. With sufficient satellite coverage and Satellite-Based Augmentation System (SBAS) corrections, the accuracy of the field GPS device will be within 0.5 to 1.0 feet of actual locations. This receiver can be integrated directly into an Esri field maps application that provides real-time location information which can be used for navigation to a particular well and updating corrected coordinates once the wellhead location data is collected. In offline mode, locations can be updated with new information, photos, and coordinates and then automatically synchronized

to the ArcGIS Online Portal once back in network connection. These updates can be provided in the form of figures and reports to WVDEP through conventional methods.

An additional integration using Esri ArcGIS Online Collaboration may be possible with the assistance of WVDEP's GIS and Mapping team. A Collaboration would allow Antea Group's field updated mapping information to be shared with WVDEP's ArcGIS Online Organization in near real-time through an Esri ArcGIS Online group. This group would be housed within Antea Group with access provided to members of WVDEP's GIS and Mapping team. By connecting the two organizations with the Collaboration feature, WVDEP GIS staff would see updates on well status as the work is conducted in the field. These updates could include well sampling status, photos, and updated input fields.

4.2.2 FIELD SAFETY

A project health and safety plan will be developed before field work begins. Each on-site Antea Group worker is trained and compliant with 29 Code of Federal Regulations (CFR) Part 1910.120. Field personnel will be equipped with a multi-gas personal meter recording total VOCs, H₂S, CO, and O₂ content and LEL of ambient air conditions surrounding the well to assess whether the breathing zone is safe to conduct field activities. Due to the remote nature of the work, Antea Group will implement our lone worker program which allows for frequent communication between field staff and project management personnel to ensure work safety. Field personnel will strictly follow a specific scope of work limiting activities to a specific work area and check in at a minimum of once every two hours via one of the following methods: available cellular phone service, satellite phone, or other applicable messaging device. Antea Group's lone worker practice raises awareness and promotes safe work practices for employees who work alone. Antea Group acknowledges it is necessary for some employees to work alone in a diverse range of environments. Lone worker training includes hazard identification and risk assessment, control measures, and risk reduction.

5.0 DATA PRESENTATION AND REPORTING

Antea Group will collect and store field data utilizing a RMLD and SEMTECH HI-Flow 2 internal data logging tools and a Juniper Cedar CT8XT tablet (or equivalent). Individual well report will be prepared summarizing field activities, provide methane emissions (g/hr.), classification of wells per DOI guidance (non-detect, detect, or detect and may be high) including tables, graphs, GPS coordinates, weather data, site map, etc.

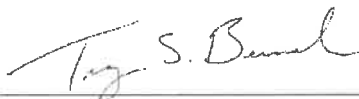
6.0 PROJECT SCHEDULE

Antea Group has availability of qualified measurement specialists to begin field work upon acceptance of this proposal and finalization of contract between Antea Group and WVDEP. Initial primary focus will be given to pre-plugging monitoring of wells. Post-plugging monitoring would be performed once plugging and abandonment has been completed on a set of 20 wells.

7.0 CLOSING

Thank you for the opportunity to provide this proposal to support WVDEP. We believe that by collaborating with our clients we can design the service approach and deliverables that best meet their needs. Should you desire any changes or modifications to this proposal, please contact us; we strive to ensure our service approach is the most successful option.

Our client relationships are very important to us and we aim to provide you with the highest quality of service and prompt response to your EHS needs. We look forward to speaking with you further about this proposal.



August 27, 2024

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August 27, 2024

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8.0 CONTACT INFORMATION

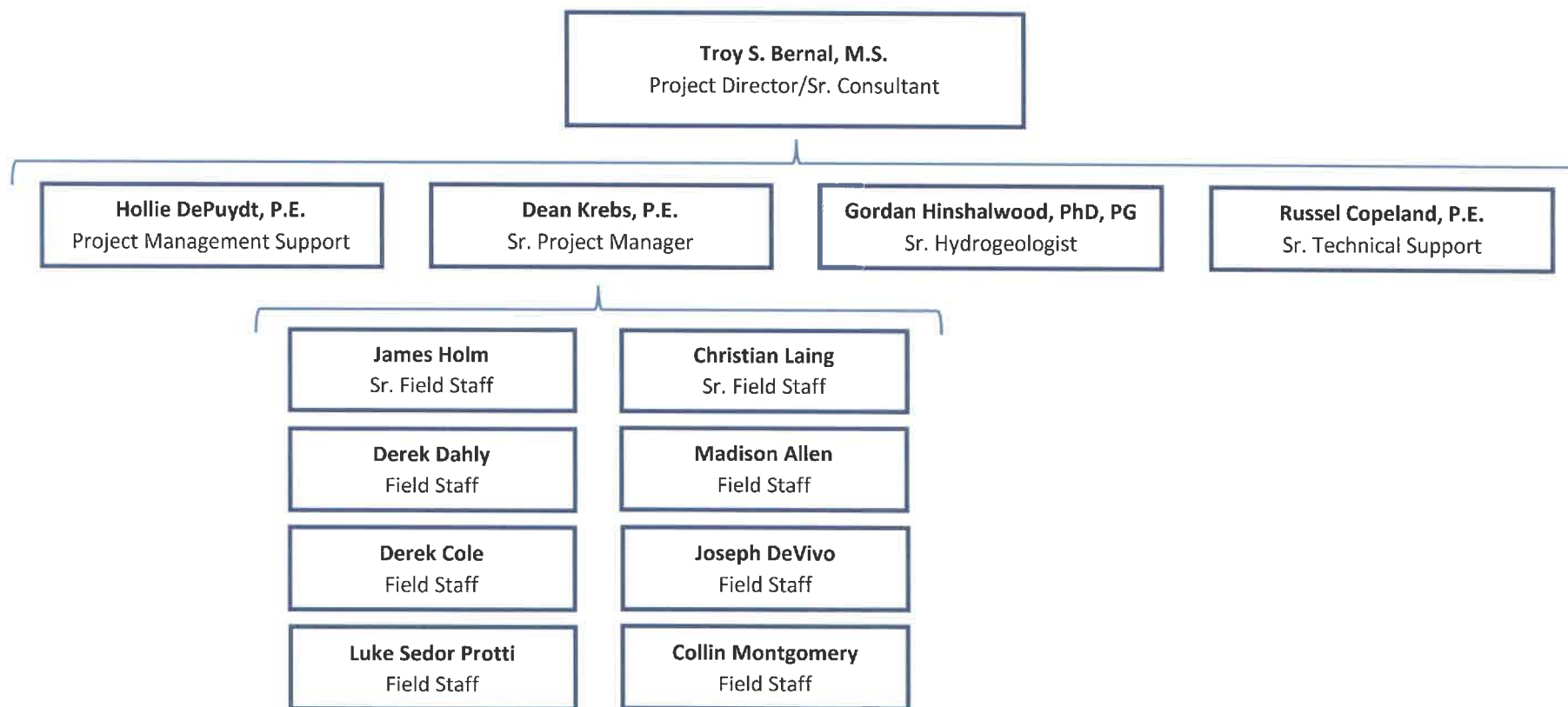
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Appendix A – Organization Chart and Team Resumes

Antea Group Organization Chart



Troy S. Bernal

Senior Consultant



EXPERIENCE SUMMARY

Troy S. Bernal is a Senior Consultant for Antea®Group. Mr. Bernal has over 23 years of environmental consulting experience. His primary areas of expertise include plug and abandonment of oil and gas wells, site assessment and remediation, emergency response/management and preparedness, industrial hygiene, expert testimony, and environmental and human health risk assessments. Mr. Bernal's primary clients include oil and gas, railroad, petrochemical/chemical, manufacturing, maritime and insurance companies.



RELATED PROJECTS

Plug and Abandonment of Oil and Gas Wells

- Mr. Bernal has completed numerous plug and abandonment projects for the oil and gas industrial sector. His involvement has included preparations of well designs, civil project plans, air monitoring and sensitive protection plans, emergency response plans and closure reports. Field services have included contractor oversight and collaboration of quality assurance and quality control for successful project completions, environmental impact oversight, tracking of project financial (burn rates), environmental assessment and remediation, landowner outreach, and regulatory liaison. Additionally, Mr. Bernal has prepared and completed methane emission detection and quantification plans as well as testing per the Department of Interior (DOI) and the American Carbon Registry and (ACR) guidelines.
- Mr. Bernal help develop and implement methane detection and subsequent methane emissions quantification testing program for the NYSDEC. Over 80 orphan wells have been assessed in the program and data reported quarterly to the DOI as part of the BIL.

Environmental Investigation and Remediation

- Mr. Bernal, together with the employees under his direction, have completed numerous Phase I and Phase II Environmental Site Assessments throughout the United States. These assessments were conducted at the following properties (non-exhaustive list): railyards, railway track segments, pipelines and terminals, refineries, manufacturing facilities, product distribution centers and warehouses, automotive service facilities, vacant and undeveloped parcels, and office and commercial facilities.
- Mr. Bernal and his team completed the site investigation, risk assessment, and remediation of a 56-acre tract, which was formerly a chemical manufacturing plant, located adjacent to the Mississippi River in Gretna, Louisiana. Project scope included defining the extent of impacted soils and groundwater; clearing 20 acres of trees and concrete; and removal and off-site disposal of 20,000 tons of soils. Groundwater was contained and treated in the on-site wastewater treatment system. After corrective actions were completed, a determination of NFA-ATT was issued by the regulatory authority.

EDUCATION

MS – Environmental Toxicology, Louisiana State University

BS – Environmental Science, Louisiana State University

PROFESSIONAL REGISTRATIONS

FEMA ICS 100, 200, 300, 400, 700 & 800

Inland SCAT Training – Owens Coastal Consultants

LANGUAGES

English



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Emergency Spill Response, Incident Management, Planning and Preparedness

- After a chemical plant exploded in Duson, LA, a three-mile excavation was ordered until the fire was extinguished, and emergency responders were brought in to assess human health and environmental conditions. Mr. Bernal, with the help of his team, provided the client with a comprehensive response effort including: support within Incident Command Structure (ICS); preparing all Incident Action Plans (IAP), work plans and updates; detailed GIS Mapping for use within the ICS; emergency air monitoring for the affected communities, work perimeter, and work zone; air dispersion modeling; product transfer support, including air monitoring and quantity tracking; waste management of nonhazardous and hazardous waste; and management of emergency corrective actions

Mr. Bernal responded to a 1000-barrel crude oil release in Louisiana that impacted over 15 miles of bayou and surrounding lands. He assisted colleague with providing the client with a comprehensive response effort including: support within ICS, Preparing all Incident Action Plans, work plans, and updates; Shoreline cleanup and Assessment Technique (SCAT) surveys with detailed GIS mapping for within ICS to coordinate/implement cleanup and the response effort; emergency cleanup and the response effort; emergency air monitoring for the affected communities, work perimeter and work zone; air monitoring dispersion modelling; including air monitoring and quantity tracking; product recovery using vacuum trucks; drum skimmers and snare booms; surface water, sediment, soil and biota sampling; off-site transportation and disposal of impacted soil, onsite product storage, off site transportation and disposal, comprehensive soil and groundwater sampling, excavation, confirmatory sampling; human health and environmental risk assessments, ecological and wetland assessments, and a site restoration plan. Mr. Bernal and colleagues successfully received closure status from EPA and LDEQ.

- After a train derailed, 10 of its railcars released crude oil, methanol, urea fertilizer and petroleum distillates. Mr. Bernal, with the help of his team, provided the client with a comprehensive response effort including: support within ICS; preparing all IAPs, work plans, and updates; providing detailed GIS Mapping for use within the ICS; emergency air monitoring for the affected communities, work perimeter and work zone; air dispersion modeling; product transfer support, including air monitoring and quantity tracking; product recovery using vacuum trucks, drum skimmers and snare booms; surface water sampling; off-site transportation and disposal of impacted soil; on-site product and wastewater storage; off-site transportation and disposal of wastewater; comprehensive soil and groundwater sampling; excavation; confirmatory sampling; risk assessments; and a site restoration plan. Mr. Bernal and his group successfully received closure status from MDEQ and EPA Region IV within only six (6) months following the derailment.
- Mr. Bernal has responded to numerous others chemical and petroleum releases providing the following services: ICS support, SCAT development and surveys; environmental sampling of all media, environmental risk assessment, industrial hygiene, remediation, and waste characterization and disposal.
- Mr. Bernal managed and developed tactical response deliverables and Geographic Response Plans (GRP) for pre-planning emergency response activities for facilities, pipelines, and railroads. Plans developed were in accordance with local and federal regulatory agencies and emergency response organizations providing air dispersion modeling; identification of receptors at risk; development of site and community monitoring plans; and integration within ICS.

Industrial Hygiene Evaluations

- Mr. Bernal and team members directed by him were responsible for conducting air monitoring and providing site support for vinyl chloride and chlorine transfers from damaged railcars located in Livonia and Geismar, Louisiana. Air samples were collected from on-site personnel and contractor employees, as well as from the perimeter of the work zone. This data was collected to evaluate worker safety and to support process decisions during the transfer operation.

Human Health and Environmental Risk Assessments

- As an environmental toxicologist, Mr. Bernal has been responsible for preparing numerous human health and environmental risk assessments in the Southern United States, using the following risk assessment programs: Louisiana's Risk Evaluation Corrective Action Program (RECAP), Mississippi's Brownfields, Alabama's Risk Based Corrective Action (RBCA) and Texas' Texas Risk Reduction Program (TRRP).

Litigation Support

- Mr. Bernal has provided litigation support services for clients involving environmental issues for sites in Louisiana, Arkansas, Mississippi, and Alabama. Responsibilities include: development of sampling and analysis plans; health and safety plans; assessment reports and expert reports; and planning and coordinating sampling efforts for soil, groundwater, surface water and sediment data collection. Mr. Bernal has provided testimony in Louisiana in the areas of environmental risk assessment, remediation, and related matters.

Hollie DePuydt, PE

Project Manager – Environmental Engineer



EXPERIENCE SUMMARY

Hollie DePuydt is a licensed Professional Engineer with over 18 years of experience in our St. Paul, Minnesota office. She specializes in site investigation and remediation, Phase I and II Environmental Site Assessments (ESA), and stormwater and wastewater permitting.

Hollie successfully manages these projects with various clients and regulatory agencies to ensure minimal business interruptions, compliance with applicable orders, and environmental regulations. The collaboration with federal, state, and local regulators as well as various reimbursement program authorities.

RELATED PROJECTS

Project Management

Served as Project Manager and/or Engineer for numerous petroleum hydrocarbon, chlorinated volatile organic compounds (VOC), and agricultural chemical spill investigations and remediation projects in Kansas, North Dakota, Oklahoma, and Wisconsin. Management tasks involved communication with clients, regulators, and contractors; preparation of work plans, cost estimates, and reports; and design and implementation of investigations and remediation systems. Fieldwork included installation of soil borings and monitoring wells; collection of soil, groundwater, and soil gas samples; excavation of tanks and contaminated soils.

- Manage environmental projects including oversight of staff and contractors.
- Compliance negotiations with local, state, and federal agencies.

Environmental Site Assessments

Environmental assessments including Phase I Environmental Site Assessments (ESA), Phase II ESA, and Transaction Screening including the All-Appropriate Inquiry standard.

- Conducted numerous Phase I ESA and subsequent Phase II Site Assessments.
- Conducted assessments prior to property transaction for large, developed, manufacturing, and forestland properties.
- Clients included private landowners, lenders, attorneys, municipalities, and businesses.

Site Investigation

Developed and implemented site investigations to determine source, soil, groundwater, and other media impacts, plume definition, and evaluation of hydrogeologic conditions.

- Conduct subsurface investigations related to chemical releases including petroleum hydrocarbon, chlorinated VOC, and agricultural chemicals.
- Evaluate migration pathways and potential sensitive receptors.
- Sample soil and groundwater to define extent and degree of impacts.
- Completed site investigations in accordance with and related policy as required by the local regulatory agency to define the extent of soil and



EDUCATION

BS in Chemical Engineering
(2002) University of
Minnesota - Duluth

PROFESSIONAL REGISTRATIONS

Registered Professional
Engineer:
Connecticut
Delaware
Kansas
Maryland
Oklahoma
Pennsylvania
Wisconsin

LANGUAGES

English



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groundwater contamination associated with petroleum releases from storage tank systems.

- The collection of soil and groundwater samples for laboratory analysis. The laboratory reports are reviewed and summarized to be compared to state regulatory standards, preventative action limits, enforcement standards, and residual contaminant levels.
- Conducted and evaluated conceptual site models (CSM) including groundwater modeling.
- Review historic site investigation data to determine a path forward for cost effective site restoration and monitoring evaluation.

Environmental Remediation

Based on site investigation and site-specific data, managed, and developed a remedial strategy to remediate contaminant source and groundwater plume mitigation.

- Prepared remedial action plans for the implementation of remediations to protect human health and the environment.
- Designed, installed, monitored, and maintained vapor extraction, groundwater pumping, and air sparging systems to remediate soil and groundwater.
- Completed site remediation for both soil and groundwater contamination within state regulations.

Wastewater Discharge Permit

- Conducted a pilot test, designed, and permitted a dechlorination system for the discharge of chlorine treated potable water used as non-contact cooling water in an industrial process.
- Manage wastewater discharge permit for active landfill, non-contact cooling water, and pump and treat remediation system.
- Prepared and managed wastewater discharge permit for the remediation of carbon tetrachloride groundwater extraction system with air stripper and discharge to local creek.

Landfill Management

Landfill management from planning and design to construction with stormwater permitting to waste acceptance with industrial activity stormwater permit to groundwater monitoring and leachate collection and treatment.

- Monitor landfill parameters as directed by Wisconsin Department of Natural Resources (WDNR).
- Manage landfill leachate by phytoremediation.
- Prepare plan modifications for landfill monitoring.
- Methane production monitoring and evaluation.
- Obtain monitoring termination.

Stormwater Planning

Stormwater permitting to include construction and industrial activities followed by required permit monitoring.

- Stormwater runoff calculations to determine peak flow and storage capacity.
- Stormwater impacts to contaminant plumes and migration.

Dean A. Krebs, P.E.

Senior Engineer



EXPERIENCE SUMMARY

Dean Krebs, a Senior Environmental Engineer, is a Registered Professional Engineer with more than 30 years of experience in remedial investigations, environmental assessments, soil and groundwater remediation, compliance services, and project/program management. He has implemented programmatic work across multiple business groups for various clients. His responsibilities have included all aspects of client /portfolio management, including business development, resourcing, budgeting and technical review. He has extensive experience managing complex portfolios of Spill Prevention, Control and Countermeasure (SPCC), Storm Water Pollution Prevention plans and gas well abandonment in addition to managing Antea Group's Engineering Program. Dean works out of our St. Paul, MN office.



EDUCATION

BS – Geological Engineering,
University of Minnesota,
Minneapolis, MN

RELATED PROJECTS

- Managed a large plug and abandonment portfolio of orphaned gas wells in rural upstate New York. His team assessed fugitive methane emissions using high flow methane meters on abandoned oil and gas wells in accordance with established federal guidelines. His team conducted oversight during well plugging and abandonment activities which included implantation of health and safety protocols, documentation of daily activities, material use, and ensuring subcontractors were complying with regulatory requirements.
- Designed, implemented, and managed a program to complete preparation of a portfolio of 130+ SPCC plans for complex railroad facilities across the western United States. This project consisted of customizing the plan to each site while adhering to overall client procedures and compliance with SPCC rules and regulations. The program required coalescing a team of engineers throughout multiple business units and geographies to serve a broad geographical base of facilities. The facilities ranged from moderately complex to some the largest railroad yards in the US. The program expanded to include Facility Response Plans and other compliance related inspections and documents.
- Led Antea Group's Railroad Segment from a concept to a fully funded segment with year over year growth. In his role as Segment Leader, he developed the marketing plan, conducted a market analysis, and generated and led multiple campaigns to promote Antea Group to the railroad industry.
- Provided client management on a portfolio of over 200 remediation, compliance and due diligence sites across the western U.S. that averaged \$3 million dollar annual spend. Successfully negotiated two 5-year contract extensions with this client without having to go through an expensive procurement process.
- Led a solution development team to bring an automated application to SPCC field evaluations creating efficiency and reducing human touch points.
- Developed and managed a program to sample treated wood (railroad ties, bridge components, signal poles, etc.) across multiple states in a logistically challenging environment.

PROFESSIONAL REGISTRATIONS

Professional Engineer:
Minnesota, Iowa, North
Dakota, South Dakota,
Montana, Kentucky, New
Jersey, Missouri, Maine,
Tennessee

LANGUAGES

English



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- Provided program management on a portfolio of SWPPP plans for a nationwide client that involved creating consistency across the facilities yet are tailored to meet the requirements of each state and locality. Managed the development and/or completed more than 160 SPCC, SWPPP or Facility Response plans.
- Provided senior engineering and oversight of engineering for all aspects of the firm's projects. As a senior engineer, he is focused on managing the remediation aspects of a project and tracking progress against financial and time schedule requirements. He has written external documentation and reports to meet company, client, and regulatory requirements. Additionally, he has prepared proposals and bid documents, secured new work, arranged and provided contractor oversight, and reviewed proposals, work plans, designs, and the data evaluation of staff and project level engineers.
- Has supervised many engineers-in-training and other remediation specialists. He has led a team of engineers who have worked on many large-scale remediation projects and designed complex remedial systems in many parts of the United States. He has been consulted to provide senior engineering support and review on remediation projects undertaken by other divisions within the firm. His support consists of reviewing the site and remediation technology to determine compatibility, followed by reviewing the design to determine whether it is both technically and economically feasible. During the past ten years, some of the specific project tasks completed have included the following:
- Designed and managed multiple large-scale excavations, including; a multimillion dollar excavation that included soils contaminated with polychlorinated biphenyls (PCBs), chlorinated solvents, and petroleum hydrocarbons, a major excavation of DDT impacted soil at a former mushroom farm, a logistically complicated excavation of chlorinated solvent impacted soil at an active dry-cleaning facility, and numerous excavations for petroleum impacted soils at service stations.
- Designed, installed, and operated numerous remediation systems including, a steam injection/extraction system to recover No. 6 fuel oil at a manufacturing facility, a combination of bioventing (BV), soil vapor extraction (SVE), and air sparging (AS) featuring more than 170 points at a major oil company terminal, a BV/SVE/AS system at a major oil company terminal located within a complicated geological region, a successful bioslurping pilot test at a site featuring more than 30,000 gallons of free phase hydrocarbons located 45 feet below ground surface, six additional bioslurping pilot study/system designs, six dual phase extraction systems across the United States to remove free phase product while minimizing groundwater recovery, 21 AS/SVE systems for service stations, chemical manufacturing facilities, and other industrial clients, five thermal and catalytic oxidizers for treatment of air emissions
- Operated and evaluated the efficiency of a steam injection/dual phase extraction/SVE system on a 20-acre former railroad site impacted with more than 50,000 gallons of diesel fuel.
- Designed and installed a stream aeration system to remove dissolved petroleum hydrocarbons from a major pipeline leak in rural Illinois. Designed and installed a pump-and-treat system to reduce impacts to the stream. Designed and coordinated a free-product remediation plan utilizing dual-phase extraction.

Gordon Hinshalwood, PhD, PG

Senior Professional



EXPERIENCE SUMMARY

Gordon Hinshalwood has 30 years of professional experience in environmental consulting. His expertise includes investigation and remediation of contaminated sites in a variety of hydrogeological settings in both the industrial and petroleum sectors. As a portfolio manager, Gordon managed the environmental liability of an approximately 60 site portfolio of retail gasoline service stations and terminals for a major petroleum corporation. As a senior technical resource, he has provided technical support to remediation teams managing projects in the northeastern US (NY, NJ, PA, MD, DE, MA, CT, and RI) and beyond (CA, NV, GA, MI).

Gordon's expertise includes cost and strategic management of remediation portfolios, the application of innovative and biologically-based remedial solutions to petroleum hydrocarbon LUST sites, and the development of new delineation and remediation strategies for both current and emergent contaminants. In this capacity he has developed protocols for implementing bio-stimulation technologies and monitored natural attenuation at spill sites and partnered with government and academic institutes to advance the use of novel bioremediation technologies.

RELATED PROJECTS

- Has worked on development of conceptual site models/remedial investigations in both porous media and fractured bedrock at petroleum terminals, retail service station sites and industrial facilities in NY, NJ, MA, GA, MI and CA. These efforts included three bulk storage terminals and numerous retail service stations in the northeastern US.
- Currently acting as the lead hydrogeologist on an active investigation/remediation project addressing the release of perfluorinated compounds at an asphalt bulk terminal in upstate New York. Activities have included data analysis and predictive modeling of potential impacts to an adjacent river, and evaluation of remedial alternatives for impacted stormwater.
- Acted as lead hydrogeologist on a fractured bedrock industrial site located on the Hudson River in upstate New York. Site activities included an extensive bedrock investigation in support site conceptual model development, and completion of a water balance study.
- Managed the design and installation of two air sparging/soil vapor extraction remediation systems at a petroleum bulk storage terminal and a retail service station in NY.
- Has provided senior technical review/support for a major petroleum bulk storage facility clean up in Brooklyn NY since 2006, including enhancement of the site conceptual model, remediation system expansion, and continued operation and maintenance of remedial activities. Total NAPL recovery over the project history exceeds 3 million gallons.
- Completed interpolative and numerical fate and transport ground water models in support of remediation projects in NY, MA, CA, GA and NV.



EDUCATION

PhD – Earth Sciences, City University of New York Graduate Center, New York, NY

MS – Environmental Science, New Jersey Institute of Technology, Newark, NJ

BS – Biochemistry, Cook College, Rutgers University, New Brunswick, NJ

PROFESSIONAL REGISTRATIONS

New York State Professional Geologist, Registration No 000641-1

New York Academy of Science

Scientists Without Borders

LANGUAGES

English



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April 27, 2023

- Performed and supported vapor intrusion modeling in NY and PA, and has managed or supported 10 – 12 soil vapor investigations at retail services station sites since 2004.
- Managed or supported several NAPL investigations on retail petroleum sites in NY and NJ, including integration of vertical saturation data to develop volume estimates.
- Managed geophysical investigations in support of site conceptual model development at two retail service station sites and an industrial site in NY.
- Provided technical support to a major petroleum legal team working on the MTBE product liability suits in NY State, and provided technical support to a major petroleum legal team working on a class-action neighborhood suit and potential legal action from the NY Attorney General's office in Greenpoint, NY.
- Has managed and consulted on numerous (more than 20) MTBE-contaminated LUST sites in NYSDEC region 1 (Long Island), and many more (in excess of 40) in other regions and other states, including management of multiple (more than 10) MTBE delineation projects involving 3D dissolved-phase plume delineation and/or MTBE fate and transport modeling.
- Consulted on several ground water forensic investigations in NY, MA and NV.

PUBLICATIONS

- Hinshalwood, Huang and Curran, Anaerobic Biostimulation as a Secondary Treatment Option for the Remediation of Petroleum Hydrocarbon Impacts at Two Gasoline Service Stations on Long Island, NY, 29th Annual International Conference on Soils, Sediments, Water and Energy, University of Massachusetts Amherst, October 2013.
- Hinshalwood, Huang and Curran, *Site Remediation in Urban Environments: Challenges and Limitations*, poster presentation platform for the 29th Annual International Conference on Soils, Sediments, Water and Energy, University of Massachusetts Amherst, October 2013.
- Hinshalwood, G., Biodegradation of Fuel Oxygenates in Northeastern US Aquifers with an Analysis of Leaking Underground Storage Tanks, PhD Thesis, City University of New York Graduate Center, 2009.
- Huang, Hinshalwood, and Lapine, *Remediation and Redevelopment of a Gasoline-Impacted Site Using the ISCO-SSD Coupling Approach*, Proceedings for the 28th Annual International Conference on Soils, Sediments, Water and Energy, University of Massachusetts Amherst, October 15 – 18, 2012.
- Kolhatkar, Wilson and Hinshalwood, *Natural Biodegradation of MTBE at a Site on Long Island, NY*, Proceedings of the Sixth International In Situ and On-site Bioremediation Symposium, San Diego, California, 2001.
- Kafkewitz, Armenante, Hinshalwood and San Augustin, *Immobilization of Heavy Metals in Incinerator Ash by the Activity of Desulfovibrio desulfuricans*, Hazardous Waste & Hazardous Materials, v 11, no 4, 1994.
- Hinshalwood and Raggio, *Pollution Prevention in New York State*, Environmental Law in New York, v 5, no. 3, 1994.
- Javello and Hinshalwood, *Pollution Prevention in New Jersey: An Overview of Benefits and Requirements*, New Jersey Industrial News, October 1993.

PRESENTATIONS

- Sheldon and Hinshalwood, *Remediation of Volatile Organics in Groundwater Using In Situ Carbon (ISC) Injection Technologies: A Comparative Analysis*, Proceedings for the Eleventh International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, CA, April 2018.
- Pehlivan, Hinshalwood, Israel and Meyer, *Vacuum Driven In-Well Air Stripping and Re-Circulation*, Proceedings for the AEHS 25th International Conference on Soil, Water, Energy and Air, San Diego, CA, March 2015.

Gordon Hinshalwood, PhD. PG

Senior Professional



- Hinshalwood, Huang and Curran, *Site Remediation in Urban Environments: Challenges and Limitations*, poster presentation platform for the 29th Annual International Conference on Soils, Sediments, Water and Energy, University of Massachusetts Amherst, October 2013.
- Hinshalwood, G., *Biodegradation of the Fuel Oxygenate MTBE in Northeastern Aquifers*, poster session, The Graduate Center, City University of NY, 2005.
- Hinshalwood, G., *Overview of Soil and Ground Water Remediation Technologies*, technical presentation, New Jersey Department of Environmental Protection, 2004.
- Thuma, Hinshalwood, Kremesec and Kolhatkar, *Application of Ground Water Fate and Transport Models to Evaluate Contaminant Mass Flux and Remedial Options for a MTBE Plume on Long Island, NY*: NGWA Annual Meeting, Houston, TX, 2003.
- Hinshalwood, G., *Overview of Federal Environmental Regulations Pertaining to the Business Community*, technical presentation, Department of Natural Resources, USVI, 1996.

Russell D. Copeland, PE

Senior Project Manager



EXPERIENCE SUMMARY

Russell D. Copeland, a Senior Project Manager, has twenty-nine years of diverse civil and environmental engineering experience. He specializes in innovative groundwater and soil remediation technologies. Russell D. Copeland is an analytical, accurate, detail-oriented, and innovative problem-solver who is knowledgeable in a variety of technical software including AutoCAD, Surfer, Voxler, Equus, and Microsoft Office and Project.



RELATED PROJECTS

Senior Engineer/Project Manager/Director of Remediation

- Presented webinars on various in situ remediation technologies, including EZVI, phytoremediation, and groundwater flow path investigations.
- Designed and implemented groundwater remediation projects for multiple clients based upon in situ chemical reduction (ISCR) and bioremediation, as well as projects involving the injection of Emulsified Zero Valent Iron (EZVI) and emulsified oil.
- Performed groundwater flow path surveys at sites in the United States, South Africa, and Australia.
- Prepared and implemented Remedial Action Plans.
- Performed reporting to provincial regulatory agency and participated in negotiations.
- Prepared and implemented approved Remediation Investigation Work Plan for a site entering the LDEQ Voluntary Remediation Program.
- Designed and installed pump skids to replace in-well pumps as well as rehabilitation and optimization of groundwater circulation wells.
- Assisted in fate and transport modeling.
- Designed and implemented capping of contaminated areas.
- Served as an expert witness regarding potential remediation scenarios for a contaminated property.
- Investigated and prepared Affected Property Assessment Report for a site under the Voluntary Cleanup Program, also managing the project.
- Successfully performed risk-based closure of sites.
- Performed groundwater biogeochemical sampling and reporting for natural attenuation.
- Installed a soil vapor extraction system.
- Implemented air sparging and soil vapor extraction pilot test.
- Performed data management, contractor coordination, and reporting for a large mercury investigation and remediation project along a natural gas pipeline. Coordinated multiple field crews.
- Designed secondary containment and sumps and prepared associated engineering cost estimates, specifications and bid documents for a forestry products plant in Louisiana.
- Designed a pump lift station, sump and force main for a large municipal landfill and performed precipitation and infiltration modeling to estimate leachate generation.
- Performed sound surveys for highway improvement projects.

EDUCATION

Agricultural and Biosystems Engineering,
University of Arizona, M.S.

BS –Civil Engineering,
University of Minnesota, ,
1986

BA –Dual-degree Engineering Program,
Bethel College, St. Paul, MN,

PROFESSIONAL REGISTRATIONS

Registered Professional Civil Engineer No. 27994,

40-hour HAZWOPER certification

TWIC card

LANGUAGES

English



August 22, 2024

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James E.N. Holm

Project Professional



EXPERIENCE SUMMARY

As a Project Professional for Antea®Group, James Holm has experience conducting Oil and Gas well installation and abandonment, Preliminary Assessments/Phase One Site Assessments, Site Investigations, Remedial Investigations and Remedial Actions. He has been involved with the design, construction and operation of soil and groundwater remediation systems, and stormwater management systems. Additionally, has been involved with curation of permitting applications and submissions as well as writing, editing, and submitting Environmental remediation reports.



RELATED PROJECTS

Areas of Expertise

- Well Installation and Well Abandonment
- Methane Quantification & Air Monitoring
- Phase 1 Site Assessments (ASTM 1527-21)
- Site and Remedial Investigations
- Soil and Groundwater Remediation
- Environmental Compliance
- Construction Management

EDUCATION

Bachelor of Science-Roger
Williams University

LANGUAGES

English

PROJECT EXPERIENCE

- HI-FLOW Methane Quantification & Methane Verification sampling utilizing 40 CFR 60 Subpart OOOOb & ACR compliant sampling practices, as well as real time monitoring during Plugging and Abandonment operations across the state of NY at several sites. .
- Multiple Site evaluation and design assistance for oil and gas well redevelopment and abandonment on various sites, including oversight, assistance with plugging structures, estimating, and site owner/project team coordination.
- Provided environmental consulting and construction management services. Projects included environmental investigation and remediation services for groundwater and soil contamination. Monitored and documented project status and activities and interacted with NJDEP representatives.
- Performed Preliminary Assessments and Phase 1 assessments across several sites in diverse areas of NJ, NY, and PA.
- Performed Site Investigation design and implementation. Project responsibilities included site history review and assessment, sample location and analytical parameter design, laboratory analytical data review for compliance, and owner consulting as well as development concept plans for investigation development.
- Managed annual inspection and form submission for institutional and engineering controls such as residential and commercial cappings.
- Experience with Regenesys product injections for in-situ environmental remediation of contaminants.
- Assisted in the writing, reviewing, editing, and submission of all aspects of the administrative environmental reports in East Coast regulated



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- states (New Jersey, Connecticut, Massachusetts, Pennsylvania, and Maryland)
- Completed an investigation for an insurance company involving a sodium concentration issue on a residential property that had a UST removed and remediated by using oxidizing compounds. Through monitor well placement and sampling proved the issue was regional and the case was closed after starting in 2009.
 - Assisted in preliminary GIS design of a multi-county, 17-mile walking and biking path designed for North-West, New Jersey.
 - Assisted and provided oversight for remedial work related to sodium hydroxide spill at a chemical manufacturing facility; responsibilities included safety oversight, cost and material tracking, and project team coordination.

Christian Laing

Project Professional



EXPERIENCE SUMMARY

Christian Laing has three years of environmental consulting experience and has assisted in a multitude of projects from multiple service lines, including Health and Safety and Environmental Liability Management. As a Project Professional, Christian performs field work at client sites, completes reports, and helps coordinate field work for other field staff. Christian has completed a variety of environmental services and has experience with contractor oversight in many contexts. Christian's client support spans multiple industries and includes a large amount of work in the oil and gas industry.



RELATED PROJECTS

- Oversight of well plugging and abandonment in New York, Minnesota, Wisconsin, and North Dakota. Tasks include documentation of well P&A material use, implementation of safety protocols during P&A operations, and ensuring subcontractors adhere to plugging regulations.
- Air monitoring in a variety of settings, including well installations, well abandonments, regular maintenance of remediation systems, and emergency response operations.
- Assessment of fugitive methane emissions using a high flow methane analyzer in an oil and gas setting, in accordance with established federal guidance.
- Well installation and drilling oversight in Illinois, Minnesota, North Dakota, and Wisconsin as part of numerous site investigations and characterizations.
- Oversight of in-situ chemical oxidation (ISCO) injection at a chlorinated solvent contaminated site in Texas and a petroleum contaminated site in Minnesota. Simultaneous third-party demolition and heavy equipment traffic adjacent to Antea work site necessitated a robust traffic control plan and extra health and safety vigilance.
- Product recovery and remediation system O&M at petroleum contaminated sites in Minnesota, Wisconsin, and Iowa.
- Groundwater monitoring at multiple petroleum impacted sites in Minnesota, Wisconsin, Michigan, Iowa, and North Dakota. Sampled groundwater using peristaltic pumps, submersible pumps, and bailers.
- Stormwater Pollution Prevention Plan inspections, monitoring best management practices (BMPs) at rail yards in Minnesota and Wisconsin.
- Coordinating field events in North Dakota and Minnesota. Tasks include developing field work plans, notification of relevant state and municipal entities, and bidding and scheduling subcontractors.
- Data management in support of a variety of ELM and HSSE projects.
- Conducting Phase I and II Environmental Site Assessments for several clients in Minnesota, Wisconsin, and North Dakota.
- Drafting a variety of reports and plans, including quarterly monitoring reports, Phase I and II reports, routine groundwater monitoring reports, Field Work Plans, SWPP and SPCC plans, and Facility Response Plans (FRP).

EDUCATION

Bachelor of Science; Geology –
Winona State University

PROFESSIONAL REGISTRATIONS

Geologist-In-Training
Certification # 161061

LANGUAGES

English



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August 23, 2024

Derek Dahly

Staff Professional



EXPERIENCE SUMMARY

Derek Dahly has two and a half years of environmental consulting experience and has assisted in a multitude of projects varying from different service lines, including Health and Safety, Environmental Liability Management, and GIS mapping. As a Staff Professional, Derek performs field work at client sites, completes reports, helps coordinate field work for other field staff, and supports the Digital Solutions team with GIS needs. Derek has completed a variety of environmental services and has experience with contractor oversight in many contexts. Derek's client support spans multiple industries and includes a large amount of work in the oil and gas industry.



RELATED PROJECTS

- Oversight of well plugging and abandonment in multiple states. Tasks include documentation of well P&A material use, implementation of safety protocols during P&A operations, and ensuring subcontractors adhere to plugging regulations.
- Drafting and reviewing of well plugging designs for oil and gas wells using well boring lithological records and regional geologic trends.
- Well installation and drilling oversight in multiple states.
- GIS mapping of well locations and other related site features.
- Methane monitoring in a variety of settings, including well installations, Orphan well abandonments, regular maintenance of remediation systems, and emergency response operations.
- Product recovery and remediation system O&M at petroleum contaminated sites in multiple states.
- Groundwater monitoring at multiple petroleum impacted sites.
- Sampled groundwater using peristaltic pumps, submersible pumps, and bailers.
- Stormwater Pollution Prevention Plan inspections, monitoring best management practices (BMPs) at rail yards in Minnesota and Wisconsin.
- Conducting Phase II Environmental Site Assessments for several clients in multiple states.
- Coordination of field work for other field staff. Tasks include developing field work plans, notification of relevant state and municipal entities, and bidding and scheduling subcontractors.
- Data management in support of a variety of ELM and HSSE projects.
- Drafting a variety of reports and plans, including quarterly monitoring reports, Phase I and II reports, routine groundwater monitoring reports, Field Work Plans, SWPP and SPCC plans.

EDUCATION

Bachelor of Arts; Geology –
University of MN, Duluth

LANGUAGES

English



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Madison Allen

Staff Professional



EXPERIENCE SUMMARY

Madison Allen is a staff professional and is just beginning her career as an environmental professional. She is located in our Charlotte, North Carolina office and supports various sectors within Antea Group. She graduated from North Carolina State University with a dual major, receiving a Bachelor's of Science in Environmental Sciences and a Bachelor's of Art in Biological Sciences.

RELATED PROJECTS

Field Work

- North Carolina, South Carolina, Georgia -- Conducted scheduled, routine groundwater sampling events at various sites. Communicated directly with subcontracted laboratories for analytical needs and support.
- New York -- Oversaw methane/gas well abandonments. Communicated directly with drillers and other contractors, completing daily deliverables for delivery to the regulatory agency. Assessment of fugitive methane emissions using a high flow methane analyzer in an oil and gas setting, in accordance with established state and federal guidance.
- North Carolina – Oversaw the excavation of a legacy UST leak site. Communicated directly with contracted drillers. Took soil samples from excavated soil and communicated with lab for analysis.

EPCRA (Tier II / TRI Reporting)

- Assisted in preparing EPCRA (Tier II) documents for various facilities located throughout the United States, including facilities in the sectors of chemical processing, metal cable processing, and software development, utilizing systems such as E-plan, Tier2Submit, and local emergency planning committee platforms.

Stormwater / Spill Response

- Reviewed, summarized, and supported the drafting and finalization of stormwater pollution prevention plans and spill prevention, control, and countermeasure plans.

Reporting

- Supported the drafting and review of various groundwater monitoring site assessment reports.

EDUCATION

B.S. - Environmental Sciences,
B.A. - Biological Sciences –
North Carolina State
University, Raleigh, NC

PROFESSIONAL REGISTRATIONS

OSHA 40-hour HAZWOPER
certification

LANGUAGES

English



August 24, 2024

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Derek Cole

Staff Professional



EXPERIENCE SUMMARY

Derek Cole has three years of environmental consulting experience and has assisted in a multitude of projects from multiple service lines, including Health and Safety and Environmental Liability Management. As a Staff Professional, Derek performs field work at client sites, completes reports, and helps coordinate field work for other field staff. Derek has completed a variety of environmental services and has experience with contractor oversight in many contexts. Derek's client support spans multiple industries and includes a large amount of work in the oil and gas industry.



RELATED PROJECTS

- Oversight of well plugging and abandonment in New York, Minnesota, and Wisconsin. Tasks include documentation of well P&A material use, implementation of safety protocols during P&A operations, and ensuring subcontractors adhere to plugging regulations.
- Air monitoring in a variety of settings, including well installations, well abandonments, regular maintenance of remediation systems, and emergency response operations.
- Assessment of fugitive methane emissions using a high flow methane analyzer in an oil and gas setting, in accordance with established federal guidance.
- Well installation and drilling oversight in Minnesota, North Dakota, and Wisconsin as part of numerous site investigations and characterizations.
- Oversight of in-situ chemical oxidation (ISCO) application at a petroleum contaminated site in Minnesota.
- Product recovery and remediation system O&M at petroleum contaminated sites in Minnesota, Wisconsin, and Iowa.
- Groundwater monitoring at multiple petroleum impacted sites in Minnesota, Wisconsin, Michigan, Iowa, Kansas, Nebraska, and North Dakota. Sampled groundwater using peristaltic pumps, submersible pumps, and bailers.
- Stormwater Pollution Prevention Plan inspections, monitoring best management practices (BMPs) at rail yards in Minnesota and Wisconsin.
- Coordinating field events in North Dakota and Minnesota, Wisconsin, and Kansas. Tasks include developing field work plans, notification of relevant state and municipal entities, and bidding and scheduling subcontractors.
- Data management in support of a variety of ELM and HSSE projects.
- Drafting a variety of reports and plans, including quarterly monitoring reports, Phase I and II reports, routine groundwater monitoring reports, Field Work Plans, SWPP and SPCC plans, and Facility Response Plans (FRP).

EDUCATION

Bachelor of Science; Geology –
University of Minnesota Twin
Cities

PROFESSIONAL REGISTRATIONS

Geologist-In-Training

LANGUAGES

English



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August 24, 2024

Joseph J. DeVivo III

Staff Professional

EXPERIENCE SUMMARY

Experienced in contractor oversight, drilling oversight, well abandonment, soil sampling, ground and surface water sampling with Antea Group. Served three years in the U.S. Army as a combat infantryman, deploying twice to Afghanistan, supporting OEF in 2012-2013 and support SOF in 2014-2015 responsible for accountability of vehicle, radio encryption, hazardous material transport (ammunition), and small arms maintenance and training. Assisted with detainment team training. Mechanic from 2015-2022 in various positions from lube technician to B-level mechanic before transitioning to Antea Group.



NOTABLE PROJECTS

Antea Group

- NY Orphan Well support: Conducted pre and post closure methane quantification sampling, site assessment and health and safety oversight at multiple OOG wells during supporting efforts of NY Well abandonment program as part of the Bipartisan Infrastructure Law.
- Edwardsville IL: Ecological Risk Assessment sampling in Cahokia Creek, sampling surface water and creek bank sediment, logging environmental conditions during sampling as well as logging water parameters. Installation of 20 monitoring wells with IEPA approval via EPA method 5035 for environmental monitoring and remediation.
- Wood River Creek Alton IL: Well abandonment following approval of site closer by IEPA.
- Putnam IDEM FSI: Further site investigation on behalf of Marathon Pipeline. The scope of work included PNA of temporary wells, the advancement of 20 soil borings, well installation in 19 of the soil borings. Each soil boring was sampled prior to well installation. Conducting Low-Flow Sampling afterwards.
- Muncie, 191/190 Connect, Levee Turnout, Track 019 Ext: Soil management for Union Pacific Railroad as part of their overhaul operations. Scope of work included utility clearance, advancement of 27 soil borings across 4 separate locations and sampling of those soil borings.
- Armourdale Intermodal Terminal: Soil Management for Union Pacific Railroad as part of their overhaul operations. The scope of work included utility clearance and advancement of 146 soil borings and sampling of those soil borings.
- Marshalltown: Remediation and Operations and Maintenance of remediation system onsite for Union Pacific Railroad. Scope of work includes well gauging, manual LNAPL recovery, and cleaning and maintenance of well stingers and vacuum extraction system on-site.

EDUCATION

B.S. Environmental Science –
Lindenwood University 2021

A.S. Sciences – Palomar
College 2018

LANGUAGES

American Sign Language

Luke Sedor Protti

Staff Professional



EXPERIENCE SUMMARY

Luke Sedor Protti is a Staff Professional in the Greater New England Office. He has environmental consulting experience in remediation activities including the collection of soil, groundwater, and vapor samples, data management and data interpretation, and report writing.

RELATED PROJECTS

Field Activities

- Performs remediation work at numerous retail petroleum and commercial properties in Connecticut and Massachusetts as part of environmental remediation projects.
- Conducts groundwater sampling according to U.S. Environmental Protection Agency low-flow groundwater procedures.
- Monitoring well gauging, groundwater sampling via low flow, bailer, and bladder pump, groundwater screening using YSI, soil vapor screening using a PID, soil vapor sampling using SUMMA canisters.
- Laboratory data entry using EQUIS and Excel, evaluating laboratory analytical reports for internal data verifications, writing and sending sampling notification letters to the public.
- Prepares technical reports detailing site investigation results and site monitoring progress and submits deliverables to clients and state regulatory agencies under guidance of project managers.
- Oversees UST tank removal according to US Environmental Protection Agency procedures
- Oversees monitoring well installations and abandonments throughout New York and New England
- Oversight of orphan well plugging and abandonment in New York. Work includes documentation of well P&A activities and materials used, ensuring subcontractors adhere to health and safety regulations, continuous air and gas monitoring of work site to ensure safe conditions, and preparation and submission of daily update reports to the state of New York
- Assessment of methane emissions from orphan wells in New York using a high flow methane analyzer in accordance with established federal guidance.



EDUCATION

Bachelor's Degree –
Bates College,
Lewiston, ME
Bachelor of Science in Geology
with concentration of Water
and Society

PROFESSIONAL REGISTRATIONS

OSHA HAZWOPER 40-Hour
Training Certification
BP HITRA Certification
CPR and First Aid Certification
API WorkSafe Certification
TWIC

LANGUAGES

English (Fluent)



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February 15, 2023

Collin Montgomery

Staff Professional



EXPERIENCE SUMMARY

Collin Montgomery is a Staff Professional in the Greater New England Office who comes to Antea®Group boasting academic awards such as Academic Excellence and Dean's List/Academic Distinction. He has environmental consulting experience in remediation activities including the collection of soil, groundwater, and vapor samples, data management and data interpretation, and basic report writing.



RELATED PROJECTS

Field Activities

- Performs remediation work at numerous retail petroleum and commercial properties in Connecticut and Massachusetts as part of environmental remediation projects
- Conducts groundwater sampling according to U.S. Environmental Protection Agency low-flow groundwater procedures
- Monitoring well gauging, groundwater sampling via low flow, groundwater screening using YSI, soil vapor screening using a PID, soil vapor sampling using SUMMA canisters
- Oversees Monitoring Well and Soil Boring drilling by Sub-Contractors

Administrative Activities

- Laboratory data entry using EQulS and Excel, evaluating laboratory analytical reports for internal data verifications, writing and sending sampling notification letters to the public
- Assists in preparation of technical reports detailing site monitoring progress under guidance of project managers
- Reviews and completes up to date information in Health and Safety Plans
- HI-FLOW certified, Methane Quantification & Methane Verification sampling utilizing 40 CFR 60 Subpart OOOOb & ACR compliant sampling practices, as well as real time monitoring during Plugging and Abandonment operations

EDUCATION

Bachelor's Degree –
Assumption University,
Worcester, MA
Bachelor of Science in
Environmental Science

PROFESSIONAL REGISTRATIONS

OSHA HAZWOPER 40-Hour
Training Certification
Geographic Information
Systems
(qGIS-LTR 2)

LANGUAGES

English



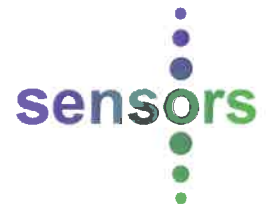
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August 23, 2023

Appendix B – Field Equipment Specification

SEMTECH HI-FLOW 2



Accurate Quantification of Fugitive Methane

SEMTECH HI-FLOW 2 is a robust, portable, battery powered, high volume sampler for the most accurate quantification of fugitive methane emissions. Our combination of the Analyzer and the Sampler (with a variety of sampling adapters) allows the entire fugitive methane emission to be captured, diluted, and quantified accurately.

HI-FLOW 2 utilizes state-of-the-art Tunable Diode Laser Absorption Spectroscopy (TDLAS) and a high-output fan which together facilitates 3-5x lower detection limit (0.0005 CFM) and a 3x increase in maximum leak rate (25 CFM) when compared to the historical Bacharach device. SEMTECH's TDLAS tuned specifically to methane (unlike non-dispersive spectroscopy techniques) eliminates the known problems of interferences from other gases present in up, down and mid-stream applications. Moreover, our HI-FLOW 2 addresses potential poisoning and saturation of found in other solutions that use non-optical-based low-cost sensors.

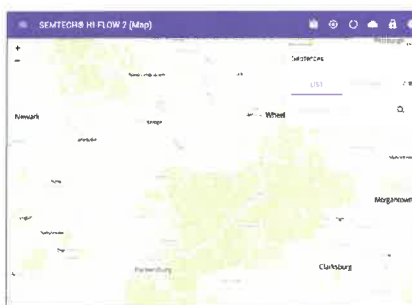
Analyzer incorporates the advanced gas sensing technology, control electronics, and battery pack in a portable control module which can be carried, placed on the floor, or mounted to a backpack.

Classified to
Hazardous Location
Class 1, Division 2,
Group D, T4



Complies with
EPA 40 CFR Part 60-
NSPS 0000b

Handheld Sampler includes a high-output sampling fan and total flow rate monitor in a ergonomic handheld device.



GPS and Geofences



Web-based software

SEMTECH HI-FLOW 2		Certificate of Calibration	
Model	Serial	Calibrated	Valid Until
HI-FLOW 2	123456	10/15/2024	10/15/2025
Calibration Results			
Parameter	Target	Measured	Result
Flow Rate (CFM)	1.000	0.998	Pass
Leak Rate (CFM)	0.000	0.001	Pass
Calibration Results (Continued)			
Parameter	Target	Measured	Result
Flow Rate (CFM)	1.000	0.998	Pass
Leak Rate (CFM)	0.000	0.001	Pass

Calibration Certificate

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SEMTECH HI-FLOW 2

Benefits

- Methane specific advanced gas sensor technology (10 ppm to 100% with integrated diluter) (and 0 to 8% with no dilution)
- Battery – LiFEPO4 (spare battery included) rated to 12.8V with 96 Wh capacity and a run time of 4 to 6 hours per battery at 50% duty cycle (Charge time: ca 4 hours)
- Built-in Wi-Fi communication utilizing an SBC Linux framework with web-based GUI for interactive full control on user preferred display (tablet, mobile, laptop, etc...)
- GPS for location data recording during testing
- Built-in scripts for regulatory compliance, sampling protocols, and periodic pre and post checks and audits
- SQL data management architecture with advanced pre-loaded queries for automated report generation (supports measurement campaigns, geofencing, and compliance management)
- API ready (for IoT applications)
- Integrated flow and sampling system, configurable up to ~30CFM
- Ergonomic handheld with balanced weight distribution
- Flexibility with industry accepted sampling adapters / nozzles / hoses
- Umbilical from sampler to analyzer (conveys sample, power, fan control, and serial interface)
- 2 controls on the sampler handle for sampling and fan speed control
- 4 tri-colored LED lights for handsfree feedback of system operation with configurable fan speed
- PWM controlled fan with manual lock with on/off control



Accessories

- Oval nozzle and extension tube
- Tools
- Charger 14.46 V 2A
- Backpack
- Umbilical harness
- First Use/Safety Guide
- Sampling Collection Bag (*optional*)
- 6' hose, cam and groove connectors (*optional*)
- Pelican Case (*optional*)

SPECIFICATIONS

Total Flow Rate*	5-30 CFM (upper limit dependent on accessories)
Measurable Leak Rate*	0.0005 to 25 CFM (0.015 to 700 lpm) (LDL 0.6 g/hr)
Leak Rate Accuracy	<5% of full scale or 15% of point, whichever is lower (for volume or mass rate)
Flow Rate Accuracy	< ±2.5% (with density correction)
TDL Accuracy	< ±2.5% p.t.
Background Correction	Recommended pre- and post- correction with a precision of 2 ppm
Hazardous Classification	Class 1, Division 2, Group D, T4
Complies With	EPA 40 CFR Part 60, NSPS OOOOb ACR - carbon registry methodology
W x D x H	Analyzer: 12 x 12 x 5.7 in. (30 x 30 x 14.5 cm) / Sampler: 26.3 x 7.5 x 10.5 in. (66.8 x 19 x 12.7 cm)
Weight	Analyzer: 17.5 lbs. (7.9 Kg) / Sampler: 10.8 lbs (4.9 Kg)
Connection	Wi-Fi
Data Output	Customizable csv files / compressed zip files with configuration data.
Memory	4000 2-hour tests; >10 Gigabytes database (recommended annual cleanup)
Batteries	LiFEPO4 (with spare battery included) rated 12.8V, with capacity of 96 Wh Run Time: 4 to 6 hours (per battery) at 50% duty cycle Charging Time: ca 4 hours

*Inlet restrictions on the handheld sampling unit will reduce the maximum achievable flow.



Recognize the potential for increased safety, significant productivity gains and time-savings with the new RMLD-CS. Remote detection allows utility services personnel and first responders to quickly scan an area for suspected gas leaks at a safe distance.

The HEATH Remote Methane Leak Detector - Complete Solution (RMLD-CS) is a highly advanced technology, capable of detecting methane leaks from a remote distance utilizing the same TDLAS (tunable diode laser absorption spectroscopy) technology as the current RMLD. This instrument eliminates the separate receiver and transceiver, combining them into one hand-held instrument that is lightweight, portable and field rugged. The RMLD-CS makes it possible to detect leaks without having to travel the entire length of the pipe line, thus creating safer surveys in areas that may be difficult to reach such as busy roadways, yards with dogs, fenced off areas and other hard to access places. It operates under a variety of field conditions including a wide temperature range, light rain and fog. Its rugged design will stand up to normal field use and operating conditions and its sensitivity or range is not affected by reasonable amounts of dust on the instrument's window.

The RMLD-CS includes many new features including:

- ➔ Rechargeable and replaceable battery
- ➔ Dual battery charger
- ➔ Mobile App support
- ➔ Ergonomic housing
- ➔ Lightweight
- ➔ Graphical user interface
- ➔ Internal data logging
- ➔ WiFi
- ➔ GPS
- ➔ Bluetooth BLE
- ➔ Color camera
- ➔ Color display




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SPECIFICATIONS

Detection Method	Tunable Diode Laser Absorption Spectroscopy (TDLAS)
Measurement Range	1 to 50,000 ppm-m
Sensitivity	5 ppm-m at distances from 0 to 50 ft (15m)
Detection Distance	100ft (30m) nominal. Actual distance may vary due to background type and conditions.
Beam Size	Conical in shape with a 22" diameter at 100 ft (55 cm at 30 m)
Detection Alarms Modes	Digital Methane Detection(DMD): Audible tone relative to concentration when detection threshold exceeded Adjustable Detection Alarm Level 1 to 999 Real Time(RT): Continuous audio chirp relative to concentration.
System Fault Warning	Unique audible pitch and indication on the display.
Self Test & Calibration	Built-in Self Test and Calibration function verifies operation and adjusts laser wavelength for maximum sensitivity. Calibration results are stored on the device and can be downloaded by the user. Test gas cell integrated within carrying case.
Compliance	 EMC (EN61000-6-2, EN6100-6-4)
Intrinsic Safety	Pending
Laser Eye Safety	IR Laser: Class I, Spotter : Class 2 Do not stare into beam or view directly with optical instrument.
Communications	Bluetooth 4.2 BLE, WiFi, USB Dual Mode
Display	3.5" LCD
Operating Temperature	0° to +122° F (-17° to 50° C)
Humidity	5 to 95% RH, non-condensing
Enclosure (Inst.)	IP54 (Water Splash and Dust Resistant)
Instrument Weight	≈ 3 lbs.
Battery	Removable, rechargeable, Li-ion battery pack, 12-15 VDC
Battery Run Time	8 hours at 32° F
Battery Charging	External, in-line, 110-240 Vac, 50/60 hertz, international
Charge Time, Maximum	2 - 3 hours
Charging Indicator	Integrated into dual battery charger

ORDERING DETAILS



RMLD-CS - HPN 105301

Includes carry strap, case, battery charger, power supply, USB cable, one battery pack, gas calibration test cell.



Battery Pack - HPN 105384
Li-ion replacement battery.



Battery Charger Base - HPN 105358
Battery Charger Cable - HPN 105359
Charges two batteries at a time.

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Your Safety...Our Commitment

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