EA Engineering, Science, and Technology, Inc., PBC

REMEDIAL ACTION FOR THE SANTA FE COUNTY JUDICIAL COMPLEX STATE LEAD SITE

RFP# 19 667 3200 0004

PREPARED FOR:
NEW MEXICO ENVIRONMENT DEPARTMENT
RESOURCE PROTECTION DIVISION
PETROLEUM STORAGE TANK BUREAU

TAB A

Letter of Transmittal

TAB A

Letter of Transmittal Form

RFP#: 19-667-3200-0004
Offeror Name: EA Engineering, Science, and Technology, Inc., PBC

Items #1 to #7 EACH MUST BE COMPLETED IN FULL Failure to respond to all seven items WILL RESULT IN THE DISQUALIFICATION OF THE PROPOSAL!

1. **Identity (Name) and Mailing Address** of the submitting organization:
EA Engineering, Science, and Technology, Inc., PBC
320 Gold Ave. SW, Suite 1300
Albuquerque, New Mexico 87102

2. For the person authorized by the organization to contractually obligate on behalf of this Offer:
Name Jay T. Snyder
Title Vice President, Albuquerque Operations Manager
E-Mail Address jsnyder@eaest.com
Telephone Number 505-715-4286

3. For the person authorized by the organization to negotiate on behalf of this Offer:
Name Jay T. Snyder
Title Vice President, Albuquerque Operations Manager
E-Mail Address jsnyder@eaest.com
Telephone Number 505-715-4286

4. For the person authorized by the organization to clarify/respond to queries regarding this Offer:
Name Michael D. McVey
Title Senior Hydrogeologist, Project Manager
E-Mail Address mmcvey@eaest.com
Telephone Number 505-369-3149

5. Use of Sub-Contractors (Select one)
___ No sub-contractors will be used in the performance of any resultant contract OR
_X_ The following sub-contractors will be used in the performance of any resultant contract:
See attached sheet Table A-1
(Attach extra sheets, as needed)

6. Please describe any relationship with any entity (other than Subcontractors listed in (5) above) which will be used in the performance of any resultant contract.
None
(Attach extra sheets, as needed)

7. _X_ On behalf of the submitting organization named in item #1, above, I accept the Conditions Governing the Procurement as required in Section II, Paragraph C.1.
_X_ I concur that submission of our proposal constitutes acceptance of the Evaluation Factors contained in Section V of this RFP.
_X_ I acknowledge receipt of any and all amendments to this RFP.

[signature] December 19, 2018
Authorized Signature and Date (Must be signed by the person identified in item #2, above.)

EA Engineering, Science, and Technology, Inc., PBC

TABLE A-1
SUBCONTRACTORS

	Location	Experience and Capabilities
Drillers		
Cascade Drilling Services	Peralta, New Mexico	Hollow stem auger, rotary - air and mud, sonic, ODEX, direct push, well plugging and abandonment, amendment injection
Enviro-Drill, Inc.	Albuquerque, New Mexico	Hollow stem auger, rotary drilling - air and mud, , direct push drilling, and well plugging and abandonment
Vendors		
Regenesis	San Clemente, California	Innovative technologies and services to treat a wide range of contaminants, including petroleum hydrocarbons and chlorinated solvents, via enhanced bioremediation, chemical oxidation, desorption and metals immobilization
Environmental Services		
Rhino Environmental Services	El Paso, Texas	Excavation services, trenching, underground system construction, system decommissioning, contaminated water and soil disposal
Laboratories		
Hall Environmental Analysis Laboratory	Albuquerque, New Mexico	Analytical laboratory familiar with PSTB sampling and analytical requirements, can provide rapid turn around if required
Microbial Insights	Knoxville, Tenneessee	Broad spectrum of Molecular Biological Tools (MBTs) and Site Logic services with the goal of aiding in characterizing, understanding, and managing biological processes
Eurofins	Folsom, California	Analytical laboratory specializing in air, vapor, and soil gas samples

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EA Engineering, Science, and Technology, Inc., PBC

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EA Engineering, Science, and Technology, Inc., PBC

TAB C — TECHNICAL PROPOSAL SUMMARY

EA Engineering, Science, and Technology, Inc., PBC (EA) is pleased to submit this proposal for Remedial Action at the Santa Fe County Judicial Complex (SFCJC) State Lead Site. EA provides a multi-disciplined team of engineers, geologists, hydrologists and environmental scientists with decades of PST remediation experience, including in situ remediation techniques.

The SFCJC site has undergone a number of remedial actions to date, the most significant being soil vapor extraction (SVE), which resulted in non-aqueous phase liquid (NAPL) removal and cleanup of most all vadose zone soils at the site. Groundwater treatment included chemical oxidation (ozone and hydrogen peroxide) and mobile dual-phase extraction events on existing monitoring and remediation wells. SVE was highly successful, having impacted virtually all affected soils at the site, while the groundwater remedial action success was likely limited to the vicinity of the wells where the treatments occurred. As a result, four distinct groundwater plumes, or “hot spots," remain. These four plumes are located 1) in the parking lot of the West De Vargas Condominiums, 2) on the eastern side of the new SFCJC complex, 3) at the former Capital 66, and 4) near the Design Center to the south. That these remaining plumes are disconnected renders active remediation (e.g., groundwater pump and treat, multi-phase extraction, air sparging, etc.) complicated due to constructability of conveyance systems. Moreover, concentrations are not so high as to warrant this aggressive action. However, natural degradation of contaminants has stalled and is not achieving cleanup standards. This may be for several reasons that could include lack of alternative electron acceptors, sulfide toxicity, and/or too low of bacterial counts. EA’s proposal is designed to address these concerns and render the plume stable until contaminant destruction is complete.

EA proposes injection of Regenesis Petro Fix, a micron-scale liquid activated carbon, which when injected, disperses with the viscosity of water as it coats soil grains. In approximately a week, the active surface treatment on Petro Fix breaks down, and the activated carbon forms a permanent several micron thick coating on the soil. This coating sorbs contaminants proportional to their respective soil organic carbon partition coefficients.

The sorption of contaminants onto the solid will immediately reduce dissolved-phase contaminant concentrations; however, this is a transfer from aqueous to sorbed phase. Contaminant destruction is necessary, and this is accomplished with Petro Fix by addition of alternative electron acceptors, such as sulfate, to provide assimilative capacity to the aquifer to complete anaerobic degradation by sulfate reducing bacteria. This process is already ongoing but is likely rate-limited due to insufficient alternative electron acceptors and/or sulfide toxicity. The EDB and EDC pose a challenge in that they anaerobically degrade in the presence of robust dehalobacter bacteria, which are likely present. At KAFB Bulk Fuel Farm, APTIM (formerly CB&I) discovered that biostimulation with diammonium phosphate was sufficient to elevate dehalobacter populations and completely reduce EDB. Therefore, nutrients will be blended into the Petro Fix in the De Vargas plume, and based on Bio-Trap™ results, perhaps throughout all four plumes.

The EA team, and Project Manager Mike McVey, have extensive understanding of complications working in this busy area, and will use night and weekend work in addition to daytime to ensure the work can be completed in a safe manner with minimal disturbance to business.

This approach means no “active” operation and maintenance. Rather, once the injections have been completed, groundwater monitoring and performance assessment is all that is required. Performance assessment will include use of passive diffusion bags to check for methane and hydrogen sulfide toxicity, and Microbial Insight’s Bio-Trap™ Samplers to monitor microbial populations, appropriate degrading bacteria, and levels of alternative electron acceptors to verify adequate assimilative capacity of the amended aquifer.

TAB D

Response to Specifications

EA Engineering, Science, and Technology, Inc., PBC

TAB D – TECHNICAL PROPOSAL

This proposal presents EA Engineering, Science, and Technology, Inc.'s (EA) approach to completing the scope of services specified in Section I.C of the Request for Proposals (RFP) 19 667 3200 0004 for the Santa Fe County Judicial Complex (SFCJC) State Lead Site (Release ID #4597) in Santa Fe, NM.

D.1 Statement of Capabilities and Available Resources

A narrative describing EA Engineering, Science, and Technology, Inc.'s (EA) capabilities and available resources for providing each of the services listed in Section IV.A.1 of the RFP is included in Tab E, Offeror's Statement of Qualifications.

The proposed EA team has extensive SFCJC experience. Our proposed Project Manager, Mike McVey, P.G., served as Project Manager during corrective action activities performed on behalf of the responsible party (RP) at the 210 & 218 Montezuma Avenue UST site from 2003 to 2009 and then on corrective action activities performed at the SFCJC Site from 2009 through 2014 under a new State Lead contract. During the term of the initial State Lead contract Mr. McVey served as Project Manager and oversaw installation of the grout barrier/slurry wall for the SFCJC underground parking garage, installation and operation of the thermal enhanced soil vapor extraction (SVE) systems, ozone injection, and subsequent hydrogen peroxide injection while with another firm. During that initial State Lead contract, Jay Snyder and Vener Mustafin, as subcontractors, helped with preparation of the Final Remediation Plan, site characterization, and PSTB support in discussions with Santa Fe County.

This thorough historical site knowledge that EA possesses will provide the PSTB with the necessary administrative knowledge and knowledge of stake-holder sensitivities and local points-of-contact to ensure that remediation at the site is completed in an efficient and cost-effective manner.

D.2 Site Activities

EA has developed the following technical approach for active remediation at the SFCJC (the site) located at 327 Sandoval Street in historic downtown Santa Fe, New Mexico (Figure 1). The site is a consolidation of several underground storage tank (UST) sites and other potential sources in the vicinity of Montezuma Avenue and Cerrillos Road. Although numerous corrective actions have been completed at the site, four "hot spots" remain where dissolved-phase contaminant concentrations are elevated to the degree that natural attenuation will not reduce concentrations in a reasonable timeframe. Our proposal details the following technical approach:

- Remediation of the remaining four recalcitrant "hot spots" by injection of amendments (Petro Fix - a micron-scale, liquid activated carbon with alternative electron acceptors and nutrients) below the water table.
- Perform groundwater monitoring with microbial analysis to demonstrate the efficacy and adequacy of the amendment injection.

D.2.1 Background

The properties which comprise the site includes the Santa Fe County Judicial Complex (SFCJC), the District Attorney Building, and several surrounding office and retail buildings. Several different consultants have performed corrective action at the site in recent years. The corrective actions that have been performed since 2009 include (1) thermally enhanced soil vapor extraction (SVE), (2) ozone injection, (3) chemical oxidation using hydrogen peroxide, and (4) mobile dual-phase extraction (MDPE)

followed by installation of Regenesis Oxygen Releasing Compound-Advanced (ORC-A) socks, another chemical oxygen technique. Each of these is discussed briefly below.

Phase 1 and 2 corrective action activities were performed initially at the 210 & 218 Montezuma Avenue (Montezuma Avenue) underground storage tank (UST) site (Figure 1) under contract to the responsible party from 2003 until 2009. In 2009, the Montezuma Avenue site was included in a State Lead remediation procurement that included the Capitol 66 UST site, the SFCJC, and surrounding properties. The site was collectively referred to as the SFCJC.

Following award of the State Lead contract in 2009, three separate phases of SVE system operation were implemented at the site. Once contaminant concentration trends indicated that the effectiveness of SVE operations was decreasing, ozone injection was initiated at the site to more aggressively address elevated dissolved-phase contaminant concentrations. Wells SVE-1, SVE-3, SVE-4 and SVE-6 were connected to an ozone generator in November 2012 for pilot testing. The unit was later purchased and operated until November 2013. The equipment was eventually dismantled in February 2015.

Additional treatment of dissolved-phase contamination included five hydrogen peroxide injection events in September, October, and November 2013, and March and May 2014.

Three 48-hour Mobile Dual Phase Extraction (MDPE) events were conducted on three areas of the site between October 3 and 9, 2017. MDPE was focused on dissolved-phase "hot spots" in the vicinity of the Design Center (using MW-1R, MW-4R, and TWS-4 as extraction wells), Montezuma Avenue (using SFCMW-01, SFCMW-10, MW-6, and SVE-3 as extraction wells), and the West De Vargas Condominiums (using MW-11, MW-14, TWN-2 and TWN-3 as extraction wells). Results showed generally low petroleum concentrations in soil vapor of 11 to 42 µg/L TPH GRO and that soil was clean. A total of approximately 17,000 gallons of petroleum-contaminated groundwater were extracted and disposed.

After completion of the MDPE events, ORC-Advanced socks were installed in each of the wells treated with MDPE except the two Santa Fe County wells (SFCMW-01 and SFCMW10). Wells SVE-1 and SVE-5 had socks installed as substitutes for the Santa Fe County wells.

Groundwater monitoring has been ongoing at the site in conjunction with corrective action activities since a baseline groundwater monitoring event was conducted in March 2010. There are currently more than 60 wells associated with the site, which were installed by various stakeholders, such as the NMED and Santa Fe County.

D.2.2 Site Hydrogeology

The site is underlain by Quaternary Alluvium which is comprised of brownish, poorly sorted, weakly cemented, sand and gravel that unconformably overlies the Nambe Member in the Tesuque Formation of the Santa Fe Group. The Tesuque Formation consists of pinkish red, weakly cemented, silty sand/clayey sand, and fine-grained sand (see Figure 2).

The Tesuque Formation Aquifer serves as the City of Santa Fe's principal source of groundwater. Shallow groundwater in the Santa Fe area occurs either at or within 20 ft of the contact between the Quaternary alluvium and Tesuque Formation sediments. This shallow groundwater is locally controlled by buried channels, faults, and higher permeability zones at the top of the Tesuque Formation. The shallow aquifer has very low productivity and an estimated hydraulic conductivity of 0.2 to 0.4 ft/day. The shallow groundwater is vulnerable to contamination by near-surface sources, most commonly by

leaking underground storage tanks. Groundwater flow velocities and maximum solute transport rates in the aquifer range from 0.015 to 0.09 ft/day (5.5 to 33 ft/year). At locations where a strong vertical gradient exists, the shallow, contaminated groundwater may migrate vertically through high-permeability faults, fractures and bedding planes to deeper portions of the Tesuque Formation aquifer.

Groundwater is present at the site at depths ranging from approximately 23 feet to 34 feet below ground surface (bgs). Groundwater depths differ on either side of Cerrillos Road. To the west of Cerrillos Road, depth to groundwater is roughly 10 feet deeper than on the east side with a relatively shallow gradient on the order of 0.001 foot per foot compared to the gradient on the east side of Cerrillos Road which is approximately 0.03 foot per foot (Figure 3). The predominant groundwater flow direction is to the north-northwest at the site. Groundwater flow is restricted from east to west by a subsurface discontinuity, which is believed to be a fault based on published reports (Spiegel and Baldwin, 1963).

D.2.3 Distribution of Contaminants

The primary contaminants of concern (COCs) at the site are petroleum hydrocarbons including benzene, toluene, ethylbenzene, total xylenes, 1,2 dibromoethane (EDB), 1,2-dichlorethane (EDC), and naphthalenes. Methyl tertiary-butyl ether (MTBE) has historically exceeded the NMEIB standard at the site; however, MTBE has not been detected in groundwater since 2014. Historically, contamination has existed in a narrow north-south corridor between Sandoval Street to the west and Galisteo Street to the east. Contamination is believed to have been conveyed through the more conductive, poorly sorted sands of a paleo-channel, as opposed to tighter, well-sorted silty sands and gravels located outside of the known extent of contamination.

Distribution of Contaminants in Soil

Historical soil contamination has been documented with the installation of over 60 monitoring wells associated with the site. During monitoring well installation, field screening of soil samples collected during drilling showed photoionization detector (PID) headspace readings in excess of the PSTB action level of 100 parts per million by volume (ppmv) at depths of approximately 25 to 35 feet bgs, or within 5 feet of the water table interface. During 2014 site investigations, field screening and laboratory analytical results for soil samples collected below the water table showed that residual contamination is typically present at depths of 35 to 45 feet bgs or 5 to 15 feet below the water table interface (Figure 2).

The low TPH GRO concentrations in soil gas generated during the three MDPE events conducted in October 2017 suggest that the majority of vadose zone contamination has been remediated by the multiple phases of SVE system operation at the site. It is clear, based on the dissolved-phase contaminant concentrations present at four “hot spots” at the site, that residual soil contamination remains below the water table in these areas.

To explain the current position of submerged contamination, as well as dissolved-phase impacts, an understanding of the hydrologic history is necessary. Groundwater pumping for public water supply affected groundwater flow at one point in time, creating a lower water table and variable direction of groundwater flow. This explains the depth of contamination and controls the treatment interval proposed in the technical approach. In summary, city well pumping in Santa Fe lowered the water table, and changed the direction of groundwater flow. Leaking USTs at the Capital 66 and Montezuma Avenue sites, and attendant plume positions, reflect these historic groundwater dynamics. The construction dewatering and attendant water table drop affected direction and thickness of impact to a lesser degree, since UST leaking was no longer active. As a result, the plume position and plume thickness in the

southern portion of the site near the Design Center does not agree with current groundwater flow direction. However, an understanding that groundwater dynamics have changed over time explains this incongruity and helps identify the thickness of contamination data gap identified in this proposal.

Non-Aqueous Phase Liquid

Measurable NAPL was last observed at the site in June 2013 in well CMW-3R at a thickness of 0.06 foot. COC concentrations have significantly decreased in wells which previously contained NAPL.

Distribution of Contaminants in Water

Figures 4, 5 and 6 show the most recent extent of dissolved-phased benzene, EDB, EDC, and naphthalenes. Monitoring well MW-16 defines the downgradient extent of contamination, and monitoring wells TWS-2 and TWS-3 define the upgradient extent of contamination. The northern-most wells at the site, Santa Fe River monitoring wells SFRMW-01, SFRMW 01D, and SFRMW-02, historically have had concentrations below laboratory reporting limits. Numerous monitoring wells define the cross-gradient extent of groundwater contamination including MW-5, MW-12, MW-14, MW-18, MW-20, SFCMW-12, TWN-1 and others. These wells have exhibited COC concentrations, either existing or historical, below laboratory reporting limits or applicable standards.

At the former Capital 66 site, dissolved-phase benzene contamination is not adequately defined to the northeast, east, or southeast of monitoring well CMW-1. The dissolved-phase COC concentrations in this area have been low except for benzene in well CMW-1.

D.2.4 Summary of Conceptual Site Model

Previous corrective action activities completed at the site has resulted in elimination of measurable NAPL and soil contamination. Combined with focused groundwater treatment, removal of the contaminant source has resulted in a reduction of contaminant concentrations by several orders of magnitude, particularly in wells located north of Montezuma Avenue. The dissolved-phase plume is currently stable but nonetheless recalcitrant in the "hot spots" identified in the RFP. Therefore, what remains is contaminant cleanup in these aquifer and plume "hot-spots." Soil cleanup is complete as MDPE results indicate. Our proposed technical approach has been designed to specifically address these recalcitrant areas and close out groundwater issues at the site.

Exposure Pathways

Potential exposure pathways of principal concern include vapor migration and vapor intrusion into indoor air space, and potential groundwater exposure.

D.2.5 Data Gaps and Additional Site Characterization

Data gaps specific to the proposed technical approach include:

- A current round of groundwater sampling and analysis is needed to provide a current design basis for the mass of Petro Fix necessary, and to verify plume areas requiring treatment;
- Microbial Insights will be contracted for microbial testing. The proposed tests will include bacterial counts, alternative electron acceptors, and DNA to establish existing sulfate reducing bacteria to support fuel hydrocarbon degradation and dehalobacter for EDB and EDC destruction via use of "Bio-Trap®" samplers, as described in Section D.5.1;
- File review of all boring logs and heated headspace in the aquifer matrix for the Design Center plume to verify plume thickness and treatment intervals. Contamination extends to depth at this

location, likely in response to historic groundwater pumping and dewatering. If review of logs cannot sufficiently answer this question, then two or three soil borings with continuous sampling and heated headspace analysis may be required in the Design Center plume to finalize the design.

- East of CMW-1, a grab sample will be collected through Geoprobe push rods with a pencil bailer and analyzed with 24-hour turn-around to verify the edge of benzene and accordingly the treatment zone in this area.

D.3 Discussion of Cleanup Options

Vadose zone soil has been cleaned up at the site by SVE, and as documented in the MDPE events conducted by Souder, Miller & Associates (SMA). What remains are "hot-spots" of solute contamination that appears to be relatively stable. Options for treatment include groundwater pump and treat, air sparging, chemical oxidation, and in situ bioremediation. Groundwater pump and treat and air sparging would require expensive conveyance systems linking the separated plumes. Chemical oxidation (hydrogen peroxide injections) has been attempted, albeit not as tight of spacing as would be required since chemical oxidation requires contact of the injectate with the contaminant. It is also not uncommon for chemical oxidation to require two or three applications. In situ bioremediation destroys contaminants in place by microbial degradation. In situ biodegradation has currently stalled; however, there are mechanisms to diagnose the problem and add amendments to stimulate the bacteria, increase the available alternative electron acceptors, sorb contaminants, and provide substrate for microbial growth. This is typically a straight forward proposition for fuel hydrocarbons. The EDB and EDC add a challenge to the approach, but they can be destroyed microbially as well. Therefore, the selected option is in situ biodegradation with injection of micron scale activated carbon to sorb contaminants and nutrients to rapidly reduce groundwater concentrations to below applicable water quality standards.

D.4 Cleanup Strategy

Section I.A of the Request for Proposals (RFP) lists the numerous corrective actions that have been performed at the site to date. SVE was highly successful, and likely so because SVE affected most all contaminated vadose zone soils at the site. Soil gas data from the MDPE events indicate that soil cleanup is likely complete. The ozone and hydrogen peroxide groundwater treatments were performed in select existing wells or at "points," and therefore did not affect all of the contaminated aquifer matrix. The key to cleanup of the residual, dissolved-phase "hot spots" that are not attenuating is to treat all of the contaminated aquifer matrix. This will be accomplished by direct push amendment injection below the water table.

EA has extensive experience with these types of in situ remediation techniques. The proposed team has injected multiple aquifer amendments including Peroxychem EHC-L, Terra Solv SRS, Newman Zone, Regenesis 3DMe, ORC, PlumeStop, and AquaZVI, and hydrogen peroxide at 5 Superfund Sites in Texas, at the Laun Dry site in Albuquerque, and several LUST sites. Key applications include:

- Injection of Newman Zone in over 240 direct-push injection points at the Sol Lynn Superfund Site in Houston, Texas.
- Injection of EHC-L into over 90 direct-push injection points at the Jones Road Superfund Site, Harris County, Texas.
- Injection of SRS and PlumeStop in over 50 injection wells at the East 67th Street Groundwater Plume Superfund Site, Odessa, Texas.
- Injection of 3DMe, SRS, and EHC-L at the Sprague Road Groundwater Plume Superfund Site,

Odessa, Texas.

- Injection of PlumeStop and HRC for source control, and PlumeStop with AquaZVI for permeable reactive barriers at the Sandy Beach Road Groundwater Plume Superfund Site in Pelican Bay, Texas.
- Injection of Plume Stop with AquaZVI in 45 direct-push injection points installed along 8th Street at the Laun Dry Site (former 12th and Haines Site), Albuquerque, New Mexico.

EA proposes injection of Regenesis Petro Fix at the SFCJC. Petro Fix is a micron-scale, liquid activated carbon with electron acceptors, which when injected disperses with the viscosity of water as it coats soil grains. After approximately a week, the coating on carbon breaks down, and the activated carbon forms a permanent several-micron-thick coating on the soil. This coating sorbs contaminants proportional to their respective soil organic carbon partition coefficients. For example, naphthalene, which is particularly persistent at that the site, sorbs 10 times more strongly than benzene, which in turn sorbs 3 to 4 times more strongly than EDB and EDC.

The sorption of contaminants onto the solid will immediately reduce dissolved-phase contaminant concentrations; however, this is a transfer from aqueous to sorbed phase. Contaminant destruction is necessary, and this is accomplished with Petro Fix by the addition of alternative electron acceptors, such as sulfate, to provide assimilative capacity to the aquifer to complete anaerobic degradation by sulfate reducing bacteria. This process is already ongoing but is likely rate-limited due to insufficient alternative electron acceptors. The EDB and EDC pose an additional challenge in that they anaerobically degrade in the presence of robust dehalobacter bacteria, which are likely present. During treatability studies at the KAFB Bulk Fuel Farm, APTIM (formerly CB&I) discovered that biostimulation (addition of diammonium phosphate) alone was sufficient to substantially elevate dehalobacter population and completely reduce EDB. Therefore, nutrients will be blended into the Petro Fix in the De Vargas plume, and based on the Bio-Trap™ results, perhaps throughout all four of the plumes or "hot spots."

D.5 Implementation Strategy

Implementation of the proposed remedial strategy is described below. A schedule for implementing the strategy is provided on the attached Timetable.

D.5.1 Baseline Groundwater Monitoring and Pre-Injection Microbial Testing

Baseline groundwater monitoring will be performed in accordance Section D.7 of this proposal. Dissolved oxygen (DO), oxidation-reduction potential (ORP), specific conductance, temperature and pH will be measured in situ (e.g., downhole in the well) with a multi-meter on extended cable. Bio-Trap® samplers will be placed in select wells. From Microbial Insights website:

> "Bio-Trap® samplers are passive sampling tools that collect microbes over time for the purpose of better understanding biodegradation potential. The key to the Bio-Trap® approach uses Bio-Sep® beads, 2-4 mm in diameter composite of Nomex® and powdered activated carbon (PAC). When a Bio-Trap® sampler is deployed, the Bio-Sep® beads absorb contaminants and nutrients present in the aquifer creating an in-situ microcosm which is readily colonized by subsurface microorganisms. Once recovered 30-60 days after deployment, DNA, RNA, or phospholipid fatty acids (PLFA) can be extracted for a host of microbial tests.
>
> Most microbes prefer to be attached to a surface rather than free floating. The Bio-Trap® provides a large surface area for the microbes to colonize and form biofilms. Standard Bio-

> Trap® samplers are commonly used during site characterization and routine monitoring to (1) quantify specific microbes or contaminant degrading bacteria; (2) evaluate monitored natural attenuation (MNA); (3) compare microbial populations at different sampling points across a site, and (4) monitor shifts in microbial communities following enhanced bioremediation (i.e. amendment additions). Bio-Trap® Samplers can be "baited" with various amendments or compounds to answer site-specific questions and screen remedial alternatives. For example, Bio-Traps can be baited with specific contaminants of concern, various electron donors such as HRC®, EOS®, or lactate, or with inorganic amendments like nitrate or sulfate."

EA will deploy both standard Bio-Trap® Samplers to evaluate the ambient condition, and baited Bio-Trap® Samplers to observe the effect of the proposed remediation strategy. Because current bioattenuation rates are stalled, we will carefully evaluate methane and hydrogen sulfide (H_2S) accumulation for toxicity effects. As an example, H_2S toxicity can be addressed by amending the injection solution with an iron salt to precipitated hydrogen sulfide and render the aquifer matrix suitable for bioattenuation once again.

D.5.2 Perform Vapor Intrusion Pathway Evaluation

EA has performed vapor intrusion assessments in accordance with the EPA and NMED guidance at numerous Superfund Sites and Ground Water Quality Bureau sites in New Mexico and Texas. If further vapor intrusion assessment is required at the District Attorney building, or other locations at the site, EA is fully capable of performing these assessments.

Typically, an assessment consists of completing an indoor air quality questionnaire and building inventory, collecting indoor air and sub-slab or crawl-space soil gas samples of occupied buildings as required, and collecting outdoor ambient air samples upwind of the buildings in which indoor air samples are collected.

Laboratory results from air and/or soil gas samples will be compared to Vapor Intrusion Screening Levels (VISLs) found in the NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017.

D.5.3 Conceptual Remediation Plan

This proposal, attached design drawings, and mass and volume of Petro Fix design constitute EA's Conceptual Remediation Plan (CRP). The CRP includes groundwater and aquifer amendment using micron-scale injection activated carbon with alternative electron acceptor and nutrients. The preliminary dosing requirement based on the Regenesis Petro Fix design tool is provided is provided as Table D-1. The preliminary design is based on August 2018 groundwater monitoring data collected by SMA. Based on EA experience and the permeability of the site, the injection spacing is based on a 9-foot radius of influence, placing injection points 15-feet on center. This presumed ROI will be field checked at a rate of 10 percent as discussed in Section D.5.7. If necessary, injection spacing will be tightened. The intervals of injection are based on review of impacts below the water table from available borelogs and range from 7 feet thickness at De Vargas Plume to an estimated 15 feet at Design Center Plume. Locations of injection points for the respective plumes are shown on Figures 7 through 10. Points will be adjusted for underground utilities and structures.

Injection will be conducted using the top-down method to minimize short-circuiting between injection intervals. Injection will be initiated at a water table and injections will be performed sequentially, as rods are advanced to the bottom of the impacted zone in each point. Injection tool would be selected based on

soil type. Injection pressure and flowrate will be monitored and adjusted to optimize injection and subsurface distribution of fluids. Breakthrough pressures will be established at the beginning of the injection in each area and pressures will be adjusted accordingly. Injection pumps will have sufficient pressure and flowrate specifications to optimize and adjust injection based on field conditions. Injection lines will be equipped with control valves, pressure gauges, and flowmeters. Materials will be carefully measured, batched, and thoroughly mixed prior to injection. Totalizing flowmeters will be used to monitor dosing into each injection interval. Detailed logs of each batch and each injection will be maintained.

The design will be refined in the Final Remediation Plan (FRP) based on baseline data collected as soon as a contract is awarded, if EA is the selected contractor.

The micron-scale activated carbon in Petro Fix readily injects and distributes at the viscosity of water. The carbon coats sediment grains and provides substrate for microbial growth and sorbs contaminants, increasing their mass in the sorbed phase and depleting the concentration in the groundwater phase to below standards. The addition of an alternative electron acceptor (sulfate and nitrate) provides assimilative capacity for anaerobic biodegradation of hydrocarbon, and the nutrients will stimulate bacteria to accelerate biodegradation rates. Biostimulation in the presence of fuel hydrocarbons at the Kirtland AFB Bulk Fuel Farm demonstrated rapid biological destruction of EDB with growth of dehalobacter. The carbon, the electron acceptors, and biostimulation will result in cleanup of the "hot spots" in a minimally intrusive manner without the need for remediation equipment, conveyance lines, major equipment, or operation and maintenance. Once the injections are complete, the only action remaining is groundwater monitoring with a few added parameters for performance assessment of the aquifer amendments.

D.5.4 Injection Design and Final Remediation Plan

An FRP will be prepared in accordance with 20.5.119.1923 NMAC. The design and engineering of the FRP will be executed under the supervision of Vener Mustafin, P.E., who is a professional engineer registered to practice engineering in the State of New Mexico. The FRP will include: (1) Goals of remediation and target concentrations to be achieved in each medium; (2) A site plan drawn (40 scale) showing site features including utilities, former and existing USTs, sources of and nature and extent of contamination, and existing and proposed monitor wells; (3) A cross section showing contaminant mass in relation to the injection zones and a topographic map of appropriate scale showing the site in relation to existing and future receptors; (4) An implementation schedule; (5) A schedule for remediation of the "hot spots," for protection of receptors, and for achieving target concentrations, and a demonstration through calculations and analysis which supports this schedule; (6) A design for Performance Assessment and System Optimization; (7) A contingency plan in case of a change in site conditions that threatens public health, safety and welfare or the environment; (8) Copies of all permits, permit applications, and property access agreements required to initiate remediation, including, if necessary, permits required by the state engineer.

Because injection is specified, EA will provide specification for (1) dosage/batch mixing (amendment mix ratios, including mass of Petro Fix, electron acceptors, nutrients and mix water per batch based on ground water concentrations), (2) injection regimen including injection points per batch, approximate flow rate range per injection point and allowable injection pressures, (4) top-down injection intervals and gallons of injectate per interval relative to grade, and (5) fraction pore volume flood per injection interval. A Process and Instrumentation diagram of batch mixing and injection process will be prepared.

In accordance with 20.5.119.1923.D.10 NMAC, EA will publish a legal notice of the submission or planned submission of the remediation plan at least twice in a local newspaper. The second publication will occur no later than 7 days after the date the remediation proposal was submitted to NMED. Two certified Affidavits of Publication from the newspaper will be submitted to NMED within 21 days after the date the remediation proposal was submitted. The notice will be in the format as specified in Section 20.5.119.1923.D.10.b NMAC. EA will post the notice on-site within 7 days of submission of the FRP in conformance with 20.5.119.1923.10.d NMAC. In addition, within 7 days of the date the FRP is submitted to NMED, EA will send via certified mail a copy of the notice to adjacent property owners.

D.5.5 Permits, Access, Meetings, PSTB Notice

Corrective action at the site will require extensive coordination with the many stakeholders involved with the project. In addition to the PSTB, ongoing coordination will be required with: Santa Fe County and its subcontractors, the Old Santa Fe Inn and Barker Realty, the Santa Fe County District Attorney, owners and tenants at the West De Vargas Condominium Complex, the Hinkle Law Firm, owners and tenants of the Design Center and the New Mexico Attorney General's Office. EA's proposed Project Manager, Mike McVey, has established relationships with each of the above stakeholders, which will be a critical component of future work at the site.

EA will obtain the necessary permits prior to implementation of corrective action at the site. These include: a groundwater discharge permit from the NMED GWQB for amendment injection, right-of-entry for injections, laydown, and mixing from all impacted parties, and construction permits and right-of-way (ROW) and excavation permits (which includes traffic control plans) from the City of Santa Fe. In addition, any work performed in City ROW during the day may require a permit to hood on-street parking meters, if present within the working area.

Since this is a State Lead site, EA assumes that the PSTB has access agreements in place with each property owner where corrective action activities have been ongoing. Injection points located on Santa Fe County, Old Santa Fe Inn, Saveur Bistro (former Capitol 66 UST site), the Design Center, 210 &218 Montezuma Avenue, and West De Vargas Condominium properties will require meetings with appropriate representatives to discuss injection activities and secure access for completing the proposed activities. Relationships established by Mr. McVey over years of working at the site will be essential in securing access for these activities and addressing issues as they arise.

EA will provide notice to the PSTB a minimum of 96 hours prior to initiating any meetings or conducting any field activities, etc.

D.5.6 Field Activities

Prior to implementing field activities, EA will obtain all necessary permits to cover the proposed corrective action activities as discussed above. A site-specific health and safety plan (HASP) will be prepared and strictly adhered to during completion of field activities. Site utilities will be cleared through New Mexico One Call, the property owners, Santa Fe County and the City of Santa Fe. Meetings will be held with pertinent representatives, as discussed above, and access agreements will be updated and renegotiated as necessary to cover the proposed project activities. Copies of new or revised access agreements will be forwarded to the NMED Project Manager.

The locations and number of amendment injection points for treating the four "hot spots" will require an off-hour work schedule. EA anticipates completing most of the amendment injection at night or on the

weekend. Amendment injection in Montezuma Avenue and Cerrillos Road will require work to be performed exclusively at night due to the volume of traffic during the day. A robust TCP will be developed to protect workers during amendment injection in the streets. Other locations, such as the West De Vargas parking lot or the Saveur Bistro (former Capital 66), might be accessible on one or both days of the weekend. EA will meet individually with property/business owners to determine the most appropriate time to perform the injections.

Batch mixing can be performed away from the injection points, if necessary. High pressure hoses can be used to distribute amendment to the injection points from hundreds of feet away if necessary. This will allow for the separation of process and batch mixing areas from injection areas, an important feature in that many injection points are in heavy trafficked areas that will need to be accessed during off business hours or at night.

D.5.7 Evaluate ROI and Injection Performance

To evaluate ROI and injection performance, EA will have the injection subcontractor push rods intermediate in the injection pattern at a rate of 10 percent. A pencil bailer will then be lowered, and a sample will be collected to check for Petro Fix. Petro Fix, yields a black return. As needed, injection spacing may be tightened to ensure distribution. It should be noted that Petro Fix will advect with groundwater for several weeks, thereby increasing the coverage. But tightening up the injection spacing with the narrow 1.5-inch diameter injection rods is easily facilitated: batch mixing the quantity of injectate proposed (172,000 gallons) is the limiting factor in the process.

D.5.8 Prepare and Submit As-Built Report

Following completion of the amendment injection, an as-built report in accordance with 20.5.119.1925.D with complete drawings stamped by a New Mexico Registered Professional Engineer will be prepared and submitted to the PSTB Project Manager. The report will satisfy the requirements of the above citation and will include, but not be limited to, the following: (1) Area/vicinity map; (2) Detailed site diagram showing all injection points, amendment volumes and mass, (3) permits and notifications, and (4) verification of radius of influence and treatment completeness.

D.6 O & M Strategy

A positive of in situ remediation via aquifer amendment is that there is no operation and maintenance – no electric bills, no equipment maintenance, and no well rehabilitation. Performance assessment and groundwater monitoring is all that is required. Performance assessment will consist of evaluating contaminant trend data, geochemical indicators, and periodically checking ambient Bio-Trap® Samplers to evaluate microbial populations and assimilative capacity of alternative electron acceptors.

D.7 Groundwater Monitoring and Performance Assessment

Groundwater monitoring will consist of bailing or low flow sampling to support evaluation of the Petro Fix remedy. The monitoring will focus on analyte concentrations by analytical chemistry and geochemical conditions in the aquifer by measurement of DO and ORP. In addition, passive diffusion bags will be place in key wells so that methane and hydrogen sulfide can be monitored in groundwater to ensure toxic conditions are avoided, and Bio-Trap™ Samplers deployed to monitor microbial counts and level of alternative electron acceptors. The Petro Fix will take down the contaminant concentrations in groundwater; however, there will still be a need to monitor the efficacy of the destruction mechanisms to ensure that the remedy is permanent. The proposed monitoring regimen is provided in Table D.2.

TABLE D-1
PETRO FIX PRELIMINARY DESIGN QUANTITIES

Santa Fe County Court House EDIT

Cerrillos Road
Santa Fe, New Mexico 87105
US EDIT

Areas

Add New Area

NAME	AREA	VTI	DOSE	PRODUCT
Capital 66	3,000.0sq.ft	7.0ft	5.14lbs/cy	4,000lbs
De Vargas	4,000.0sq.ft	7.0ft	4.63lbs/cy	4,800lbs
Design Center Plume	8,500.0sq.ft	15.0ft	6.69lbs/cy	31,600lbs
Judicial Complex Dilute Plume	9,000.0sq.ft	11.0ft	4.36lbs/cy	16,000lbs
Judicial Complex Hot Spot	1,000.0sq.ft	11.0ft	11.78lbs/cy	4,800lbs

TOTAL
Product **61,200 lbs**

TABLE D-2. SAMPLING, PERFORMANCE EVALUATION, AND MONITORING
SANTA FE COUNTY JUDICIAL COMPLEX SITE, SANTA FE, NEW MEXICO

Purpose	Sampling Frequency	Sampling Point	Analyses
Routine groundwater monitoring for trend analysis	Quarterly	Monitoring wells	VOCs by EPA 8260B, EDB by EPA 504.1, Sulfate and Nitrate by EPA 300.1
Monitor suitability for in situ bioremediation be sulfate reduction	Semi Annual	Passive diffusion bags in select monitoring wells	Methane by EPA RSK-175 and Hydrogen Sulfide by EPA 9034 then calculated
Microbial analysis and biodegradation	Semi Annual	Bio-Trap™ Samplers in select monitoring wells	CENSUS DNA Testing, Microbial plate counts, in situ microcosm study, verify dehalobactor, monitori levels of nitrate and sulfate for assimilative capacity
Water levels for potentiomentric maps and verify plume stability	Quarterly	Each well	Groundwater level gauging and data reduction to water levels

Notes:

VOC = Volatile Organic Compounds

EDB = Ethylene dibromide

EPA = U.S. Environmental Protection Agency

EA Engineering, Science, and Technology, Inc., PBC

TAB D — TIMETABLE

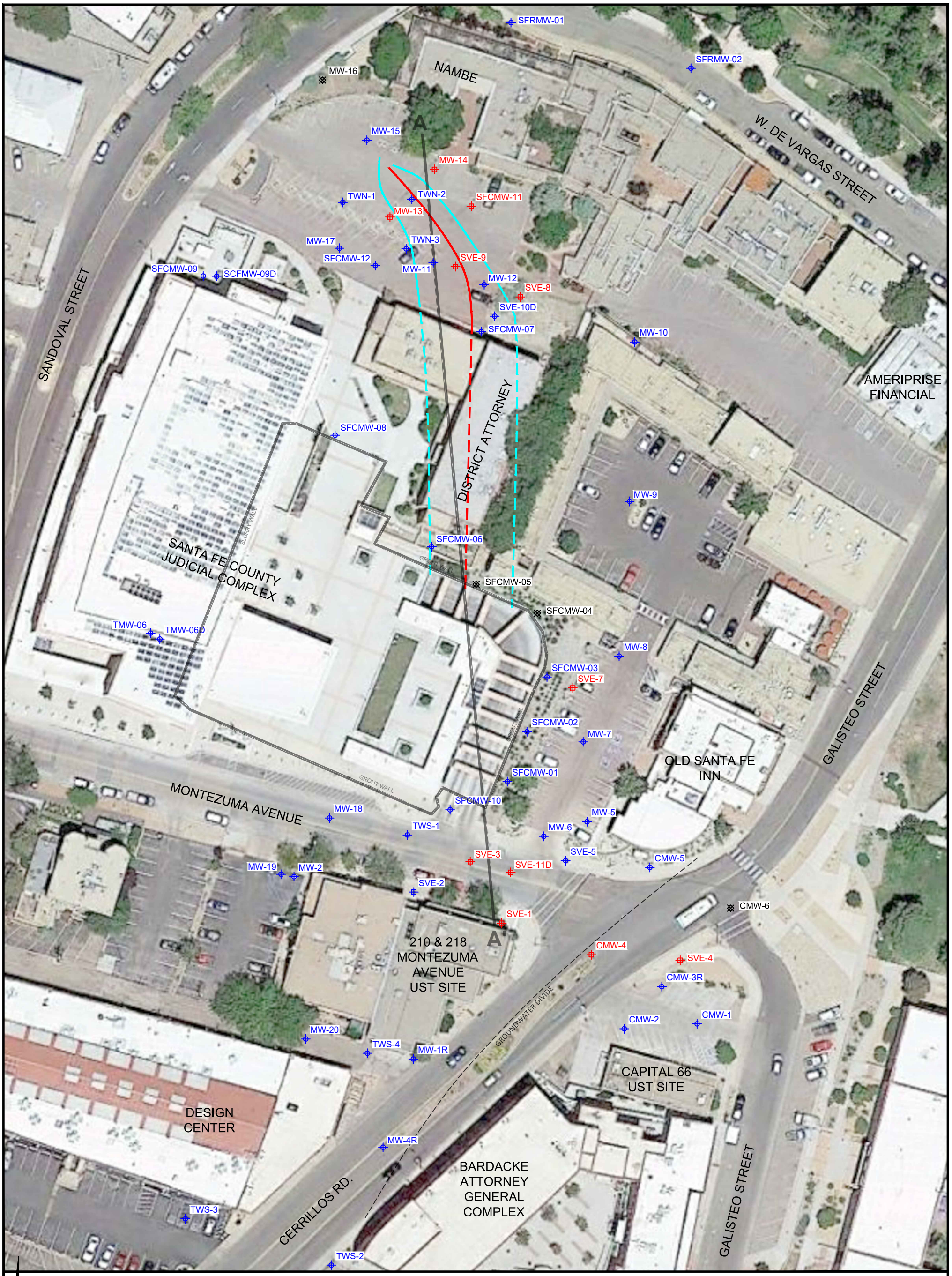
• Work Plan to NMED	Week 1
• Work Plan Approval	Week 3
• Obtain access, rights of entry, Class V Injection and other permit applications	Weeks 3 through 10
• Baseline groundwater monitoring, set Bio-Trap™ Samplers	Weeks 3 through 4
• Verify treatment zone thickness through file review, Montezuma UST Site	Week 4
• Retrieve Bio-Trap™ Samplers and analyze	Week 20
• Finalize Petro Fix mix ratios, alternative electron acceptors, nutrient and bacteria design	Week 21
• FRP Complete	Week 24
• FRP Approved/Public Notice Cleared	Week 30
• Secure Site	Week 32
• Field Injections	Weeks 31 through 36
• As-Built Report	Week 38
• 1st Quarterly Monitoring Event	Week 47
• 2nd Quarterly Monitoring Event, Performance Assessment, System Optimization	Week 59
• 3rd Quarterly Monitoring Event	Week 72
• 4th Quarterly (1st Annual) Monitoring Event, Performance Assessment, System Optimization	Week 84

EA Engineering, Science, and Technology, Inc., PBC

TAB D ORAL PRESENTATION CONCURRENCE

EA Engineering, Science, and Technology, Inc., PBC agrees to provide the Evaluation Committee the opportunity to interview proposed staff members identified by the Evaluation Committee, at the option of the Agency. EA understands and accepts that the Evaluation Committee may request a finalist to provide an oral presentation of the proposal as an opportunity for the Evaluation Committee to ask questions and seek clarifications as stated in in Section V.B(5) of the RFP.

P:\Marketing-Proposals\Santa Fe Judicial Complex - 2018-Nov\Figures



LEGEND:

- MONITORING WELL
- DESTROYED MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- HORIZONTAL SVE WELL
- HORIZONTAL HOT AIR INJECTION WELL
- A—A' CROSS SECTION LOCATION

SOURCE: SOUDER, MILLER & ASSOCIATES. 2018 AUGUST.

60 30 0 60

SCALE IN FEET

SANTA FE COUNTY JUDICIAL COMPLEX
SANTA FE, NEW MEXICO

FIGURE 1
SITE LAYOUT

PROJECT #:	PROPOSAL	PROJECT PHASE:	__	PROJECT MANAGER:	___

320 Gold Avenue, SW Suite 1300
Albuquerque, NM 87102
Phone: (505) 224-9013

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC. PBC

A
NORTH

A'
SOUTH

ELEVATION, FEET AMSL

6,985
6,980
6,975
6,970
6,965
6,960
6,955
6,950
6,945
6,940
6,935

MW-15 | MW-14 | TWN-2 | SFMW-11 MW-13 | TWN-3 | SVE-9 | SFCMW-07 | SFMW-08 | DPB-04 | DPB-05/TMW-03 | SFCMW-10 | TWS-1 MW-5 | MW-6 | SVE-3 | MW-3/SVE-1

GW - GRAVEL WITH SAND
SM/GW - SILTY SAND WITH COBBLES
SM - SILTY SAND
SP - POORLY GRADED SAND
UNDERGROUND PARKING GARAGE
GW GRAVEL WITH SAND
SW SAND WITH GRAVEL
SW/GW FINE SAND AND GRAVEL
SM
SC

AUGUST 2018 WATER LEVEL
JUNE 2011 DEWATERING WATER LEVEL

PID ABOVE 100 AFTER SYSTEM DEWATERING

TARGET INJECTION SATURATED ZONE BASED ON HISTORICAL 100 PPMV PID LEVELS

PID ABOVE 100 AFTER SYSTEM DEWATERING

HISTORICAL 100 PPMV PID LEVEL EXTENT IN VADOSE ZONE. BASED ON DPE PILOT TEST DATA, VADOSE ZONE HAS BEEN CLEANED UP BY SOIL VAPOR EXTRACTION

0 30 60 90 120 150 180 210 240 270 300 330 360 390 420 450 480 510 540

TWN-2 ← SOIL BORING ID AND/OR MONITORING WELL ID
133.6 ← PID READING, PPMV
SOIL BORING AND/OR MONITORING WELL
STATIC GROUNDWATER LEVEL
WELL SCREEN

0.9 BELOW 100 PPMV
704 ABOVE 100 PPMV
1,829 ABOVE 100 PPMV AFTER DE-WATERING
PPMV = PARTS PER MILLION BY VOLUME

10 5 0 10
VERTICAL SCALE IN FEET

40 20 0 40
HORIZONTAL SCALE IN FEET

SOURCE: DBS&A

SANTA FE COUNTY JUDICIAL COMPLEX

FIGURE 2
GEOLOGIC CROSS-SECTION A-A'

PROJECT #:	6236201	PROJECT PHASE:	25	PROJECT MANAGER:	VM

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Albuquerque, NM 87102
Phone: (505) 224-9013
Fax:(505) 224-9016

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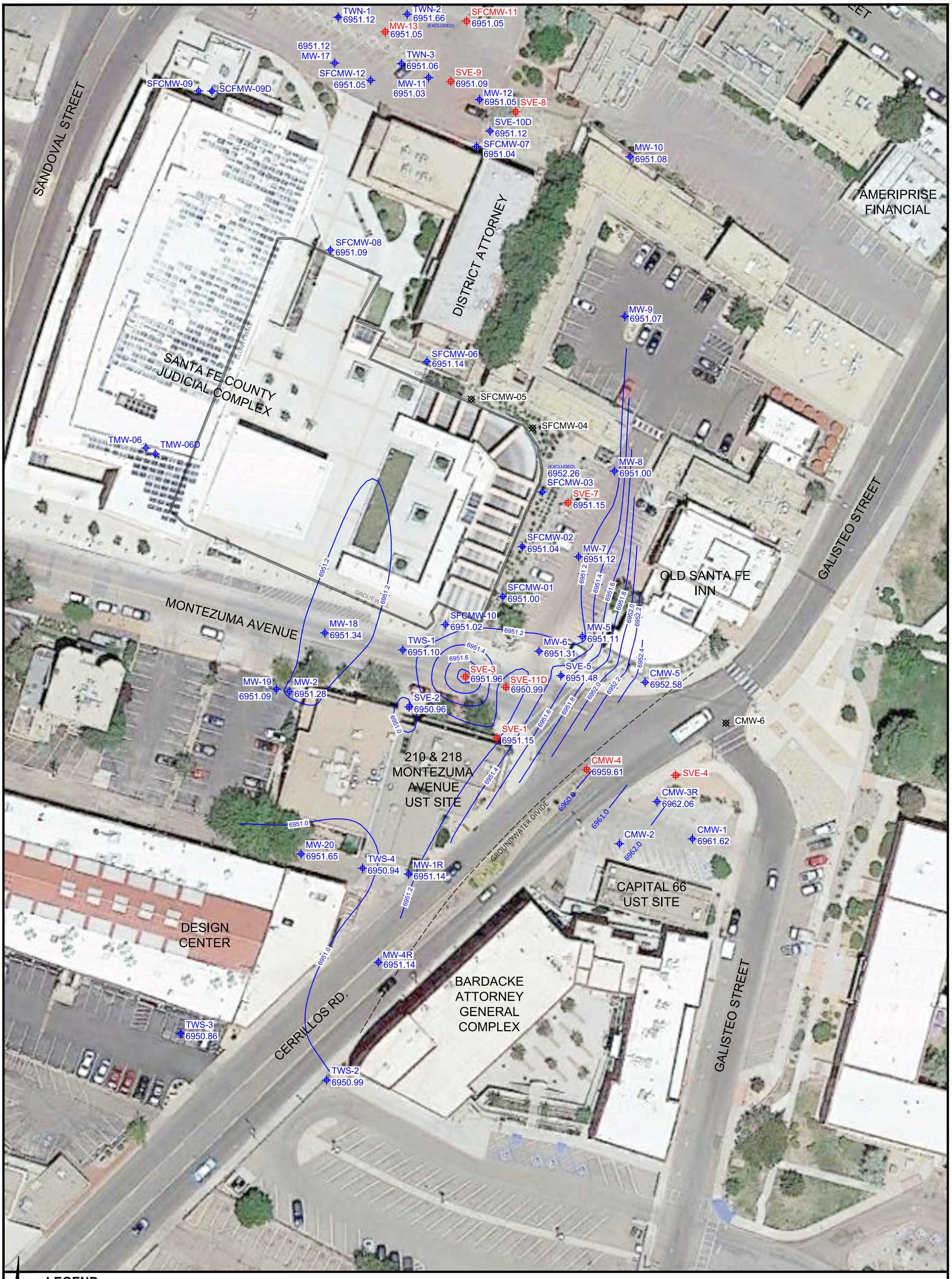

LEGEND:

- MONITORING WELL
- DESTROYED MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- GROUNDWATER CONTOUR, FEET AMSL
- 6950.99 GROUNDWATER ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL (AMSL)

SOURCE: SOUDER, MILLER & ASSOCIATES. 2018 AUGUST.

60 30 0 60

SCALE IN FEET

SANTA FE COUNTY JUDICIAL COMPLEX
SANTA FE, NEW MEXICO

FIGURE 3
GROUNDWATER CONTOURS - AUGUST 2018

PROJECT #:	PROPOSAL	PROJECT PHASE: __	PROJECT MANAGER: ___

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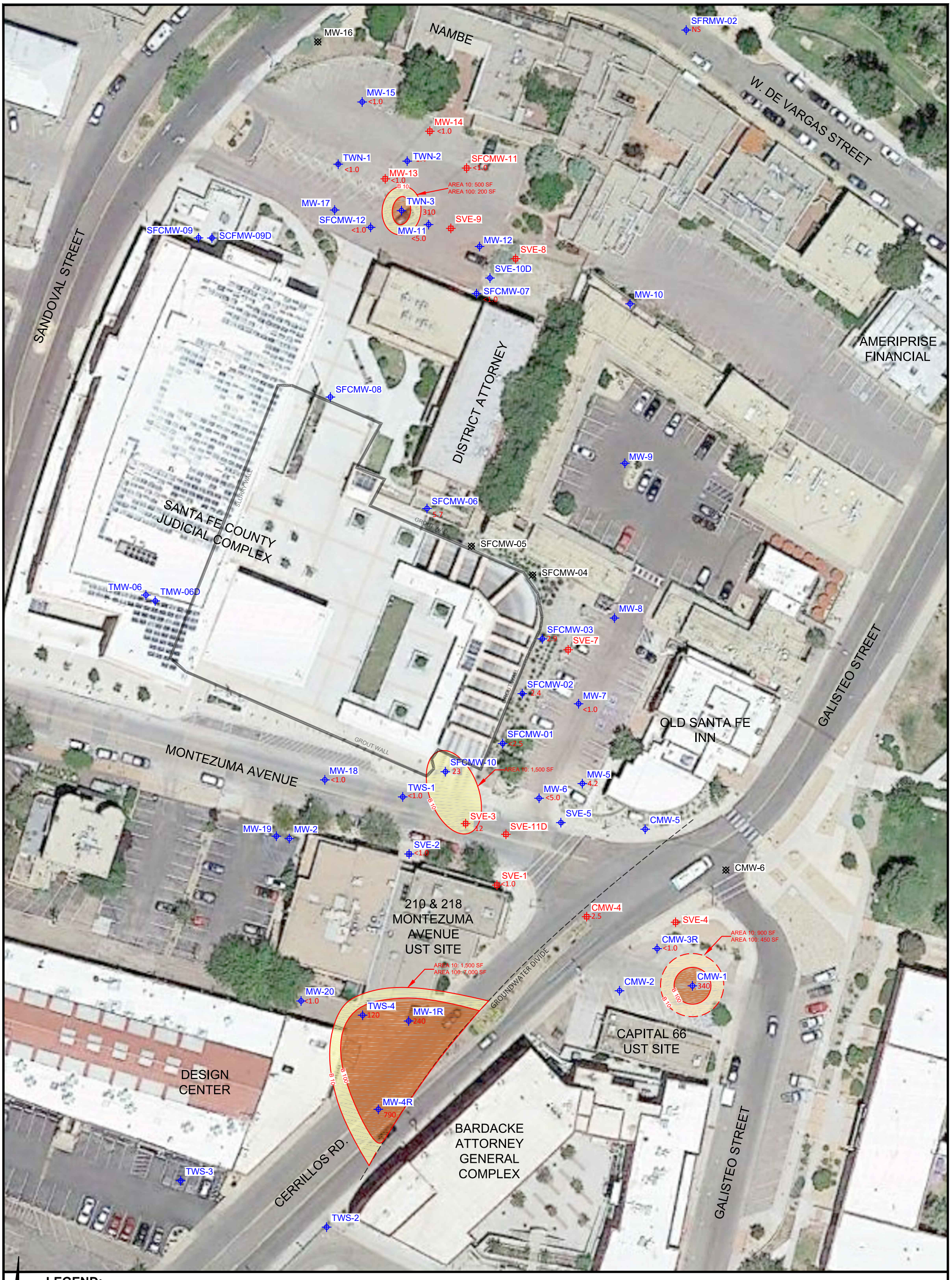

LEGEND:

- MONITORING WELL
- DESTROYED MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- BENZENE CONCENTRATION ABOVE 100 ug/L
- BENZENE CONCENTRATION BETWEEN 10 AND 100 ug/L
- ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER (ug/L)

SOURCE: SOUDER, MILLER & ASSOCIATES. 2018 AUGUST.

60 30 0 60

SCALE IN FEET

SANTA FE COUNTY JUDICIAL COMPLEX
SANTA FE, NEW MEXICO

FIGURE 4
DISSOLVED BENZENE - AUGUST 2018

PROJECT #:	PROPOSAL	PROJECT PHASE: __	PROJECT MANAGER: __

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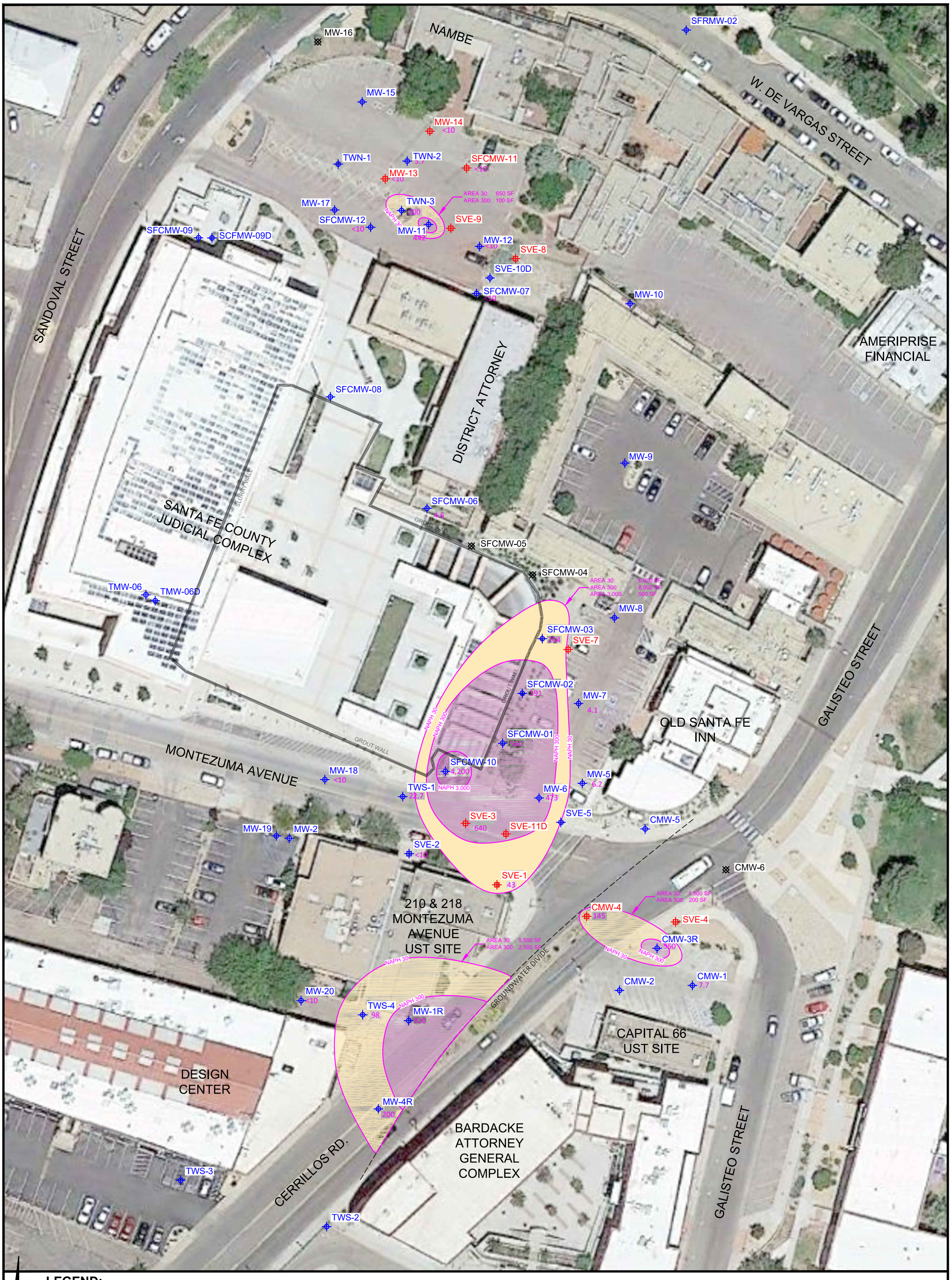

LEGEND:

- MONITORING WELL
- DESTROYED MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- NAPHTHALENE CONCENTRATION ABOVE 3,000 ug/L
- NAPHTHALENE CONCENTRATION BETWEEN 300 AND 3,000 ug/L
- NAPHTHALENE CONCENTRATION BETWEEN 30 AND 300 ug/L

ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER (ug/L)

SOURCE: SOUDER, MILLER & ASSOCIATES. 2018 AUGUST.

60 30 0 60

SCALE IN FEET

SANTA FE COUNTY JUDICIAL COMPLEX
SANTA FE, NEW MEXICO
FIGURE 5
DISSOLVED NAPTHALENE - AUGUST 2018

PROJECT #:	PROPOSAL	PROJECT PHASE:	__	PROJECT MANAGER:	___

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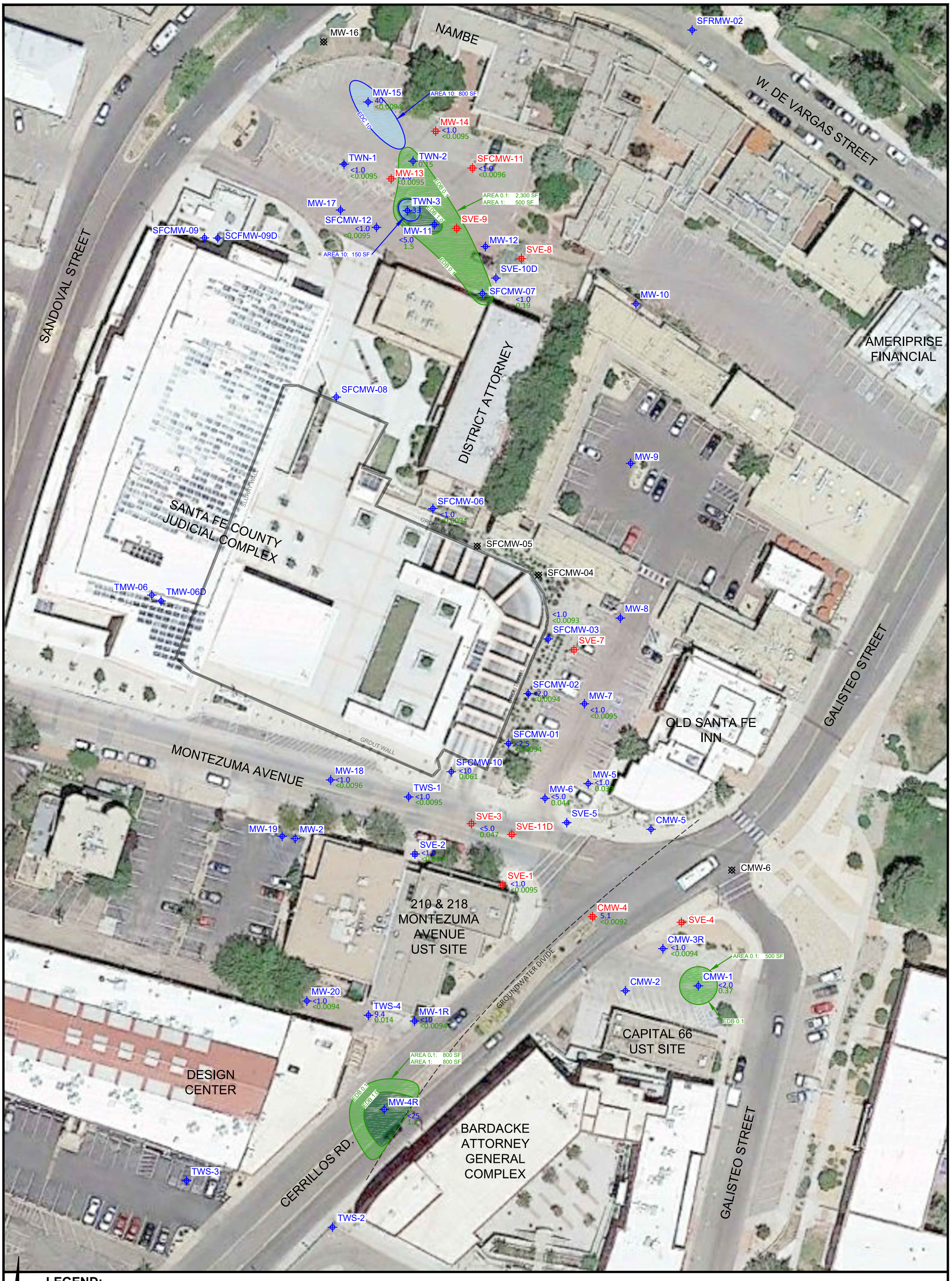

LEGEND:

- MONITORING WELL
- DESTROYED MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- 9.4 EDC CONCENTRATION
- 1.2 EDB CONCENTRATION

- EDB CONCENTRATION ABOVE 1 ug/L
- EDB CONCENTRATION BETWEEN 0.1 AND 1 ug/L
- EDC CONCENTRATION ABOVE 10 ug/L

ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER (ug/L)

SOURCE: SOUDER, MILLER & ASSOCIATES. 2018 AUGUST.

60 30 0 60

SCALE IN FEET

SANTA FE COUNTY JUDICIAL COMPLEX
SANTA FE, NEW MEXICO

FIGURE 6
DISSOLVED EDB AND EDC - AUGUST 2018

PROJECT #:	PROPOSAL	PROJECT PHASE:	__	PROJECT MANAGER:	__

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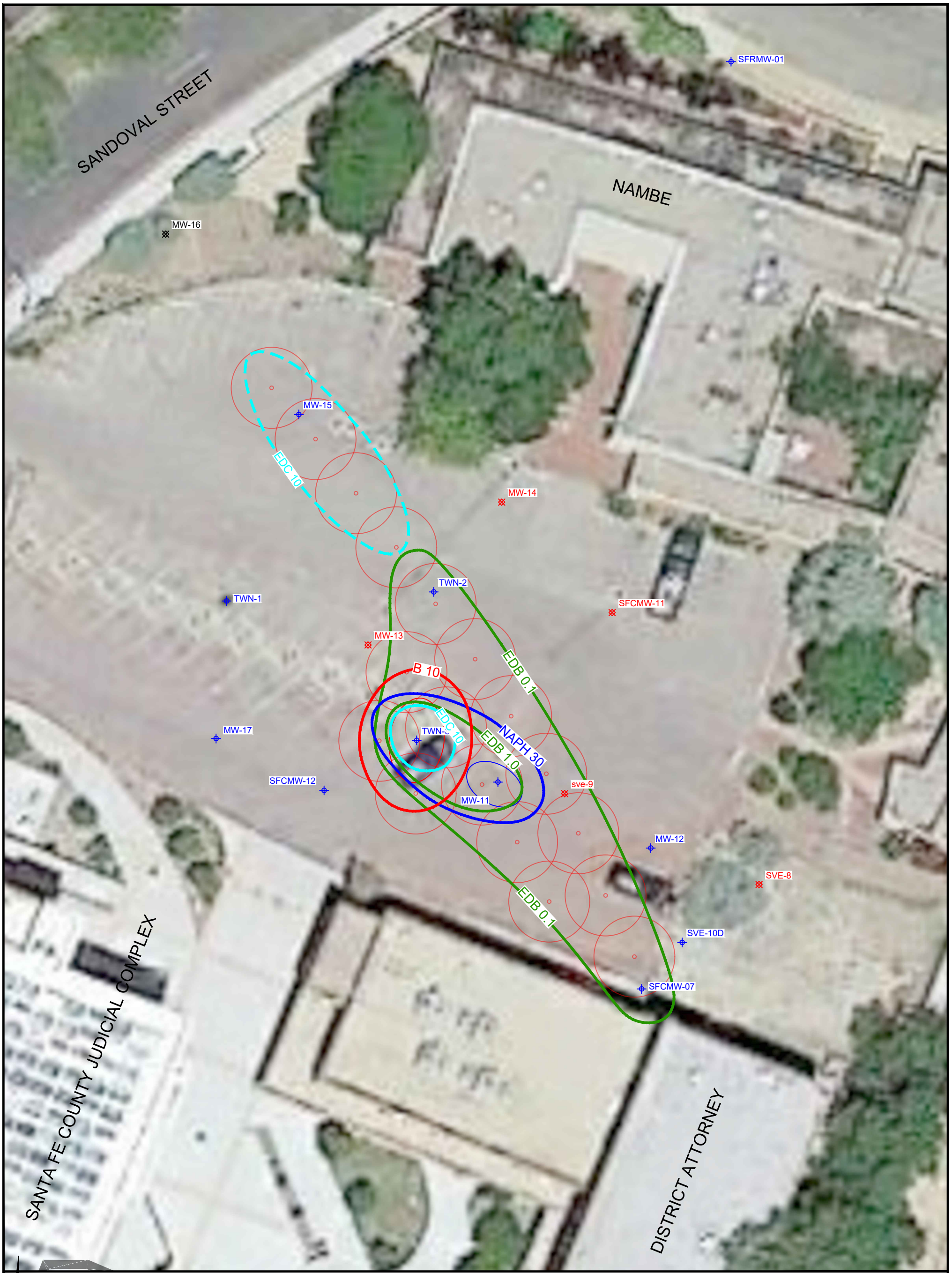

LEGEND:

- MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- BENZENE CONTOUR
- NAPHTHALENE CONTOUR
- EDB CONTOUR
- EDC CONTOUR

B	BENZENE
NAPH	NAPHTHALENE
EDB	ETHYLENE DIBROMIDE
EDC	ETHYLENE DICHLORIDE

ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER

SHOWN PLUME EXTENTS ARE AUGUST 2018 SAMPLING EVENT

INJECTION POINT WITH 9-FT RADIUS OF INFLUENCE

20 10 0 20

SCALE IN FEET

SANTA FE JUDICIAL COMPLEX
SANTA FE, NEW MEXICO

FIGURE 7
DE VARGAS PLUMES AND INJECTION POINTS

PROJECT #:	PROPOSAL	PROJECT PHASE: __	PROJECT MANAGER: ___

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC. PBC
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Albuquerque, NM 87102
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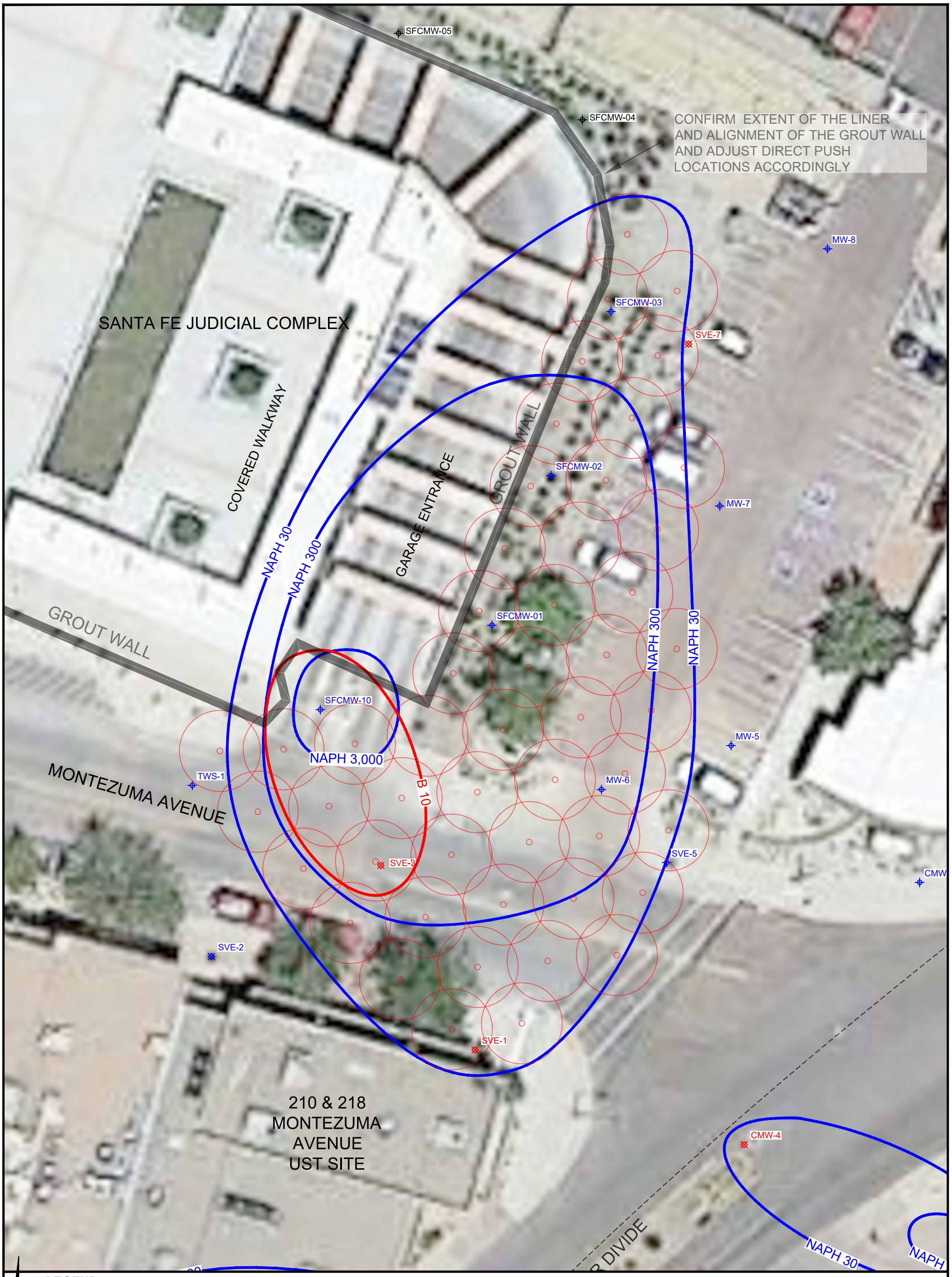

LEGEND:

- MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- BENZENE CONTOUR
- NAPHTHALENE CONTOUR

B	BENZENE
NAPH	NAPHTHALENE
EDB	ETHYLENE DIBROMIDE
EDC	ETHYLENE DICHLORIDE

ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER
SHOWN PLUME EXTENTS ARE AUGUST 2018 SAMPLING EVENT

INJECTION POINT WITH 9-FT RADIUS OF INFLUENCE

20 10 0 20
SCALE IN FEET

SANTA FE JUDICIAL COMPLEX
SANTA FE, NEW MEXICO

FIGURE 8. SANTA FE JUDICIAL COMPLEX PLUMES AND INJECTION POINTS

PROJECT #:	PROPOSAL	PROJECT PHASE: __	PROJECT MANAGER: ___

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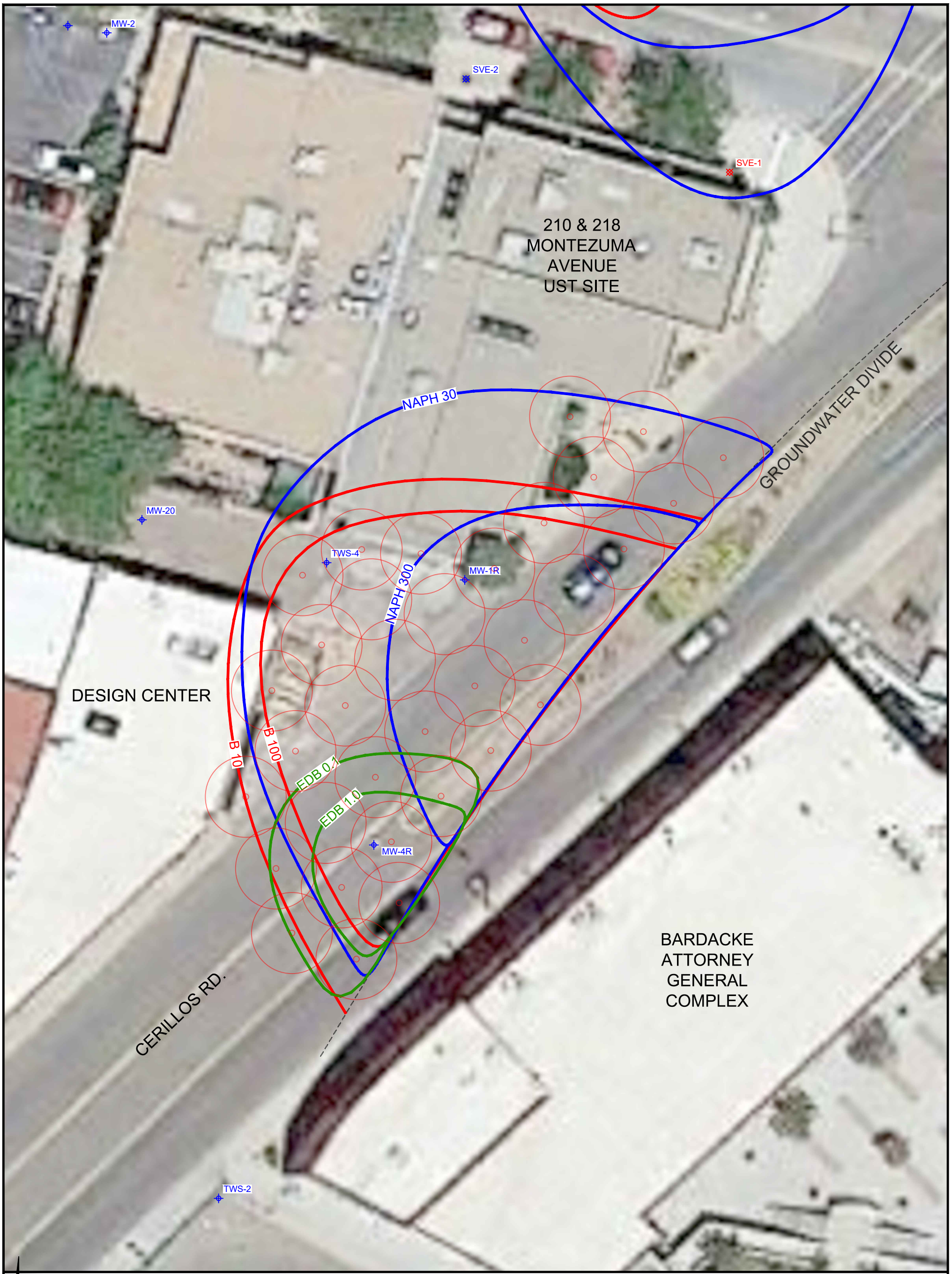

LEGEND:

- MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- BENZENE CONTOUR
- NAPHTHALENE CONTOUR
- EDB CONTOUR
- EDC CONTOUR

B	BENZENE
NAPH	NAPHTHALENE
EDB	ETHYLENE DIBROMIDE
EDC	ETHYLENE DICHLORIDE

ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER
SHOWN PLUME EXTENTS ARE AUGUST 2018 SAMPLING EVENT

INJECTION POINT WITH 9-FT RADIUS OF influence

20 10 0 20

SCALE IN FEET

SANTA FE JUDICIAL COMPLEX
SANTA FE, NEW MEXICO

FIGURE 9
DESIGN CENTER PLUMES AND INJECTION POINTS

PROJECT #:	PROPOSAL	PROJECT PHASE: __	PROJECT MANAGER: ___

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EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC. PBC

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LEGEND:

- MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- BENZENE CONTOUR
- NAPHTHALENE CONTOUR
- EDB CONTOUR
- EDC CONTOUR

B	BENZENE
NAPH	NAPHTHALENE
EDB	ETHYLENE DIBROMIDE
EDC	ETHYLENE DICHLORIDE

ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER
SHOWN PLUME EXTENTS ARE AUGUST 2018 SAMPLING EVENT

INJECTION POINT WITH 9-FT RADIUS OF INFLUENCE

20 10 0 20
SCALE IN FEET

SANTA FE JUDICIAL COMPLEX
SANTA FE, NEW MEXICO

FIGURE 10
CAPITAL 66 PLUMES AND INJECTION POINTS

PROJECT #:	PROPOSAL	PROJECT PHASE: __	PROJECT MANAGER: ___

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC. PBC
320 Gold Avenue, SW Suite 1300
Albuquerque, NM 87102
Phone: (505) 224-9013

TAB E

Offeror's Statement of Qualifications

EA Engineering, Science, and Technology, Inc., PBC

TAB E
STATEMENT OF QUALIFICATIONS

E.1 Corporate and Staff Experience

EA was founded in 1973 and now has over 500 employees at 25 offices nationwide. EA is consistently ranked among the "Top 30 All-Environmental Firms (#14)", "Top 200 Environmental Firms (#70)", and the "Top 500 Design Firms (#139)" by leading trade publication *Engineering News-Record* (2017 rankings). The firm's Southwest presence began in 1988 (current offices in Albuquerque, New Mexico, Denver, Colorado, and Dallas and Houston, Texas). In the Southwest EA specializes in site investigations, engineering design, construction management, operation and maintenance, and other environmental services. The EA Albuquerque, New Mexico office's CRS No. is 02-280770-00-5.

EA provides corporate and local experience to assist NMED with remediation activities and corrective action at the Santa Fe County Judicial Complex State Lead Site located in Santa Fe, New Mexico. EA has performed all elements of corrective action including preparing Conceptual Remediation Plans, Final Remediation Plans (FRP), and implementation of FRPs, for state, private, and federal clients for decades. Within the Southwest, EA has provided petroleum storage tank corrective action services at small RP-lead sites, NMED state-lead, TCEQ state-lead, and Federal Facilities (Kirtland Air Force Base, White Sands Missile Range, and New Mexico Formerly Utilized Defense Sites). The proposed team has extensive leaking underground storage tank (LUST) experience as well as assessment and remediation at other corrective sites such as RCRA facilities, Superfund sites, and oil and gas sites.

EA's qualified staff have extensive experience with corrective action and remediation activities at locations that pose a threat to public health and the environment, including potential impacts to drinking water supplies. EA staff have studied and developed options and approaches for groundwater monitoring, non-aqueous phase liquid (NAPL) containment and removal, remediation system operation and maintenance, system optimization and documentation of remediation system effectiveness at multiple sites within New Mexico and the southwest United States. Mike McVey, P.G., Teri McMillan, P.G., David Werth, P.G., Lane Andress, P.G., Jay Snyder, P.G., and Vener Mustafin, P.E. provide extensive experience in relation to Petroleum Storage Tank Sites and remediation of contaminated soils. In addition, our subcontractors, shown in Table E-3, enhance our capabilities. An organizational chart is provided in Figure E-1 and Tables E-1, E-2 and E-4 show the resources and areas of expertise available for this contract.

E.2 Experience Relevant to Scope of Work

The EA team has extensive experience with in situ remediation techniques. Table E-1 presents the proposed project team and experience with all phases of corrective action including but not limited to initial abatement, investigations, pilot studies, groundwater monitoring and testing, product removal, remediation system design, operation & maintenance, excavation activities, public meeting support and expert testimony. Table E-2 provides an experience table regarding hydrogeologic assessment and characterization experience. As evidenced by the information in these tables and personnel resumes, credentials, and pertinent training provided in the resume section of Tab E, EA has the local breadth and depth of capabilities to fully support this contract, including expert testimony experience. The following are specific experience that EA's Albuquerque's employees have with regards to designing, implementing, and operating engineered systems for the remediation of petroleum hydrocarbon contamination; including the cleanup of hydrocarbon contaminated soils.

The proposed team has injected multiple aquifer amendments including Peroxychem EHC-L, Terra Solv SRS, Newman Zone, Regenesis 3DMe, ORC, PlumeStop, and AquaZVI, and hydrogen peroxide at 5

Superfund Sites in Texas, at the Laun Dry site in Albuquerque, and several leaking underground storage tank (LUST) sites. Key applications include:

- Injection of Newman Zone in over 240 direct-push injection points at the Sol Lynn Superfund Site in Houston, Texas. Key staff included Vener Mustafin, P.E., Jay Snyder, P.G.
- Injection of EHC-L in over 90 direct-push injection points at the Jones Road Superfund Site, Harris County, Texas. Key staff included Jay Snyder, P.G.
- Injection of SRS and PlumeStop in over 50 injection wells at the East 67th Street Groundwater Plume Superfund Site, Odessa, Texas. Key staff included Teri McMillan, P.G., Tyler Curley, P.E., David Werth, P.G. and Jay Snyder, P.G.
- Injection of 3DMe, SRS, and EHC-L at the Sprague Road Groundwater Plume Superfund Site, Odessa, Texas. Key staff included Jay Snyder, P.G. and Teri McMillan, P.G.
- Injection of PlumeStop and HRC for source control, and PlumeStop with AquaZVI for permeable reactive barriers at the Sandy Beach Road Groundwater Plume Superfund Site in Pelican Bay, Texas. Key staff included Teri McMillan, P.G., Vener Mustafin, P.E., Tyler Curley, P.E., and Jay Snyder, P.G.
- Injection of Plume Stop with AquaZVI in 45 direct-push injection points installed along 8th Street at the Laun Dry Site (former 12th and Haines Site) in Albuquerque, New Mexico. Key staff included Teri McMillan, P.G., Tyler Curley, P.E., David Werth, P.G., Vener Mustafin, P.E., and Jay Snyder, P.G.

E.3 Key Personnel Credentials

EA's qualified staff has extensive experience with regards to the scope of services as described in RFP 19 667 3200 0004. Credentials and experience of key personnel are provided in individual resumes and summarized below:

Mike McVey – Program Manager/Project Manager
Academic Degrees:
M.S., South Dakota School of Mines & Technology, Geological Engineering/Hydrogeology, 1990; B.S., South Dakota School of Mines & Technology, Geological Engineering, 1986

Registration:
Professional Geologist—TX (No. PG-664), 2013; WY (No. PG-1273), 1992; TN (No. PG-6012), 2018, AK (No. CPG-140029), 2018; AIPG (No. CPG-9028), 1997

Other Pertinent Training:
OSHA 40-Hour Hazardous Waste Operations Safety Training, 1991; OSHA 8-Hour Hazardous Waste Operations Safety Training Refresher (annually), current; OSHA 8-Hour Hazardous Waste Operations Safety Supervisor Training; 2010, OSHA 10-Hour Construction Safety Training; 2007; OSHA 30-Hour Construction Safety, 2018; ASTM Risk-Based Corrective Action Applied at Petroleum Release Sites; Princeton Remediation Course; NPDES Regulations Workshop

Experience in Storage Tank investigations

Santa Fe County Judicial Complex Remediation for the NMED PSTB, Leaking Underground Storage Tank Sites Investigation and Characterization for the NMED PSTB (contract liaison, program manager, and technical lead for approximately 100 state-lead and responsible party-lead LUST sites); A-1 Auto Remedial Action and Water Line Replacement (Peñasco); Hooter Brown's Country Store Interim Soil Removal and Groundwater Monitoring; Paul's Place Remedial Action (Tome); Midway Grocery Remedial Action (Jarales); Cibola Chevron Remedial Action (Grants); Bell Gas 1186 Remedial Action (Alto); Moberg's Garage Remedial Action; Arroyo Hondo Remedial Action (Santa Fe); Professional Services and Emergency Response Contract for the NMED PSTB; Hazardous Materials Contract for the NMDOT; Site Maintenance and Monitoring Contract for the NMDOT

Teri McMillan – Health and Safety Officer/Geologist
Academic Degrees:
B.S., University of New Mexico, Geology, 1988, M.S.; Texas Tech University, Geoscience, 1991

Registration:
Professional Geologist—TX (No. PG-11469), 2013; LA (No. PG-376), 2014

Other Pertinent Training:
OSHA 40-Hour Hazardous Waste Operations Safety Training; 1991, OSHA 8-Hour Hazardous Waste Operations Safety Training Refresher (annually), OSHA 8-Hour Hazardous Waste Operations Safety Supervisor Training; 2010, OSHA 10-Hour Construction Safety Training; 2007

Experience in Storage Tank investigations
Ms. McMillan has prepared work plans, conducted pilot tests and pump tests, implemented remediation plans, site restoration, prepared completion reports, and monitoring and operation and maintenance reports at numerous remediation sites. She has managed the removal actions at Holiday Chevron located in Tucumcari, New Mexico and Santa Fe Nimitz located in Grants, New Mexico. She provided construction oversight and was involved with the operation and maintenance of the systems at Laguna Mart, in Laguna, New Mexico and Portales Chevron, in Portales, New Mexico as well as the thermal desorption pilot test system at Allsup's 261 located in Dexter, New Mexico. Ms. McMillan has participated in numerous pilot test including, soil vapor extraction, multiphase extraction, and injection pilot tests at LUST, GWQB and Superfund sites.

Lane Andress - Geologist
Academic Degrees:
B.A., New Mexico Institute of Mining and Technology, Geology, 2000

Registration:
Professional Geologist—TX (No. PG-10998), 2011

Other Pertinent Training:
OSHA 40-Hour Hazardous Waste Operations Safety Training; 2000, OSHA 8-Hour Hazardous Waste Operations Safety Training Refresher (annually), OSHA 8-Hour Hazardous Waste Operations Safety Supervisor Training; 2010, OSHA 10-Hour Construction Safety Training; 2000

TAB E
STATEMENT OF QUALIFICATIONS

Experience in Storage Tank investigations
Ms. Andress has over 17 years of institutional knowledge of numerous NMED PSTB State Lead sites having worked on many of the same sites over this time. In 2000, she wrote workplans, performed site investigations, performed groundwater sampling activities, and report writing for several State Lead sites while working for a local consulting firm who had the State Lead contract. From 2000 – 2006, she worked for the remedial action section of NMED's PSTB where she managed approximately 60 contaminated responsible party and state lead petroleum storage tank sites in New Mexico. This entailed overseeing all aspects of investigations and remedial action activities including emergency response, 72-Hour and 14-Day reporting, initial abatement activities, multiple stages of investigation reporting, conceptual remediation plans, pilot testing, design and operation of SVE systems, groundwater monitoring, and site closure. She maintains a comprehensive understanding of 20 NMAC 12.5 which will ensure compliance with State regulations. She also provided NMED oversight to an emergency response at the Bulk Fuel Facility in Albuquerque, New Mexico when there was an accidental overfill of an AST of greater than 10,000 gallons. During the past seven years she has worked on numerous State Lead sites as a project manager (Atex 213, Bass, Halsell's Grocery, Hondo School, Jennings, Marvin Burrows, and Old Horn Isleta) writing workplans, reports, obtaining property access, managing field staff, performing field investigations, installing groundwater monitoring wells, performing NAPL recovery, and performing groundwater sampling activities in monitoring wells and private wells.

David Werth - Geologist
Academic Degrees:
B.S., University of Texas at Austin, Hydrology/ Environmental Geology, 2010

Registration:
Professional Geologist—AZ (No. 61786), 2016; UT (No. 9623683-2250), 2016, U.S. Environmental Protection Agency CFC/HCFC Refrigerant Processing Certification; 1999, Texas Board of Professional Geoscientists GIT; 2012, State of Utah Underground Storage Tank Groundwater and Soil Sampler; 2013

Other Pertinent Training:
OSHA 40-Hour Hazardous Waste Operations Safety Training; 2000, OSHA 8-Hour Hazardous Waste Operations Safety Training Refresher (annually), OSHA 8-Hour Hazardous Waste Operations Safety Supervisor Training; 2010, OSHA 30-Hour Construction Safety Training; 2015

Experience in Storage Tank investigations
Mr. Werth has prepared a work plans for groundwater monitoring and/or NAPL recovery at numerous Sate Lead Sites including Climate Roofing, Former Mobil #7, Hall's Wells, Halsell's Grocery, Jennings Property, Worley Mills, Yocum's Texaco, Fairview Station, and Tucumcari Airport. He has conducted field work contained in the work plans along with interpreting and reporting the findings of the information collected. He has performed LUST investigations s for over 7 years in New Mexico, Utah, and Texas. He is well-versed in well installation utilizing multiple drilling technologies, UST and AST closure sampling, NAPL recovery, vapor intrusion investigations, remediation system installations, and operation and maintenance. He is a licensed professional geologist in the States of Arizona and Utah.

Jay Snyder – Principle Scientist/Hydrogeologist

Academic Degrees:
B.S., Meteorology; Texas A&M University, 1988; B.S., Geology, University of Wisconsin at Platteville, 1982; M.S., Geology/Geophysics, New Mexico State University, 1986; M.S., Geological Engineering, University of Idaho, 2014

Registration:
Professional Geologist—AL (No.1454); AR (No. 1852); AZ (No. 45804); CA (No. 8048); ID (No. PGL-1550); KS (No. 905); LA (No. 438), NE (G-0366); OR (No. G2454); TX (No. 867); UT (No. 8947362-2250); and WI (No. 1306-13), Professional Engineer—CO (No. PE.0051233); 2016, Certified Hydrogeologist—CA (No. 978); 2013, Professional Hydrologist Groundwater – American Institute of Hydrology (13-HGW-5005), Licensed Soil and Groundwater Remediation Contractor; NM (GS-29); 2005

Other Pertinent Training:
Geochemistry and Hydrology of Waste Rocks, Tailing, and Pit Lakes, New Mexico Tech; Fall 2015, Vapor Intrusion – Learning the Current Approaches, at Battelle Conference on Recalcitrant Compounds, Monterey, California; 2012, Horizontal Wells: Enhanced Access for Characterization and Remediation, at Battelle Conference on Recalcitrant Compounds, Monterey, California; 2012, Environmental Forensics, Northwest Environmental Training Center, 2012, Stable Isotopes in Environmental and Forensic Geochemistry, at Battelle Conference on Recalcitrant Compounds, Monterey, California; 2010, Contaminant Chemistry and Transport in Soil and Groundwater, Northwest Environmental Training Center; 2008, Remediation by Natural Attenuation, National Groundwater Association; 1999, Risk-Based Corrective Action, University of Houston; 1998, Vadose Zone Hydrology Short Course, Daniel B. Stephens & Associates, Inc.; 1991, RCRA Training, PRC EMI; 1990, OSHA 40-Hour Hazardous Waste Operations Training, OSHA 40-Hour Annual Refresher.

Experience in Storage Tank investigations
Mr. Snyder has over 28 years of experience remediating petroleum storage tank sites in New Mexico, Texas, Arizona, California, Nevada, and Alaska. He has prepared Final Remediation Plans for a number of high-profile state-lead sites in New Mexico, including Hobbs City Wells, Tatum Cotton Butane, Reese Drive Shell, JR's Food Mart, Coronado Airport, and Lee's Gung Fu. He has managed hundreds of hydrogeologic investigations, pilot tests and remedial action plans at leaking underground storage tank facilities, Resource Conservation and Recovery Act (RCRA) facilities, Superfund sites, and oil and gas facilities. He specializes in risk-based corrective action at hydrocarbon contaminated sites, remedial investigations at hazardous waste sites, and evaluation of remedial alternatives at a wide variety of sites, including fuel hydrocarbon, chlorinated solvent, heavy metals, and wood treatment sites. Mr. Snyder has applied a wide variety of remedial technologies at sites, including groundwater pump and treat, air sparging, multiphase extraction, in situ thermal desorption, soil vapor extraction, in situ bioremediation, monitored natural attenuation, land farming, chemical oxidation, and permeable reactive barriers. He has permitted numerous remediation systems, including Class V injection wells, discharge plans, and New Source Review for air emissions.

Sharon Richmond – Bioremediation/Microbiology
Academic Degrees:
B.S, Pre-Medical Microbiology/Chemistry, Northern Arizona University, 1991; M.S., Applied and Environmental Microbiology, Northern Arizona University, 1994; Ph.D., Biological Sciences, University of Alaska Fairbanks, 2001

Registration:
Qualified Environmental Professional (QEP)—AK (18 AAC 75.333 and 18 AAC 78.088), 1999

Other Pertinent Training:
OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training; 2017, Strategies for Monitoring the Performance of Dense Non-Aqueous Phase Liquid Source Zone Remedies; 2009, Interstate Technology Regulatory Council Vapor Intrusion; 2006, 2007, 2009
Natural Attenuation of Chlorinated Solvents; 2008, Battelle's Chlorinated and Recalcitrant Compounds, Method 8330B; 2008, Sampling for Defensible Environmental Decision-Making; 2006, Data Quality Objectives; Managing Uncertainty with Systematic Planning for Environmental Decision-Making; 2005, Dense Non-Aqueous Phase Liquids, Performance Assessment; 2005.

Experience in Storage Tank investigations
Dr. Richmond is an environmental microbiologist and chemist with more than 27 years of experience investigating and remediating environmental contaminants. Her current and previous responsibilities include management and technical oversight of more than 250 contaminated sites associated with federal facilities, and numerous other private and federal civilian sites across urban and rural Alaska. She is an experienced research scientist, having studied the effects of groundwater/surface water interactions and nutrient amendment on groundwater biogeochemistry, natural attenuation, and enhanced bioremediation of chlorinated aliphatics and petroleum hydrocarbons at contaminated sites. She has managed all phases of site investigation and remediation and maintains current knowledge of the technical aspects of sampling and chemical analysis of soil, groundwater, and soil gas/vapor intrusion monitoring. Dr. Richmond has authored or reviewed hundreds of documents including: technical memoranda, site investigation reports, underground storage tank removal reports, risk assessments, Uniform Federal Policy (UFP)-Quality Assurance Project Plans (QAPPs), preliminary source evaluations, remedial investigations, feasibility studies, proposed plans, Records of Decision, and five-year Record of Decision reviews.

Vener Mustafin – Engineer in Charge
Academic Degrees:
B.S. and M.S., Civil Engineering/Construction Management, Tajik Technical University, 1994;
M.S., Civil Engineering, Environmental, University of New Mexico, 1997

Registration: Professional Engineer (Environmental) NM (No. 17630), 2006; NV (No. 19987), 2009; AZ (No. 50186), 2009; TX (No. 110533) 2012, UT (No.8188418-2202), 2012

Other Pertinent Training:
Battelle Conference Remediation of Chlorinated and Recalcitrant Compounds, National Groundwater Association "Remediation of Chlorinated Solvents in Groundwater", U.S. Army Corps of Engineer Air Sparging, Soil Vapor Extraction, and Multiphase Extraction,
OSHA 40-Hour Hazardous Waste Operations Training, and OSHA 10-Hour Construction Safety

Experience in Storage Tank investigations:
Mr. Mustafin has designed and oversaw and/or directed excavation, backfilling, compaction and site restorations at Nick's Chevron, Belen; Guggino's Station, Belen; Hanz Bazen, Los Lunas; Santa Fe Nimitz, Grants; Holiday Chevron, Tucumcari; Didio's Service Station, Bernardo; Gasamat, Bosque Farms; Climate Roofing, Albuquerque; Sullivan Stables, Albuquerque; Century 21, Roswell; and Sparkle Car Wash, Albuquerque. He also designed, oversaw/directed construction of remediation system, and/or conducted operations and maintenance to address remediation of petroleum hydrocarbons at Fina Truck Stop, Albuquerque (vapor enhanced NAPL recovery and bioventing); Laguna Mart, Laguna (MPE, nutrient-enhanced bioremediation, bioventing, air sparging); Budget Tire, Deming (SVE, thermal catalytic destruction); Portales Chevron, Portales (MPE, air stripping, gravity separation, thermal

destruction); Midway Chevron, Sapello (MPE, gravity separation, air stripping, thermal destruction, in-situ chemical oxidation); Mike's Auto Detailing, Belen (MPE, NAPL skimming, gravity separation, air stripping, thermal destruction, thermally-enhanced volatilization); Ryder Truck Stop, Albuquerque (NAPL skimming, MPE, gravity separation, carbon adsorption); Driver's Travelmart, San Jon (surfactant-enhanced NAPL recovery pilot testing; mobile DPE); Lee's Conoco, Albuquerque (air sparging, SVE); and Santa Fe Judicial Complex, Santa Fe (thermally enhanced volatilization, SVE, thermal destruction, NAPL recovery).

Tyler Curley - Engineer
Academic Degrees:
B.S., Colorado State University, Civil Engineering, 2011

Registration:
Professional Engineer—NM (No. 23885), 2016

Other Pertinent Training:
OSHA 40-Hour Hazardous Waste Operations Safety Training; 2011, OSHA 8-Hour Hazardous Waste Operations Safety Training Refresher (annually), OSHA 30-Hour Construction Safety Training; 2016, Construction Quality Management Training, 2015.

Experience in Storage Tank investigations
Mr. Curley has 5 years' experience in design, installation, and operation and maintenance of remediation systems at petroleum storage tank sites in New Mexico. He has prepared design plans, performed construction oversight, and installed remediation systems at a number of sites in New Mexico including, Driver's Travel Mart, Fina Truck Stop, Laguna Mart, Laun Dry, Midway Chevron, and Mike's Auto Detail.

Max Key – Remediation Technician
Academic Degrees:
B.S., Geology, Stephen Austin State University, 2009

Registration:
None

Other Pertinent Training:
OSHA 40-Hour Hazardous Waste Operations Safety Training; OSHA 8-Hour Hazardous Waste Operations Safety Training Refresher (annually).

Experience in Storage Tank investigations
Mr. Key has 8 years' experience in the environmental industry performing soil and groundwater assessment and remediation at retail gasoline facilities and natural gas/petroleum gathering and transmission facilities. He has performed soil vapor contaminant assessments, remediation system installation and O&M, and monitoring well installation.

E.4 Subcontractor Information

Subcontractor information and capabilities are provided in Tab N-1 and on Table E-3. Subcontractors will have the primary responsibility for the execution of specialized services included in the approved work plan and will report directly to EA Technical Personnel. Subcontractors will also have reporting

responsibilities to the Project Manager or Program Manager as needed. EA will maintain responsibility for the quality of work and performance of its Subcontractors.

E.5 Equipment, Health and Safety, and Licensure

Equipment
EA maintains an inventory of company-owned field vehicles, equipment, field safety supplies, surveying equipment, various field air and water quality monitoring equipment, sampling tools, hand tools, generators, submersible pumps, and other equipment that allow for the accomplishment of all services expected under this contract (Table E-4). EA's subcontractors have available resources and equipment to achieve project goals and can support NMED's current mission with the ability to quickly respond.
EA has invested in computer resources and networks that facilitate communication, publication, and information management to contribute to the successful completion of work orders. EA offices are connected via an ethernet-based area network. EA is equipped with AutoCAD, Geographic Information System, modeling, and document production software.

These resources enable EA to effectively manage environmental data to make informed and rational environmental business decisions in a timely manner, in emergency and non-emergency situations, with NMED PSTB.

A listing of EA owned equipment in Albuquerque is provided in Table E-4.

Health and Safety
EA is committed to health and safety. Prior to conducting any fieldwork, EA will prepare a site-specific health and safety plan (HASP) in accordance with the requirements of Title 29, Code of Federal Regulations, and Part 1910.120. A copy of an EA site specific health and safety plan is included in Tab O.

Licensure – CID and PE
EA is a licensed soil and groundwater remediation contractor (Jay Snyder [GS 29 License # 359538], Qualifying Party) and maintains New Mexico Professional Engineers in both Alameda, California (Stan Wallace) and Albuquerque, New Mexico (Vener Mustafin and Jay Snyder). Vener Mustafin is an EA employee and can contractually bind EA. A current copy of Mr. Mustafin's Professional Engineering License and statements that Mr. Mustafin can contractually bind EA and that he is in compliance with the Professional Engineer Rules, Parts 8 and 9 of 16.39 NMAC are included in Tab P. The CID license and a printout showing that Mr. Snyder is the Qualifying Party are provided in Tab Q.

E.6 References

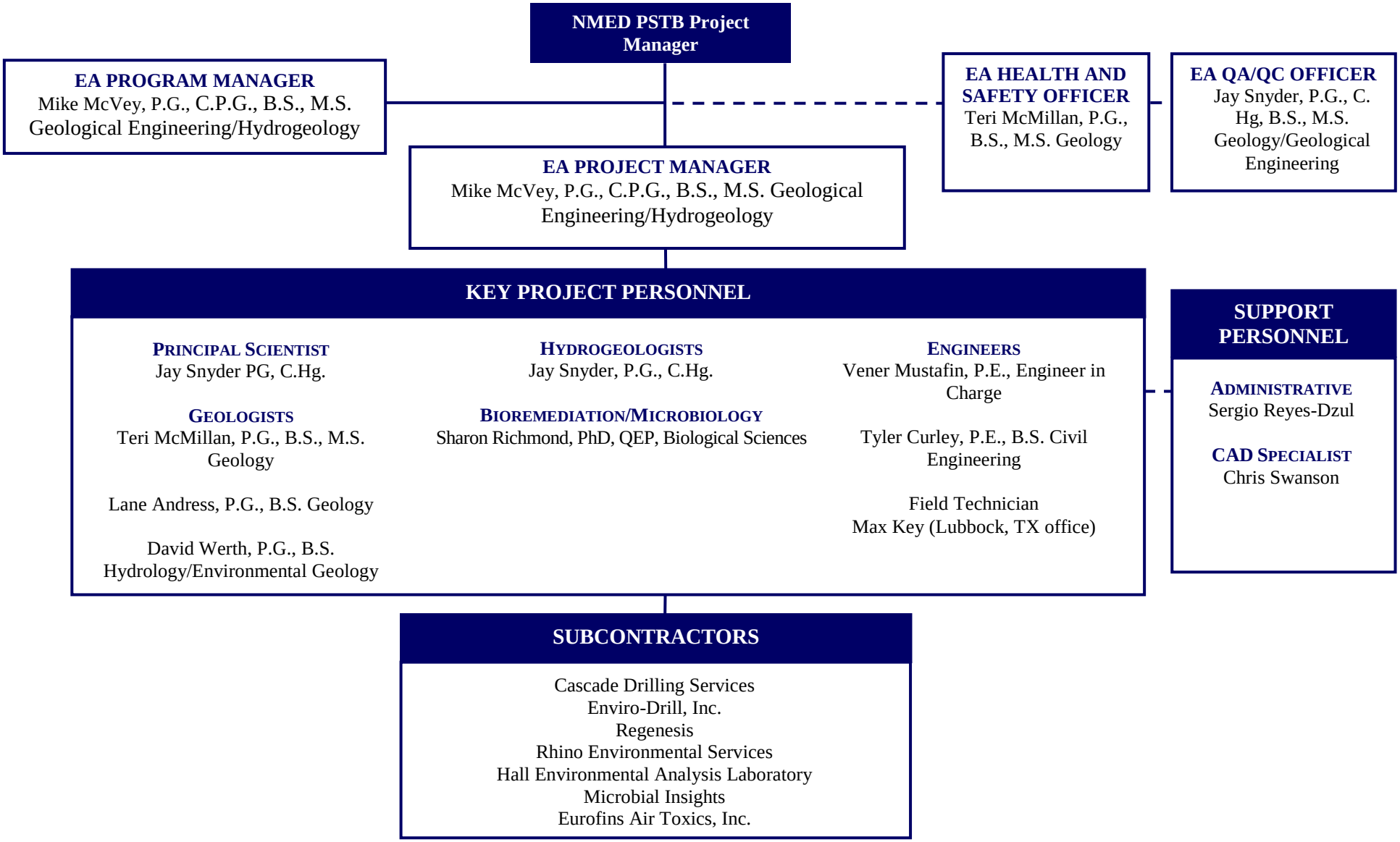
References have been completed and submitted directly to NMED. EA's references include Allsup Petroleum Inc., Three Star Corporation LLC, and The Truck Stop Plaza, LLC. Table E-5 provides the business reference information.

E.7 Commitment to Oral Presentation

EA Engineering, Science, and Technology, Inc., PBC agrees to provide the Evaluation Committee the opportunity to interview proposed staff members identified by the Evaluation Committee, at the option of the Agency. EA understands and accepts that the Evaluation Committee may request a finalist to provide an oral presentation of the proposal as an opportunity for the Evaluation Committee to ask questions and seek clarifications as stated in in Section V.B(5) of the RFP.

EA Engineering, Science, and Technology, Inc., PBC

FIGURE E-1 ORGANIZATIONAL CHART



EA Engineering, Science, and Technology, Inc., PBC

TABLE E-1
PROJECT STAFF QUALIFICATIONS - PST REMEDIATION ACTIVITIES

Staff Member	Years Experience	PREDESIGN INVESTIGATION, PILOT TESTING, REMEDIATION PLANS, REMEDIAL ACTION, AND OPERATION AND MAINTENACE ACTIVITIES																								
		LUST Project Management	Site Investigations (MSA & Secondary Investigations)/Pre Design Investigations	Emergency Response/Temporary Water Supply	Active Soil Gas Sampling	Passive Soil Gas Sampling	Vapor Intrusion Investigation	Vapor Mitigation	NAPL Containment and Removal	Contaminated Soil Excavation	Aquifer Pumping Tests	SVE Pilot Testing	MPE Pilot Testing	Injection Pilot Testing	Remedial Design / Remedial Action, Final Remediation Plans	Groundwater Pump and Treat	Multiphase Extraction	In Situ Bioremediation	Ex Situ Bioremediation	In Site Thermal Desorption	Chemical Oxidation	Air Sparging	Groundwater Monitoring	Groundwater and Vadose Zone Modeling	Remediation System Operation & Maintenance	Remediation System Optimization and Performance Assessment	Plugging and Abandonment	Public Meetings and Support	Expert Testimony
Mike McVey, P.G. , C.P.G.	30	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Jay Snyder, P.E., P.G., C.Hg.	28	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Teri McMillan, P.G.	25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	
Vener Mustafin, P.E	19	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	
Lane Andress, P.G.	16	●	●		●				●	●	●	●			●	●		●	●	●			●		●	●	●	●	
David Werth, P.G.	7	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Tyler Curley, P.E.	6	●	●		●	●		●	●	●	●	●			●			●	●	●			●		●	●	●		
Max Key	8		●					●	●	●	●	●			●			●	●	●			●		●	●	●		

EA Engineering, Science, and Technology, Inc., PBC

TABLE E-2
PROJECT STAFF QUALIFICATIONS - HYDROGEOLOGIC ASSESSMENT

Staff Member	Years Experience	HYDROGEOLOGIC CHARACTERIZATION EXPERIENCE																	
		Direct Push Drilling	Membrane Interface Probe	Hollow Stem Auger Drilling	Air Rotary Drilling	Mud Rotary Drilling	Rotary Casing Hammer	Sonic Drilling	Unconsolidated Sediment	Bedrock	Fractured Bedrock	Vapor Testing Wells	Shallow Monitor Wells	Surface Cased Monitor Wells	Private Supply Wells	Horizontal Mud Rotory Drilling	Vapor Abatement Wells	Multi-Level Monitoring Wells	Geophysical Logging and Sub-Surface Surveys
Mike McVey, P.G., C.P.G.	30	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Jay Snyder, P.E., P.G., C.Hg.	28	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Teri McMillan, P.G.	25	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●
Vener Mustafin, P.E.	19	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●
Lane Andress, P.G.	16	●		●	●		●	●	●	●	●	●	●		●	●	●	●	●
David Werth, P.G.	7	●		●	●	●	●		●	●	●	●	●			●	●	●	●
Tyler Curley, P.E.	6	●		●	●	●		●	●	●	●	●	●		●	●	●		●
Max Key	8			●	●	●			●	●	●	●	●		●	●	●		●

EA Engineering, Science, and Technology, Inc., PBC

TABLE E-3
SUBCONTRACTORS

	Location	Experience and Capabilities
Drillers		
Cascade Drilling Services	Peralta, New Mexico	Hollow stem auger, rotary - air and mud, sonic, ODEX, direct push, well plugging and abandonment, amendment injection
Enviro-Drill, Inc.	Albuquerque, New Mexico	Hollow stem auger, rotary drilling - air and mud, , direct push drilling, and well plugging and abandonment
Vendors		
Regenesis	San Clemente, California	Innovative technologies and services to treat a wide range of contaminants, including petroleum hydrocarbons and chlorinated solvents, via enhanced bioremediation, chemical oxidation, desorption and metals immobilization
Environmental Services		
Rhino Environmental Services	El Paso, Texas	Excavation services, trenching, underground system construction, system decommissioning, contaminated water and soil disposal
Laboratories		
Hall Environmental Analysis Laboratory	Albuquerque, New Mexico	Analytical laboratory familiar with PSTB sampling and analytical requirements, can provide rapid turn around if required
Microbial Insights	Knoxville, Tenneessee	Broad spectrum of Molecular Biological Tools (MBTs) and Site Logic services with the goal of aiding in characterizing, understanding, and managing biological processes
Eurofins	Folsom, California	Analytical laboratory specializing in air, vapor, and soil gas samples

EA Engineering, Science, and Technology, Inc., PBC

TABLE E-4
SUMMARY OF AVAILABLE EQUIPMENT
EA ENGINEERING, SCIENCE, AND TECHONOLGY, INC., PBC

EQUIPMENT ON-HAND		
Item	Description	Location
1	Geotech Interface Probe, 200 ft.	EA - ABQ
2	Solnist Water Level Meter, 200 ft.	EA - ABQ
3	Solnist Interface Probe, 500 ft.	EA - ABQ
4	Ion Science Photoionization Detectors	EA - ABQ
5	Rae Systems MiniRae 3000 Photoionization Detectors	EA - ABQ
6	Tygon tubing and in line filters for PID and LEL/O2	EA - ABQ
7	QRae II LEL/Combustible Gas Indicators	EA - ABQ
8	Oakton Water Quality Meters (SpC, Temp, pH)	EA - ABQ
9	Hanna Water Quality Meter (SpC, Temp, pH, DO, ORP)	EA - ABQ
10	UltrMeter II Water Quality Meter	EA - ABQ
11	YSI Pro Plus Water Quality Meters (SpC, Temp, pH, DO, ORP)	EA - ABQ
12	Flow-Through Cells	EA - ABQ
13	YSI ProODO Meter	EA - ABQ
14	Portable Generators	EA - ABQ
15	Portable Air Compressors	EA - ABQ
16	Portable Hammer Drill	EA - ABQ
17	Hand Augers	EA - ABQ
18	Hach 2100Q Turbidity Meters	EA - ABQ
19	Full-Face Respirators	EA - ABQ
20	Peristaltic Pump	EA - ABQ
21	Mega Monsoon Submersible Pump	EA - ABQ
22	Bennett Submersible Piston Pumps	EA - ABQ
23	Water Tanks (500, 300, 150 gallon)	EA - ABQ
24	Wattera Foot Valve and Tubing	EA - ABQ
25	Metal Detectors	EA - ABQ
26	Digital Camera	EA - ABQ
27	GAST Pump	EA - ABQ
28	Grundfos Redi-Flo 2 groundwater sampling pump and tubing	EA - Dallas
29	Hand Auger	EA - ABQ
30	Shaw Back Pack Drill	EA - ABQ
31	Disposable polyethylene bailers	EA - ABQ
32	Polyethylene tubing, silicon surgical tubing	EA - ABQ
33	Fully found tool box	EA - ABQ

EA Engineering, Science, and Technology, Inc., PBC

TABLE E-4
SUMMARY OF AVAILABLE EQUIPMENT
EA ENGINEERING, SCIENCE, AND TECHONOLGY, INC., PBC

EQUIPMENT ON-HAND		
34	Miscellaneous Health & Safety Supplies including nitrile gloves, steel-toe boots, work gloves, safety vests, traffic cones, traffic signs, hard hats, safety glasses, fall protection harness, chemical resistant gloves, emergency first aid kits, ear plugs, eye wash, fire extinguishers, etc.	EA - ABQ
35	Utility Van	EA - ABQ
36	Half-TonTrucks (2) (1 with 4x4)	EA - ABQ
37	3/4-TonTruck	EA - ABQ
38	1-Ton Trucks (2) flat beds equiped with lift-gates, compressors, Bennett Pumps, etc.	EA - ABQ
Facilities & Services		
1	Office in Albuquerque, New Mexico	EA - ABQ
2	Personnel near Southeast New Mexico in Lubbock and Odessa, Texas	EA - TX
3	CAD, GIS, and Groundwater and Vadose Zone Modeling capabilities	EA - ABQ
4	Real-time analyticals via portable gas chromatograph and similar equipment	EA - ABQ
5	Environmental Site Assessments	EA - ABQ
EQUIPMENT AVAILABLE WITHIN 24-HOURS UNDER CONTRACT		
EA has a contract with Geotech Environmental Equipment, Inc. and can rent additional equipment.		

EA Engineering, Science, and Technology, Inc., PBC

TABLE E-5
BUISNESS REFERENCE INFORMATION
EA ENGINEERING, SCIENCE, AND TECHONOLGY, INC., PBC

References

Client Name	Project Description	Project Dates	Technical Environment	Staff Assigned to Reference Engagement	Client Project Manager
Allsup Petroleum Inc.	Corrective action services at over 20 Allsup's sites and tank removal sampling activities at over 19 sites located throughout New Mexico	2002 to Present	Tank removal sampling activities, 72 hour & 14-Day Reporting, Interim Removal, Preliminary Investigations- MSA and Secondary Investigations, Groundwater Monitoring, NAPL Recovery, System Decommissioning, Well Plugging and Abandonment	Jay Snyder, Teri McMillan, David Werth	Jeff Scarbrough 575-769-2311 - Work 575-769-2564 - Fax jeff.scarbrough@allsups.com
The Truck Stop Plaza, LLC	Fina Truck Stop - Albuquerque, New Mexico	2002 to Present	Phase 2 NAPL Recovery and Groundwater Monitoring	Vener Mustafin, Tyler Curley	Sheryl Paloni (505) 328-7979 - Work none - Fax paltruper@aol.com
Three Star Corporation LLC	Phillips 66 Socorro Site, Socorro, New Mexico	2012 to Present	Phase 2 NAPL Recovery and Groundwater Monitoring, direct-push investigation	Teri McMillan, Tyler Curley, David Werth	Patricia Jones (865)-806-2922 - Work (865)-252-1111 - Home patti.jones@franklincovey.com

EA Engineering, Science,
and Technology, Inc., PBC

If selected as a finalist, EA Engineering, Science, and Technology, Inc., PBC agrees to provide the Evaluation Committee the opportunity to interview proposed staff members identified by the Evaluation Committee, at the option of the Agency. The Evaluation Committee may request a finalist to provide an oral presentation of the proposal as an opportunity for the Evaluation Committee to ask questions and seek clarifications.

Jay T. Snyder
Albuquerque Operations Manager

Michael D. McVey, P.G., C.P.G.
Senior Hydrogeologist

Mr. McVey has 30 years of professional experience in the environmental industry serving a variety of federal, state, and commercial clients as a client services manager, program manager, senior project manager, and senior technical lead. He has managed hundreds of hydrogeologic investigations, pilot tests, and remedial action plans at leaking underground storage tank facilities; interfaced with regulatory agencies, designed in situ and laboratory testing programs to determine material properties; and provided expert testimony.

Mr. McVey has also managed investigation, characterization, and remediation activities at Department of Energy facilities, Resource Conservation and Recovery Act (RCRA) facilities, and Superfund sites for both soil and groundwater contamination problems resulting from past and present operations. He has applied a wide variety of remedial technologies at contaminated sites, including groundwater pump-and-treat, air sparging, multiphase extraction, soil vapor extraction, in situ bioremediation, monitored natural attenuation, and land farming. Mr. McVey has served as the program manager for New Mexico Environment Department (NMED), New Mexico Department of Transportation (NMDOT), and New Mexico Oil Conservation Division (NMOCD) contracts.

Education
M.S./Geological Engineering/ Hydrogeology/1990 (South Dakota School of Mines and Technology)
B.S./Geological Engineering/1986 (South Dakota School of Mines and Technology)

Registrations/Certifications
Professional Geoscientist—Texas (2003, No. 664)
Professional Geologist—Wyoming (1992, No. PG-1273)
Certified Professional Geologist, American Institute of Professional Geologists (1997, No. 9028)

Specialized Training
OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training
OSHA 8-Hour Hazardous Waste Operations and Emergency Response Refresher, Current
OSHA 8-Hour Hazardous Waste Operations Manager/Supervisor Refresher, Current
OSHA 10-Hour Construction Industries Outreach Training
ASTM International Risk-Based Corrective Action Applied at Petroleum Release Sites
Princeton Remediation Course
NPDES Regulations Workshop
Radiological Worker 1I and II Certification, Department of Energy
CPR and First Aid Training, Current

Experience
Years with EA: <1 Total Years: 30

Professional Experience

***Program Management*—**Served as Program Manager for numerous contracts with the State of New Mexico, including NMED – Petroleum Storage Tank Bureau (PSTB) and Groundwater Quality Bureau (GWQB), NMDOT, and NMOCD. Responsibilities included scope and pricing negotiations, subcontractor and team partner management, project management, staffing selection, and client management.

Project Management—Experienced in managing technical staff, scheduling, procurement, and financial aspects of complex environmental projects with multiple stakeholders, including federal and state agencies, tribes, and public interest groups.

Site Characterization and Remediation—Specialize in risk-based corrective action at petroleum hydrocarbon contaminated sites, remedial investigations at hazardous waste sites, contaminant fate and transport, and evaluation of remedial alternatives at a wide variety of sites, including petroleum hydrocarbons, chlorinated solvents, and wood treatment facilities. Implemented a variety of different remedial technologies at sites, including groundwater pump and treat, air sparging, multiphase extraction, soil vapor extraction, in situ bioremediation, monitored natural attenuation, land farming, and chemical oxidation.

Phase I and II Environmental Site Assessments—Extensive experience performing Phase I and Phase II environmental site assessments in accordance with current ASTM International standards. Phase I environmental site assessments for due diligence have included single-site real property and large portfolio transactions at commercial, industrial, and retail locations. Subsequent Phase II environmental site assessments have included hydrogeologic investigations, soil and water quality analysis, contaminated soil delineation and removal, conceptual

remedial action design, pilot studies, remediation system analysis and feasibility studies, mobile mapping and geographic information system, and construction management.

Selected Publications and Presentations

von Gonten, S., M. McVey, and G. Peterson. 2016. *Cleanup of Petroleum Contaminated Soil at the Former Midway Grocery Gasoline Station in Jarales, New Mexico.* In: The Geology of the Belen Area, Frey, Bonnie A.; Karlstrom, Karl E.; Lucas, Spencer G.; Williams, Shannon; Zeigler, Kate; McLemore, Virginia; Ulmer-Scholle, Dana S., New Mexico Geological Society, Guidebook, 67th Field Conference. pp. 95-96.

McVey, M. and S. von Gonten. 2016. *Petroleum Hydrocarbon Permeation of a PVC Water Line and Cleanup via Soil Excavation and Water Line Replacement*. Presented at the AIPG 53rd National Conference, Santa Fe, New Mexico. 10-13 September.

Golden, T., S. von Gonten, and M. McVey. 2013. *Thermally Enhanced Remediation Success.* Presented at the 24th National Tanks Conference and Expo. Denver, Colorado. 16 September.

Golden, T., M. McVey, G. Peterson, and J. Doesburg. 2012. *Thermally enhanced remediation in Santa Fe, New Mexico, and potential applications for chlorinated hydrocarbon remediation.* Presented at Eighth Annual Conference, Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California. 21-24 May.

McVey, M. and S. von Gonten. 2009. *Remediation of Petroleum Hydrocarbon Permeation of a PVC Water Line*. Presented at the 21st National Tanks Conference and Expo. Sacramento, California. 30 March – 1 April.

Peace, J.L., T.J. Goering, and M.D. McVey. 2002. *Report of the Mixed Waste Landfill Phase 2 RCRA Facility Investigation, Sandia National Laboratories/New Mexico*. SAND2002-2997. September.

McVey, M.D. 1999. *Deployment of an alternative cover and final closure of the Mixed Waste Landfill, Sandia National Laboratories/New Mexico*. Prepared for U.S. Department of Energy, Albuquerque Operations Office. 23 September.

McVey, M.D. 1999. *Strategy for deployment of an alternative cover and final closure of the Mixed Waste Landfill, Sandia National Laboratories/New Mexico*. Prepared for U.S. Department of Energy, Albuquerque Operations Office. 12 April.

McVey, M.D., T.J. Goering, and J. Peace. 1996. *Passive and Active Soil Gas Sampling at the Mixed Waste Landfill, Technical Area III, Sandia National Laboratories/New Mexico*. SAND95-1356. February.

Peace, J., T.J. Goering, and M.D. McVey. 1996. *Tritium in Surface Soils at the Mixed Waste Landfill, Technical Area 3, Sandia National Laboratories/New Mexico*. SAND95-1611. March.

Goering, T.J. and M.D. McVey. 1996. *Analysis of Instantaneous Profile Test Data from Soils near the Mixed Waste Landfill, Technical Area 3, Sandia National Laboratories/New Mexico*. SAND95-1637. February.

Bayliss, S.C., T.J. Goering, M.D. McVey, W.R. Strong, and J.L. Peace. 1996. *Preliminary Data from an Instantaneous Profile Test Conducted near the Mixed Waste Landfill, Technical Area 3, Sandia National Laboratories/New Mexico*. SAND96-0813. April.

Roepke, C.S., W.R. Strong, H.A. Nyugen, M.D. McVey, and T.J. Goering. 1996. *Unsaturated Hydrologic Flow Parameters Based on Laboratory and Field Data for Soils Near the Mixed Waste Landfill, Technical Area 3, Sandia National Laboratories/New Mexico*. SAND96-2090. August.

McVey, M.D. 1992. *Use of Granular Activated Carbon for Treatment of Explosives-Contaminated Ground Water*. Abstract of M.S. Thesis, Ground Water, Vol. 30, No. 2. March-April.

Peace, J., T.J. Goering, and M.D. McVey. 1990. *Report of the Phase I RCRA Facility Investigation of the Mixed Waste Landfill*. Prepared for U.S. Department of Energy, Albuquerque Operations Office. September.

EA Project Experience

To be completed

Other Project Experience

Butte Wildfire Cleanup Project, Calaveras County, California; Cal Recycle and California Office of Emergency Services; 2015—As one of six Division Supervisors, managed six debris removal crews and their Task Force Leaders during cleanup of more than 850 residential properties that were destroyed by the Butte Fire. Reviewed debris removal documentation, worked closely with the general contractor, trucking contractor, CalRecycle, California Office of Emergency Services, and the Federal Emergency Management Agency contractor, assessing site access conditions and work schedule to ensure a smooth, logical, and cost-effective progression of work. Interfaced daily with affected residents, negotiating cleanup work schedules and coordinating property recovery efforts.

Petroleum Storage Tank Cleanup Program; NMED PSTB, New Mexico; 2003-2018—Program Manager and senior technical lead for approximately 100 state-lead and responsible party-lead leaking underground and aboveground storage tank sites located throughout New Mexico. Responsible for overall project management associated with all phases of investigation and characterization through corrective action, including technical guidance and project quality assurance, budget tracking, regulatory compliance, and staff management.

Professional Services (State Lead) Contract; NMED PSTB, New Mexico; 2004-2018—Program Manager and contract liaison for several 4-year PSTB Professional Services contracts. Responsible for overall contract management, including budget development and tracking, and overall project management, including regulatory compliance, staff management, coordination with emergency response entities (i.e., fire, police, etc.), PSTB personnel, local civil entities (i.e., public works, city personnel, etc.), media, and the public. Develop and implement proper response activities to mitigate immediate threat to human health and the environment, including product recovery and containment, drilling, excavation and disposal, providing alternate (temporary and/or permanent) potable water, and any other activities required to control and mitigate released contamination.

Environmental Services Contract; NMED GWQB, New Mexico; 2010-2018—Program Manager and contract liaison for a contract providing consulting services at Brownfields and State-lead Superfund sites. Responsible for coordinating with NMED, project managers, and team members in preparing and executing scopes of work for Phase I and II site assessments and limited remedial actions throughout the state.

Site Maintenance and Monitoring Contract; NMDOT, New Mexico; 2003-2016—Program Manager and contract liaison for NMDOT site maintenance and monitoring contract. Responsible for overall contract management, including budget development and tracking, senior technical review for investigations and remedial actions performed under the contract.

Hazardous Materials Contract; NMDOT, New Mexico; 2003-2018—Program Manager and contract liaison for NMDOT hazardous materials contract. Responsible for overall contract management, including budget development and tracking, senior technical review for initial site assessments, follow-on preliminary site investigations, and detailed site investigations.

Assessment, Investigation, and Removal Services Contract, Multiple locations throughout Texas; Texas Commission on Environmental Quality; 2014-2018—Project Manager for task orders performed under the Assessment, Investigation, and Removal Services contract for the Texas Commission on Environmental Quality. Responsibilities included development of scope of services for Superfund, Brownfields, and removal action projects throughout Texas for several contaminants, including heavy metals, chlorinated solvents, and smelter wastes. Performed senior technical review on planning documents and final reports.

Investigation of Chemical Release, Albuquerque, New Mexico; Intel Corporation; 2011—Project Manager and technical lead responsible for investigation, characterization, and remediation of contaminated soils associated with release of chemicals from process waste line. Developed and implemented work plans for two phases of investigation and characterization to determine magnitude and extent of contamination resulting from process waste chemical release. Authored final report detailing findings of investigation and characterization and provided recommendations for corrective action. Developed and implemented corrective action plan, which included excavation of contaminated soil within a highly complex surface and subsurface environment consisting of numerous aboveground tanks, process and waste lines, and buried utilities.

Site Abatement and Alternative Soil Cover Modeling, Newman Well #1, Carlsbad, New Mexico; New Mexico Energy, Minerals and Natural Resources Department, NMOCD; 2010-2012—Project Manager for vadose-zone modeling using UNSAT-H simulations to determine moisture flux through an engineered evapotranspiration cover proposed for an alternative, onsite approach to disposal of salinity-impacted soil at a former oil well location. Model runs were designed to simulate a variety of material characteristics, surface treatments, and climatic conditions. Favorable model results supported installation of the alternative abatement approach, potentially resulting in significant reductions in site remediation costs.

Landfill Gas Assessment and Risk Abatement, Albuquerque, New Mexico; Corley's Lincoln Mercury Volvo Dealership; 2009-2010—Project Manager and technical lead for conducting a landfill gas assessment on a large parcel of land located within a landfill buffer zone. The assessment was completed to address Albuquerque Environmental Health Department interim guidelines governing development within City designated landfill buffer zones. The assessment included the collection and analysis of multiple soil gas samples from the subsurface using a Geoprobe. Authored final report submitted to Albuquerque Environmental Health Department providing results of the assessment along with recommendations for limited risk abatement, monitoring, and reporting rather than active abatement or installation of an extensive abatement system. Implemented approved limited risk abatement by installing a series of landfill gas monitoring wells around the perimeter of the developed property with semiannual monitoring of the wells for landfill gases.

Vadose Zone Modeling, Carlsbad, New Mexico; Confidential Client; 2009—Project Manager responsible for vadose zone modeling in support of drilling mud pit closure. Two different vadose zone models were used to evaluate the potential for drilling mud pit contents to impact groundwater under three different pit design scenarios. Chloride was used as a conservative tracer to evaluate the migration. Activities included development of work plan and budget, file reviews at NMOCD and New Mexico Office of the State Engineer, sampling and analysis of drilling mud pit, preparation of a localized conceptual hydrogeologic model of the site for use in the modeling, and preparation of a final report.

District 4 Headquarters Remediation, Las Vegas, New Mexico; NMDOT; 2008-2016—Team coordinator for design modification and implementation of a groundwater extraction and treatment system for contamination from road salts, solvents, and gasoline products. Treatment processes include air stripping, metals treatment, and reverse osmosis. Project entailed design, construction observation, and operation of the remediation system at the site.

Lea County Electric Co-Op Remedial Action, Lovington, New Mexico; NMED PSTB; 2008-2018—Project Manager for the design and implementation of a soil vapor extraction system to remediate gasoline- impacted soil and phase-separated hydrocarbons in the vadose zone. The system included 6 soil vapor extraction wells that were routed separately through a common manifold to an internal combustion engine. The internal combustion engine unit oxidized the contaminated vapors prior to discharging to the atmosphere and was also capable of dual-phase extraction. Site well configuration was based on the analysis of pilot test data collected at the site. Tasks included engineering design, calculations, drawings and specifications, system plumbing, construction observation, system operation, field sampling, data analysis, and report preparation.

Santa Fe County Judicial Complex Remediation; NMED PSTB, Santa Fe, New Mexico; 2008-2012—Project Manager for American Council of Engineering Companies Engineering Excellence award-winning design and implementation of a jet grout barrier and soil vapor extraction/hot air injection system for remediation of petroleum-contaminated soil and free-phase gasoline. The $5 million project included design and construction oversight for installation of 600 linear ft of jet grouted barrier, 200 linear ft of slurry wall, and 3 horizontal and 13 vertical soil vapor extraction/hot air injection wells.

Anderson Lake Site Assessment, Malaga, New Mexico; Bureau of Reclamation; 2008-2009—Project Manager and technical lead responsible for investigation and characterization of soil and groundwater contamination resulting from unregulated disposal of oil field wastes. Activities included work plan and budget development, development of sampling and analysis plan, soil boring and monitoring well installation, groundwater and soil sampling, and final report preparation. Expert witness for Bureau of Reclamation in negotiations between the Bureau of Reclamation and the Responsible Party.

Salty Dog Brine Station Site Characterization and Remediation, Hobbs, New Mexico; PAB Services, Inc.; 2007-2018—Project Manager and senior hydrogeologist for site characterization and remediation of chloride impacted groundwater at a brine disposal facility in southeastern New Mexico. Two releases of brine, reported to the NMOCD, occurred at the site resulting in chloride groundwater plumes measuring approximately 1,100 ft long by approximately 500 ft wide and 600 ft long by 300 ft wide. The releases resulted in an Administrative Compliance Order being issued to the operator of the facility by NMOCD. Designed and implemented a groundwater investigation program that included the installation of nine groundwater monitoring wells, two nested wells, and two groundwater extraction wells. Performed pumping tests at the recovery wells to determine aquifer properties. Using the pumping test data, performed hydrologic modeling and an evaluation of water treatment alternatives to: (1) determine whether pumping from the extraction wells could provide sufficient capture of chloride-impacted groundwater at both release locations, (2) identify pumping rates necessary to achieve capture, and (3) evaluate drawdown caused by extraction well pumping and determine whether sufficient water columns exist to support the identified pumping rates. Proved the feasibility of pumping from the two extraction wells, resulting in remediation costs much lower than anticipated by the client, allowing for continued operation of the brine station while remediation is ongoing.

Artesia Aeration Land Farm Groundwater Characterization, Maljamar, New Mexico; Confidential Client; 2007—Project Manager and technical lead for determination of the source and extent of shallow groundwater discovered beneath a portion of an active land farm. The determination was required by the NMOCD prior to consideration of a permit application for planned expansion of the land farm. Developed and implemented the field investigation and prepared and submitted the final report detailing the findings of the investigation to the NMOCD.

Cunningham Station Power Plant Groundwater Assessment, Hobbs, New Mexico; Xcel Energy; 2007—Project Manager and technical lead responsible for investigation and characterization activities proposed in the Stage 1 abatement plan submitted to the NMED GWQB. Activities included monitoring well installation, groundwater sampling, aquifer testing and analysis, and final report preparation for submittal to NMED GWQB.

A-1 Auto Repair Remedial Action and Water Line Replacement, Peñasco, New Mexico; NMED PSTB; 2006—Project Manager for American Council of Engineering Companies Engineering Excellence award-winning remedial design and implementation of an excavation and water line replacement for the community of Peñasco. The $3 million project involved removal of more than 11,000 yards of petroleum-contaminated soil and 600 ft of impacted water line and included removal and replacement of 400 ft of a New Mexico state highway. Tasks included coordination with residents and regulatory personnel, as well as management of scope, schedule, budget, and personnel. This high profile, short duration project was completed on time and below budget.

Cunningham Station Power Plant Stage 1 Abatement Plan, Hobbs, New Mexico; Xcel Energy; 2006—Project Manager and technical lead responsible for development of a Stage 1 groundwater abatement plan for NMED GWQB. The plan outlined a site investigation strategy to define the source, nature, and extent of contamination observed in monitoring wells located downgradient of the plant's permitted overflow pond and land application areas.

Site Assessments and Remediation of Petroleum Contamination/Hazardous Materials, Multiple Sites throughout New Mexico; NMDOT; 2003-2018—Project Manager for numerous Phase I and Phase II investigations and remedial actions at various NMDOT patrol yards throughout the state of New Mexico. Project activities have included hydrogeologic investigations, contaminated soil delineation and removal, remedial action system analysis and feasibility studies, conceptual remedial action design and pilot studies, water quality analysis, mobile mapping and geographic information systems, construction management, and report preparation.

Rio Algom Mine Site Characterization, Grants, New Mexico; Confidential Client; 2005—Project Manager during delineation of diesel-impacted soils at a former uranium extraction facility. Provided mine with volume estimates and remedial strategy for land farming of impacted soils.

Paul's Place Remedial Action, Tomé, New Mexico; NMED PSTB; 2004—Project Manager for remedial design and implementation of a soil excavation and dewatering system in the community of Tomé. The $1.5 million project was completed on time and below budget and removed more than 8,500 yards of petroleum-contaminated soil and extracted and treated more than 750,000 gallons of contaminated groundwater. Tasks included coordination with residents and regulatory personnel, management of scope, schedule, budget, and personnel.

State Road 114 Superfund Site, Levelland, Texas; Texas Commission on Environmental Quality and U.S. Environmental Protection Agency; 2004-2005—Senior Hydrogeologist for a soil vapor and groundwater remediation system design at the State Road 114 Superfund site. The system includes 21 groundwater extraction wells, 4 groundwater injection wells, and 62 dual-completion soil vapor extraction wells, to remediate a dissolved- and free-phase hydrocarbon plume. Treatment technologies include air stripping and adsorption to remove volatile organic compounds and chemical precipitation to remove dissolved metals. The system is unique in that extracted soil vapors are treated using the C-3 technology, which cryogenically compresses and condenses the vapors into a waste oil product that can be recycled. This was the largest application of this technology in the United States.

Shollenbarger Wood Treating Facility Site Assessment, Bernalillo, New Mexico; Confidential Client; 2004—Project Manager and technical lead responsible for investigation and characterization of potential groundwater contamination resulting from wood treating operations using chromated copper arsenate. The investigation was conducted on behalf of a law firm representing a prospective buyer. Activities included monitoring well installation, lithologic logging of drill core, soil and groundwater sampling, aquifer testing and analysis, and final report preparation.

Albuquerque Sportsplex Site Assessment, Albuquerque, New Mexico; Pueblo of Sandia; 2004—Project Manager responsible for assessment of contamination resulting from operations within a maintenance building. The building contained a variety of chemicals, oils, paints, and petroleum products that were all used in varying degrees. Vertical and horizontal extent of contamination was defined, excavation of contaminated soil from identified hot spots was performed, contaminated soils were appropriately disposed of at a licensed facility, and the building was demolished. Prepared final report documenting all activities for submittal to the Pueblo.

Tier 2 Risk Assessments, McCasland and Main and McGaffey Underground Storage Tank Sites, Los Lunas and Roswell, New Mexico; Confidential Client; 2004—Prepared Tier 2 risk-based assessment reports and risk-based corrective action models for two hydrocarbon-contaminated sites in New Mexico for a confidential client under the NMED Voluntary Remediation Program. Performed risk assessments in accordance with NMED PSTB guidance and ASTM International protocol.

Remedial Investigation, United Creosote, Rio Chemical, and State Road 114 Sites, Conroe, San Antonio, and Levelland, Texas; U.S. Environmental Protection Agency and Texas Commission on Environmental Quality; 2004-2006—Senior hydrogeologist responsible for managing remedial investigation field activities at three Superfund sites in Texas. Developed sampling and analysis plans for investigation and characterization of extent and magnitude of contamination resulting from past operations at the sites. Field characterization activities included geophysical surveys, soil gas sampling, monitoring well installation, surface soil and groundwater sampling, and aquifer testing and analysis. Co-authored final reports submitted to the Texas Commission on Environmental Quality and U.S. Environmental Protection Agency.

Public Works Director, City of Box Elder, South Dakota; 2001-2003—As a mayoral appointee, directly responsible for the oversight and management of all new construction and maintenance associated with street, sewer, and potable water supply within the City. Served as the interface between the public and the mayor's office for all issues relating to the above. Managed seven full-time employees, three part-time employees, and a yearly budget of $2 million.

RCRA Facility Investigation of the Mixed Waste Landfill, TA-3, Environmental Restoration Program, Albuquerque, New Mexico; Sandia National Laboratories; 1992-2001—Assistant Task Leader responsible for directing and implementing RCRA Facility Investigation activities at the Mixed Waste Landfill. Managed efforts to characterize the extent and magnitude of contamination resulting from the Mixed Waste Landfill. Characterization consisted of Phase 1 and Phase 2 RCRA Facility Investigations, which included walkover radiation surveys, geophysics to identify disposal cell boundaries, tritium flux measurements, drilling and sampling of surface and subsurface soils, monitoring well installation and associated sampling and analysis, voluntary corrective action activities in the classified area, passive and active soil gas surveys, instantaneous profile tests and pump tests to characterize the properties of the vadose zone, and associated Phase 1 and Phase 2 RCRA Facility Investigation reports. An alternative monolithic native soil cover was proposed and designed for the Mixed Waste Landfill and approved by the Department of Energy and NMED.

Voluntary Corrective Action, Site 16, Arroyo del Coyote Open Dump Environmental Restoration Program, Albuquerque, New Mexico; Sandia National Laboratories; 1997—Project Manager responsible for completing voluntary corrective action activities at Site 16, a 10-acre open dump located in and around Arroyo del Coyote. Unregulated dumping in and along the arroyo since the early 1960s resulted in depleted uranium-contaminated soils, uranium-contaminated concrete targets (10 ft by 10 ft), free asbestos and asbestos bricks, radioactively-contaminated crucibles (2 ft by 3 ft), and general construction debris contaminated with an assortment of radionuclides. Remediation took 6 months, incorporating numerous types of heavy equipment. Remedial activities consisted of excavation, segmented gate technology to segregate uranium-contaminated soils from non-contaminated soils, removal of concrete targets and construction debris, management of radioactively contaminated soils and debris, and disposal. The site was reseeded after remediation with native grasses and flowers.

RCRA Facility Investigation, Environmental Restoration Program, Pinellas Plant, Largo, Florida; 1990-1992—Project Engineer/Hydrogeologist responsible for managing characterization and assessment of the extent of soil and groundwater contamination resulting from weapons production operations at 15 environmental restoration sites. Authored sections of final report detailing findings of investigation and identified sites requiring further investigation under a Corrective Measures Study.

Groundwater Remediation Pilot Study, Milan, Tennessee; U.S. Army Toxic and Hazardous Materials Agency, Milan Army Ammunition Plant; 1990—Field Manager/Engineer responsible for on-site project management of 3-month granular activated carbon pilot study. Designed, operated, and maintained a four-in-series, continuous-flow (granular activated carbon) pilot plant, interpreted high performance liquid chromatography analytical data, developed and analyzed breakthrough curves for carbon efficiency and project status, interacted daily with plant management and personnel. Co-authored final project report submitted to the U.S. Army Toxic and Hazardous Materials Agency.

RCRA/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Investigation and Characterization, Environmental Restoration Program, Los Alamos, New Mexico; Los Alamos National Laboratory; 1988-1990—Project Engineer/Hydrogeologist responsible for conducting preliminary assessment/site investigation activities at technical areas (TA)-21, TA-3, TA-33, and TA-16. Performed subsequent RCRA/CERCLA field investigations of these sites. Developed and implemented environmental sampling and drilling programs; instituted quality assurance/quality control programs associated with sampling and analysis; interpreted data from field investigations and laboratory analysis; and evaluated, organized, and authored technical and regulatory documents and reports.

RCRA/CERCLA Investigation and Characterization, Environmental Restoration Program, Los Alamos National Laboratory, Los Alamos, New Mexico; Pantex Plant, Amarillo, Texas; Oak Ridge Plant, Y-12 Plant, and K-25 Plant, Oak Ridge, Tennessee; and Mound Plant, Miamisburg, Ohio; 1988-1990—Project Engineer/Hydrogeologist responsible for managing the characterization and assessment of the extent of soil and groundwater contamination resulting from weapons production operations. Responsible for developing and implementing environmental sampling and drilling programs; instituting quality assurance/quality control programs associated with sampling and analysis; interpreting data from field investigations and laboratory analysis; and evaluating, organizing, and authoring technical and regulatory documents and reports.

Remedial Investigation, Municipal Waste Landfill, Farmington, New Mexico; Confidential Client; 1988-1991—Project Engineer/Hydrogeologist responsible for managing an extensive 3-year, multi-million-dollar drilling and sampling program to define the extent and magnitude of subsurface contamination resulting from leaching of contaminants from the landfill to groundwater. Authored sections of the final report detailing findings of the investigation for submittal to the U.S. Environmental Protection Agency. Designed erosion control measures along eastern boundary of landfill to prevent undercutting by adjacent arroyo.

Jackpile-Paguate Uranium Mine, Reclamation Activities, Laguna, New Mexico; Bureau of Indian Affairs; 1988—Project Engineer for development of final waste pile slope design criteria to support Record of Decision. Design was conducted under review and oversight of Bureau of Indian Affairs. Final slope designs required terracing slopes that exceeded established height and length requirements, benches on some angle-of-repose slopes, and, in some cases, a combination of the two.

Employment History

Employer—EA Engineering, Science, and Technology, Inc., PBC (Albuquerque, New Mexico)
Dates of Employment—September 2018 – Present
Title—Senior Hydrogeologist

Employer—Daniel B. Stephens & Associates, Inc., Albuquerque, New Mexico
Dates of Employment—January 2003 – September 2018
Title—Principal Hydrogeologist

Employer—City of Box Elder, South Dakota
Dates of Employment—September 2001 – January 2003
Title—Public Works Director

Employer—Sandia National Laboratories, Environmental Restoration Program, Albuquerque, New Mexico
Dates of Employment—July 1992 – September 2001
Title—Assistant Task Leader

Employer—Roy F. Weston, Inc., Albuquerque, New Mexico
Dates of Employment—June 1988 – July 1992
Title—Staff Engineer/Hydrogeologist

Employer—South Dakota School of Mines & Technology, Rapid City, South Dakota
Dates of Employment—January 1987 – June 1988
Title—Teaching Assistant

List of Technical Skills and Specializations

- Client services management
- Construction oversight
- Contaminant hydrogeology
- Contaminated site investigation and characterization
- Hydrogeologic characterization
- Petroleum storage tank investigation and remediation
- Phase I and II environmental site assessments
- Project management

Vener Mustafin, P.E.
Senior Engineer

Mr. Mustafin is a registered professional environmental engineer with 20 years of experience in providing environmental consulting and engineering services to government and private clients.

Education
M.S./Civil Engineering, Environmental/1997 (University of New Mexico)
B.S. and M.S./Civil Engineering, Construction Management/1994 (Tajik Technical University)

Registrations/Certifications
Registered Professional Engineer (Environmental)— AZ (2009, No. 50186), NM (2006, No. 17630), NV (2009, No. 19987), TX (2012, No. 110533), UT (2012, No. 8188418-2202)

Specialized Training
Battelle Conference *Remediation of Chlorinated and Recalcitrant Compounds*
National Groundwater Association "Remediation of Chlorinated Solvents in Groundwater"
Geoenvironmental Engineering
Foundations Engineering I and II
Earth Structures
Design of Masonry and Wood Structures
Slope Stability
U.S. Army Corps of Engineer Air Sparging, Soil Vapor Extraction, and Multiphase Extraction
OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training
OSHA 10-Hour Construction Safety Training
Maryland State Highway Administration 30-Hour Training
Competent Person for Excavation and Trenching

Experience
Years with EA: 10 Total Years: 20

Professional Experience

***Project Management*—**Managed numerous remediation, site investigation, and operation and maintenance of remediation system projects.

Engineering Design—Soil vapor extraction and bioventing, multiphase extraction, air sparging, granular activated carbon adsorption, thermal and catalytic destruction, air stripping, density separation, pressure and gravity pipe flow and networks, *in situ* mineralization, *in situ* reductive dechlorination, *in situ* chemical oxidation, *in situ* COGAC™ application, *in situ* liquid-carbon adsorption and degradation, light non-aqueous phase liquid (NAPL) skimming; surfactant enhanced NAPL removal; mobile dual-phase extraction; groundwater injection using wells and infiltration galleries, thermal desorption, thermally-enhanced volatilization, open channel hydraulics, stormwater pond design, channel revetment using rip-rap, grouted rip-rap, articulated concrete mats, and gabion mats; and commercial wastewater treatment. Removal of contaminated soil by excavation, slope pinning, slurry wall, site grading and earthwork, backfill, and compaction. In addition, conducted soil vapor extraction, multiphase extraction, air sparging, biosparging, and surfactant enhanced flushing pilot tests.

Operation and Maintenance—Soil vapor extraction, bioventing, multiphase extraction, vacuum enhanced light NAPL skimming, air and biosparging sparging, and pump-and-treat systems.

Oversight—Construction of soil vapor, bioventing, NAPL skimming, air sparging, injection, pump-and-treat, and extraction systems; *in situ* chemical oxidation and bioremediation, excavation, backfilling, compacting, and construction of hydrogen peroxide injection systems; well development by surge-and-bail, over pumping, and air-lifting; and drilling using direct-push, hollow stem auger, air, and mud rotary and sonic technologies.

Investigations—Numerous site assessments, remedial investigations, feasibility studies, baseline surveys, groundwater characterization studies, and water and wastewater system evaluations.

EA Project Experience

***Auto Clinic., Petroleum Storage Tank Bureau, Grants, New Mexico; Project Manager/Engineer*—**Conducted additional direct push investigation to delineate impacted soil and establish waste profile. Designed excavation, placement of COGAC, backfill, compaction, grading, asphalt placement, and site restoration. Removed 25,000 tons of contaminated soil followed by COGAC application and backfill and compaction. Directed installation of monitoring wells and soil and groundwater sampling.

Project Date: 2014–2018
Project Value – $2.4 million; Contract Type – Fixed Price

Laguna Mart, Laguna Pueblo, New Mexico Environment Department, Petroleum Storage Tank Bureau, New Mexico; Project Manager/Engineer—Modified, repaired, and started up the *in situ* bioremediation system consisting of groundwater extraction and treatment, nutrient amendment and injection, and bioventing components. Conducted system startup, modifications, repairs, operation and maintenance, and monitoring. Evaluated system performance and managed the project. Expanded system by use of infiltration gallery and installation of additional wells and advancement of soil borings. Oversaw, directed, and managed two years of system operation and maintenance. Developed scope, schedule, and costs; developed drawings and specifications for an additional site investigation; and conducted air sparging pilot testing. Prepared evaluation report, feasibility assessment, and assisted client with decision making on further remediation approach at the site. Developed work plan for additional investigation, deep zone air sparge pilot testing, managed and directed investigation and pilot testing activities. Prepared drawing and specification for air sparge application in shallow and deep water-bearing zones—system consists of 14 soil vapor extraction wells, 20 vent wells to remove vapors from confined zone, 49 shallow zone sparge wells, and 34 deep zone sparge wells. Managed and directed system construction that included well installation; trenching, pipe installation, backfilling, and compaction; compound expansion; horizontal road bore installation; compound expansion, and equipment testing and startup. Managed system operation and maintenance, groundwater sampling, system performance evaluation, and optimization.
Project Date: 2009–2018
Project Value – $2.2 million; Contract Type – Fixed Cost

Fina Truck Stop, JSP Paloni, New Mexico Environment Department, Petroleum Storage Tank Bureau, Albuquerque, New Mexico; Project Manager/Engineer—Modified existing bioventing/NAPL skimming system with a larger blower, managed operation and management of the system, and conducted well rehabilitation and NAPL recovery testing. Prepared drawings and specifications, directed, and oversaw system expansion. Managed system operation and maintenance, groundwater sampling, and system performance evaluation and optimization.
Project Date: 2009–2018
Project Value – $850,000; Contract Type – Fixed Cost

Pit Stop Texaco, Gallup, New Mexico; Petroleum Storage Tank Bureau; Project Manager/Engineer—Participated in developing and presenting a technical proposal for pre-design site characterization, former remediation system decommissioning, and injection of COGAC (a mixture of powered activated carbon, sodium persulfate, and calcium peroxide). Directed and managed additional investigation, bench and field pilot testing, and system decommissioning. Prepared groundwater discharge permit.
Project Date: 2014–2017
Project Value – $238,000; Contract Type – Fixed Price

Nick's Chevron, New Mexico Environment Department, Petroleum Storage Tank Bureau, Albuquerque, Belen, New Mexico; Project Manager/Engineer—Designed excavation, backfill, compaction, and site restoration plans for soil and groundwater removal at a former leaking underground storage tank site. Conducted direct-push investigation to refine excavation extent. Managed and oversaw contaminated soil removal, installation of permeable reactive barrier wall along the excavation perimeter, placement of oxidation-reduction-compound into saturated backfill, backfilling and compaction, and site restoration. Managed post-removal groundwater monitoring and conducted performance evaluation.
Project Date: 2009–2018
Project Value – $1M; Contract Type – Fixed Cost

Driver's Travelmart, New Mexico Environment Department, Petroleum Storage Tank Bureau, San Jon, New Mexico; Project Manager/Engineer—Oversaw bench-scale surfactant selection, mobile dual phase extraction, and surfactant flushing pilot testing; evaluated results; and prepared technical memorandum presenting results and recommendations. Designed well field and prepared drawings and specifications for installation of remediation wells. Oversaw and managed six quarters of mobile dual phase extraction, four events of manual NAPL skimming, and groundwater monitoring events and prepared evaluation reports.
Project Date: 2011–2018
Project Value – $1M; Contract Type – Fixed Cost

Holiday Chevron, New Mexico Environment Department, Petroleum Storage Tank Bureau, Tucumcari, New Mexico; Project Manager/Engineer—Evaluated existing site data, designed removal action, and prepared drawing and specification for excavation, transportation, and disposal of soil impacted by gasoline; backfill, compaction, and restoration of site property; and installation of drain lines for injection of remediation fluids. Oversaw remedial action and prepared as-built drawings. Designed and directed injection of hydrogen peroxide for remediation of residual contamination. Reviewed hydrogen peroxide injection and monitoring reports.
Project Date: 2011–2014
Project Value – $850,000; Contract Type – Fixed Cost

Mike's Auto Detailing, Belen New Mexico; Haller and Associates, Inc., New Mexico Environment Department Petroleum Storage Tank Bureau; Project Manager/Engineer—Prepared remedial design for multi-phase extraction system with thermally enhanced volatilization. Oversaw system construction. Evaluated 17 quarters of system performance and operation and maintenance. Approximately 50,000 gallons of gasoline were recovered and destroyed *in situ* during system operation. Groundwater concentrations were remediation to levels meeting New Mexico Water Quality Control Commission standards. Site will be monitored and petitioned for administrative closure. The system has been decommissioned and the groundwater is being monitored.
Project Date: 2009–2017
Project Value – $160,000; Contract Type – Fixed Cost

Midway Chevron, Sapello, New Mexico; Haller and Associates, Inc., New Mexico Environment Department Petroleum Storage Tank Bureau; Project Manager/Engineer—Prepared quarterly operation, maintenance, and groundwater monitoring reports and evaluated performance of the multiphase extraction system. Prepared drawings and specifications for system expansion. Designed *in situ* chemical oxidation of the source area using hydrogen peroxide, expansion and conversion to air/ozone sparging. Evaluated system performance.
Project Date: 2009–2018
Project Value – $100,000; Contract Type – Fixed Cost

Lee's Conoco, Albuquerque, New Mexico; Haller and Associates, Inc., New Mexico Environment Department Petroleum Storage Tank Bureau; Project Manager/Engineer—Prepared design drawings and specification for air sparge and soil vapor extraction system, oversaw system construction, conducted engineering evaluation of system performance. Approximately 12,000 gallons of gasoline have been extracted or destroyed in-situ during system operation. NAPL has been removed and benzene, toluene, and ethylbenzene concentrations are below the New Mexico Groundwater Quality Commission standards. System have been decommissioned and groundwater is being monitored.
Project Date: 2009–2017
Project Value – $120,000; Contract Type – Fixed Cost

Indian Hills, Haller and Associates, Inc., Petroleum Storage Tank Bureau, Zuzax, New Mexico; Project Manager/Engineer—Prepared drawings and specifications and as-built drawings for expansion of a multiphase extraction system in the fractured bedrock, reviewed the work plan, and plans for implementation.
Project Date: 2015
Project Value – $15,000; Contract Type – Fixed Cost

Turner Branch, Haller and Associates, Inc., Petroleum Storage Tank Bureau, Zuzax, New Mexico; Project Manager/Engineer—Prepared drawings and specifications for installation of a multiphase extraction system in the fractured bedrock, evaluated percolation test, prepared a groundwater discharge permit modification. Oversaw system construction, prepared As-Built Report, and quarterly evaluation report. Concentrations of benzene, toluene, ethylbenzene, and xylene in groundwater have been reduced to below standards. Naphthalene concentrations in one well remained slightly above the standards. System has been turned off per client's directives.
Project Date: 2015–2018
Project Value – $60,000; Contract Type – Fixed Cost

Leisure Mountain Mobile Home & RV Park, 768 East Highway 33, Tijeras, New Mexico; Project Manager/Engineer—Prepared drawings and specification for installation of water production well and connecting it to the existing water treatment unit.
Project Date: 2015–2016

Project Value – $5,000; Contract Type – Fixed Cost

Canoncito Grocery, Mountain, New Mexico; Project Manager/Engineer—Evaluated air sparge/vent testing and prepared a Pilot Test Report. Prepared the Final Remediation Plan that included drawings, specifications, and permits for an air sparge/vent remediation system.
Project Date: 2016–2018
Project Value – $25,000; Contract Type – Fixed Cost

Texas Commission of Environmental Quality, Product Storage Tank Bureau; Engineer—Provided engineering evaluation of multiple remediation projects. Analyzed data, evaluated performance, provided recommendations for system operation and maintenance. Conducted site visits and oversaw operation and maintenance and repair activities.
Project Date: 2014–2017

Performance Based Remedial Contract at Hill Air Force Base, Utah; Air Force Center for Engineering and the Environment; Engineer—Reviewed remedial action work plans and design drawings and specifications for multiple site requiring remedial action.
Project Date: 2014–2018
Project Value – $30 million; Contract Type – Performance-Based Remediation

Allsup's 102, Allsups, Knox City, Texas; Engineer—Prepared drawings and specifications for a soil vapor extraction system utilizing horizontal wells. Conducted site reconnaissance and technical review of the design documents.
Project Date: 2015–2017

Basewide Performance-Based Remediation at Hill Air Force Base, Utah; Air Force Center for Engineering and the Environment; Engineer—Provide engineering review and evaluation of remedial work plans for multiple sites.
Project Date: 2012–2018
Project Value – $3 million; Contract Type – Fixed Cost

Bulk Fuel Plume Mitigation, Kirtland Air Force Base, Utah; Engineer—Provide engineering review and evaluation of remedial work plans for multiple site.

Performance-Based Remediation for Expansion of the Dissolved Ethylene Dibromide Plume Groundwater Treatment System, Kirtland Air Force Base, New Mexico; U.S. Army Corps of Engineers–Albuquerque District; Engineer—Project requires implementation of a RCRA Interim Measure for expanding the groundwater treatment system at Solid Waste Management Unit ST-106/SS-111 at Kirtland Air Force Base, New Mexico for containment of the dissolved-phase ethylene dibromide off-base plume associated with the Bulk Fuel Facility and historical releases of JP-4, JP-8, and Avgas. The project includes installation of large diameter groundwater extraction wells into the regional aquifer that occurs at a depth of approximately 460 ft below ground surface. Additional groundwater monitoring wells will be installed at multiple depths for collection of data supporting the vertical profile of the dissolved-phase ethylene dibromide plume. Dual-walled conveyance lines will be installed from the off-base extraction wells to the groundwater treatment system Building on Kirtland Air Force Base. The groundwater treatment system expansion includes the proposed construction of a second 400-gallons per minute granular activated carbon filter treatment system. EA is responsible for the operation and maintenance of the treatment system, and performance of groundwater monitoring at over 130 deep, regional aquifer wells. Discharge options for the treated groundwater will be implemented through installation of additional regional aquifer injection wells and/or injection well galleries and conveyance lines to discharge treated water from the groundwater treatment system building to the injection area.
Project Date: 2012–2017 and 2015–2018
Project Value – $317.8 million; Contract Type – Fixed Cost PBC Task Order; Contract – U.S. Army Corps of Engineers–Baltimore MAES W912DR-12-D-0006; EA Project No. – 62599DM01; EA Project Manager – Devon Jercinovic

Operation and Maintenance of Remediation System at Hill Air Force Base, Utah; Air Force Center for Engineering and the Environment; Engineer—Participated in scoping meetings, provided input on system's operation and maintenance. Evaluated bioventing pilot test at ST-061 and prepared evaluation report.
Project Date: 2012
Project Type – $3 million; Contract Type – Fixed Cost

East 67th Groundwater Plume, Odessa, Texas, U.S. Environmental Protection Agency, Remedial Action Contract; Engineer—Participated in developing remedial alternatives, evaluated alternatives, developed alternatives scope, and prepared Feasibility Study Report. Evaluated alternatives included carbon filtration at points of use; installation of alternative water supply system; groundwater extraction and *ex situ* treatment using bag filtration, reverse osmosis, air stripping, carbon polishing, and re-injection into aquifer; *in situ* remediation using oxidation, reduction, and co-metabolic dechlorination; soil vapor extraction; and well abandonment. Directed and managed groundwater sampling event and developed scope for well installation. Managed water distribution line design. Reviewed drawings and specifications for limited in-situ bioremediation of the source area using emulsified vegetable oil. Directed design of soil vapor extraction system to mitigate source area of the vadose zone. System consisted of three horizontal soil vapor extraction wells, soil vapor extraction blower, moisture knockout, and granular activated carbon filtration. Directed design of the PlumeStop injection in the source area of the groundwater plume using vertical wells. Directed system construction and Completion Report preparation.
Project Date: 2010–2018
Project Value – $3 million; Contract Type – Cost Plus

Sandy Beach Groundwater Plume, Azle, Texas, U.S. Environmental Protection Agency, Feasibility Study; Engineer—Prepared the feasibility study. Evaluated alternatives for drinking water included no action, municipal water supply connection, new residential water supply wells, and point of entry/point of use. Filtration for groundwater alternatives including no action, pump and treat, *in situ* bioremediation, and combination of pump and treat with *in situ* bioremediation; and for soil alternatives including no action and soil vapor extraction. Assisted the client with preparation of Record of Decision documents. Oversaw and directed design of the remediation system (well location and construction, conveyance piping and trenching, and horizontal drilling and caissons). Reviewed drawings and specifications for soil vapor extraction of the source area and exploratory trenching of the source area. Evaluated system performance and operation and maintenance. Directed design of a PlumeStop and electron donor injection to mitigate groundwater plume.
Project Date: 2011–2018
Project Value – $5 million; Contract Type – Cost Plus

Sol Lynn, Houston, Texas, U.S. Environmental Protection Agency, Remedial Action Contract; Engineer/Project Manager—Oversaw and directed emulsified edible oil injection into subsurface using direct-push rigs for *in situ* reductive dechlorination of chlorinated solvents, and oversaw site demolition and restoration activities. Managed installation of monitoring wells, and groundwater and indoor air monitoring activities. Prepared Remedial Action Report and evaluated remedy and concentrations trends.
Project Date: 2010–2018
Project Value – $1.9 million; Contract Type – Cost Plus

LF-001, LF-002, LF-008 Landfill Repairs and Maintenance, Kirtland Air Force Base, New Mexico; Air Force Center for Engineering and the Environment; Engineer—Conducted landfill inspections and prepared inspection reports. Developed scope and specifications for landfill repairs and oversaw the implementation. Implemented measures included rill and soil piping repairs, installation of excelsior fiber rolls, repair of channels by installation of rip-rap revetment and rock check dams, and removal of sediment from channels and sediment ponds. Developed plans and specifications for repairs of wire-enclosed rip-rap arroyo bank armor and site grading, and directed and oversaw construction and prepared completion report.
Project Date: 2010–2012
Project Value – $1.2 million; Contract Type – Fixed Cost

RSR Corporation, Dallas, Texas, U.S. Environmental Protection Agency, Remedial Action Contract; Engineer—Prepared the Five-Year Review Report for the RSR Corporation Superfund site.
Project Date: 2010

Sheridan Disposal Services, Waller County, Texas, U.S. Environmental Protection Agency, Remedial Action Contract; Engineer—Conducted field inspection of the landfill cap, collector channels, and monitoring wells. Prepared technical assessment of the implemented remedy (capping and monitoring) for the Five-Year Review Report.
Project Date: 2010

Santa Fe Judicial Complex, Santa Fe, New Mexico, New Mexico Environment Department Petroleum Storage Tank Bureau; Design Engineer—Participated in the development of scope for remediation of soil and groundwater contaminated with gasoline. Designed heated air injection portion of the remediation system. Oversaw construction activities.
Project Date: 2010

Titanium Metals Corporation, Henderson, Nevada; Design and Certifying Engineer—Designed groundwater extraction, treatment, and amendment system; slurry wall working platform; slurry cutoff soil-bentonite wall; and site grading. Also prepared plans and specifications for slurry wall installation and earthwork.
Project Date: 2009–2010

Ricoh Corporation, Reclamation Associated with Exploration of Uranium Deposits, Grants, New Mexico; Project Engineer—Coordinated collection of geo-referenced photographs using Ree-Coh camera; processed Global Positioning System and photographic data documenting reclamation activities associated with uranium exploration.
Project Date: 2009

Garland Creosote Site, Texas; U.S. Environmental Protection Agency; Project Engineer—Reviewed specifications for construction of remediation system and prepared a list of submittals.
Project Date: 2009

Texarkana Wood Preserving Company, Texas; U.S. Environmental Protection Agency; Quality Assurance Reviewer—Provided technical review for the Focused Feasibility Study of remedial alternatives for remediation of soil, groundwater, and dense NAPL. Remedial alternatives for soil remediation included no further action, *in situ* solidification/stabilization, excavation and onsite disposal, *in situ* chemical oxidation, and *in situ* bioremediation. Remedial alternatives for dense NAPL remediation included on further action, *in situ* solidification/stabilization, and containment wall construction. Remedial alternatives for groundwater remediation included no further action, monitored natural attenuation, and *in situ* chemical oxidation.
Project Date: 2009

Cal-Maine Corporation, Albuquerque, New Mexico; Project Engineer—Prepared computer aided drafting drawings for site investigation.
Project Date: 2009

Chet Wyant, Various Dairies, New Mexico; Project Engineer—Prepared computer aided drafting drawings for site abatement.
Project Date: 2009

Other Project Experience

Site Restoration and Mine Reclamation

Remedial Action at Budget Tire, Deming, New Mexico; New Mexico Environment Department; 2005–2009; Certifying Engineer/Project Manager—Managed and conducted a soil vapor extraction pilot testing; prepared a preliminary remediation system design; designed the final soil vapor extraction system entailing vacuum vapor phase extraction, vapor-liquid separation, and thermal destruction using catalytical oxidizer; obtained air permit; prepared a remediation plan with plans and specifications; and oversaw system construction and startup.

Remedial Action at Thriftway 220, Farmington, New Mexico; New Mexico Environment Department; 2005–2008; Certifying Engineer/Project Manager—Managed and participated in competitive bidding; designed a multiphase extraction pump-and-treat system entailing down-hole pump total fluids extraction, gravity separation, air stripping, scaling control, injection into subsurface using injection wells, vacuum vapor phase extraction, vapor-liquid separation, and thermal destruction using thermal oxidizer; prepared a plans and specifications; oversaw system construction and startup; prepared the as-built; and managed operations and maintenance of the installed system.

Remedial Action at Portales Chevron, Portales, New Mexico; New Mexico Environment Department; 2008; Certifying Engineer—Participated in competitive bidding; designed a multiphase extraction pump-and-treat system entailing downhole pump total fluids extraction, gravity separation, air stripping, scaling control, injection into subsurface using injection wells, vacuum vapor phase extraction, vapor-liquid separation, and thermal destruction using thermal oxidizer; and prepared a plans and specifications and oversaw system construction and startup.

Tyrone, Stockpile 7; Tyrone, New Mexico; Freeport McMoRan Copper & Gold, Inc.; 2008; Project Engineer—Evaluated design options for leachate collection channel revetment using riprap, grouted riprap, gabion, and articulated concrete block mats.

Remedial Action at Midway Chevron, Sapello, New Mexico; New Mexico Environment Department; 2007–2017; Certifying Engineer—Participated in competitive bidding; designed a multiphase extraction pump-and-treat system entailing down-hole pump total fluids extraction, gravity separation, air stripping, scaling control, injection into subsurface using injection wells, vacuum vapor phase extraction, vapor-liquid separation, thermal destruction using thermal oxidizer; and prepared a plans and specifications; and oversaw system construction and startup.

Remedial Action at Gasamat, Bosque Farms, New Mexico; New Mexico Environment Department; 2006–2008—Participated in competitive bidding, designed excavation to remove contaminated soil with dewatering, groundwater treatment using air stripper, hydrogen peroxide amendment, and subsequent re-injection; designed slope pinning along excavation wall adjacent to the road; designed chemical oxidation of residual contamination using oxygen release compound; and prepared plans and specifications.

Remedial Action at Laguna Mart, Laguna Pueblo, Laguna, New Mexico; New Mexico Environment Department; 2006–2017; Certifying Engineer—Participated in competitive bidding; designed a multiphase extraction pump-and-treat system with close-loop nutrient injection and bioventing entailing downhole pump total groundwater extraction, air stripping, scaling control, amending of treated water with nutrients, injection into subsurface using injection wells, bioventing by vacuum vapor phase extraction, and vapor-liquid separation; prepared a plans and specifications; and oversaw system construction and startup. Managed and designed, oversaw construction, and started and conducted operation and maintenance of a biosparge/vent system.

Remedial Action at Didio's Service Station, Bernardo, New Mexico; New Mexico Environment Department; 2007; Certifying Engineer—Designed excavation to remove contaminated soil; prepared plans and specifications; oversaw excavation of overburden and contaminated soils, transportation, backfilling, and compacting; and prepared an As-Built Report.

Tyrone, Stockpile 7 Far West; Tyrone, New Mexico; Freeport McMoRan Copper & Gold, Inc.; 2007; Project Engineer—Designed stormwater conveyance offsite channels protected with rip-rap and gabion revetment.

Cobre, New Mexico; Freeport McMoRan Copper & Gold, Inc.; 2006-2007; Project Engineer—Conducted field and Global Positioning System surveys of historical shafts and adits, processed Global Positioning System data against CORE stations, and provided quality control of drawings.

Remedial Action at Santa Fe – Nimitz Site, Grants, New Mexico; New Mexico Environment Department; 2005–2006; Certifying Engineer—Participated in competitive bidding; designed excavation to remove contaminated soil; prepared plans and specifications; oversaw excavation of overburden and contaminated soils, transportation, backfilling, and compacting; and prepared an As-Built Report.

Remedial Action at 7-2-11, Tuba City, Navajo Nation; Advanced Corrosion and Environmental Services, Inc.; 2006; Certifying Engineer—Modified the existing system to incorporate soil vapor extraction and air sparging, and prepared plans and calculations with recommendations for remediation equipment.

Tyrone, Stockpile 7A West; Tyrone, New Mexico; Freeport McMoRan Copper & Gold, Inc.; 2006; Project Engineer—Prepared as-built drawings for leachate collection system.

Tyrone, No. 1 Stockpile; Tyrone, New Mexico; Freeport McMoRan Copper & Gold, Inc.; 2005–2008—Designed stormwater conveyance for reclaimed stockpile offsite channels and detention ponds, designed channel revetment using rip-rap and gabion mattress, and evaluated grouted rip-rap option.

Site Assessment/Feasibility Evaluation and Remedial Action; Misawa Air Force Base Firing Range; U.S. Army Corps of Engineers; 2005; Project Engineer—Provided technical guidance for site assessment of a gun range at Misawa Air Force Base, Japan. Prepared feasibility study to evaluate remediation cleanup alternatives.

Remedial Action at Indian Hills; Zuzax, New Mexico; Haller and Associates, Inc.; 2005; Project Engineer—Designed trenching, well installation, well head design, and concrete slab to supplement the existing remedial design.

Remedial Action at Climate Roofing, Albuquerque, New Mexico; Haller and Associates, Inc.; 2005; Project Engineer—Designed excavation to remove contaminated soil impacted by gasoline with and groundwater extraction and hydrogen peroxide chemical oxidation; and prepared plans and specifications and completion.

Remedial Action at Mike's Auto, Belen, New Mexico; New Mexico Environment Department; 2004–2005; Design Engineer—Conducted a multiphase extraction testing, designed a multiphase extraction pump-and-treat system entailing downhole pump total fluids extraction and NAPL skimming, gravity separation, air stripping, scaling control, injection into subsurface using injection wells and injection gallery, thermally enhanced vacuum vapor phase extraction, vapor-liquid separation, thermal destruction using catalytic/thermal oxidizer; and prepared a plans and specifications.

Remedial Action at Bazen Site, Los Lunas, New Mexico; New Mexico Environment Department; 2004–2005; Project Engineer—Conducted baseline site assessment and post-remediation groundwater monitoring and prepared a remediation plan entailing excavation of contaminated soil, groundwater extraction and treatment using air stripper, subsequent mixing with hydrogen peroxide, and re-injection into subsurface, and prepared an as-built report.

Remedial Action at Sparkle Car Wash, Haller and Associates, Inc., Albuquerque, New Mexico; 2004; Project Engineer—Designed excavation for removal of contaminated soil and subsequent hydrogen peroxide injection gallery to remediate residual soil and groundwater gasoline contamination; prepared plans and specifications; inspected excavation, backfilling, and compacting; and prepared completion report.

Remedial Action at Sullivan Stables; New Mexico; NSYNC Environmental, Inc.; 2004; Project Engineer—Designed excavation with groundwater extraction and hydrogen peroxide injection to remove contaminated soil impacted by gasoline; prepared plans, specifications, and completion report.

Remedial Action at Guggino's; Belen, New Mexico; NSYNC Environmental, Inc.; 2004; Project Engineer—Designed excavation with groundwater extraction and hydrogen peroxide injection to remove contaminated soil impacted by gasoline; prepared plans, specifications, and completion report.

Remedial Action at Century 21; Roswell, New Mexico; NSYNC Environmental, Inc.; 2004; Project Engineer—Designed excavation with groundwater extraction and hydrogen peroxide injection to remove contaminated soil impacted by gasoline; prepared plans, specifications, and completion report.

Test Plot Design; Tyrone, New Mexico; Freeport McMoRan Copper & Gold, Inc.; 2004; Project Engineer—Assisted with designing test plots for evaluating alternatives for mine reclamation cap design.

Site Investigation and Remedial Action at Navy Exchange, NAX, and Public Works Gas Stations; Naval Air Weapons Station China Lake, California; U.S. Navy; 2000–2005; Project Engineer—Conducted site investigation to determine fate and extent of organic and inorganic contamination by installing monitoring wells and collecting groundwater and soil samples; provided technical expertise in developing groundwater monitoring program for post-remedial monitoring natural attenuation. Served as a technical lead for groundwater monitoring reports.

Site 12 Landfill Monitoring and Maintenance, Naval Air Weapons Station China Lake, California; U.S. Navy; 1998-2005; Project Engineer—Participated in groundwater monitoring activities to verify containment of contaminants within the site boundary, oversaw landfill cap and drainage maintenance activities, and prepared land use reports.

Site Investigation and Multiphase Pilot Testing at China Lake Propulsion Laboratory Gas Station; Naval Air Weapons Station China Lake, California; U.S. Navy; 1998–2000; Project Engineer/Manager—Conducted site investigation to determine fate and extent of gasoline contamination in fractured granodiorite by installing monitoring wells, collected soil and groundwater samples and conducting geophysical survey, and conducted a multiphase extraction testing to evaluated remedial alternatives for site remediation.

Remedial Action at Ryder Truck Property, Albuquerque, New Mexico; Ryder Transportation Services; 1998–2000; Project Engineer—Provided engineering support for a diesel skimming system coupled with total fluids extraction for hydraulic control, conducted routine operation and maintenance, analyzed and processed data, and prepared operation and maintenance reports.

Site Investigation and Soil Vapor Extraction Pilot Testing at Site 70; Naval Air Weapons Station China Lake, California; U.S. Navy; 1998–1999; Project Engineer—Conducted site investigation to determine fate and extent of gasoline contamination in alluvial deposit by installing monitoring wells and collecting soil and groundwater samples, and reviewed soil vapor testing plan.

Site Investigation and Soil and Groundwater Characterization

Background Groundwater Chemistry Study; ***Naval Air Weapons Station China Lake, California, U.S. Navy; 1998–2002; Project Engineer***—Drilled and installed monitoring wells, installed groundwater sampling pumps, collected samples, processed and analyzed data, and prepared report for the background groundwater chemistry. The study developed a defensible background dataset for naturally occurring inorganic constituents in shallow groundwater that were applied base-wide for site-to-background statistical comparisons. The results of the study were designed to provide background data that can be used in conjunction with risk-based screening criteria to identify anthropogenic impacts to shallow groundwater.

Fenceline Study; Naval Air Weapons Station China Lake, California, U.S. Navy; 1998–2002; Project Engineer—Drilled and installed monitoring wells, installed groundwater sampling pumps, collected samples, processed and analysed data, and prepared report for the fenceline study at the Naval Air Weapons Station China Lake. The study was conducted to determine whether the existing contamination migrated offsite.

Basewide Hydrogeologic Investigation; Naval Air Weapons Station China Lake, California, U.S. Navy; 1998–2005; Project Engineer—Processed hydrogeologic data to determine placement of deep boreholes and monitoring wells. Prepared statements of work to procure subcontractors. Coordinated drilling activities and scheduling. Oversaw mud rotary drilling and described lithology. Fifteen 800-1,200 ft deep boreholes were drilled using mud rotary methodology and 8 nested monitoring wells constructed. Installed pumps, coordinated groundwater sampling, and prepared reports. Results of the study were used to establish hydrogeologic conceptual model for the basin and to determine connectivity between various hydrogeologic zones.

Removal Site Evaluation, Site 6 Unexploded Ordnance Trenches; Naval Air Weapons Station China Lake, California, U.S. Navy; 1998–2002; Project Engineer—Oversaw sonic drilling activities at the site to determine extent of contamination and depth to groundwater at unexploded ordnance disposal trenches. Oversaw and directed trenching to determine waste composition and extent of the trenches. Collected soil samples to assess extent and degree of contamination.

Areas of Concern Investigation; Naval Air Weapons Station China Lake, California, U.S. Navy; 1998–2002; Project Engineer—Collected soil and groundwater samples to establish extent of soil contamination in residential areas designated for razing in the vicinity of day care and schools and in the areas of previous waste disposal.

Site Investigation and Multiphase Pilot Testing at China Lake Propulsion Laboratory Gas Station; Naval Air Weapons Station China Lake, California; U.S. Navy; 1998–2000; Project Engineer/Manager—Conducted site investigation to determine fate and extent of gasoline contamination in fractured granodiorite by installing monitoring wells, collected soil and groundwater samples, and conducting geophysical survey; and conducted a multiphase extraction test to evaluate remedial alternatives for site remediation.

Site Assessment at Randsburg Wash Gas Station; Naval Air Weapons Station China Lake, California; U.S. Navy; 1998–2000; Project Engineer—Managed site assessment at the Randsburg Wash Gas Station. Coordinated procurement, scheduling, and implementation of field activities. Oversaw drilling activities and collected soil samples. Filed a request for site closure. As result of the assessment, the site was received a no further action status.

Remedial Investigation/Feasibility Study at the Former Fire Training Pad, Minideck, Site 43; Naval Air Weapons Station China Lake, California; U.S. Navy; 1998–2003; Project Engineer—Drilled boreholes, conducted a membrane interface probe investigation, processed and analyzed results of the geophysical surveys, participated in aquifer testing, conducted pilot testing to evaluate effectiveness of French drain and bioventing technologies for remediation of hydrocarbon soil and groundwater contamination, and participated in feasibility evaluation.

Remedial Investigation at Former Disposal Trenches, Site 23; Naval Air Weapons Station China Lake, California; U.S. Navy; 2002–2003; Project Engineer—Drilled boreholes and collected soil and groundwater samples to assess the extent of subsurface soil and groundwater contamination. The results of the investigation were used to estimate extents of excavation and volume of affected soil for critical removal action.

Site Assessment at the Former Polychlorinated Biphenyl Storage Facility, Site 68; Naval Air Weapons Station China Lake, California; U.S. Navy; 2002–2003; Project Engineer—Drilled boreholes and collected soil and groundwater samples to determine extent of subsurface polychlorinated biphenyl contamination. The results of the assessment were used to establish volume and extents of excavation for removal action.

Site Assessment at the Former Disposal Well, Site 70; Naval Air Weapons Station China Lake, California; U.S. Navy; 2002–2003; Project Engineer—Drilled boreholes and collected soil and groundwater samples to determine extent of subsurface hydrocarbon contamination. Conducted soil vapor survey and participated in the development of the soil vapor pilot test and remedial action at the site.

Groundwater Monitoring at Naval Airfield, Navy Exchange, and Public Works Gas Stations; Naval Air Weapons Station China Lake, California; U.S. Navy; 2002–2004; Project Engineer—Provided technical oversight for developing sampling strategy for several underground storage tank sites. Reviewed groundwater monitoring reports prepared by the subcontractor. Acted as a technical lead for groundwater monitoring program.
Groundwater Modelling for Well 26S40E26P01; Naval Air Weapons Station China Lake, California; U.S. Navy; 2002–2004; Project Engineer—Developed a groundwater transport model and conducted a sensitivity analysis for migration of hydrocarbon contamination from a point source (well 26S40E26P01) toward the supply wells.

Remedial Investigation at Public Works and Michelson Laboratory Operating Units; Naval Air Weapons Station China Lake, California; U.S. Navy; 2001–2004; Project Engineer—Oversaw drilling and sampling activities at the Public Works and Michelson Laboratory Operating Units. Coordinated field activities and scheduling, installed monitoring wells, collected soil and groundwater samples, and conducted aquifer testing to evaluate extent of groundwater contamination associated with the activities of the abovementioned units.

Groundwater Monitoring at Site 12 Landfill; Naval Air Weapons Station China Lake, California; U.S. Navy; 2003–2004; Project Engineer—Trained subcontractor personnel to conduct groundwater sampling and oversaw the activities to determine whether groundwater was impacted and if contamination migrated offsite. Oversaw landfill cap and drainage maintenance activities and prepared reports.

Phase II Environmental Site Assessment at Del Norte Gun Club Small Arms Range; New Mexico Environment Department; 2002–2003; Project Engineer—Conducted Phase II Environmental Site Assessment to evaluate extent of lead contamination in soil and Feasibility Evaluation for remedial alternatives. Over 400 soil samples were collected and analyzed for lead content by x-ray fluorescence; in addition, particulate lead was sieved and weighted in the field. Results of the x-ray fluorescence were correlated to the randomly analyzed split samples. Sandoval County used the results of the project to excavate and cap the affected soil onsite.

Phase II Environmental Site Assessment at Alamogordo Landfill; New Mexico Environment Department, 2001–2002; Project Engineer—Conducted Phase II Environmental Site Assessment to determine potential for vapor intrusion into the proposed structures and potential for migration of contamination from soil to groundwater for the proposed sports complex. Qualitatively assessed suitability of soil based on visual observations during drilling for proposed construction. Multiple disposal trenches were evaluated by drilling and collection of soil gas samples

Low Rio Grande Water Quality Monitoring; New Mexico Environment Department, 2000–2002; Project Engineer—Assisted Elephant Butte Irrigation District in setting up and implementing the Low Rio Grande long-term groundwater monitoring program. Trained and supervised personnel on use of sampling and monitoring equipment and was instrumental in implementing the overall program. In addition, conducted groundwater sampling to access groundwater quality along the Low Rio Grande

Habitat Restoration; Interstate Stream Commission; 2002; Project Engineer—Evaluation of various uses of Rio Grande and prepared Geographic Information System drawings representing the uses.

New Mexico State Lead Contract; New Mexico Environment Department; 2000–2005; Project Engineer—Provided engineering support for remedial actions, site assessments, and monitoring at a number of underground storage tank sites throughout New Mexico.

Basewide Map Initiative; ***Kirtland Air Force Base, U.S. Air Force; 2002–2003; Project Engineer***—Prepared a comprehensive base-wide Geographic Information System map of Environmental Restoration, Compliance, and Munitions sites.

Site Management Plan; ***Kirtland Air Force Base, U.S. Air Force; 2004; Project Engineer***—Participated in the development of the Site Management Plan for Kirtland Air Force Base, the governing document for managing Environmental Restoration, Compliance, and Munitions sites.

Site Assessment at ST-57; Kirtland Air Force Base, U.S. Air Force; 2004; Project Engineer—Developed a Sampling and Analysis Plan for site investigation and prepared site assessment report.

Water Resources, Emergency Response, and Wastewater Characterization

Water System Evaluation; Kirtland Air Force Base, U.S. Air Force; 2000–2001; Project Engineer—Participated in water system evaluation at the Kirtland Air Force Base, Albuquerque, New Mexico. Developed a sampling strategy to access quality of water through the base and participated in sampling and reporting activities. Based on the results of this evaluation, recommendations for improvements of water supply system for the base were developed.

Water Source Assessment; Hopi, Hopi Nation; Arizona; 2003–2004; Project Engineer—Assessed water resources and potential sources of contamination at Hopi Reservation. Program included surveying supply wells and surrounding area to access risks associated with potential for contamination to the existing water supply wells and storage. Prepared a comprehensive set of maps using ArcMAP Geographic Information System software presenting supply wells, potential sources of contamination, results of groundwater capture zone modelling, and cultural features.

Emergency Response to Fuel Spill, Sandia Pueblo, Albuquerque, New Mexico; 2000; Project Engineer— Participated in emergency response activities related to a spill of crude oil in the Albuquerque metro area. This work involved collection of soil characterization samples near the spill to determine its extent and prevent further propagation.

Performance Assessment of the Constructed Wastewater Treatment Wetlands; Albuquerque Public Schools, Los Padillas, New Mexico; 1996–1997; Professor Assistant—Collected wastewater samples, analyzed data, and prepared report to evaluate the performance of the Los Padillas Constructed Wetlands.

Performance Assessment of the Bio-Flotator Wastewater Treatment Plant; University of New Mexico; 1996–1997; Professor Assistant—Collected wastewater samples and conducted the laboratory analysis to assess the performance of an experimental bio-flotator wastewater treatment mini-plant.

Non-Environmental Consulting

Sandia National Laboratories Subcontractor; Albuquerque, New Mexico; 1997–2003; Part-Time Freelance Interpreter—Provided Russian-English and English Russian interpretation services during technical discussions, excursions, and social interactions between American and Russian physicists, scientists, and engineers.

American Embassy, Dushanbe, Tajikistan (former Union of Soviet Socialist Republics); 1994–1995; General Services Officer Assistant—Oversaw Embassy maintenance, repairs, motor pool, warehouse, supply ordering, and receiving.

American Embassy, Dushanbe, Tajikistan (former Union of Soviet Socialist Republics); 1993–1994; Security Officer—Provided security for Embassy personnel and property. Accompanied political officer on missions to obtain security updates, provide humanitarian aid, and various meetings.

Makhmud Mustafin, Dushanbe, Tajikistan (former Union of Soviet Socialist Republics); 1988–1990; Part-Time Welder/Plumber Assistant—Assisted master welder/plumber installing residential heating systems, plumbing, insulating industrial piping, and other miscellaneous tasks.

Employment History

Employer—EA Engineering, Science, and Technology, Inc., PBC (Albuquerque, New Mexico)
Dates of Employment—2008 – Present
Title—Senior Engineer

Employer—Golder Associates – Albuquerque, New Mexico
Dates of Employment—2005–2008
Title—Senior Engineer

Employer—Tetra Tech EMI – Albuquerque, New Mexico
Dates of Employment—1998–2005
Title—Environmental Engineer

Employer—University of New Mexico – Albuquerque, New Mexico
Dates of Employment—1996–1997
Title—Research/Professor Assistant

Employer—Sandia National Laboratories – Albuquerque, New Mexico
Dates of Employment—1997–2003
Title—Freelance Russian-English Interpreter

Employer—American Embassy – Dushanbe, Tajikistan (former Union of Soviet Socialist Republics)
Dates of Employment—1994–1995
Title—General Services Officer Assistant

Employer—American Embassy – Dushanbe, Tajikistan (former Union of Soviet Socialist Republics)
Dates of Employment—1993–1994
Title—Security Officer

Employer—Makhmud Mustafin – Dushanbe, Tajikistan (former Union of Soviet Socialist Republics)
Dates of Employment—1988–1990
Title—Welder/Plumber Assistant

List of Technical Skills and Specializations

- Autodesk Civil 3D, Civil Design, AutoCAD
- Excavation, grading, hydraulic channel design, channel revetment, mine reclamation
- Google Earth Pro, All Topo
- HELP, Winstabl, VS2D, ProSheet, Macra 1, Macra 2, MathCAD, EPANet, Corpscon, Winflow
- Microsoft Office, Microsfot Project
- Proficient in Russian, some Spanish
- Soil and groundwater characterization
- Soil and groundwater remediation and geo-environmental engineering

Sharon A. Richmond, Ph.D., QEP

Senior Scientist/Project Manager

Dr. Richmond is an environmental microbiologist and chemist with more than 27 years of experience investigating and remediating environmental contaminants. Her current and previous responsibilities include management and technical oversight of more than 250 contaminated sites associated with the Installation Restoration Programs on Eielson Air Force Base, Joint Base Elmendorf-Richardson, and Fort Wainwright, and numerous other private and federal civilian sites across urban and rural Alaska. She is an experienced research scientist, having studied the effects of groundwater/surface water interactions and nutrient amendment on groundwater biogeochemistry, natural attenuation, and enhanced bioremediation of chlorinated aliphatics and petroleum hydrocarbons at contaminated sites in subarctic Alaska.

In addition to her technical experience, Dr. Richmond worked 8 years as an environmental program specialist with the State of Alaska Contaminated Sites Program, and is intimately familiar with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and Alaska Department of Environmental Conservation (ADEC) regulations. She has managed all phases of site investigation and remediation and maintains current knowledge of the technical aspects of sampling and chemical analysis of soil, groundwater, and soil gas/vapor intrusion monitoring. In addition to project management, she serves as a technical reviewer. Over her career, Dr. Richmond has authored or reviewed hundreds of documents including: technical memoranda, site investigation reports, underground storage tank removal reports, risk assessments, Uniform Federal Policy (UFP)-Quality Assurance Project Plans (QAPPs), preliminary source evaluations, remedial investigations, feasibility studies, proposed plans, Records of Decision, and five-year Record of Decision reviews.

As an ADEC project manager and private consultant, Dr. Richmond has managed a wide variety of projects including all Two-Party petroleum and Three-Party CERCLA sites on Fort Wainwright, Northern Region Alaska Department of Transportation Maintenance Stations, rural and urban Federal Aviation Administration facilities, and several high-profile sites for which site investigations and remediation were driven by community concern or high-priority construction projects including the investigation, remediation, and monitoring at Taku Gardens Housing Development, the West Nome Tank Farm, and Post-wide construction support activities at Fort Wainwright. Her familiarity with State and CERCLA regulatory requirements and her ability to develop innovative solutions consistently meet or exceed customer needs and client expectations, while minimizing construction delays and ensuring regulatory compliance of responsible parties.

Education

Ph.D./Biological Sciences/2001 (University of Alaska Fairbanks)
M.S./Applied and Environmental Microbiology/1994 (Northern Arizona University)
B.S./Pre-Medical Microbiology/Chemistry/1991 (Northern Arizona University)

Registrations/Certifications

Qualified Environmental Professional (QEP)—AK (18 AAC 75.333 and 18 AAC 78.088); 1999

Specialized Training

OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training; 2017
Strategies for Monitoring the Performance of Dense Non-Aqueous Phase Liquid Source Zone Remedies; 2009
Interstate Technology Regulatory Council Quality Considerations for Munitions Response Projects; 2008
Interstate Technology Regulatory Council Vapor Intrusion; 2006, 2007, 2009
Natural Attenuation of Chlorinated Solvents; 2008
Battelle's Chlorinated and Recalcitrant Compounds, Method 8330B; 2008
U.S. Army Corps of Engineers Analysis of Explosives and Energetic Compounds; 2008
Wielding Regulatory Authority; 2008
Sampling for Defensible Environmental Decision-Making; 2006
Data Quality Objectives; Managing Uncertainty with Systematic Planning for Environmental Decision-Making; 2005
Dense Non-Aqueous Phase Liquids, Performance Assessment; 2005
Environmental Investigations in the Canadian Arctic and Other Remote Locations; 2005
Risk Assessments in Arctic Environments; 2005
Geophysical Prove-Outs for Munitions Response Projects; 2004, 2005
Unexploded Ordnance Basic Training; 2004
CPR and First Aid Training; 2016

Professional Affiliations

American Chemical Society
American Society for Microbiology

Experience

Years with EA: <1 Total Years: 27

Professional Experience

Project Management—Has over 15 years of experience managing environmental projects in Alaska, including 8 years as a regulator with the ADEC Contaminated Sites Program. Experience ranges from underground storage tank removals to multimillion dollar CERCLA investigations and remedial actions at federal military installations. Strong communication and negotiation skills have facilitated several multimillion dollar construction projects at contaminated sites, facilitating economic development and beneficial reuse of contaminated properties in rural and urban and Alaska. All projects have been completed within or under budget and customer-defined schedules. Has an average U.S. Army Corps of Engineer Contractor Performance Assessment Report score of 99% and typically receives 100% on customer satisfaction surveys.

Environmental Impact/Risk Assessment—Has overseen several CERCLA risk assessments, including the human health and ecological risk assessment for the Taku Gardens Family Housing project on Fort Wainwright, Alaska. After extensive excavation and disposal of soil contaminated with petroleum, chlorinated solvents, metals, polychlorinated biphenyls, and munitions-related items, a human health risk assessment determined that this housing development was suitable for residential occupation with institutional controls restricting access to groundwater and subsurface soil. Wrote the U.S. Environmental Protection Agency-approved Proposed Plan Record of Decision.

Regulatory Specialist—With over 25 years of experience in the environmental field, has become intimately familiar with state and federal regulations governing hazardous waste investigation, remediation, management, and disposal. Experienced with State of Alaska regulations governing water quality, contaminated sites, and underground storage tanks, as well as CERCLA and Resource Conservation and Recovery Act.

Environmental Microbiology and Chemistry/Field and Laboratory Studies—Designed and conducted numerous laboratory and field studies investigating the fate and transport of a wide range of environmental contaminants. Is considered a subject matter expert in natural attenuation of chlorinated solvents, with an emphasis on how groundwater/surface water interactions affect naturally-occurring biodegradation processes. Has an extensive list of publications in peer-reviewed scientific and engineering journals and presents work at local, state, and international technical conferences. Is currently working to isolate bacteria capable of degrading per- and polyfluoroalkyl compounds.

Select Publications and Presentations

McKelvie, J.R., J.E. Lindstrom, H.R. Beller, S.A. Richmond, and B.S. Lollar. 2006. Analysis of anaerobic BTEX biodegradation in a subarctic aquifer using isotopes and benzylsuccinates. *Journal of Contaminant Hydrology*. 81. 167-86. doi:10.1016/j.jconhyd.2005.08.002.

Bradley, P.M., S. Richmond, and F.H. Chapelle. 2005. Chloroethene Biodegradation in Sediments at 4°C. *Applied and Environmental Microbiology*. 71(10) 6414-6417. doi:10.1128/AEM.71.10.6414-6417.

Richmond, S.A., R. Sundet, J. Paris, and T. Gould. 2004. Electron Donor Amendment and Bioaugmentation to Stimulate Bioremediation of Chlorinated Ethenes in Subarctic Sediments. Conference Proceedings, American Water Resources Association, Fairbanks, Alaska. April.

Richmond, S.A., J.E. Lindstrom, and J.F. Braddock. 2001. Assessment of Natural Attenuation of Chlorinated Aliphatics and BTEX in Subarctic Groundwater. *Environmental Science & Technology*. 35. 4038-45. doi:10.1021/es0108133.

Richmond, S.A., J.E. Lindstrom, and J.F. Braddock. 2001. Effects of Chitin on Microbial Emulsification, Mineralization Potential, and Toxicity of Bunker C Fuel Oil. *Marine Pollution Bulletin.* 42. 773-9. doi:10.1016/S0025-326X(00)00222-8.

Richmond, S.A. and J.F. Braddock. 2000. Geochemical characterization of anaerobic ground water in subarctic Alaska. pp. 141-145, In Proceedings of the American Water Research Association Conference on Water Resources in Cold Environments, Anchorage, Alaska. May.

Richmond, S.A. and J.F. Braddock. 2000. In situ Gibbs free energies of hydrogen-oxidizing terminal electron-accepting processes in contaminated subarctic ground water. Annual Report to the Water and Environmental Research Center, Univ. of Alaska Fairbanks. September.

Hinzman, L.D., M.R. Lilly, J.F. Braddock, K.A. McCarthy, S. Richmond and M. Wegner. 2000. Natural Attenuation of Chlorinated-Hydrocarbon Contamination at Fort Wainwright, Alaska, A Hydrogeochemical and Microbiological Investigation. INE/WERC Report 00.02.

Richmond, S.A. and J.F. Braddock. 1999. Results of the microbiological and geochemical study, Chapter 3, in *A hydrologic, microbiological, and geochemical characterization of a trichloroethene-contaminated ground-water site on Fort Wainwright, Alaska*. U.S. Geological Survey Open-File Report.

Braddock, J.F., P.H. Catterall, and S.A. Richmond. 1998. Assessment of the Potential for Biodegradation of Petroleum Hydrocarbons in the Railroad Industrial Area, Fairbanks, Alaska, 1993-94. U.S. Geological Survey Open-File Report 98-287.

Richmond, S.A., J.E. Lindstrom, and J.F. Braddock. 2002. Biogeochemical Footprints of TCE and BTEX Attenuation in Subarctic Groundwater. Oral presentation at the American Society for Microbiology—Alaska Chapter 18th Annual Meeting, Fairbanks, Alaska. March.

Mueller, S.H., R.J. Goldfarb, G.L. Farmer, R. Sanzolone, M. Adams, P.M. Theodorakos, S.A. Richmond, and R.B. McCleskey. 2002. Trace, Minor, and Major Element Data for Ground Water Near Fairbanks, Alaska, 1999-2000. U.S. Geological Survey Open-File Report 02-0090.

Richmond, S.A., J.E. Lindstrom, and J.F. Braddock. 2001. Assessment of natural attenuation of chlorinated aliphatics and BTEX in subarctic ground water. Oral presentation at the American Society for Microbiology Alaska Chapter 17th Annual Meeting, Anchorage, Alaska. April.

Richmond, S.A. and J.F. Braddock. 2001. Ground-water/surface water interactions in a subarctic aquifer: implications for natural attenuation of chlorinated solvents. Oral presentation at the American Society for Microbiology—Alaska Chapter 17th Annual Meeting, Anchorage, Alaska. April.

Richmond, S.A. and J.F. Braddock. 2000. Hydrogeochemistry and microbiology in subarctic ground water: implications for natural attenuation of trichloroethene. In Abstracts of the Arctic Forum 2000, Washington, D.C. May.

Richmond, S.A. and J.F. Braddock. 1999. Evidence of simultaneous aerobic and anaerobic transformation of trichloroethene in ground water treated with air sparging and soil vapor extraction. In Abstracts of the 99th General Meeting of the American Society for Microbiology, Chicago, Illinois. p. 538. May.

Richmond, S.A., J.E. Lindstrom, D.M.M. Adams, and J.F. Braddock. 1998. Effects of chitin and nutrient amendment on microbial mineralization and emulsification potential of bunker fuel oil spilled near Dutch Harbor, Alaska. In Abstracts of the 49th Arctic Science Conference, Fairbanks, Alaska. p. 65. October.

Richmond, S.A. and J.F. Braddock. 1998. Evidence for biotic and abiotic transformation of trichloroethylene in subarctic ground water under aerobic and anaerobic conditions. In Abstracts of the 49th Arctic Science Conference, Fairbanks, Alaska. p. 64. October.

Richmond, S.A., J.E. Lindstrom, and J.F. Braddock. 1998. Microbial mineralization and emulsification potential of bunker fuel oil spilled on a sandy beach near Dutch Harbor, Alaska. In Abstracts of the 98th General Meeting of the American Society for Microbiology, Atlanta, Georgia. May.

Richmond, S.A., J.E. Lindstrom, and J.F. Braddock. 1998. Microbial mineralization and emulsification potential of a bunker fuel oil spilled on a sandy beach near Dutch Harbor, Alaska. Oral Presentation at the American Society for Microbiology—Alaska Chapter meeting, Fairbanks, Alaska. April.

McCarthy, K.M., L.D. Hinzman, J.F. Braddock, M.R. Lilly, S.A. Richmond, and M.A. Wegner. 1997. A hydrological, geochemical, and microbiological characterization of a trichloroethene-contaminated alluvial aquifer in subarctic Alaska. In Abstracts of the American Geophysical Union Annual Meeting, San Francisco, California. December.

EA Project Experience

Currently assigned to assist with the following projects:

- F35 UFP-QAPP
- Murphy Dome Remedial Investigation Work Plan
- King Salmon Proposed Plan
- Eielson Air Force Base Generic Base-Wide UFP-QAPP
- Eielson Air Force Base Land Use Control Implementation Plan
- King Salmon Decision Document
- Joint Base Elmendorf-Richardson Landfill Annual Report
- Update Joint Base Elmendorf-Richardson UFP-QAPP and Monitoring Plan
- Tigalda Work Plan
- Tigalda Site Visit Report
- Unalga Report
- Moose Creek Annual Report
- Arctic Surplus Five-Year Review, groundwater monitoring, update UFP-QAPP, prepare Accident Prevention Plan, and update Operation and Maintenance Manual.

Other Project Experience

Taku Gardens, Fort Wainwright, Alaska (ADEC & Jacobs Engineering); May 2012 – May 2015—A former World War II-era salvage yard and company barracks were discovered during construction of a 110-unit family housing subdivision. This 54-acre site was contaminated with extremely high concentrations of polychlorinated biphenyls in addition to munitions-related items, and multiple volatile organic compounds, semivolatile organic compounds, metals, and petroleum compounds. As the ADEC project manager, provided regulatory oversight from site discovery through completion of the feasibility study. Significant challenges included conducting a CERCLA remedial investigation on an active construction site and an extremely aggressive investigation and remediation schedule. Successful execution required weekly meetings with all stakeholders including ADEC, U.S. Environmental Protection Agency, Army, U.S. Army Corps of Engineers, installation utility providers, and construction contractors so that investigation activities did not compete or interfere with construction activities. Helped lead highly charged public meetings with hundreds of attendees, and helped alleviate public concern over exposure to polychlorinated biphenyls and other environmental contaminants. The preliminary source evaluations (I and II) and remedial investigation were completed and reports approved within only 4 years of site discovery. After transferring to Jacobs, continued working on this project, authoring the Time-Critical Removal Action After-Action Report, the Proposed Plan, the contentious Record of Decision, and the Remedial Design/Remedial Action Work Plan. These documents were also subject to an aggressive schedule and were finalized and approved within 3 years of completion of the risk assessment.
Project Value – $250,000 (Jacobs); Contract Type – Cost-reimbursable

Former West Nome Tank Farm, Nome Alaska; Project Manager (ADEC)—A former bulk fuel storage (tank farm) site was located near the mouth of the Snake River on the banks of the Nome Harbor. Historical use of the facility resulted in substantial discharges of petroleum products to the ground surface, groundwater, and surface water sediments, with nearly 2 feet of non-aqueous phase liquid present at the groundwater surface. Significant challenges included multiple stakeholders (Chevron, Crowley Maritime, and the U.S. Air Force) negotiating liability during construction of critical municipal infrastructure, including new water and sewer lines to support economic development, harbor improvements, and a new power plant for the City of Nome. Provided regulatory oversight of this project. Developed alternative cleanup levels and approved a rapid, real-time field screening approach to segregate over 20,000 cubic yards of potentially contaminated soil for re-use or treatment. Received ADEC approval to discharge tens of millions of gallons of contaminated groundwater to the City of Nome municipal

wastewater treatment facility and approval to use moderately contaminated soil as daily cover at the City of Nome's Beam Road landfill. Led high-profile public meetings and participated in contentious planning meetings with stakeholders.

River Terrace Recreational Vehicle Park, Soldotna, Alaska (ADEC)—Historical operation of a former dry cleaner resulted in extremely high concentrations of chlorinated solvents in soil, groundwater, and surface sediment near the Kenai River, a world-class commercial salmon fishery. Following excavation of over 3,300 cubic yards of the most highly contaminated soil, tetrachloroethene concentrations in a glacial till confining layer were still 20 milligrams per kilogram, and groundwater concentrations of chlorinated aliphatics exceeded 44 micrograms per liter. The State of Alaska's contractor injected HRC® and a proprietary mixture of microorganisms capable of complete reductive dechlorination of tetrachloroethene to ethene but, after 2 years, degradation appeared to have "stalled" at *cis*-dichloroethene. Initiated a joint investigation with the U.S. Geological Survey to assess biogeochemical conditions in the aquifer and river sediments to determine why degradation was not proceeding as intended. Results showed that, despite a very large input of organic carbon, influx of oxygenated surface water into the aquifer prevented the formation of sufficiently reducing geochemical conditions, which led to the "stall"; however, laboratory microcosm studies provided evidence of aerobic and anaerobic mineralization of *cis*-dichloroethene to ethene in aquifer and Kenai River sediments. Results were published in *Applied and Environmental Microbiology*.

Taku Gardens Long-Term Groundwater and Vapor Intrusion Monitoring, Fort Wainwright, Alaska; December 2015 – November 2017; Project Manager (Jacobs Engineering)—Conduct bi-annual groundwater monitoring at 24 groundwater monitoring wells and quarterly soil gas monitoring at 110 occupied family housing units. Report preliminary data to customer and client within 10 calendar days of sample collection to ensure residential safety. Deliver quarterly and annual reports to customer, client, and regulators.
Project Value – $1.3M; Contract Type – FFP

Construction Support, Fort Wainwright, Alaska (Jacobs Engineering); June 2009 – December 2017—Provide emergency response to discovery of unexpected environmental contamination during military construction projects. Rapid identification and removal of hazardous, toxic, and radioactive waste to minimize construction delays. As project manager, was responsible for oversight of the field crew and subcontractors (laboratory and civil), budget management, and production of well over 100 technical documents, including a Post-wide work plan, UFP-QAPP, work plan addenda, technical memos, and after-action reports in addition to project-specific proposals.
Project Value – $19.8M; Contract Type – Cost-reimbursable

Migratory Bird Treaty Act, Fort Wainwright, Alaska (Jacobs Engineering); June 2009 – December 2017—Delineation and excavation of tar seeps and buried tar to bring the customer into compliance with the Migratory Bird Treaty Act (16 U.S. Code §§ 703–712). Treatment and disposal of over 10,000 cubic yards of excavated material. As project manager, was responsible for oversight of the field crew and subcontractors (laboratory and civil), and production of well over 100 technical documents, including a Post-wide work plan, UFP-QAPP, work plan addenda, technical memos, and after-action reports.
Project Value – $2.1 M; Contract Type – FFP

Six Mile Village, Alaska: University of Alaska Fairbanks; Doctoral Dissertation—Assessment of natural attenuation of chlorinated aliphatics and benzene, toluene, ethylbenzene, and xylenes in subarctic groundwater. Performed a comprehensive chemical and microbiological assessment to assess natural attenuation processes. Results indicated that dilution was the primary attenuation mechanism. Results were published in *Environmental Science and Technology*.

MV Kuroshima Bunker Fuel Spill, Dutch Harbor, Alaska; University of Alaska Fairbanks—Approximately 12,000 gallons of heavy bunker C fuel oil was released when the *MV Kuroshima* ran aground in the Aleutian Islands during a winter storm, resulting in beach oiling and contamination of a freshwater lake. Laboratory studies indicated that nutrient and chitin amendment enhanced microbial emulsification of the tar-like fuel oil, even at low temperatures. In addition, chitin amendment decreased toxicity of emulsified oil.

Camp Navajo Army Depot, Arizona; University of Northern Arizona; Master's Thesis— Isolation and Identification of toluene-degrading bacteria from trinitrotoluene-contaminated Soil. Performed a comprehensive

chemical and microbiological of soil at a trinitrotoluene-washout facility and an open burn/open detonation area. Results indicated that soil was nutrient-limited but toluene-degrading organisms were isolated and identified.

Water Quality Assessment, Hopi Reservation, Arizona; 1991-1992; Undergraduate Research Assistant— Performed a comprehensive chemical and microbiological water quality assessment of 36 drinking water sources and examined the efficacy of 12 wastewater water treatment systems on the Hopi Reservation in Northern Arizona. Determined which drinking water sources were the most likely sources of endemic enteric diseases and provided recommendations for wastewater treatment system improvements to the Tribe.

Employment History

Employer—EA Engineering, Science, and Technology, Inc., PBC (Fairbanks, Alaska)
Dates of Employment—January 2018 – Present
Title—Project Manager/Scientist

Employer—Jacobs Engineering
Dates of Employment—May 2012 – September 2017
Title—Environmental Project Manager/Senior Scientist

Employer—Alaska Department of Environmental Conservation, Contaminated Sites Program
Dates of Employment—February 2003 – March 2010
Title—Environmental Program Specialist III

Employer—State of Alaska Department of Health and Social Services, Virology Laboratory
Dates of Employment—March 2002 – February 2003
Title—Microbiologist III

Employer—University of Alaska Fairbanks
Dates of Employment—2001–2006
Title—Adjunct Professor; Microbiology

Employer—University of Alaska Fairbanks
Dates of Employment—June 1996 – May 2001
Title—Research Assistant; biodegradation/biogeochemistry/hydrogen in groundwater/terminal electron-accepting processes

Employer—U.S. Geological Survey
Dates of Employment—June 1996 – September 2001
Title—Hydrologist; groundwater-surface water interactions/biogeochemistry/sediment chemistry/non-point source pollution

Employer—University of Northern Arizona
Dates of Employment—October 1994 – June 1996
Title—Research Specialist; molecular biology/herbicide biodegradation

Employer—University of Northern Arizona
Dates of Employment—June 1991 – May 1994
Title: Research Assistant—Public health microbiology/wastewater microbiology/soil chemistry

List of Technical Skills and Specializations

- Analytical chemistry
- Biogeochemistry
- Contaminant fate/transport
- Enhanced bioremediation of chlorinated and petroleum compounds
- Groundwater/surface water interactions

- Monitored natural attenuation of chlorinated and petroleum compounds
- Research design and statistical analysis

Teri L. McMillan, P.G.
Senior Geologist

Ms. McMillan has 26 years of technical and managerial experience in fieldwork, project management, work plan and cost estimate preparation, technical reporting, and interaction with state and regulatory officials. Her geologic and environmental experience includes project management, hydrogeological investigations of soil and groundwater contamination, corrective action plan development, remediation construction oversight, drilling supervision and monitor well installation, water quality monitoring and sampling, analysis of groundwater elevation and analytical water quality data.

Education
M.S./Geoscience/1991 (Texas Tech University)
B.S./Geology/1988 (University of New Mexico)

Registrations/Certifications
Professional Geologist— LA (2014, No. PG-376);
2014, TX (2013, No. PG-11469)

Specialized Training
OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training; 1991
OSHA 8-Hour Hazardous Waste Operations and Emergency Response Refresher (annually)
OSHA 8-Hour Hazardous Waste Operations Supervisor Training; 2010
OSHA 10-Hour Construction Safety Training; 2007
Trenching and Excavation Competent Person
CPR and First Aid Training

Experience
Years with EA: 9 Total Years: 26

Professional Experience

Project Management—Successfully managed over 30 sites for private clients, and state and federal agencies. Projects have included leaking underground storage tank sites, agricultural sites, and various sites for the U.S. Environmental Protection Agency (EPA) Region 6 Remediation Action Contract. New Mexico Petroleum Storage Tank Program Manager for New Mexico leaking underground storage tank sites. In addition, manages the New Mexico Petroleum Storage Tank Bureau State Lead contract. As Project Manager, responsibilities have included supervising staff, managing budget and schedule, providing client updates, and interacting with regulatory agencies.

Site Characterization and Remediation—Completed numerous subsurface investigations to delineated soil and groundwater contamination at various sites in New Mexico. For leaking underground storage tank sites, developed remedial action plans, provided remediation construction oversight, and managed operation and maintenance of remedial system. Completed site characterization at EPA Superfund Sites and implemented remedial design at two Superfund sites in Texas. Remediation experience with soil vapor extraction, multi-phase extraction, pump and treat, thermal desorption, removal actions, *in situ* bioremediation and natural attenuation.

Construction Management—Successfully managed/supervised the construction of the following remediation projects: removal of up to 10,000 cubic yards of hydrocarbon contaminated soil; installation of a thermal desorption pilot test system; installation groundwater treatment system (pump and treat), bioventing, and *in situ* bioremediation barriers; replacement of private supply wells, soil vapor extraction system, and a multiphase extraction system.

Phase I Environmental Site Assessment—Responsible for generation of Phase I and II Environmental Site Assessments following American Society for Testing and Materials standards. Research included onsite visits, hazardous chemical evaluations, review of geologic data, and historical research of land uses. Subsequent investigations performed to determine if the site has been impacted by contaminants of concern.

Petroleum Storage Tank Bureau Program Manager—Responsibilities include overseeing all staff and activities associated with New Mexico Environment Department Petroleum Storage Tank Bureau Sites. This includes reviewing proposals, work plans, budgets, schedules, reports, remedial designs for all Petroleum Storage Tank Bureau site and interacting with New Mexico Environment Department Petroleum Storage Tank Bureau project managers.

Health and Safety—As Health and Safety Coordinator, prepared health and safety plans, reviewed health and safety plans, and ensured that employees conduct their jobs in a safe manner and are using the appropriate personal protective equipment.

Publications and Presentations

McMillan, T.L. and J. Snyder. 2018. Adapted Remedial Investigation Scope for Accelerated Vapor-Intrusion Evaluation. Presented at the 11th Symposium on Design and Construction Issues at Harardous Waste Sites (DCHWS 2018), Philadelphia Post Society American Military Engineers. 18-20 April.

EA Project Experience

Remedial Investigation/Feasibility Study, Lea and West Second Superfund Site, Roswell, Chaves County, New Mexico; EPA Region 6; Project Manager—Responsible for managing the Remedial Investigation/Feasibility Study of the Lea and West Second Superfund site that consists of four separate locations (or Sites) near West Second Street and East Second Street in areas of active commercial and residential use near the center of downtown Roswell. At each of these four Sites, predominantly historical dry cleaning operations were documented and hazardous substances were released to the soil and migrated to groundwater. Prepared the Conceptual Understanding of the Site that included compiling all historical data and prepared the Sampling and Analysis Plan, which includes passive soil gas and vapor intrusion in the initial sample design. Completed vapor intrusion sampling at four sites, passive soil gas sampling at three sites, and began soil and groundwater investigations at two sites. Worked with EPA in preparation and presented at Public Information Meetings.
Project Date: August 2016 – Present
Project Value – $930,232; Contract Type – Time and Materials; EA Project No. – 14342145; EA Project Manager – Teri McMillan

Remedial Design, Sandy Beach Road Groundwater Plume Superfund Site, Azle and Pelican Bay, Tarrant County Texas; EPA Region 6; Project Manager—Managed the design for the next phase of remediation of a large groundwater plume contaminated with trichloroethene. A soil vapor extraction system is operating at the source area with an *in situ* bioremediation barrier downgradient of the source area. EA designed the second phase of remediation at the source area, which entails *in situ* bioremediation groundwater source treatment with PlumeStop® and HRC® and downgradient PlumeStop® *in situ* bioremediation barriers to protect private supply wells.
Project Date: August 2016 – Present
Project Value – $857,000; Contract Type – Time and Materials; EA Project No. – 1434291; EA Project Manager – Teri McMillan

Remedial Investigation/Feasibility Study, Wilcox Oil Superfund Site, Bristow, Creek County, Oklahoma; EPA; Project Manager—Responsible for managing the Remedial Investigation/Feasibility Study of a former oil refinery where the main components of the system consisted of a skimming plant, cracking unit, and re-distillation battery with a vapor recovery system and continuous treating equipment. The project included investigation activities necessary to support EPA's remedy selection to eliminate, reduce, or control risks to human health and the environment Responsibilities included preparing the Conceptual Understanding of the Site, Health and Safety Plan, Site Management Plan and the Sampling and Analysis Plan. Participated in scoping meetings with EPA Region 6 Task order manager and technical experts as well as State of Oklahoma Department of the Environment representatives.
Project Date: July 2015 – July 2016
Project Value – $1,491,571; Contract Type – Cost Plus; EA Project No. – 1434128; EA Project Manager – Teri McMillan

Remedial Action, East 67th Street Groundwater Plume Superfund Site, Ector County, Texas; EPA Region 6; Project Manager—Managing the remedial action for tetrachloroethene groundwater plume originating from a past spill at the former Delta Solvents facility (now Brenntag Southwest) located outside the Odessa city limits in Ector County, Texas. The residual source area contamination and groundwater plume have impacted surrounding private

water supply wells that provide drinking water to residences and commercial businesses in the area. The Trinity aquifer is the only groundwater source for drinking water in the site area. Contaminants of concern for groundwater include tetrachloroethene and its degradation products, trichloroethene and *cis*-1,2-dichloroethene. Completed remedial action by implementing the remedial design. 15 replacement private water supply wells were installed, 18 existing private water supply wells were plugged and abandoned, five carbon filtration systems were installed on replacement private water supply wells, six monitoring wells were installed, Phase 1 *in situ* bioremediation wells (6 injection wells and 5 observation wells) and Phase 2 *in situ* bioremediation wells (5 injection wells and 3 observation wells) were installed, and the injection edible oil was completed. *In situ* bioremediation sampling up to 300 days to evaluate the *in situ* bioremediation remedy was completed. Completed the installation of the Phase 3 *in situ* bioremediation well installation and injection of PlumeStop®. Installed three horizontal soil vapor extraction wells. Transferred the soil vapor extraction system from another EPA Superfund Site and began installation of the system at this site.
Project Date: 2014 – Present
Project Value – $6,187,833; Contract Type –Time and Material; EA Project No. – 14342115; EA Project Manager – Teri McMillan

Remedial Action; Sandy Beach Road Groundwater Plume Superfund Site, Azle and Pelican Bay, Tarrant County, Texas; EPA Region 6; Project Manager—Managing the remedial action for a chlorinated solvent plume that is approximately 1 mile in length. The plume has affected three public water supply wells in Pelican Bay and as many as 12 residential drinking water wells in Tarrant County and Pelican Bay. As part of the remedial action, new residential water supply wells were installed in the Twin Mountain aquifer to replace the contaminated water supply wells that were completed in the Paluxy. A soil vapor extraction system was installed at the source area to extract and treat soil vapor collected through the soil vapor extraction wells. Operation and maintenance of the soil vapor extraction system was completed and the system was decommissioned. The northern *in situ* bioremediation well field was installed and two edible oil injections were completed. Performance assessments of the *in situ* bioremediation barrier is ongoing. Installed 30 nested injection wells in the source area and began preparation of injecting PlumeStop®, HRC, and bioaugmentation.
Project Date: 2015 – Present
Project Value – $7.9 million; Contract Type – Time and Materials; EA Project No. – 14342114; EA Project Manager – Teri McMillan

Long-Term Remedial Action, Sprague Road Ground Water Plume Superfund Site, Odessa, Ector County, Texas; Geologist—Geologist on groundwater plume. The site consists of three abandoned metal plating facilities located within one mile of each other. The past operations and waste disposal practices at the facilities have results in the release of chromium to the groundwater. The remedial system consists of a network of recovery and injection wells and an ultraviolet light-activated slurry catalyst system (Photo-Cat) to reduce hexavalent chromium to trivalent chromium. Lead for delineate chromium contamination at one of the three facilities, installation of new private supply wells, and design research for possible future permeable reactive barriers. Currently the project is in the design phase for a new ion exchange system.
Project Date: 2006 – Present
Project Value – $17, 039,153; Contract Type – Time and Materials; EA Project No. – 1434207; EA Project Manager – Beth Liu

Remedial Investigation/Feasibility Study, Odessa Cr#1 Superfund Site, Odessa, Ector County, Texas; Project Manager—Initial project manager prepared work plan and assisted in completion of the Sampling and Analysis Plan. The site soil source area is believed to continuously contribute to the groundwater plume migration. The soil and underlying caliche is to be investigated for evaluation of the soil source impacts to the groundwater plume. Communicate with EPA project manager and update the project progress.
Project Date: 2017 – Present
Project Value – $300,000; Contract Type – Time and Materials; EA Project No. – 14342148; EA Project Manager – Beth Liu

Remedial Design, Odessa Cr#1 Superfund Site, Odessa, Ector County, Texas; Project Manager— Initial Project Manager completed work plan and worked with the design task manager and communicate with EPA project

manager with status update. The design consists of expansion of a water distribution system servicing an area impacted by the chromium-contaminated groundwater plume. Design stages include pre-final and final design and deliverables include Basis of Design Report, Design Criteria Report, Design Specifications, Drawings and Schematics, Construction Quality Assurance Plan, Traffic Control Plan, Cost Estimates, Remedial Action Solicitation Package, and Construction Schedule. Design elements include utility and right-of-way survey and water distribution network modeling to evaluate system pressures, flow rates, and water quality.
Project Date: 2017 – Present
Project Value – $351,795; Contract Type – Time and Materials; EA Project No. – 14342149; EA Project Manager – Beth Liu

Marion Pressure Treating Company Superfund Site, Marion, Louisiana; EPA; Project Manager—Managed a remedial investigation/feasibility study reassessment associated with a former pressure-treated wood product company located in Marion, Louisiana. Creosote was reported to be the only wood preservative used during the wood treatment process. A remedial investigation and feasibility study were completed at the site in 2001, and the Record of Decision was completed in 2002. A remedial design was developed in September 2003 and an independent technical review of the design was performed by the U.S. Army Corps of Engineers in 2006. However, due to issues with the selected technology, the remedial action was never performed. EA conducted a supplemental field investigation employing the use of a cone penetrometer testing rig in conjunction with the Tar-specific Green Optical Technology® to delineate the extent of creosote at the site. A feasibility study reassessment and Proposed Plan were completed.
Project Date: 2015 – December 2016
Project Value – $596,000; Contract Type – Time and Materials; EA Project No. – 1434262; EA Project Manager – Teri McMillan

Performance-Based Remediation, Hill Air Force Base, Utah; Air Force Civil Engineer Center—Site Manager for underground storage tank-regulated sites ST050, ST055, ST059, ST066, ST068 and ST074 for the fence-to-fence performance-based remediation contract at Hill Air Force Base. Responsible for technical oversight and management of all site activities, planning, execution, schedule, and budget for these projects. Projects involve Performance Objective of site closeout. Site activities include development of proposed plans for data gap investigations, Uniform Federal Policy–Quality Assurance Project Plans, design and implementation of site investigations and reporting, risk assessment, and Explanation of Significant Differences. At ST061, a bulk fuel facility that had a release of JP-8, an additional investigation was completed to meet Utah Department of Environmental Quality Petroleum Storage Tank Branch Tier 2 evaluation. Was site geologist assisted in soil sample collection and soil vapor extraction well installation. Used SiteLab to field screen soils for total petroleum hydrocarbons.
Project Date: 2012–2016
Project Value – $23.2 million; Contract Type – PBC; Contract = WERC09 Air Force Civil Engineer Center; EA Project No. – 6236906; EA Project Manager – Sandy Staigerwald

Investigation/Remedial Design; Laun-Dry Supply Company, Albuquerque, New Mexico; Project Manager—The site is a laundry and dry cleaning supply distribution facility that had a release of tetrachloroethylene that contaminated soil and groundwater, resulting in a groundwater plume that is at a minimum 3,000 feet long. Responsibilities include (1) completing site investigation, Stage 1 Abatement, activities that consisted of preparing a Site Summary/Data Gaps report, long-term soil vapor extraction pilot test, groundwater aquifer tests and a work plan for additional investigation activities that include installation of shallow and deep plume delineation monitoring wells, conducting a passive soil gas survey, conducting an *in situ* bioremediation pilot test, vapor intrusion assessment, and semi-annual site wide groundwater monitoring, (2) completing the remedial design, Stage 2 Abatement, that included the installation of two *in situ* bioremediation barriers within two areas of the groundwater plume, and (3) completing the interim abatement measures with installation of a soil vapor extraction system.
Project Date: 2013 – Present
Project Value – $1,450,885; Contract Type –Time and Material; EA Project No. – 1506901/1506902; EA Project Manager – Teri McMillan

Site Closeout of Oil/Water Separator Site OW510; Hill Air Force Base Performance Based Contract; Air Force Civil Engineer Center—Project geologist for the site closeout activities at the site under the performance-based contract. Site OW510 is an active 2,000-gallon steel oil/water separator located in the parking area adjacent to Building 37. The oil/water separator processes liquids from aircraft and equipment maintenance and repair and floor washing inside hangars and buildings. Prior investigations have confirmed the presence of hydrocarbon-related volatile organic compounds in subsurface soil. The site activities included developing the closure strategy and collecting the necessary data to support it. Field activities included a cone penetration test/membrane interface probe survey, followed by confirmatory soil borings.
Project Date: 2012–2014
Site Value – $693,758; Contract Type – Lump Sum PBC; EA Project No. – 6236906; EA Project Manager – Sandy Staigerwald

Site Closeout of Oil/Water Separator Site OW529; Hill Air Force Base Performance-Based Contract; Air Force Civil Engineer Center—Project geologist for the site closeout activities at the site under the performance based contract. Site OW529 is an active 4,000-gallon steel oil/water separator located in the parking area near Building 911. The oil/water separator processes liquids from aircraft and equipment maintenance and repair and floor washing inside Buildings 911, 914, 916, and 924. Prior investigations have confirmed the presence of hydrocarbon-related volatile organic compounds in subsurface soil. The site activities included developing the closure strategy and collecting the necessary data to support it. The site activities included cone penetrometer test/membrane interface probe survey, followed by confirmatory soil borings.
Project Date: 2012–2014
Site Value – $630,145; Contract Type – Lump Sum PBC; EA Project No. – 6236906; EA Project Manager – Sandy Staigerwald

Site Closeout of Polychlorinated Biphenyl Spill Site SS030; Hill Air Force Base Performance-Based Contract; Air Force Civil Engineer Center—Managed field team during the site closeout activities at the site under the performance based contract. SS030 is located in the central portion of Hill Air Force Base and includes the area east of Building 20 and north of Building 26. During removal of old asphalt in 1989, workers detected an odor and discovered discolored soils east of Building 20 and north of Building 26. Polychlorinated biphenyls were detected in the soils at levels exceeding the polychlorinated biphenyl Cleanup Standard. The site was investigated and remediated in 1989 under the polychlorinated biphenyl Spill Cleanup Policy. No Further Response Action Planned based on industrial future use was recorded for the site in 1992 and an asphalt cap was put in place over the remediated area. The site does not meet the current U.S. Air Force objective of unrestricted use. The site activities are designed to assess data gaps in order to obtain unrestricted residential site closure for SS030. The conceptual site model for the site will be refined. Initial confirmation samples to address data gaps in order to confirm site soils have been remediated to current EPA Residential Cleanup Standards for polychlorinated biphenyls will be collected and reported. If needed, further removal actions will be conducted to remove residual polychlorinated biphenyl contamination that exceeds residential standards.
Project Date: 2013–2014
Site Value – $123,169; Contract Type – Lump Sum PBC; EA Project No. – 6236906; EA Project Manager – Sandy Staigerwald

Remedial Investigation/Feasibility Study at National Priorities List Site, Falcon Refinery Superfund Site, Ingleside, Texas—Project geologist and managing the field activities for the remedial investigation/feasibility study for a 104-acre site that consists of an inactive refinery except for a crude oil storage operation. When in operation, the refinery had a capacity of 40,000 barrels per day and the primary products consisted of naphtha, jet fuel, kerosene, diesel, and fuel oil. The refinery also historically transferred and stored vinyl acetate, a substance not excluded under the petroleum exclusion. Phase 1 of the remedial investigation was conducted by the potentially responsible parties and identified seven areas of concern with volatile organics, semivolatile organics, and metals in the soil, sediment, surface water, and groundwater. Three areas of concern were located offsite including AOC-5, which included the Intracoastal Waterway adjacent to the docking facility.
Project Date: 2012–2014
Project Value – $1,236,965; Contract Type – Time and Materials; EA Project No. – 1434288; EA Project Manager – Bob Owens

Investigation; Allsup's 102, Knox City, Texas; Allsups Petroleum Inc.—The site is a Texas Commission on Environmental Quality leaking underground storage tank site that has contaminated soil and groundwater beneath the site. Non-aqueous phase liquid is present onsite and offsite. The extent of the non-aqueous phase liquid and groundwater plume has been delineated. A remedial action plan was prepared and approved with the remedy consisting of horizontal soil vapor extraction wells. The soil vapor extraction system was installed in 2016. As Project Manager, prepared work plans, reports, and oversaw field staff and field activities.
Project Date: 2013–2018
Project Value – $635,000; Contract Type – Time and Material; EA Project No. – 1508301; EA Project Manager – Teri McMillan

Investigation and Remediation; Holiday Chevron, Tucumcari, New Mexico; Conway Oil Company—The site is a leaking underground storage tank site that was remediated by conducting a removal action of approximately 10,000 cubic yards of contaminated soil. During the removal action, horizontal injection lines were installed along the property boundaries. Hydrogen peroxide was injected into horizontal piping to mitigate the migration of contamination from adjacent sites. Semi-annual monitoring is currently being conducted at the site.
Project Date: 2010–2018
Project Value – $1.7 million; Contract Type – Lump Sum; EA Project No. – 6231701; EA Project Manager – Teri McMillan

Remedial Design; Jones Road Groundwater Plume Superfund Site, Houston, Harris County, Texas; EPA Region 6; Geologist—The Jones Road Site is the result of a release from a former dry cleaning facility. The contaminants present include perchloroethylene and related daughter products trichloroethylene, dichloroethene, and vinyl chloride. Prepared Conceptual Understanding of the Site Technical Memorandum, which summarized existing data and assessed its completeness that will help determine potential data gaps that will direct future activities and the remedial design. Supported the injection pilot test conducted at the site.
Project Date: 2012–2013
Project Value – $1.6 million; Contract Type – Time and Materials; EA Project Manager – Ted Telisak

Remediation; Driver's Travelmart #408, San Jon, Quay County, New Mexico; Leaking Underground Storage Tank Site; Project Manager—Project included the remediation of a diesel fuel release that contains over 70,000 gal of non-aqueous phase liquid. The site was remediated using surfactant enhanced recovery combined with dual phase extraction. Prepared work plan, discharge plan, and managed field staff completing pilot tests and remediation well field. Reviewed Final Remediation Plan for surfactant enhanced recovery with dual phase extraction.
Project Date: 2011–2012
Project Value – $1.5 million; Contract Type – Fixed Price; EA Project No. – 6253601; EA Project Manager – Teri McMillan

R&H Oil/Tropicana Energy Superfund Site, San Antonio, Texas; EPA Region 6: Geologist—The R&H Oil/Tropicana Energy Site was previously an oil refinery, fuel distribution and fuel gasoline blending facility. The potential responsible parties were conducting a remedial investigation/feasibility study at the site. Conducted oversight of potentially responsible parties during soil and groundwater investigation. This included oversight of soil boring and monitoring well installation, low flow groundwater sampling, and vapor sampling. Collected split samples during oversight.
Project Date: 2011–2012
Project Value – $300,000; Contract Type – Time and Materials; EA Project Manager – Ted Telisak

Remedial Action; Jones Road Groundwater Plume Superfund Site, Houston, Harris County, Texas; EPA Region 6; Geologist—The Jones Road Site is the result of a release from a former dry cleaning facility. The contaminants present include perchloroethylene and related daughter products trichloroethylene, dichloroethene, and vinyl chloride. Prepared work plan and cost estimate to plug and abandon 129 private wells that were previously connected to the local public drinking water system. Plugging of these wells was necessary because active pumping of the wells may cause migration of the plume, and the older water wells may act as conduits for contaminant migration.

Project Date: 2011
Project Value – $600,000; Contract Type – Time and Materials; EA Project Manager – Ted Telisak

Remedial Action Operations at Landfills LF-002, Kirtland Air Force Base, New Mexico; Air Force Center for Engineering and the Environment; Senior Geologist—The site was under remedial action operations at Resource Conservation and Recovery Act Solid Waste Management Units at Kirtland Air Force Base, New Mexico. Senior Geologist for installation of two deep monitoring wells. Oversaw field staff during drilling and well installation.
Project Date: 2012
Project Value – $1,184,743; Contract Type – FFP; EA Project No. – 6242112; 6242147; EA Project Manager – Devon Jercinovic

Remedial Investigation/Feasibility Study; Sandy Beach Road Groundwater Plume Superfund Site, Azle and Pelican Bay, Tarrant County, Texas; EPA Region 6; Project Manager—Completed remedial investigation and feasibility study of a chlorinated solvent plume that is approximately 1 mile in length. The plume affected 3 public water supply wells in Pelican Bay and as many as 12 residential drinking water wells in Tarrant County and Pelican Bay. Completed and oversaw field staff during the installation of over 20 monitoring well/temporary wells, vapor intrusion sampling, passive soil gas investigation, soil vapor extraction pilot test, *in situ* bioremediation pilot test, compound specific isotope analysis, and site wide groundwater sampling. Conduct an additional *in situ* bioremediation pilot test at the site. Completed additional pump tests in the source area and obtained mass flux measurements using passive flux meters. Responsibilities included managing budget, staff, and subcontractors in an effort to complete investigation activities and prepare a feasibility study.
Project Date: 2010 – Present
Project Value – $2.6 million; Contract Type – Time and Materials; EA Project No. – 1434213; EA Project Manager – Teri McMillan

Petroleum Storage Tank Bureau State Lead Contract; Leaking Underground Storage Tank Sites; New Mexico Environment Department; Project Manager—Program Director for Petroleum Storage Tank Bureau State Lead contract, including completing site investigations and monitoring at Mobil #7, Raton, New Mexico; Worley Mills, Tucumcari, New Mexico; Fairview Station, Espanola, New Mexico; and Johnson Park, Las Cruces, New Mexico. Includes conducting non-aqueous phase liquid recovery at Hallsel's Grocery, Hatch, New Mexico and Tucumcari Airport, Tucumcari, New Mexico. Responsibilities included preparing work plans, health and safety plans, overseeing project staff, preparing and reviewing reports, and interaction with Petroleum Storage Tank Bureau project managers.
Project Date: 2010 – Present
Project Value – $250,000; Contract Type – Fixed Price; EA Project Manager – Teri McMillan

Allsup Petroleum, Inc. Leaking Underground Storage Tank Sites, New Mexico—Program Director for 18 leaking underground storage tank sites located within New Mexico. Prepared and implemented work plans for minimum site assessments, groundwater monitoring and non-aqueous phase liquid recovery activities. Supervised field staff and prepared groundwater investigation and monitoring reports. Interact with New Mexico regulators on behalf of client. Provide oversight and collect soil samples during tank removal activities.
Project Date: 2009 – Present
Project Value – $500,000; Contract Type – Lump Sum; EA Project No. – Various; EA Project Manager –Teri McMillan

Conway Oil Company; Leaking Underground Storage Tank Sites, New Mexico—Program Director for five leaking underground storage tank sites located in southeastern New Mexico, one of which received a status of no further action. Prepared and implemented work plans for groundwater monitoring and non-aqueous phase liquid recovery. Supervised field staff and prepared and reviewed monitoring reports.
Project Date: 2009 – Present
Project Value – $150,000; Contract Type – Fixed Price; EA Project Manager – Teri McMillan

Cloudcroft Texaco; Cloudcroft, New Mexico; Aubrey Dunn—Interact with the New Mexico Environment Petroleum Storage Tank Bureau on behalf of client. Prepared and implemented work plan for well repair and semi-annual groundwater monitoring.
Project Date: 2009 – Present
Project Value – $30,000; Contract Type – Lump Sum; EA Project No. – 6231801 and 6231802; EA Project Manager – Teri McMillan

Stage 1 Abatement; Cal-Maine; Albuquerque, New Mexico; Cal-Maine Foods, Inc.—Responsible for preparing and implementing abatement plans for former egg farm that included completing site investigation/characterization, plume delineation, data analysis and quarterly monitoring. As Project Manager, interacted with state agency on behalf of client and prepared investigation and quarterly reports.
Project Date: 2009–2015
Project Value – $150,000; Contract Type – Time and Materials; EA Project No. – 1464501 and 1464502; EA Project Manager – Teri McMillan

Stage 1 Abatement; Dona Ana Dairies; Mesquite, New Mexico; Dona Ana Dairy Consortium—Twelve dairies formed a consortium to address nitrate, chloride, and total dissolved solids groundwater contamination in the most effective manner. Responsible for preparing and implementing Stage 1 Abatement Plan that included completing site investigation/characterization, plume delineation, data analysis and quarterly monitoring. Prepared Stage 2 Abatement Plan that consisted of monitored natural attenuation and implementation of the Stage 2 Abatement Plan.
Project Date: 2009–2017
Project Value – $386,000; Contract Type – Time and Materials; EA Project No. – 1464103; EA Project Manager – Teri McMillan

Brownfields Projects, Various Sites in Northwest New Mexico—Reviewed Phase 1 reports for the Northwest New Mexico Council of Governments. The Northwest New Mexico Council of Governments has received from EPA a $1,000,000 Brownfields Assessment grant to evaluate and if necessary, remediate, potentially contaminated properties targeted for redevelopment in the northwestern New Mexico counties of Cibola, McKinley, and San Juan. The Brownfields program is funded through the American Recovery and Reinvestment Act.
Project Date: 2011–2012
Project Value – $60,000; Contract Type – Time and Materials; EA Project No. – 1478301; EA Project Manager – Cristina Radu

Bio-Ecology Superfund Site, Grand Prairie, Texas; EPA Region 6—Managed the preparation of the fourth Five-Year Review. The remedy called for raising the elevation of the site above the 100-year floodplain, constructing a Resource Conservation and Recovery Act compliant onsite disposal cell with a synthetic liner and leachate collection system, stabilizing the waste and placing it in the Resource Conservation and Recovery Act landfill, constructing a Resource Conservation and Recovery Act compliant final cover, and installing a groundwater monitoring system.
Project Date: 2010
Project Value – $41,350; Contract Type – Time and Materials; EA Project No. – 1434260; EA Project Manager – Teri McMillan

Griggs and Walnut Superfund Site, Las Cruces, New Mexico; EPA Region 6—Prepared and implemented Sampling and Analysis Plan for the Integrated Site Assessment/Site Investigation, which included the installation of three new monitoring wells, as well as, installation and sampling of passive diffusion bags. In 2015, completed one sampling event using passive diffusion bags.
Project Date: 2010 and 2015
Project Value – $133,267; Contract Type – Time and Materials; EA Project No. – 1434251 and 14342124; EA Project Manager – Teri McMillan

Tex Tin Corporation Superfund Site, Texas City, Texas; EPA Region 6—Prepared third Five-Year Review for the former smelter Site, which included two operable units. The selected remedy included treatment, offsite disposal, onsite stabilization and containment, and institutional controls to mitigate the carcinogenic risk and non-carcinogenic hazards at the site.

Project Date: 2010
Project Value – $45,523; Contract Type – Time and Materials; EA Project No. – 1434256; EA Project Manager – Ted Telisak

Oklahoma Refining Superfund Site, Oklahoma; EPA Region 6—Reviewed historical site data and prepared the evaluation of the petroleum exclusion of the refinery portion of the Oklahoma Refining Company facility from the Oklahoma Refining Company Superfund site.
Project Date: 2010–2011
Project Value – $136,127; Contract Type – Time and Materials; EA Project No. – 1434250; EA Project Manager – Brian Yost

Tom Visser Dairy, Roswell, New Mexico; EnviroCompliance Services—Responsible for completing and preparing Stage 1 Abatement Plan, which included the installation of soil borings and monitoring wells to delineate soil and groundwater contamination, analyzing data, and preparing report. Contaminants of concern include nitrate, chloride, sulfate and total dissolved solids.
Project Date: 2009–2010
Project Value – $25,000; Contract Type – Time and Materials; EA Project No. – 1463901; EA Project Manager – Cristina Radu

Sprague Road Superfund Site, Odessa, Texas; EPA Region 6; 2010—Responsible for logging and installing pilot test well, and provided oversight for well development and well completions. Contaminant of concern at the site is chromium.
Project Date: 2010
Project Value – $4,583,698; Contract Type – Time and Materials; EA Project No. – 1434207; EA Project Manager – Stan Wallace

Eagle Picher Carefree Batteries Superfund Site, Socorro, New Mexico; EPA Region 6—Prepared Sampling and Analysis Plan and Site Conceptual Understanding of the Site for the Remedial Investigation/Feasibility Study. Completed historical review of previous investigation report, and interacted with New Mexico Environment Department Groundwater Quality Bureau Superfund Oversight. The site contaminants of concern were volatile organic compounds (specifically chlorinated compounds) and metals.
Project Date: 2009–2010
Project Value – $326,752; Contract Type – Time and Materials; EA Project No. – 1434243; EA Project Manager – Luis Vega

BMR, Albuquerque, New Mexico—Supervised Phase 1 Site Assessment for a site located within Albuquerque South Valley following American Society for Testing and Materials standards. Completed onsite visit and oversaw staff conducting research, hazardous chemical evaluations, review of geologic data, and historical research of land uses.
Project Date: 2009
Project Value – $8,135; Contract Type – Time and Materials; EA Project No. – 6230501; EA Project Manager – Cristina Radu

Remedial Investigation/Feasibility Study; East 67th Street Groundwater Plume, Superfund Site, Odessa, Texas; EPA Region 6—Provided oversight for installation of nested vapor sampling wells. Wrote standard operating procedures for conducting active soil gas survey, completed active soil gas survey following standard operating procedure and collected vapor samples using Summa canisters.
Project Date: 2009
Project Value – $1,196,284; Contract Type – Time and Materials; EA Project No. – 1434211; EA Project Manager – Tim Startz

Undisclosed Site, Loco Hills, New Mexico; Gordon Environmental, Inc.—Completed Phase 1 Site Assessment for oil field site following American Society for Testing and Materials standards. Research included onsite visit, hazardous chemical evaluations, review of geologic data, and historical research of land uses.

Project Date: 2009
Project Value – $6,565; Contract Type – Time and Materials; EA Project No. – 6235001; EA Project Manager – Vener Mustafin

Bristol Environmental Remediation Services; Comprehensive Environmental Response, Compensation, and Liability Act Site Inspections and Removal Actions, Multiple Formerly Used Defense Sites, New Mexico—Researched historic information for U.S. Army Corps of Engineers–Albuquerque District for site inspections/removal actions in New Mexico at Former Army Air Field Properties in Hobbs, Carlsbad, Deming, and Fort Sumner and former Air Force Stations in Tierra Amarilla and Las Cruces. Prepared site conceptual model and Quality Assurance Project Plan for former Las Cruces Air Force Station.
Project Date: 2009–2011
Project Value – $834,683; Contract Type – Time and Materials; EA Project No. – 6237101; EA Project Manager – Devon Jercinovic

Other Project Experience

Plume Delineation and Remediation System Installation at Leaking Underground Storage Tank Site; Portales Chevron, Portales, New Mexico; Conway Oil Company; 2004–2008; Project Manager—Conducted investigations to delineate extent of hydrocarbon contamination, including monitor well installation, sampling and reporting. Was part of winning team that was awarded remedial design, implementation and system operation and maintenance by the New Mexico Environment Department Petroleum Storage Tank Bureau. As Project Manager, provided construction oversight of remediation contractor and interacted with state agency.

Remediation System Installation and System Operation and Maintenance at Leaking Underground Storage Tank Site; Laguna Mart, Laguna, New Mexico; NSYNC Environmental; 2008; Project Manager—Prepared work plans and costs to install and operate remediation system. Provided construction oversight during installation of bioventing, pump and treat, in-situ bioremediation system. Remediation system was installed under budget. Interacted with state agency and Laguna Pueblo. Prepared operation and maintenance monitoring report.

Diesel Release on Navajo Nation; Consol Energy; Burnham, New Mexico; 2008; Project Manager – Project Geologist—Completed field investigation delineating the extent of diesel contamination. Prepared landfarm test plots, interpreted test plot data and helped prepare excavation and landfarm remedial design. Interacted on behalf of client with Burnham Chapter, Navajo Nation EPA and EPA Region 9.

Thermal Desorption Pilot Test; Allsup's 261; Dexter, New Mexico; Allsup Petroleum; 2007-2008; Project Manager—Completed plume delineation of leaking underground storage tank site. Performed 6-month thermal desorption pilot test, which resulted in 100 percent non-aqueous phase liquid removal and 95 percent reduction in vadose zone hydrocarbon contamination. Project completed under budget.

Removal Action Santa Fe/Nimitz; Grants, New Mexico; Anthony Candelaria; 2007-2008; Project Manager – Project Geologist—Provided field oversight during excavation and removal of 4,000 cubic yd of hydrocarbon contaminated soil. Removal action resulted in dissolved phase contamination decreasing by at least 90 percent. Prepared removal action final report and subsequent quarterly groundwater monitoring reports.

Numerous Phase I and II Investigations, Various Clients; Roswell, Albuquerque, New Mexico; 2005-2008; Project Manager—Performed site walk through, historical record search, and reporting. Phase 1 activities followed all appropriate American Society for Testing and Materials standards. If warranted, field investigations were conducted.

Numerous Leaking Underground Storage Tank Investigations; Fort Sumner, Clovis, Tucumcari, New Mexico; Conway Oil Company; 2005; Project Manager Project Geologist—Completed site investigations, installation of borings/monitor wells, plume delineation, and reporting. Monitoring programs initiated, including groundwater

sampling and reporting. Completed Tier analysis that resulted in a status of no further action. All projects completed under approved budget.

Numerous Leaking Underground Storage Tank Investigations; Southeastern New Mexico; Allsup Petroleum; 2005; Project Manager—Conducted investigations to delineate the extent of gasoline related contamination in soil and groundwater. Investigations include the installation of soil borings and monitor wells. Project management activities included work plan preparation, agency interaction, and budget. All projects completed under approved budget.

Voluntary Remediation Program – Schwartzman Properties; Schwartzman, Albuquerque, New Mexico; 2005-2007; Project Manager —Prepared Phase I environmental site assessment reports, conducted field investigations, collected samples, data analysis and completed Voluntary Remediation Program Completion Report.

Voluntary Remediation Program – Girardo; Girardo, Albuquerque, New Mexico; 2006; Project Manager—Conducted field investigation to delineate nitrate contamination in vadose zone. Collected samples, data analysis and completed Voluntary Remediation Program Completion Report.

New Mexico Environment Department Brownfield Program; Ponderosa; Albuquerque, New Mexico; 2005; New Mexico Environment Department Groundwater Quality Board—Provided oversight of remedial activities, collected soil and groundwater samples, data reduction and report preparation.

Former Walker Air Force Base; City of Roswell; Roswell, New Mexico; Project Geologist—Prepared work plans, sampling plans, health and safety plans, sampling protocol, and operation and maintenance reports quarterly for the trichloroethylene remediation at the Former Walker Air Force Base-Roswell Industrial Air Center.

Various Dairies; Roswell, Mesquite, New Mexico; Project Geologist—Responsible for implementing abatement plans for various dairies, which included data base management, data analysis, and quarterly monitoring report preparation.

Various Leaking Underground Storage Tank Sites; Southeastern New Mexico; 1993-1998; Project Manager—New Mexico Environment Department Project Manager for 45-50 Responsible Party Lead and 5 State Lead underground storage tank sites. As New Mexico Environment Department Project Manager, approved work plans, negotiated costs, and provided regulatory review of all phases of underground storage tank work. Attended and spoke at public meetings.

Underground Storage Tank Prevention Inspection; Southeastern New Mexico; 1993-1995; Prevention Inspector, New Mexico Environment Department Prevention Inspector—Inspected underground storage tank sites for leak detection requirements, performed critical juncture inspection of underground storage tank installations, and underground storage tank closures. Implemented outreach program in various communities for tank owner to inform them of new regulations regarding underground storage tank upgrades.

Employment History

Employer—EA Engineering, Science, and Technology, Inc., PBC (Albuquerque, New Mexico)
Dates of Employment—January 2009 – Present
Title—Senior Geologist

Employer—Golder Associates – Albuquerque, New Mexico
Dates of Employment—2005 – January 2009
Title—Senior Scientist—Project Manager

Employer—Tetra Tech EMI – Roswell/Albuquerque, New Mexico
Dates of Employment—2002–2005

Title—Project Geologist – Part Time/Full Time

Employer—Atkins Engineering Associates – Roswell, New Mexico
Dates of Employment—1988–2002
Title—Project Scientist – Part Time

Employer—New Mexico Environment Department – Roswell, New Mexico
Dates of Employment—1993–1998
Title—Water Resource Specialist 3 – Underground Storage Tank Bureau

Employer—Eastern New Mexico University Roswell – Roswell, New Mexico
Dates of Employment—1992–1993
Title—Part-Time Teacher – Geology

Employer—Geraghty & Miller, Inc. – Houston, Texas
Dates of Employment—1991–1992
Title—Staff Scientist

List of Technical Skills and Specializations

- Construction oversight
- Health and safety coordinator
- Leaking underground storage tank investigation and remediation
- Phase I and II investigations
- Project management
- Site investigation

Jay Snyder, P.G., P.E., CHG, PHG

Vice President/Chief Geologist

Mr. Snyder has 29 years of professional experience in the environmental industry, serving a variety of federal, state, and commercial clients. He presently serves as Chief Geologist, coordinating licensure, professional development, and career progression for EA's junior geoscientists. He has worked as an operations manager, business development manager, program manager, project manager, and senior technical reviewer. Mr. Snyder has managed hundreds of hydrogeologic investigations, pilot tests and remedial action plans at leaking underground storage tank facilities, Resource Conservation and Recovery Act (RCRA) facilities, Superfund sites, and oil and gas facilities. He specializes in risk-based corrective action at hydrocarbon contaminated sites, remedial investigations at hazardous waste sites, and evaluation of remedial alternatives at a wide variety of sites, including fuel hydrocarbon, chlorinated solvent, heavy metals, and wood treatment sites.

Mr. Snyder applied a wide variety of remedial technologies at sites, including groundwater pump and treat, air sparging, multiphase extraction, *in situ* thermal desorption, soil vapor extraction, *in situ* bioremediation, monitored natural attenuation, land farming, chemical oxidation, and permeable reactive barriers. He has permitted numerous remediation systems, including Class V injection wells, discharge plans, and New Source Review for air emissions.

Mr. Snyder has served as hydrogeology technical lead for U.S. Environmental Protection Agency (EPA) Region 6 Response Action Contract; Installation Restoration Program activities at Naval Air Station Fallon, Nevada; and the TIMET facility in Henderson, Nevada. He served as the program manager for

Education
M.S/Geological Engineering/2014 (University of Idaho)
M.S./Geology/Geophysics/1986 (New Mexico State University)
B.S./Meteorology/1988 (Texas A&M University)
B.S./Geology/1982 (University of Wisconsin at Platteville)

Registrations/Certifications
Professional Geologist—AL (No.1454); AR (No. 1852); AZ (No. 45804); CA (No. 8048); ID (No. PGL-1550); KS (No. 905); LA (No. 438), MN (No. 54555); MS (No. 946); NE (G-0366); OR (No. G2454); TX (No. 867); UT (No. 8947362-2250); and WI (No. 1306-13)
Professional Engineer—CO (2016, No. PE.0051233)
Certified Hydrogeologist—CA (2013, No. 978)
Professional Hydrologist Groundwater – American Institute of Hydrology (13-HGW-5005)
Licensed Soil and Groundwater Remediation Contractor; NM (2005, GS-29)

Specialized Training
OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training
OSHA 40-Hour Hazardous Waste Operations and Emergency Response Refresher
OSHA 8-Hour Hazardous Waste Operations Supervisor Training
OSHA 10-Hour Construction Training
Geochemistry and Hydrology of Waste Rocks, Tailing, and Pit Lakes, New Mexico Tech; Fall 2015
Vapor Intrusion – Learning the Current Approaches, at Battelle Conference on Recalcitrant Compounds, Monterey, California; 2012
Horizontal Wells: Enhanced Access for Characterization and Remediation, at Battelle Conference on Recalcitrant Compounds, Monterey, California; 2012
Environmental Forensics, Northwest Environmental Training Center, 2012
Stable Isotopes in Environmental and Forensic Geochemistry, at Battelle Conference on Recalcitrant Compounds, Monterey, California; 2010
Contaminant Chemistry and Transport in Soil and Groundwater, Northwest Environmental Training Center; 2008
Texas Risk Reduction Program Training, TNRCC and University of Houston; 2000
Remediation by Natural Attenuation, National Groundwater Association; 1999
RCRA Refinery Workshop, EPA Region 8, Denver; 1998
Risk-Based Corrective Action, University of Houston; 1998
Operating Permits (Title V), Trinity Consultants; 1996
Project Management Training, Fred Pryor Seminar; 1994
Air Dispersion Modeling Short Course, Trinity Consultants; 1992
Vadose Zone Hydrology Short Course, Daniel B. Stephens & Associates, Inc.; 1991
RCRA Training, PRC EMI; 1990
CPR and First Aid Training

Professional Affiliations
American Society of Civil Engineers; Member
Association of Ground Water Scientists and Engineers

Experience
Years with EA: 9 Total Years: 29

New Mexico Environment Department, New Mexico State Highway and Transportation Department, Texas Natural Resource Conservation Commission (TNRCC) State, and TNRCC Responsible Party Section contracts. Mr. Snyder also participated in the Langley Air Force Base Installation Restoration Program, the New Mexico Environment Department risk-based corrective action working group, and the TNRCC Investigation Report Form working group.

Mr. Snyder has conducted numerous remedial investigations, aquifer pumping tests, and treatability studies including: (1) soil vapor extraction; (2) multiphase extraction; (3) air and ozone sparging; (4) *in situ* reductive dechlorination and reduction of metals; and (5) chemical oxidation, feasibility studies, and remedial designs. He serves as hydrogeology technical lead on numerous of projects.

Professional Experience

Environmental Services—Specializes in risk-based corrective action at hydrocarbon contaminated sites, remedial investigations at hazardous waste sites, contaminant fate and transport, and evaluation of remedial alternatives at a wide variety of sites, including fuel hydrocarbon, chlorinated solvent, heavy metals, and wood treatment sites.

Remedial Technologies—Applied a wide variety of remedial technologies at sites, including groundwater pump and treat, air sparging, multiphase extraction, *in situ* thermal desorption, soil vapor extraction, *in situ* bioremediation, *in situ* reductive dechlorination and in *in situ* reduction of metals, monitored natural attenuation, land farming, chemical oxidation, and permeable reactive barriers.

Permitting—Has permitted numerous remediation systems, including Class V injection wells, discharge plans, and New Source Review for air emissions.

Publications and Presentations

McMillan, T.L. and J. Snyder. 2018. Adapted Remedial Investigation Scope for Accelerated Vapor-intrusion Evaluation. Presented at the 11th Symposium on Design and Construction Issues at Harardous Waste Sites (DCHWS 2018), Philadelphia Post Society American Military Engineers. 18-20 April.

Snyder, J.T., F. Barranco, K. Min, and S. Saalfield. 2017. A Field Scale Pilot Study of Chromium Reduction and ERD in a Declared Aquifer. Presented at Remediation Technology (RemTEC) Summit 2017, Denver Colorado.

Snyder, J.T., V. Mustafin, and T. Curley. 2017. Biosparging Pilot Test in a Confined Aquifer. Presented at Remediation Technology (RemTEC) Summit 2017, Denver Colorado.

Snyder, J.T., K. Waldron, M. Wilkinson, D. Beistel, and P. Jurena. 2014. A Design for Cold Region Monitoring Wells and Piezometers. Association of Environmental and Engineering Geologists Technical Session 8 – Groundwater/Environmental Site Characterization. 57th Annual Meeting, Scottsdale, Arizona.

Snyder, J.T., J. Frain, T. Telesak, G. Baumgarten, and C. Hueni. 2014. Use of Passive Soil Gas to Indicate Change in Remedy at a Dry Cleaner Site. Battelle Ninth International Conference, Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California.

Saalfield, S., S. Styger, S. Wallace, J. Snyder, J. Frain, and V. Mallot. 2014. Secondary Metals Release Associated with In Situ Chemical Reduction. Battelle Ninth International Conference, Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California.

Snyder, J.T. 1986. Heat Flow in the Southern Mesilla Basin with an Analysis of the East Potrillo Geothermal System, Doña Ana County, New Mexico. Master's Thesis. New Mexico State University, Las Cruces. 252 pp.

Snyder, J.T. and C.A. Swanberg. 1984. Heat Flow in the Southern Mesilla Bolson, Southern Rio Grande Rift, New Mexico. In New Mexico Geological Society Spring Conference Abstracts, p. 27.

Swanberg C. and J. Snyder. 1983. Terrestrial Heat Flow in New Mexico: Preliminary Analysis of the Private Database. *EOS Transactions of the American Geophysical Union*. 64(45): 836.

EA Project Experience

Kirtland Air Force Base Bulk Fuel Farm Corrective Action, Albuquerque, New Mexico; Groundwater Technical Lead—As groundwater technical lead, has designed groundwater extraction wells, designed multi-level monitoring wells, soil vapor monitoring wells, and airlift enhanced bioremediation wells. Helped develop protocol to evaluate plume capture and mass removed, designed an aquifer pumping test, and identified groundwater data gaps. Prepared field scale pilot test work plans for bioventing residual contamination and non-aqueous phase liquid in vadose zone, and airlift enhanced bioremediation to address solute contamination in source zone. Participates in stakeholder groups that includes Kirtland Air Force Base, U.S. Army Corps of Engineers–Albuquerque District, New Mexico Environment Department, City of Albuquerque, and Albuquerque-Bernalillo County Water Utility Authority.
Project Date: September 2015 – Present
Project Value – $17,900,000; Contract Type – Performance Based; EA Project No. – 62599DM01; EA Project Manager – Devon Jercinovic

12th and Haines Groundwater Plume, Albuquerque, New Mexico; Groundwater Technical Lead—Hydrogeologist in charge of developing conceptual site model, design and implementation of soil vapor extraction system to clean up source area and abate vapor intrusion pathway. Designed and reviewed aquifer pumping tests, designed and assessed in situ reductive dechlorination pilot tests, prepared remedial design specifying reductive dechlorination. Presented selected cleanup option at public meetings.
Project Date: August 2013 – Present
Project Value – $770,000; Contract Type – Time & Materials; EA Project No. – 1506902; EA Project Manager – Teri McMillan

Northeast 2nd Street Groundwater Plume Site (National Priorities List), Happy, Texas; EPA Region 6; Groundwater Technical Lead—Designed hydrogeologic investigation and groundwater monitoring network in distal portion of carbon tetrachloride solute plume in sole-source Ogallala aquifer. Designed and implemented soil vapor extraction pilot test in source area.
Project Date: August 2016 – Present
Project Value – $511,000; Contract Type – Time & Materials; EA Project No. – 1434142; EA Project Manager – Ted Telisak

Circle Court Groundwater Plume Site (National Priorities List), Willow Park, Texas; EPA Region 6; Groundwater Technical Lead—Senior technical reviewer for hydrogeologic characterization and development of conceptual site model for trichloroethene solute plume in Paluxy aquifer. Designed and oversaw soil vapor extraction pilot test to evaluate source zone cleanup.
Project Date: September 2012 – Present
Project Value – $1,495,000; Contract Type – Time & Materials; EA Project No. – 1434292; EA Project Manager – Luis Vega

Colonial Creosoting (National Priorities List), Bogalusa, Louisiana; EPA Region 6; Groundwater Technical Lead—Senior Technical Reviewer and hydrogeologist for Remedial Investigation at former creosote wood treating facility. Designed direct-push survey to map source area of dense non-aqueous phase liquid and determine extent of soil impacts. Designed multi-level groundwater monitoring wells for vertical delineation of solute impacts.
Project Date: August 2016 – Present
Project Value – $700,000; Contract Type – Time & Materials; EA Project No. – 14342141; EA Project Manager – Sheena Styger

Questa Mine (National Priorities List), Questa, New Mexico; EPA Region 6; Groundwater Technical Lead—Senior Technical Reviewer for Remedial Design/Remedial Action at underground and open pit molybdenum mine situated on the Red River in northern New Mexico. Remedial action includes stabilization of steep waste rock piles,

treatment of mine discharge, seepage and solute transport in groundwater and surface water from two principal tailings pond. Consolidation and subsidence evaluation related to pore water drain down. Hydraulic analysis and design of hydraulic contaminant systems, seepage and drainage from waste rock piles,
Project Date: August 2016 – Present
Project Value – $1,820,000; Contract Type – Time & Materials; EA Project No. – 1434294; EA Project Manager – Ted Telisak

Celtor Chemical Works (National Priorities List), Humboldt County, California; EPA Region 9; Groundwater Technical Lead—Senior Technical Reviewer for remedial investigation of tail outwash on point bar located on Trinity River in northern California. Designed test pit program to assess occurrence, depth, and thickness of tailing outwash onto the active bar. Reviewed data, pit logs, and technical memorandum documenting activity results.
Project Date: April 2017 – Present
Project Value – $395,000; Contract Type – Time & Materials; EA Project No. – 1518922; EA Project Manager – Sheena Styger

Argonaut Mine (National Priorities List), Jackson, California; EPA Region 9; Groundwater Technical Lead—Senior Technical Reviewer for groundwater seepage through tailings at a former gold mine. Scope of work including review of pore water behind multiple arch tailing dam that is failing, seepage pathways, development of conceptual site model for surface water and groundwater interaction, flow through former tailings ponds, and nature of pore water in tailing. Field activities to date have included groundwater, surface water, and soil sampling.
Project Date: December 2016 – Present
Project Value – $805,000; Contract Type – Time & Materials; EA Project No. – 1518921; EA Project Manager – Lee Becker

Conroe Creosoting Company (National Priorities List) Long-Term Remedial Action, Conroe, Texas. EPA Region 6; Groundwater Technical Lead—Lead development of targeted data gaps investigation, nature and extent of creosote dense non-aqueous phase liquid in site soils, stability of groundwater solute plumes, and efficacy of monitored natural attenuation remedy for groundwater pathways. Designed and installed deep groundwater monitoring into second water bearing zone in area of dense non-aqueous phase liquid impact. Directed the preparation of geologic cross sections, contaminant trend plots, solute plume maps and potentiometric surface maps. Evaluated partitioning mechanics and potential for sorption-back diffusion of solute as release mechanism.
Project Date: September 2015 – Present
Project Value – $505,000; Contract Type – Time and Materials; EA Project No. – 14342131; EA Project Manager – Mark Paddock

Allsup's 320 Expert Opinion/Litigation Support, Clovis, New Mexico; Hinkle-Shanor Law Firm; Expert Witness —Prepared expert opinion regarding commingled groundwater plumes emanating from Allsup's 320 and an abandoned gasoline station in Clovis, New Mexico. Analysis included nature and timing of releases, relevant forensic contaminants of concern, current and historical water levels and directions of groundwater flow, inventory of City of Clovis pumping stresses, and historic capture of city wells. Evaluated remediation costs, apportionment of contaminant mass between the two facilities, and allocation of cleanup costs. Lawsuit settled favorably for Allsup's.
Project Date: October 2015 – May 2017
Project Value – $30,000; Contract Type – Time & Materials; EA Project No. – 1531501; EA Project Manager – Teri McMillan

MacMillan Ring Free Oil (National Priorities List) Remedial Investigation, Norphlet, Arizona; EPA Region 6; Groundwater Technical Lead—Assisted with design of remedial investigation and developed conceptual site model to guide investigation of light non-aqueous phase liquid impacts emanating perching layers and hill slope seeps, nature and extent of soil impacts, and delineation of groundwater solute impacts. Provided senior technical review and Geologist of Record for Remedial Investigation Report.
P***roject Date: April 2015 – Present***
Project Value – $1,025,000; Contract Type – Time & Materials; EA Project No. – 14342118; EA Project Manager – Mark Paddock

Former Price's Valley Gold Dairy, Bernalillo, New Mexico; Groundwater Technical Lead and Project Manager—Prepared petition for Alternative Abatement Standards under New Mexico Water Quality Control Commission Regulations for alternative nitrate, chloride, and total dissolved solids groundwater standards to facilitate abatement completion in a perched aquifer at the former dairy. Provided expert testimony in support of the alternative standards before the Water Quality Control Commission. Successfully petitioned for Technical Infeasibility Demonstration for abatement of contaminants in the regional aquifer, successfully resulting in abatement completion. Designed groundwater pump and discharge system for removal of "hot-spot" nitrate contamination.
Project Date: June 2013 – May 2017
Project Value – $ $110,000; Contract Type – Time & Materials; EA Project No. – 1505701; EA Project Manager – Jay Snyder

Main Street Plume Superfund Site (National Priorities List), Burnet, Texas; Groundwater Technical Lead—Prepared conceptual site model, designed multi-level monitoring wells, and designed passive soil gas monitoring network for source area and migration pathway evaluation. Site is impacted with tetrachloroethene from a dry cleaner impacting a karst aquifer network. Oversaw drilling and construction of multi-level monitoring wells and conventional water table monitoring wells, and design and implementation of passive soil gas surveys to refine source of contamination.
Project Date: July 2016 – Present
Project Value – $ 800,000; Contract Type – Time & Materials; EA Project No. – 14342139; EA Project Manager – Ted Telisak

EVR-Wood Superfund Site (National Priorities List), Jennings, Louisiana; Groundwater Technical Lead—Assisted with conceptual site model for former refinery and wood treater operation along Bayou Nezpique in Acadian Parish. The site overlies the Chicot aquifer, a major source of irrigation water for agriculture. Activities included refining, bulk fuel storage, and wood treating. Remedial investigation activities included sampling pits, Geoprobe boring of multiple small dumps and other source areas, and investigation of the tank farm and other process areas. A number of monitoring wells were installed to evaluate shallow surficial sand water bearing zones (that have been dewatered at the site by irrigation withdrawals), and the upper part of the Chicot aquifer system "massive sand" unit. Several single well recovery pumping tests were performed as well as a bail down recovery test in low yielding strata.
Project Date: July 2016 – Present
Project Value – $ 1,465,000; Contract Type – Time & Materials; EA Project No. – 14342120; EA Project Manager – Sheena Styger

Arkwood, Inc. Superfund Site (National Priorities List), Omaha, Arkansas—EPA is conducting a dioxin re-evaluation for the site. In addition, EPA continues to conduct Five-Year Reviews of the site remedy. These Five-Year Reviews ensure that the site soil and groundwater remedies remain protective of human health and the environment. The next Five-Year Review will be completed in 2016.
Project Date: May 2014 – Present
Project Value – $ 350,000; Contract Type – Time & Materials; EA Project No. – 14342100; EA Project Manager – Ted Telisak

Jones Road Groundwater Plume Site (National Priorities List), Houston, Texas; EPA Region 6; Groundwater Technical Lead—Prepared conceptual site model for multi-aquifer (Chicot and Evangeline) system impacted with chlorinated ethenes. Designed and conducted passive soil gas survey to pinpoint source area, designed Continuous Multichannel Tubing multi-level monitoring well to assess dense non-aqueous phase liquid in multiple aquifers and aquicludes, designed field scale treatability studies for *in situ* reductive dechlorination.
Project Date: November 2010 – Present
Project Value – $1,010,420; Contract Type – Time & Materials; EA Project No. – 1434270; EA Project Manager – Ted Telisak

Van der Horst Groundwater Plume Site (National Priorities List), Terrell, Texas; EPA Region 6; Groundwater Technical Lead—Prepared conceptual site model for two-aquifer (water table and Nacatoch Sand) system impacted with hexavalant chromium from plating operations. Designed hydrogeologic investigation to delineate both aquifer systems and establish hydraulic communication and vertical migration pathways. Oversaw drilling and field activities for plume delineation, aquifer pumping tests, and *in situ* chemical reduction treatability studies.
Project Date: October 2010 – Present
Project Value – $1,085,164; Contract Type – Time & Materials; EA Project No. – 1434263; EA Project Manager – Doug McReynolds

Eielson Air Force Base, Fairbanks, Alaska; Air Force Center for Engineering and the Environment; Geologist/Hydrogeologist—Prepared conceptual site models for multiple source areas impacted with chlorinated solvents, fuel hydrocarbons, polychlorinated biphenyls, and metals. Scoped and directed development of Uniform Federal Policy for Quality Assurance Project Plans. Designed vertical and horizontal delineation program at trichloroethylene site using direct-push techniques and triad approach with Waterloo APS sampler for continuous permeability and soil type profiling, and groundwater sample collection to 200 ft below ground surface.
Project Date: January 2011 – Present
Project Value – $5 million; Contract Type – Time & Materials; EA Project No. – Various; EA Project Manager – Mark Wilkinson

King Salmon Air Force Station, King Salmon, Alaska; Air Force Center for Engineering and the Environment; Hydrogeology Technical Lead—Technical lead for source area and solute plume characterization for chlorinated solvent plume in multi-layered aquifer system. Scoped field work for mapping of potential source areas using passive soil gas samplers and soil sampling, plume delineation in multi-layer aquifer system, evaluation of nature and permeability of aquitard separating aquifers, design, oversight and review of aquifer pumping tests in affected aquifers, development of conceptual site model, and remedial alternative evaluation. Senior technical review of work plans, Quality Assurance Project Plans, and technical reports
Project Date: January 2011 – Present
Project Value – $1 million; Contract Type – Time & Materials; EA Project No. – Various; EA Project Manager – Steve Wrenn

Fort Sumner Army Air Field (Formerly Used Defense Site), Fort Sumner, New Mexico; Bristol Environmental Remediation Services; Groundwater Technical Lead—Designed and installed BARCAD multi-level monitoring wells in Chinle Formation water bearing zones at Formerly Used Defense Site. Drilling included RotaSonic and Stratex casing advance methods. Reviewed and developed conceptual site model for groundwater pathways.
Project Date: 2009 – Present
Project Value – $400,000; Contract Type – Firm-Fixed Price; EA Project No. – 6237101; EA Project Manager – Devon Jercinovic

Midessa Groundwater Plume Site (National Priorities List), Midland, Texas; EPA Region 6; Groundwater Technical Lead—Prepared conceptual site model for two-aquifer (Ogallala and Trinity aquifers) system impacted with chlorinated solvents related to oil field maintenance activities. Designed hydrogeologic investigation to delineate both aquifer systems and establish hydraulic communication and vertical migration pathways. Oversaw drilling and field activities for plume delineation, aquifer pumping tests and analyses, and field scale treatability studies.
Project Date: October 2010 – Present
Project Value – $1,085,164; Contract Type – Time & Materials; EA Project No. – 1434263; EA Project Manager – Luis Vega

West County Road 112 Groundwater Plume Site (National Priorities List), Midland, Texas; EPA Region 6; Groundwater Technical Lead—Prepared conceptual site model for two-aquifer (Ogallala and Trinity aquifers) system impacted with hexavalant chromium from injection modeling cooling water operations. Plume extends over a two-mile length and has impacted over 100 domestic supply wells. Designed hydrogeologic investigation to delineate both aquifer systems and establish hydraulic communication and vertical migration pathways. Oversaw drilling and field activities for plume delineation, and designed aquifer pumping tests and *in situ* chemical reduction treatability studies.

Project Date: October 2010 – Present
Project Value – $1,085,164; Contract Type – Time & Materials; EA Project No. – 1434263; EA Project Manager – Luis Vega

Sprague Road Groundwater Plume Site (National Priorities List), Ector County, Texas; EPA Region 6; Groundwater Technical Lead—Technical lead for a treatability study for *in situ* reduction of hexavalent chromium plume using emulsified vegetable oil and lactic acid to reduce chromium and precipitate in place. Installed and logged over 20 injection and monitoring wells, injected aquifer amendments, and evaluated performance monitoring data.
Project Date: 2010 – Present
Project Value – $7 million; Contract Type – Time & Materials; EA Project No. – 1434207; EA Project Manager – Stan Wallace

Sandy Beach Road Groundwater Plume Site (National Priorities List), Pelican Bay, Texas; EPA Region 6; Groundwater Technical Lead—Designed and installed water table groundwater monitoring wells as well as deep (>400 ft deep) monitoring wells at a large chlorinated solvent plume in Tarrant County, Texas. Designed and oversaw 72-hour pumping test, two slug tests, and six single well recovery tests to map out permeability to support fate and transport modeling. Senior technical review of remedial investigation.
Project Date: 2010 – Present
Project Value – $2.7 million; Contract Type – Time & Materials; EA Project No. – 1434213; EA Project Manager – Terri McMillan

East 67th Street Groundwater Plume Site (National Priorities List), Odessa, Texas; EPA Region 6; Groundwater Technical Lead—Senior technical reviewer of Remedial Investigation and groundwater Remedial Alternatives for Feasibility Study. Designed field scale Treatability Studies for in situ reductive dechlorination, soil vapor extraction, and hydraulic testing.
Project Date: 2010 – Present
Project Value – $1 million; Contract Type – Time & Materials; EA Project No. – 1434211; EA Project Manager – Luis Vega

New Mexico Environment Department Brownfields Program, Albuquerque, New Mexico; Northwest New Mexico Council of Governments; Program Manager—Phase I Environmental Site Assessments include Old Alamogordo Landfill, Ponderosa Products, Inc., Elementary School in House, Old Railroad Depot in Tucumcari, and Phase II Environmental Site Assessments include Old Alamogordo Landfill, the Del Norte Gun Club, and Ponderosa Products, Inc.
Project Date: 2010 – Present
Project Value – $60,000; Contract Type – Time; EA Project No. – 14783.01; EA Project Manager – Cristina Radu

Eagle Picher/Carefree Batteries Superfund Site (National Priorities List), Socorro, New Mexico; EPA Region 6; Groundwater Technical Lead—Technical lead for groundwater pathways at the Eagle Picher/Carefree Batteries Superfund Site (National Priorities List). Responsible for: (1) source area characterization, (2) evaluation of migration pathways, (3) delineation of horizontal and vertical extent of chlorinated solvent plume, (4) scoping vertical delineation multi-level groundwater sampling system, and (5) fate and transport of contaminants. Assist in scoping data gaps for the Remedial Investigation and in support of the Feasibility Study. Scoping and specifying pumping tests and analyses for aquifer characterization.
Project Date: 2009 – Present
Project Value – $2.9 million; Contract Type – Time & Materials; EA Project No. – 1434243; EA Project Manager – Luis Vega

Iron King Mine, Humbolt-Dewey, Arizona, EPA Region 6; Groundwater Technical Lead—Technical lead for groundwater pathways at the Iron King Mine Superfund Site (National Priorities List). Responsible for evaluating soil/tailing to groundwater leaching pathway, impacts to groundwater, and scoping data gaps for the remedial investigation and in support of the Feasibility Study.
Project Date: 2008 – Present
Project Value – $3.3 million; Contract Type – Time & Materials; EA Project No. – 1434234; EA Project Manager – Doug McReynolds

Bandera Road Superfund Site, San Antonio, Texas; EPA Region 6; Groundwater Technical Lead—Technical lead for groundwater issues at the Bandera Road Superfund Site (National Priorities List). Responsible for evaluating potential migration pathways for chlorinated solvent in fractured limestone and chalk, scoping geophysical investigation of preferential flow paths, scoping pilot tests for cleanup of source area contamination, and review of potential for monitored natural attenuation zones.
Project Date: 2008 – Present
Project Value – $2.4 million; Contract Type – Time & Materials; EA Project No. – 1434237; EA Project Manager – Doug McReynolds

Texarkana Wood Preserving Superfund Site, Texarkana, Texas; EPA Region 6; Hydrogeology Technical Lead—Technical lead for feasibility study at a dense non-aqueous phase liquid creosote wood treating facility. Technologies evaluated include soil/dense non-aqueous phase liquid stabilization, slurry walls/containment, *in situ* chemical oxidation, and monitored natural attenuation.
Project Date: 2008 – Present
Project Value – $1.1 million; Contract Type – Time and Materials; EA Project No. – 1434258; EA Project Manager – Ted Telisak

Titanium Metals Plant, Henderson, Nevada; Titanium Metals Inc; Lead Hydrogeologist—Senior groundwater hydrology lead on evaluation of fate and transport of groundwater plumes, remedial investigation design, and aquifer testing and analysis.
Project Date: 2008–2012
Project Value – $350,000; Contract Type – Time and Materials; EA Project No. – 1464901; EA Project Manager – Jay Snyder

Groundwater Abatement, Dona Ana Dairies, Mesquite, New Mexico, Lead Hydrogeologist—Senior groundwater hydrology lead on Stage 1 and Stage 2 Abatement of groundwater impacts by dairy wastes. Duties include plume delineation, basic groundwater hydrology, and surface water – groundwater interaction.
Project Date: 2008 – Present
Project Value – $300,000+ Contract Type – Time and Materials; EA Project No. – 1464102 and 1464103; EA Project Manager – Teri McMillan

Cal-Maine Foods Egg Plant, Bernalillo County, New Mexico; Lead Hydrogeologist—Senior groundwater hydrology lead on Stage 1 Abatement Plans for assessment of groundwater impacts by egg laying and egg washing operations. Duties include development of conceptual site model, source characterization, plume delineation, basic groundwater hydrology, and evaluation of dilution attenuation factors for soil leaching to groundwater pathway.
Project Date: 2008 – Present
Project Value – $132,125; Contract Type – Time and Materials; EA Project No. – 1464502; EA Project Manager – Teri McMillan

Monitored Natural Attenuation Sites Remedial Action; Allsup Petroleum, Inc. Various Sites, New Mexico; Project Manager/Technical Lead—Project manager and technical lead for remedial action at monitored natural attenuation sites. Scope of work includes Mann-Kendall analysis of groundwater contaminant concentrations trends, verification of monitored natural attenuation mechanisms, and petition to New Mexico Water Quality Control Commission for alternative abatement standards.
Project Date: 2008 – Present
Project Value – $100,000+; Contract Type – Time & Materials; EA Project No. – Varies; EA Project Manager – Teri McMillan

Other Project Experience

Installation Restoration Program Sites, Naval Air Station, Fallon, Nevada; Department of Navy; 2004–2005; Senior Hydrogeologist—Senior hydrogeologist and groundwater technical lead on evaluation of remedial alternatives of groundwater plumes contaminated with fuel hydrocarbons and chlorinated solvents. Activities include technical evaluation of existing hydraulic control system, *in situ* bioremediation, slurry walls, and monitored natural attenuation.

Voluntary Remediation Program Applications, Albuquerque, New Mexico; Schwartzman, Inc.; 2002–2006; Project Manager—Project manager and technical lead for processing commercial land tracts through New Mexico Voluntary Remediation Program as innocent owner applicants for covenant to sue. Activities include Phase I environmental site assessment, Existing Data Reports regarding encroachment contamination, limited Phase II sampling, completion reporting, and all other programmatic aspects.

Hans Bazen Site, Los Lunas, New Mexico; New Mexico Environment Department; 2004–2005; Project Manager—Project manager and senior technical lead for hydrogeologic investigation, 14,000 cubic yd removal action, and feasibility analysis of groundwater alternatives for state-lead leaking underground storage tank site.

Mike's Auto Detail Site, Belen, New Mexico; New Mexico Environment Department; 2004–2005; Project Manager—Project manager and senior technical lead for hydrogeologic investigation, aquifer analysis, soil vapor extraction pilot testing, and remedial design for state-lead leaking underground storage tank site. Remedial design includes thermally enhanced multiphase extraction.

Marion Creosote Site, Marion, Louisiana; EPA Region 6; 2003–2005; Hydrogeology Lead—Groundwater technical lead for feasibility study and remedial design for creosote impacted site (National Priorities List). Final remedy entails steam stripping with *in situ* thermal desorption in concert with limited removal action.

Sprague Road Groundwater Plume Remedial Action, Odessa, Texas; EPA Region 6; 2001–2005; Hydrogeology Lead—Senior technical lead for remedial action at a National Priorities List site with chromium contamination in groundwater. Activities include vadose zone and groundwater flow modeling and development of extraction well field scenarios, aquifer pumping tests, infiltration tests, chromium fate and transport, and selection of treatment technologies.

Sol Lynn Superfund Site Feasibility Study, Houston, Texas; EPA Region 6; 2004–2005; Hydrogeology Lead—Technical lead for feasibility study at a National Priorities List site contaminated with trichloroethylene, dichloroethene, and vinyl chloride. Remedies evaluated included *in situ* bioremediation, monitored natural attenuation, *in situ* thermal desorption, and permeable reactive barriers. Evaluated all aspects of aerobic/anaerobic direct and cometabolic biodegradation mechanisms, partitioning of contaminants, fate and transport, and degradation byproducts and their fate.

Ouachita-Nevada Wood Treatment Superfund Site Remedial Investigation/Feasibility Study, Reader, Arkansas; EPA Region 6; 2003–2005; Technical Lead—Technical lead for remedial investigation and feasibility study at a National Priorities List site contaminated with pentachlorophenol and polynuclear aromatic hydrocarbons. Activities included evaluation of all aspects of aerobic biodegradation mechanisms and pentachloralphenol fate and transport. Geologist of record for remedial investigation.

Turtle Bayou Superfund Site Remedial Design, Turtle Bayou, Texas; EPA Region 6; 2001–2005; Hydrogeology Lead—Technical lead for *in situ* bioremediation and monitored natural attenuation remedy for a National Priorities List site contaminated with vinyl chloride, 1,1-dichloroethane, 1,1-dichloroethene, benzene, and tertiary butyl alcohol. Evaluated all aspects of aerobic/anaerobic direct and cometabolic biodegradation mechanisms, partitioning of contaminants, fate and transport, and degradation byproducts and their fate.

Allsup's #137, Los Chavez, New Mexico; Allsup Petroleum Inc.; 2000–2005; Project Manager—Project manager for removal of 13,500 yd^3 of petroleum hydrocarbon contaminated soil and implementation of monitored natural attenuation remedy. Assessment work included completion of plume delineation, assessment of geochemical indicators for monitored natural attenuation, and calculation of aquifer assimilative capacity.

Former Belen Maintenance Yard, Belen, New Mexico; City of Belen; 2002–2005; Project Manager—Project manager for removal of 7,500 cubic yd of petroleum hydrocarbon contaminated soil and implementation of monitored natural attenuation remedy. Removal action included reconstructing city intersection including utilities. monitored natural attenuation implementation included completion of plume delineation, assessment of geochemical indicators for monitored natural attenuation, and calculation of aquifer assimilative capacity.

Multi-Site Contracts; Texas; TNRCC; 1998–2000; Program Manager—Program manager for TNRCC state-lead contracts—leaking petroleum storage tank monitoring, leaking petroleum storage tank site activities, and Superfund remedial investigation. Duties included all bid and marketing efforts, supervising all site activities and serving as primary contact for TNRCC Project Managers. Responsible for supervising the technical and administrative execution of contract work orders. Activities included preparation of work plans and cost estimates, implementation of work orders, review of invoices, verification of quality assurance/quality control procedures, review of all reports and submittals, maintaining project schedules and budgets, and maintaining compliance with TNRCC regulations and policies.

Sampson Horrice Remedial Investigation and Removal Action, Dallas, Texas; TNRCC; 1998–2000; Project Manager—Remedial investigation of state-lead Superfund site where over 300 drums of paint waste were disposed. Activities included over 3,000 linear feet of exploratory trenching, over 30 shallow soil borings, surface water and sediment sampling, drum content sampling, and monitoring well construction and sampling. Coordinated preparation of Field Sampling Plan, and Health and Safety Plan, and establishment of data quality objectives. Trenching phase of the project was performed in Level B personal protective equipment. Activities also included performing a removal action of buried drums in the main waste area.

South Valley Superfund Site, Albuquerque, New Mexico; Schwartzman, Inc.;1992–1995; Project Manager—Project manager for litigation support of chlorinated solvent contaminated properties within the South Valley Superfund site in Albuquerque, New Mexico. Support included providing assessment of contaminant distribution, technical review of proposed remedial action, technical input to formulation of complaints, and technical assistance to deposition of defendants and their consultants.

Hobbs City Wells Site, Hobbs, New Mexico; New Mexico Environment Department;1993–1996; Project Manager and Technical Lead—Provided deposition in cost recovery case involving the Hobbs City Wells underground storage tank site. Support included timing of releases, evaluation of fuel hydrocarbons present, and elimination of potential sources of contaminates in case.

Litigation Support, Ector County, Texas; Fisher, Gallegher & Lewis;1993–1995; Staff Hydrogeologist—*Field* team leader for oil filed brine contamination related to secondary oil recovery. Provided field oversight and real-time scoping of plume delineation, volume estimates and worth of impacted groundwater, fate and transport, and costing of remedial alternatives.

Corrective Action for Leaking Petroleum Storage Tanks; Various RPR Clients in West Texas; 1995–2000; Marketing/Program Manager—Marketing and program/project manager for risk-based corrective action services for leaking underground storage tanks and the oil and gas sector. Provided senior technical review, site assessments, selection of remedial technologies, remedial design, and quality assurance/quality control for over 200 contaminated sites in West Texas. Activities included hydrogeologic site assessment, Tier 1 and 2 risk assessments, remedial technology screening, preparation of remedial action plans, and operation and maintenance evaluation. Permitted remediation systems including Class V injection wells and Standard Exemptions for air emissions.

Spill Prevention Control and Countermeasure Plans; City of Lubbock, Texas; 1997; Technical Reviewer—Senior technical reviewer for over 40 spill prevention control and countermeasure plans prepared for fuel storage and service facilities and electrical generating stations and substations.

Corrective Action for Natural Gas Facilities; Multi-Site; Enron; 1993–2004; Project Manager and Senior Technical Reviewer—Served as project manager and senior technical reviewer (contaminant hydrogeology) for assessment and remediation activities at seven natural gas compressor stations and one gas processing plant in southeast New Mexico. Activities included hydrogeologic characterization, aquifer testing, feasibility testing, and remedial design/remedial action.

Maintenance Yards; Various Yards, New Mexico; New Mexico Department of Transportation; 1993–1995; Program Manager—Contract liaison and program manager for multiple sites, including Belen, Bernalillo, Santa Rosa, Tucumcari, Nara Visa, and Artesia maintenance patrol yards.

Corrective Action for Leaking Underground Storage Tanks; New Mexico Environment Department, Multiple Locations, New Mexico; 1992; Program Manager—Program and project manager for corrective action at over 40 underground storage tank sites in New Mexico, including Hobbs City Wells, Tatum Cotton Butane, Lee's Gung Fu, and Schwartzman Packing Company underground storage tank sites. Remedial designs included soil vapor extraction with thermal and catalytic oxidation, *in situ* bioremediation, aboveground biological land treatment, and groundwater pump-and-treat and reinjection. Prepared discharge plans and New Source Review (authority to construct) permits for numerous remediation systems. Duties also included bid/proposal preparation and corporate interface with New Mexico Environment Department Underground Storage Tank Bureau.

Engineering Cost Evaluation, Naval Air Station Fallon, Fallon, Nevada; Department of Navy, 1991; Project Manager—Prepared work plans, cost analysis, and final report for 27 underground storage tanks at the facility. Cost estimates included refitting options in accordance with all applicable federal underground storage tank regulations, replacement with new underground storage tanks and replacement with aboveground tanks.

Holloman Air Force Base Groundwater Assessment; Holloman Air Force Base, New Mexico; EPA Region 6; 1990–1991; Project Manager—Prepared work plan, cost estimate, and quality assurance project plan. Contracted analytical services. Fieldwork consisted of split sampling monitoring wells for RCRA Appendix IX groundwater monitoring list constituents.

Chevron Chemical Company Technical Evaluation; Richmond, California; EPA Region 9; 1991; Project Manager—Performed technical evaluation of current conditions at Chevron Chemical Company's Richmond, California, plant. Provided technical assistance to EPA Region 9 in assessing the compliance status of Chevron's Richmond Refinery in Richmond, California, including evaluation of Chevron's Current Conditions Report and a proposed refinery-wide groundwater extraction trench system.

Petro-Processors Superfund Site; Baton Rouge, Louisiana; EPA; 1990–1991; Resident Observer—Responsibilities included analysis of pumping test data; review of groundwater and solute transport modeling; review of remedial design specifications; daily observation and inspection of construction activities, geotechnical borings and recovery well construction; review of quality control/quality assurance testing and procedures; and review of air quality monitoring data.

RCRA Compliance; Various Locations; New Mexico and Louisiana; EPA Region 6; 1990–1991; Project Manager—Project manager for RCRA Implementation at eight facilities in New Mexico and Louisiana. Prepared work plans, cost estimates, and quality assurance project plans for Requests for Information activities. Performed RCRA Facility Assessments at Fort Chaffee, Arkansas, and Fort Wingate, New Mexico. Provided technical review of RCRA closure plan and post-closure care compliance for landfills and hazardous waste landfills/landfarms at Cannon Air Force Base and Navajo Refining Co. in New Mexico. Provided technical oversight for Requests for Information at the Giant Refinery (Gallup, New Mexico); Navajo Refinery (Artesia, New Mexico); Kirtland Air Force Base (Albuquerque, New Mexico); Cannon Air Force Base (Clovis, New Mexico); Laguna Industries (Laguna Pueblo, New Mexico); and General Electric Apparatus Shop (Albuquerque, New Mexico). Performed split sampling of groundwater, surface sediment, and subsurface soil. Prepared quality assurance project plans and health and safety plans, contracted laboratories, reviewed analytical results, and prepared final reports.

Meteorological Support; Langley Air Force Base, Virginia; Langley Air Force Base; 1987–1990; Wing Weather Officer (Active Duty)—Provided operational weather forecasts in support of over $3 billion in assets to Commander, 1st Tactical Fighter Wing, Langley Air Force Base, Virginia. Prepared and delivered daily briefings to Commander and Wing Staff and during periods of impending and occurring severe weather. Served on the base Environmental Policy Committee and provided input to the base Installation Restoration Program. Performed air dispersion modeling to assist in disaster preparedness contingency plans for Langley.

Tucson International Airport Quality Assurance Project Plan; Tucson, Arizona; Tucson Airport Authority; 1993; Staff Hydrogeologist—Prepared the quality assurance project plan for a remedial investigation/feasibility study being conducted to determine the extent of chlorinated solvents in the vadose zone at Tucson International Airport.

Geophysical Surveys; Southern New Mexico; New Mexico State University; 1982–1985; Research Assistant—Research assistant on a variety of geophysical surveys in southern New Mexico that included: (1) shallow and deep seismic refraction and reflection surveys in the Tularosa and Jornada del Muerto Basins and in the Burro Mountains, (2) gravity surveys in the Mesilla Basin and Burro Mountains, (3) magnetic surveys in the Burro Mountains, and (4) shallow resistivity surveys.

Employment History

Employer—EA Engineering, Science, and Technology, Inc., PBC (Albuquerque, New Mexico)
Dates of Employment—2008 – Present
Title—Operations Manager Albuquerque

Employer—Golder Associates – Albuquerque, New Mexico
Dates of Employment—2005–2008
Title—Senior Consultant—Hydrogeology and Project Manager

Employer—Tetra Tech EMI – Albuquerque, New Mexico
Dates of Employment—2000–2005
Title—Office Manager and Senior Hydrogeologist

Employer—Daniel B. Stephens & Associates, Inc. – Albuquerque, New Mexico
Dates of Employment—1991–2000
Title—Texas Operations Manager, Project Group Leader, Business Development Manager

Employer—PRC Environmental Management, Inc. – Albuquerque, New Mexico
Dates of Employment—1991–1992
Title—Staff Hydrogeologist, Project Manager

Employer—U.S. Air Force – Langley Air Force Base, Virginia
Dates of Employment—1986–1990
Title—Wing Weather Officer (Active Duty), 1st Tactical Fighter Wing

Employer—New Mexico State University – Las Cruces, New Mexico
Dates of Employment—1982–1985
Title—Teaching and Research Assistant

List of Technical Skills and Specializations

- Construction oversight
- Contaminant hydrogeology
- Design and implementation of monitored natural attenuation
- Fate and transport of contaminants
- Feasibility studies and pilot testing
- Fractured aquifer cleanup

- Hydrogeologic characterization
- Performance assessment
- Permits for corrective action systems
- Remedial design
- Risk-based corrective action at waste sites

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David L. Werth, P.G.
Geologist

Mr. Werth is a registered professional geologist with over 7 years of experience working for EA and 12 years serving as an Aerospace Ground Equipment Specialist in the U.S. Air Force. His duties at EA include project management, subsurface investigation, active and passive soil gas investigations, vapor intrusion investigations, soil and groundwater sampling, oversight of soil boring and monitoring well installation, hydrogeological testing, data reduction, mapping and analysis, proposal writing, and work plan/report preparation.

Mr. Werth's education involves a strong background in the geosciences including hydrology, geology, and geomorphology. He is also proficient in multiple computer software programs, equipment mechanics, and written/verbal communication.

Qualifications

Education
B.S.; University of Texas at Austin; Hydrology/ Environmental Geology; 2010

Registrations/Certifications
Professional Geologist—AZ (No. 61786), 2016; UT (No. 9623683-2250), 2016
U.S. Environmental Protection Agency CFC/HCFC Refrigerant Processing Certification; 1999
Texas Board of Professional Geoscientists GIT; 2012
State of Utah Underground Storage Tank Groundwater and Soil Sampler; 2013

Specialized Training
OSHA 40-Hour Hazardous Waste Operations Safety Training; 2010
OSHA 8-Hour Hazardous Waste Operations Supervisor Training 2010
OSHA 30-Hour Construction Safety and Health Training; 2015
EA Project Manager Training; 2015
CPR and First Aid Training; annually 1999 – Present

Professional Affiliations/Appointments
Phi Theta Kappa National Honor Society

Experience
Years with EA: 7 Total Years: 19

Professional Experience

***Program Management*—**Project Manager for select New Mexico Environment Department, Petroleum Storage Tank Bureau, Leaking Underground Storage Tank Sites. Manage sampling activities at U.S. Environmental Protection Agency Superfund sites. Create budgets and schedules for groundwater monitoring, underground storage tank closures, well installations, and other environmental investigation activities. Managed team personnel training program that included maintaining team member training records and ensuring team members received required one-time annual training. Planning and organizing maintenance activities. Establish production controls and standards. Interpret and implement policy directives and instructions pertaining to maintenance, including environmentally safe maintenance practices. Determine resource requirements, including facilities, training, equipment, and supplies. Inspect maintenance activities, evaluate resource use, and recommend corrective actions. Determine equipment serviceability criteria where they do not exist.

***Health and Safety Experience*—**Served as Site Health and Safety Officer on numerous sites in Arizona, Arkansas, New Mexico, Texas, and Utah for clients including Air Force Civil Engineer Center, U.S. Environmental Protection Agency, New Mexico Environment Department, Texas Commission on Environmental Quality, and various private clients. Activities overseen at these sites include soil excavation and associated soil handling, soil borings, monitoring and remediation well construction, soil vapor probe installation, and collection of environmental samples (surface/subsurface soil, surface water, groundwater, sediment, suspended sediment, air, soil gas, etc.). Health and safety responsibilities include:

- Perform health and safety oversight during site activities
- Present daily safety briefings that included awareness training for site physical/chemical/biological hazards
- Calibrate and document calibration of dust monitoring equipment prior to use
- Implement, and ensure compliance with the Accident Prevention Plan/Site Safety and Health Plan
- Conduct site inspections to evaluate work conditions for job zones
- Perform initial and daily site health and safety inspections

- Prepare health and safety compliance memoranda
- Direct, distribute, and inspect appropriate personal protective equipment to site personnel
- Maintain and enforce appropriate personal protective equipment use
- Perform environmental monitoring using photoionization detector (other equipment).

Mechanical Background—Diagnose mechanical and electronic circuitry malfunctions using visual and auditory senses, test equipment, and technical publications. Advise and perform troubleshooting on equipment before assigning repair action. Inspect and approve completed maintenance actions. Solve repair problems by studying drawings, wiring diagrams and schematics, and technical publications. Use automated maintenance systems to monitor maintenance trends, analyze equipment requirements, maintain equipment records, and document maintenance actions. Experienced in the use of conventional and digital multi-meters, voltmeters, ohmmeters, frequency counters, oscilloscopes, circuit card testers, transistor testers, and hand tools. Maintain external fuel and grounding systems.

Hazardous Materials—Storage, handling, use, and disposal of hazardous material and waste according to environmental standards.

Report Writing—Responsible for generating annual performance reports on subordinates. Performed reviews of groundwater monitoring activity reports and remediation system installation/performance reports. Generate work plans, health and safety plans, proposals, and field activity reports.

EA Project Experience

Performance-Based Remediation, Kirtland Air Force Base, New Mexico; U.S. Army Corps of Engineers–Albuquerque District, Geologist, Site Safety and Health Officer—Installed nested groundwater monitoring wells at multiple depths for collection of data supporting the vertical profile of the dissolved-phase ethylene dibromide plume. EA is responsible for the operation and maintenance of the groundwater treatment system, maintenance and operation of the groundwater monitoring network comprised of 140 deep, regional aquifer wells. Additional task associated with the groundwater treatment system include hazardous and nonhazardous waste management, performing line locates for the off-base extraction system, community relations support, and preparing all reporting plans and documents required to implement the interim measure. Future discharge options for the treated groundwater will be implemented through installation of additional regional aquifer injection wells and/or injection well galleries and conveyance lines to discharge treated water from the groundwater treatment system building to the injection area.
Project Date: 2015 – Present
Project Value – $17.8 million; Contract Type – PBC Task Order; Contract – USACE–Baltimore MAES W912DR-12-D-0006; EA Project No. – 62599DM01; EA Project Manager – Devon Jercinovic

Lea and West Second Street Superfund Site, Roswell, New Mexico; Hydrologist—Installed groundwater monitoring wells, collected soil and groundwater samples; generate work plans, reports, and figures; conduct vapor intrusion investigations; and conduct passive soil gas investigations.
Project Date: 2013 – Present
Project Value – $1,000,000; Contract Type – CPM; EA Project No. – 14342145; EA Project Manager – Teri McMillan

Griggs and Walnut Superfund Site, Las Cruces, New Mexico; Hydrologist—Conduct active soil gas investigation; aid in the generation of work plans, reports, and figures.
Project Date: 2013 – Present
Project Value – $200,000; Contract Type – CPM; EA Project No. – 14342153; EA Project Manager – April Ballweg

North Rail Road Superfund Site, Espanola, New Mexico; Hydrologist—Conduct active soil gas investigation; aid in the generation of work plans, reports, and figures.

Project Date: 2013 – Present
Project Value – $200,000; Contract Type – CPM; EA Project No. – 14342154; EA Project Manager – April Ballweg

Multiple Convenient Store Sites, New Mexico; Allsup Petroleum, Inc.; Hydrologist—Installed groundwater monitoring wells, collected groundwater and soil samples, and generated work plans and groundwater monitoring reports.
Project Date: 2011 – Present
Contract Type – LS; EA Project Manager – David Werth

Multiple Leaking Underground Storage Tank Sites, New Mexico; New Mexico Environmental Department – Petroleum Storage Tank Bureau; Hydrologist—Installed groundwater monitoring wells, collected groundwater and soil samples, generated work plans, and groundwater monitoring reports.
Project Date: 2011 – Present
Contract Type – LS; EA Project Manager – David Werth

Conway Oil, Bulk Plant Leaking Underground Storage Tank Site, Tucumcari, New Mexico; Hydrologist— Collected soil and groundwater samples; generate work plans, reports, and figures; and install/operate soil vapor extraction remediation system.
Project Date: 2015–2016
Project Value – $239,280; Contract Type – LS; EA Project No. – 6231715; EA Project Manager – David Werth

Driver's Travelmart No. 408 – Titan, San Jon, New Mexico; New Mexico Environmental Department; Hydrologist—Installed groundwater monitoring wells, developed monitoring wells, collected soil samples, conducted duel phase extraction pilot test with subsequent extraction events, participated in full scale surfactant flush, and generated reports and figures.
Project Date: 2011–2015
Project Value – $858,739; Contract Type – LS; EA Project No. – 6253601; EA Project Manager – Vener Mustafin

Multiple Allsup's Convenient Store Sites, New Mexico; Allsup Petroleum, Inc.; Hydrologist—Installed groundwater monitoring wells, collected groundwater and soil samples, and generated work plans and groundwater monitoring reports. Conduct underground storage tank closer activities.
Project Date: 2011 – Present
Contract Type – LS; EA Project Manager – Teri McMillan

Multiple Leaking Underground Storage Tank Sites, New Mexico; New Mexico Environmental Department – Petroleum Storage Tank Bureau; Hydrologist—Installed groundwater monitoring wells, collected groundwater and soil samples, generated work plans, and groundwater monitoring reports.
Project Date: 2011 – Present
Contract Type – LS; EA Project Manager – Teri McMillan

Remedial Action Objective Landfills Kirtland Air Force Base, Albuquerque, New Mexico; Air Force Center for Engineering and the Environment; Hydrologist—Collected groundwater samples, installed groundwater monitoring wells, and assisted in report generation.
Project Date: 2011–2013
Project Value – $686,720; Contract Type – LS; EA Project No. – 1456026; EA Project Manager – Devon Jercinovic

Dona Ana Dairies Site, Mesquite, New Mexico; Dona Ana Dairies; Hydrologist—Installed groundwater monitoring wells, collected soil samples, and generate groundwater monitoring reports and figures. Various other Stage I and Stage II Abatement Plan activities.
Project Date: 2011 – Present

Project Value – $97,793; Contract Type – CPM; EA Project No. – 1464103; EA Project Manager – Teri McMillan

Eielson 2011 Multi Site, Fairbanks, Alaska; Air Force Center for Engineering and the Environment; Hydrologist—Collected groundwater samples, logged soil borings utilizing direct-push technology, and re-established base-wide groundwater monitoring network utilizing direct-push and hollow-stem auger technologies.
Project Date: 2011–2012
Project Value – $5,343,114; Contract Type – CP; EA Project No. – 1456026; EA Project Manager – Mark Wilkinson

Eielson 2012 Installation-Wide Monitoring Program, Fairbanks, Alaska; Air Force Center for Engineering and the Environment; Hydrologist—Re-established base-wide groundwater monitoring network utilizing direct-push and hollow-stem auger technologies.
Project Date: 2012
Project Value – $3,815,763; Contract Type – LS; EA Project No. – 1456029; EA Project Manager – Mark Wilkinson

Mid-South Wood Products, Mena, Arkansas; U.S. Environmental Protection Agency; Geologist—Collected groundwater samples. Processed samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody.
Project Date: 2011
Project Value – $183,283; Contract Type – CPM; EA Project No. – 1434259; EA Project Manager – April Ballweg

Iron King Mine, Dewey-Humbolt, Arizona U.S. Environmental Protection Agency; Geologist—Groundwater well development and soil sample collection.
Project Date: 2012
Project Value – $3,188,962; Contract Type – RI/FS; EA Project No. – 1434234; EA Project Manager – Doug McReynolds

Garland Creosoting Superfund Site, Longview, Texas; U.S. Environmental Protection Agency; Geologist—Observed subcontractors, ensured engineering specifications were met, and Occupational Safety and Health Administration regulations were followed. Collected groundwater samples. Processed samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody. Conducted operation and maintenance actions.
Project Date: 2010–2011
Project Value – $456,000; Contract Type – Time and Materials; EA Project No. – 1434240; EA Project Manager – April Ballweg

Report Preparation, Chapa Gulf, Lamesa; Texas Commission of Environmental Quality; Administrative Support—Assisted in compilation and development of several status reports (monthly, biannual, and annual).
Project Date: 2010–2011
Project Value – $226,124; Contract Type – LS; EA Project No. – 1454015; EA Project Manager – Todd Frazee

Report Preparation, Hatcher Convenience Store-Dallas; Texas Commission of Environmental Quality; Administrative Support—Assisted in compilation and development of several status reports (monthly, biannual, and annual).
Project Date: 2010–2011
Project Value – $260,369; Contract Type – LS; EA Project No. – 1455210; EA Project Manager – Todd Frazee

Report Preparation, Brownfield Power-Brownfield; Texas Commission of Environmental Quality; Administrative Support—Assisted in compilation and development of several status reports (monthly, biannual, annual).
Project Date: 2010–2011
Project Value – $80,400; Contract Type – LS; EA Project No. – 1454018; EA Project Manager – Todd Frazee

State Road 114 Groundwater Plume Superfund Site, Levelland, Texas; U.S. Environmental Protection Agency; Geologist—Performed groundwater sampling of monitor wells involving the use of passive diffusion bags and sampling from tap locations located inside product recovery wells of remediation system.
Project Date: 2010–2017
Project Value – $13,753,300; Contract Type – Time and Materials; EA Project No. – 1434238; EA Project Manager – Luis Vega

Long-Term Response Action; Sprague Road; Odessa, Texas; U.S. Environmental Protection Agency Superfund Project; Geologist—Processed samples using Forms II Lite data base to provide U.S. Environmental Protection Agency-approved chain-of-custody forms and writing the quarterly ground water sampling report. Collected groundwater samples. Generated Statements of Work in order to procure micropurging equipment and crew as well as injection well reconditioning equipment and crew.
Project Date: 2010 – Present
Project Value – $4,199,000; Contract Type – Time and Materials; EA Project No. – 1434207; Project Manager – Beth Liu

Long-Term Response Action; Ouachita-Nevada Wood Treaters Superfund Site, Ouachita County, Arkansas; Geologist—Collected and processed groundwater samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody. Conducted operation and maintenance actions.
Project Date: 2010–2011
Project Value – $181,600; EA Project No. – 1434224; EA Project Manager – Jose Flores

Midessa Groundwater Plume Site, Midland County, Texas; Geologist—Collected groundwater, ambient air and sub-slab air samples. Processed samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody forms. Conducted 72-hour aquifer pump test along with several short-term aquifer pump tests.
Project Date: 2010–2015
Project Value – 2,702,152; EA Project No. – 1434264; EA Project Manager – Luis Vega

Bandera Road Groundwater Plume Site, Leon Valley, Bexar County, Texas; Geologist—Collected groundwater, ambient air, and passive soil gas samples. Processed samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody forms.
Project Date: 2010–2013
Project Value – $1,928,990; EA Project No. – 1434237; EA Project Manager – Doug McReynolds

Sandy Beach Road Groundwater Plume Site, Azle and Pelican Bay, Tarrant County, Texas; Geologist—Collected groundwater samples; deployed passive diffusion bags; monitor groundwater pump test; conduct vapor intrusion investigation; and generated groundwater monitoring, soil vapor extraction, and *in-situ* bioremediation reports.
Project Date: 2010 – Present
Project Value – $5,389,749; EA Project No. – 14342114; EA Project Manager – Teri McMillan

Shirley's Pick and Pay, Texas Commission on Environmental Quality, Assist with System Operations and Maintenance and Sample Collection; Henderson, Rusk County, Texas; Technician—Assisted remediation technician in the repair of a liquid ring pump, and collected groundwater and vapor samples as part of monthly operations and maintenance.
Project Date: 2010–2011
Contract Type – LS; EA Project No. – 1455215; EA Project Manager – Todd Nickerson

Response Action; Sol Lynn Superfund Site, Houston, Texas; Geologist—Collected and processed groundwater samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody. Conducted operation and maintenance actions.
Project Date: 2011–2013

Project Value – $3,225,000; Contract Type –RA; EA Project No. – 1434210; EA Project Manager – Jose Flores

Van Der Horst Groundwater Plume Site, Terrell, Texas; Geologist—Installed groundwater monitoring wells, Collected groundwater and soil samples. Processed samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody forms.
Project Date: 2010–2013
Project Value – $750,000; Contract Type – RI/FS; EA Project No. – 1434263; EA Project Manager – Doug McReynolds

Falcon Refinery Site, Ingleside, Texas; Geologist—Installed groundwater monitoring wells, and collected groundwater and soil samples.
Project Date: 2010–2013
Project Value – $700,000; Contract Type – RI/FS; EA Project No. – 1434288; EA Project Manager – Bob Owens

West County Road 112 Groundwater Plume Site, Midland County, Texas; Geologist—Collected groundwater samples, and processed samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody forms.
Project Date: 2010–2013
Project Value – 1,000,000; Contract Type – RI/FS; EA Project No. – 1434265; EA Project Manager – Luis Vega

East 67th Street Groundwater Plume Site, Odessa, Texas; Geologist—Collected groundwater samples, and processed samples using Forms II Lite database to provide U.S. Environmental Protection Agency-approved chain-of-custody forms. Install groundwater monitoring wells utilizing air-rotary technology. Conduct *in-situ* bioremediation.
Project Date: 2010 – Present
Project Value – 2,265,905; Contract Type – CPM; EA Project No. – 14342115; EA Project Manager – Teri McMillan

Jones Road Groundwater Plume Site, Houston, Texas; Geologist—Analyzed field data, and created injection pilot test report and full scale implementation *in situ* bioremediation work plan.
Project Date: 2012–2015
Project Value – 1,581,420; Contract Type – CPM; EA Project No. – 1434270; EA Project Manager – Ted Telisak

Donna Canal and Reservoir Superfund Site, Donna, Texas; Geologist—Collected groundwater, suspended sediment, and soil samples.
Project Date: 2012–2013
Project Value – $1,000,000; Contract Type – RI/FS; EA Project No. – 1434282; EA Project Manager – Doug McReynolds

Hill Air Force Base Performance-Based Remediation, Layton, Utah; Geologist—Installed groundwater monitoring wells, collected soil samples for field laboratory analysis, assisted in Quality Assurance Project Plan preparation, and generated investigation reports and figures.
Project Date: 2013 – Present
Project Value – $19,030,341; Contract Type – LS; EA Project No. – 6236906; EA Project Manager – Devon Jercinovic

Holiday Chevron Leaking Underground Storage Tank Site, Tucumcari, New Mexico; Geologist—Installed groundwater monitoring wells, collected groundwater and soil samples, and provided excavation oversight of contaminated soil.
Project Date: 2012 – Present
Project Value – $1,734,486; Contract Type – LS; EA Project No.–6231707; EA Project Manager – Teri McMillan

Auto Clinic Leaking Underground Storage Tank Site, Grants, New Mexico; Geologist—Provided excavation oversight of contaminated soil.
Project Date: 2015
Project Value – $2,399,097; Contract Type – LS; EA Project No.–6293001; EA Project Manager – Vener Mustafin

Cal-Maine Egg Farm, Albuquerque, New Mexico; Hydrologist—Installed groundwater monitoring wells; collected soil and groundwater samples; and generated work plans, reports, and figures.
Project Date: 2012–2015
Project Value – $154,860; Contract Type – CPM; EA Project No. – 1464502; EA Project Manager – Teri McMillan

Laun-Dry Supply Company, Albuquerque, New Mexico; Hydrologist—Installed groundwater monitoring wells, collected soil and groundwater samples; generate work plans, reports, and figures; horizontal road bore drilling oversight; conduct *in-situ* bioremediation pilot test; conduct vapor intrusion investigations; conduct passive soil gas survey; and install/operate soil vapor extraction remediation system.
Project Date: 2013 – Present
Project Value – $258,272; Contract Type – CPM; EA Project No. – 1506901; EA Project Manager – Teri McMillan

Former Price's Valley Gold Dairy, Bernalillo, New Mexico; Hydrologist—Installed groundwater monitoring wells; collected soil and groundwater samples; generate work plans, reports, and figures; and install/operate groundwater extraction remediation system.
Project Date: 2013 – Present
Project Value – $66,927; Contract Type – CPM; EA Project No. – 1505701; EA Project Manager – Teri McMillan

Wall Colmonoy, Isleta, New Mexico; Hydrologist—Collect groundwater samples during groundwater monitoring activities.
Project Date: 2012 – Present
Project Value – $16,686; Contract Type – CPM; EA Project No. – 1508601; EA Project Manager – Gary Desselle

Brahm Wind, Grady, New Mexico; Hydrologist—Conducted Phase I inspection activities, and generated work plans, reports, and figures.
Project Date: 2013–2014
Project Value – $6,506; Contract Type – CPM; EA Project No. – 1513001; EA Project Manager – Teri McMillan

Laguna Mart, Laguna, New Mexico; Hydrologist—Installed groundwater monitoring wells, collected soil and groundwater samples, and installed remediation system.
Project Date: 2013 – Present
Project Value – $1,478,935; Contract Type – LS; EA Project No. – 6236201; EA Project Manager – Vener Mustafin

Employment History

Employer—EA Engineering, Science, and Technology, Inc., PBC
Dates of Employment—August 2010 – Present
Title—Geologist II

Employer—U.S. Air Force
Dates of Employment—June 1999 – July 2011
Title—Aerospace Ground Equipment Craftsman

List of Technical Skills and Specializations

- Collected groundwater, surface water, sediment, suspended sediment, soil, soil vapor, and air samples
- Completed Airman Leadership School with high marks
- Directly responsible for training and supervision of subordinates
- Excelled in courses pertaining to physical and chemical hydrology as well as other geology courses and general curriculum, and proficient with water sampling/ measuring devices
- Experience managing programs peripheral to main duties in the U.S. Air Force as well as managing subordinates
- Fieldwork pertaining to hydrology/geology courses
- Generate groundwater monitoring work plans and reports
- Heavy equipment operation
- Installation of wells utilizing direct push, hollow-stem auger, air rotary, air rotary casing hammer, mud rotary, horizontal mud rotary technologies
- Managing sample collecting events including sample processing with Forms II Lite
- Phase I site assessments
- Principles of electricity, electronics, general mechanics, heating, refrigeration, pneumatics, hydraulics, and reciprocating and turbine engines
- Proficiency in the Microsoft Office suite of programs: Word, Excel, PowerPoint, experience with Geographic Information System software, experience with PHREEQC, with Forms II Lite, Log Plot, experience with desktop/laptop hardware
- Project management

Tyler Curley, P.E.
Engineer

Mr. Curley is a Professional Engineer with more than 6 years of experience in engineering design and analysis, field engineering and sampling, environmental remediation, site safety and health, and site investigation. He has directed multidisciplinary staff and performed the field planning and coordination, and safety oversight for government clients including the U.S. Environmental Protection Agency, Texas Commission on Environmental Quality, and New Mexico Environment Department Petroleum Storage Tank Bureau.

Mr. Curley also has experience in multiple faucets of Civil Engineering through his involvement with a variety of projects in both the private and public sectors. His duties include soil and groundwater sampling, remediation system design and analysis, construction oversight and system modification, system maintenance, engineering data analysis and mapping, and report composition.

Qualifications

Education
B.S.; Colorado State University; Civil Engineering; 2011

Registrations/Certifications
Professional Engineer—NM (23885); 2016

Specialized Training
OSHA 40-Hour Hazardous Waste Operations Safety Training; 2011
OSHA 8-Hour Hazardous Waste Operations Safety Training Refresher; 2016
OSHA 30-Hour Construction Safety, 2016
CPR and First Aid Training; 2015
Construction Quality Management Training: 2015

Experience
Years with EA: 6.5 Total Years: 6.5

Professional Experience

***Engineering Design*—**Experience in remediation system evaluation and design, including groundwater extraction systems, soil vapor extraction systems, air sparging systems, well field design, environmental, remediation, and private water supply well design; pressurized pipe flow for liquids and gases; chemical oxidant solution injections into groundwater; and design and installation of *in situ* bioremediation permeable reactive barriers for the reductive dechlorination of chlorinated ethenes.

***Environmental Sampling*—**Experience with surface water, groundwater, surface soil, subsurface soil, sediment, stream gauging, and air sampling. Sampling methods include low flow groundwater sampling, grab surface and groundwater sampling, grab surface and subsurface soil sampling, multi-incremental sampling for soils, suspended sediment sampling, ambient air sampling, and passive and active soil gas sampling. Served as assistant sampling manager and has experience with SCRIBE on U.S. Environmental Protection Agency projects.

***Health and Safety*—**For over 5 years, served as Site Health and Safety Officer on numerous sites in New Mexico and Texas for clients including U.S. Environmental Protection Agency, New Mexico Environment Department Petroleum Storage Tank Bureau, Texas Commission on Environmental Quality, and various private clients. Activities overseen at these sites include soil excavation and associated soil handling, soil borings, monitoring, remediation, and private water well construction; soil vapor probe installation; and collection of environmental samples (surface/subsurface soil, surface water, groundwater, sediment, suspended sediment, air, soil gas, etc.). Health and Safety responsibilities include:

- Perform health and safety oversight during site activities
- Present daily safety briefings that included awareness training for site physical/chemical/biological hazards
- Calibrate and document calibration of dust monitoring equipment prior to use
- Implement and ensure compliance with the Accident Prevention Plan/Site Safety and Health Plan
- Conduct site inspections to evaluate work conditions for job zones
- Perform initial and daily site health and safety inspections
- Prepare health and safety compliance memoranda
- Direct, distribute, and inspect appropriate personal protective equipment to site personnel

- Maintain and enforce appropriate personal protective equipment use
- Perform environmental monitoring using photoionization detector, noise dosimeter, and dust monitor (other equipment).

EA Project Experience

JVP Bryn Mawr, Albuquerque, New Mexico; Engineering/Project Manager—Design a soil vapor extraction system. Installation of three nested soil vapor extraction wells, engineering analysis, report composition, and project management duties.
Project Date: 2017 – Present
Project Value – $52,400; Contract Type – T&M; EA Project No. – 1521801; EA Project Manager – Tyler Curley

Performance-Based Remediation, Kirtland Air Force Base, New Mexico; U.S. Army Corps of Engineers–Albuquerque District; Engineer/Site Safety and Health Office—Expansion of the groundwater treatment system at Solid Waste Management Unit ST-106/SS-111 at Kirtland Air Force Base, New Mexico for containment of the dissolved-phase ethylene dibromide off-base plume associated with the Bulk Fuel Facility and historical releases of JP-4, JP-8, and Avgas. Provided construction oversite for the installation of the second 400 gallons per minute granular activated carbon filter treatment system. Provide construction oversite/management of the 106239 groundwater extraction well conveyance line. Provided site safety oversight for the installation of monitoring and groundwater extraction wells. Assisted with quarterly groundwater sampling activities and groundwater extraction system operation and maintenance tasks.
Project Date: 2015 – Present
Project Value – $17.8 million; Contract Type – PBC Task Order; Contract – U.S. Army Corps of Engineers Baltimore MAES W912DR-12-D-0006; EA Project No. – 62599DM01; EA Project Manager – Devon Jercinovic

Performance-Based Remediation, Kirtland Air Force Base, New Mexico; U.S. Army Corps of Engineers–Albuquerque District; Engineer/Site Safety and Health Office—Performed construction/health and safety oversite for the decommissioning of the soil vapor extraction system located at the Bulk Fuels Facility at Kirtland Air Force Base, and technical lead for soil vapor sampling.
Project Date: 2017 – Present
Project Value – $12.3 million; Contract Type – PBC Task Order; Contract – U.S. Army Corps of Engineers Baltimore MAES W912DR-12-D-0006; EA Project No. – 62735DM02; EA Project Manager – Devon Jercinovic

Laguna Mart, Laguna, New Mexico; Engineer/Site Safety and Health Officer—Design and installation of an air sparge remediation system and the expansion of the existing soil vapor extraction system. Installed groundwater monitoring and remediation wells, collected soil and groundwater samples, operation and maintenance activities, engineering analysis, and report composition. Provided site safety oversight during construction phases.
Project Date: 2011 – Present
Project Value – $1,478,935; Contract Type – LS; EA Project No. – 6236201; EA Project Manager – Vener Mustafin

Conway Oil Bulk Fuel Storage Plant, Tucumcari, New Mexico; Junior Engineer—Designed and installed a soil vapor extraction system to assist in the removal of free phase non-aqueous phase liquid. Performed environmental sampling of groundwater and soil vapor, system operation and maintenance, engineering analysis, report composition, and project management duties.
Project Date: June 2015 – Present
EA Project No. – 6231710; EA Project Manager – Tyler Curley

Sandy Beach Road Groundwater Plume Site Remedial Action, Azel, Texas; Junior Engineer/Site Safety and Health Officer—Designed an *in situ* bioremediation permeable reactive barrier for the reductive dechlorination of chlorinated ethenes. Performed engineering analysis and report composition for the soil vapor extraction system. Provided construction and site safety oversight during the installation of replacement groundwater supply wells as well as plumbing of the new wells into the existing residences.
Project Date: May 2015
EA Project No. – 14342114; EA Project Manager – Teri McMillan

East 67th Street Groundwater Plume Site Remedial Action, Odessa, Texas; Junior Engineer/Site Safety and Health Officer—Designed a soil vapor extraction system for the removal of chlorinated ethenes. Provided oversight during the installation of replacement groundwater supply wells as well as plumbing of the new wells into the existing residences.
Project Date: January 2015 – Present
EA Project No. – 14342115; EA Project Manager – Teri McMillan

Fina Truck Stop, JSP Paloni, New Mexico Environment Department, Petroleum Storage Tank Bureau, Albuquerque, New Mexico; Engineer/Site Safety and Health Officer—Provided oversight during operation of the modified bioventing/non-aqueous phase liquid skimming system with a larger blower, conducted quarterly groundwater and vapor sampling, and assisted in preparation of work plan and health and safety plan. Performed engineering analysis and report composition for system performance. Provided site safety oversight during construction phases.
Project Date: 2011 – Present
Project Value – $650,000; Contract Type – Fixed Cost; EA Project No. – 6229402; EA Project Manager – Vener Mustafin

Driver's Travelmart, New Mexico Environment Department, Petroleum Storage Tank Bureau, San Jon, New Mexico; Engineer/Site Safety and Health Officer—Provided oversight during operation of the mobile dual-phase extraction system, conducted quarterly groundwater and mobile dual-phase extraction sampling, and assisted in preparation of work plan and health and safety plan. Performed engineering analysis and report composition.
Project Date: 2011–2016
Project Value – $900,000; Contract Type – Fixed Cost; EA Project No. – 6253601; EA Project Manager – Vener Mustafin

New Mexico Gas Company, Velarde Compressor Station, Velarde, New Mexico; Junior Engineer—Installation of soil borings and collection of soil samples for geotechnical analysis to be used for slope stability analysis.
Project Date: April 2014
EA Project No. – 1495601; EA Project Manager – Jay Snyder

Donmenici Law Firm PC, Laun-Dry Supply Company, Albuquerque, New Mexico; Engineer—Design and installation of a soil vapor extraction system for the removal of chlorinated ethenes. Performed system operation and maintenance and collected groundwater monitoring and soil vapor samples.
Project Date: August 2013 – Present
EA Project No. – 1506901; EA Project Manager – Teri McMillan

Donmenici Law Firm PC, Price's Valley Gold Dairy, Albuquerque, New Mexico; Junior Engineer—Designed and provided oversight for the installation of a groundwater extraction system for the removal of nitrate contaminated groundwater. Performed routine operation and maintenance, groundwater sampling events,
Project Date: March 2013 – Present
EA Project No. – 1463606; EA Project Manager – Jay Snyder

Hill Air Force Base Performance-Based Remediation, Layton, Utah; Air Force Civil Engineer Center; Junior Engineer—Assisted with soil and groundwater sampling, subsurface direct-push investigation, monitoring well installation, and soil vapor extraction pilot test.
Project Date: 2012 – Present
EA Project No. – 6236906; EA Project Manager – Devon Jercinovic

Donmenici Law Firm PC, Copper Pointe Business Park, Albuquerque, New Mexico; Junior Engineer—Provided oversight for the installation of a sub-slab vapor abatement system and collected indoor ambient air samples.
Project Date: November 2012 – 2013
EA Project No. – 1463605; EA Project Manager – Jay Snyder

Holiday Chevron – Conway Oil Company, New Mexico; Junior Engineer—Performed quarterly groundwater sample collection and management. Provided construction and site safety oversight for the excavation, transportation and back filling activities during the removal action. Performed an injection of 3 percent hydrogen peroxide into the backfill material post excavation and performed engineering analysis and report composition.
Project Date: November 2011 – Present
EA Project No. – 6231702; EA Project Manager – Teri McMillan

Mike's Auto Detail – Haller & Associates. Inc., New Mexico; Junior Engineer—Performed engineering analysis and report composition for a groundwater and soil vapor extraction system to be presented to Haller & Associates Inc.
Project Date: October 2011 – 2016
EA Project No. – 6230801; EA Project Manager –Vener Mustafin

Midway Chevron – Haller & Associates. Inc., New Mexico; Junior Engineer—Performed engineering analysis and report composition for a groundwater and soil vapor extraction system to be presented to Haller & Associates Inc.
Project Date: July 2011 – 2016
Contract Type – Time and Materials; EA Project No. – 6230802; EA Project Manager – Vener Mustafin

Lee's Conoco – Haller & Associates. Inc., New Mexico; Junior Engineer—Performed engineering analysis and report composition for a groundwater and soil vapor extraction system to be presented to Haller & Associates Inc.
Project Date: March 2012 – 2016
Contract Type – Time and Materials; EA Project No. – 6230803; EA Project Manager – Vener Mustafin

Titanium Metals Corporation, TIMET, Henderson, Nevada; Junior Engineer—Assisted in the design of a traffic plan for non-hazardous material transportation onsite and offsite. Created geological cross section to aid in slope stability design.
Project Date: November 2012 – April 2013
EA Project No. – 1464901; EA Project Manager – Jay Snyder

Remedial Investigation Site 45/57, Eielson Air Force Base, Alaska; Junior Engineer—Performed multi-incremental ground water sampling to support delineation of contaminant plume. Collected elevation data for borehole sample locations using a Tremble Global Positioning system device. Provided oversight for the installation of groundwater monitoring wells.
Project Date: September–October 2011, August–September 2012
EA Project No. – 1456026; EA Project Manager –Mark Wilkinson

Remedial Action Objective Landfills Kirtland Air Force Base; New Mexico Environmental Department, New Mexico; Junior Engineer—Performed detailed inspection of landfills searching for drilling, piping, and other forms of erosion and complied information into a report format to be presented to Kirtland Air Force Base.
Project Date: November 2011 – September 2012
EA Project No. – 6242147; EA Project Manager – Devon Jercinovic

Army National Guard Military Munitions Response Sites; CH2M HILL, New Mexico & Texas; Junior Engineer—Conducted site inspections on five sites in New Mexico and Texas as subcontractors to CH2M HILL. Conducted visual surveys and multi-incremental soil sampling, in association with unexploded ordnance technician, according to the site inspection work plan.
Project Date: October 2011 – January 2012
EA Project No. – 6246901; EA Project Manager – Devon Jercinovic

Sprague Road Long-Term Response Action, Odessa, Texas; U.S. Environmental Protection Agency Region 6; Junior Engineer—Collected groundwater samples for assessment of treatability testing of *in situ* reduction of hexavalent chromium. Performed an exhaustion test for removal of hexavalent chromium using titanium dioxide.
Project Date: July–August 2011
EA Project No. – 1434207; EA Project Manager – Stan Wallace

Other Project Experience

John Martin Reservoir; U.S. Army Corps of Engineers; 2009; Park Ranger—Responsible for boat inspections for Aquatic Nuisance Species before and after launching. Conflict resolution and management of boaters.

Employment History

Employer—EA Engineering, Science, and Technology, Inc., PBC
Dates of Employment—July 2011 – Present
Title—Engineer

Employer—U.S. Army Corps of Engineers, John Martin Reservoir
Dates of Employment—May–August 2009
Title—Park Ranger

List of Technical Skills and Specializations

- AutoCAD
- AutoCAD Civil 3D
- Basic surveying
- EPA-NET
- Microsoft Excel, Word, and PowerPoint
- Remediation system design
- Visual Basics for Application
- Water quality instrumentation

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TAB F

Response to Contract Terms and Conditions

EA Engineering, Science, and Technology, Inc., PBC

TAB F RESPONSE TO CONTRACT TERMS AND CONDITIONS

EA Engineering, Science, and Technology, Inc., PBC has reviewed and accepts the Contract Terms and Conditions as provided in the RFP (Sample Contract) Appendix C and Conditions Governing the Procurement and Evaluation Factors stated in Section II.C (1).

TAB G

Offeror's Additional Terms and Conditions

EA Engineering, Science, and Technology, Inc., PBC

TAB G OFFEROR'S ADDITIONAL TERMS AND CONDITIONS

EA Engineering, Science, and Technology, Inc., PBC will not add terms and conditions to the example contract provided in Appendix C of the RFP.

TAB H

Signed Campaign Contribution Form

Campaign Contribution Disclosure Form

Pursuant to NMSA 1978, § 13-1-191.1 (2006), any person seeking to enter into a contract with any state agency or local public body for professional services, a design and build project delivery system, or the design and installation of measures the primary purpose of which is to conserve natural resources must file this form with that state agency or local public body. This form must be filed even if the contract qualifies as a small purchase or a sole source contract. The prospective contractor must disclose whether they, a family member or a representative of the prospective contractor has made a campaign contribution to an applicable public official of the state or a local public body during the two years prior to the date on which the contractor submits a proposal or, in the case of a sole source or small purchase contract, the two years prior to the date the contractor signs the contract, if the aggregate total of contributions given by the prospective contractor, a family member or a representative of the prospective contractor to the public official exceeds two hundred and fifty dollars ($250) over the two year period.

Furthermore, the state agency or local public body shall void an executed contract or cancel a solicitation or proposed award for a proposed contract if: 1) a prospective contractor, a family member of the prospective contractor, or a representative of the prospective contractor gives a campaign contribution or other thing of value to an applicable public official or the applicable public official's employees during the pendency of the procurement process or 2) a prospective contractor fails to submit a fully completed disclosure statement pursuant to the law.

THIS FORM MUST BE FILED BY ANY PROSPECTIVE CONTRACTOR WHETHER OR NOT THEY, THEIR FAMILY MEMBER, OR THEIR REPRESENTATIVE HAS MADE ANY CONTRIBUTIONS SUBJECT TO DISCLOSURE.

The following definitions apply:

"Applicable public official" means a person elected to an office or a person appointed to complete a term of an elected office, who has the authority to award or influence the award of the contract for which the prospective contractor is submitting a competitive sealed proposal or who has the authority to negotiate a sole source or small purchase contract that may be awarded without submission of a sealed competitive proposal.

"Campaign Contribution" means a gift, subscription, loan, advance or deposit of money or other thing of value, including the estimated value of an in-kind contribution, that is made to or received by an applicable public official or any person authorized to raise, collect or expend contributions on that official's behalf for the purpose of electing the official to either statewide or local office. "Campaign Contribution" includes the payment of a debt incurred in an election campaign, but does not include the value of services provided without compensation or unreimbursed travel or other personal expenses of individuals who volunteer a portion or all of their time on behalf of a candidate or political committee, nor does it include the administrative or solicitation expenses of a political committee that are paid by an organization that sponsors the committee.

"Family member" means spouse, father, mother, child, father-in-law, mother-in-law, daughter-in-law or son-in-law.

"Pendency of the procurement process" means the time period commencing with the public notice of the request for proposals and ending with the award of the contract or the cancellation of the request for proposals.

"Person" means any corporation, partnership, individual, joint venture, association or any other private legal entity.

"Prospective contractor" means a person who is subject to the competitive sealed proposal process set forth in the Procurement Code or is not required to submit a competitive sealed proposal because that person qualifies for a sole source or a small purchase contract.

"Representative of a prospective contractor" means an officer or director of a corporation, a member or manager of a limited liability corporation, a partner of a partnership or a trustee of a trust of the prospective contractor.

DISCLOSURE OF CONTRIBUTIONS:

Contribution Made By: _____

Relation to Prospective Contractor: _____

Name of Applicable Public Official: _____

Date Contribution(s) Made: _____
_____

Amount(s) of Contribution(s) _____
_____

Nature of Contribution(s) _____
_____

Purpose of Contribution(s) _____
_____

(Attach extra pages if necessary)

_____ _____
Signature Date

_____

Title (position)

—OR—

NO CONTRIBUTIONS IN THE AGGREGATE TOTAL OVER TWO HUNDRED FIFTY DOLLARS ($250) WERE MADE to an applicable public official by me, a family member or representative.

Signature

12/19/18
Date

Vice President
Title (Position)

TAB I

Signed Employee Health Coverage Form

New Mexico Employees Health Coverage Form

1. For all contracts solicited and awarded on or after January 1, 2008: If the Offeror has, or grows to, six (6) or more employees who work, or who are expected to work, an average of at least 20 hours per week over a six (6) month period during the term of the contract, Offeror must agree to have in place, and agree to maintain for the term of the contract, health insurance for those employees and offer that health insurance to those employees no later than July 1, 2010 if the expected annual value in the aggregate of any and all contracts between Contractor and the State exceed $250,000 dollars.

2. Offeror must agree to maintain a record of the number of employees who have (a) accepted health insurance; (b) decline health insurance due to other health insurance coverage already in place; or (c) decline health insurance for other reasons. These records are subject to review and audit by a representative of the state.

3. Offeror must agree to advise all employees of the availability of State publicly financed health care coverage programs by providing each employee with, as a minimum, the following web site link to additional information http://insurenewmexico.state.nm.us/.

4. For Indefinite Quantity, Indefinite Delivery contracts (price agreements without specific limitations on quantity and providing for an indeterminate number of orders to be placed against it); these requirements shall apply the first day of the second month after the Offeror reports combined sales (from state and, if applicable, from local public bodies if from a state price agreement) of $250,000.

Signature of Offeror: _____ Date 12-19-18

TAB J

Signed Affidavit Pursuant to Governmental Conduct Act (If Applicable)

EA Engineering, Science,
and Technology, Inc., PBC

TAB J

GOVERNMENTAL CONDUCT ACT AFFIDAVIT

I hereby affirm, under penalty of perjury, that EA Engineering, Science, and Technology, Inc., PBC warrants that it presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance or services required under the Agreement. EA Engineering, Science, and Technology, Inc., PBC certifies requirements of the Governmental Conduct Act, Sections 10-16-1 through 10-16-18, NMSA 1978, regarding contracting with a public officer or state employee or former state employee have been followed.

Signature

12-19-18
Date

State of New Mexico
County of Bernalillo

This instrument was signed and affirmed before me on 12/19/18 (date)
by

Jay T. Snyder.
(name)

SEAL

Sergio Reyes-Dzul
Notary Public
My commission expires: 09/24/22

OFFICIAL SEAL
Sergio Reyes-Dzul
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 09-24-22

TAB K

Resident Vendor or Resident Veteran Certificate (If Applicable)

STATE OF NEW MEXICO

TAXATION AND REVENUE DEPARTMENT

RESIDENT BUSINESS CERTIFICATE

Issued to: **EA ENGINEERING SCIENCE & TECHNOLOGY, INC.**

DBA: **EA ENGINEERING SCIENCE & TECHNOLOGY, INC.**
225 SCHILLING CIR STE 400
HUNT VALLEY, MD 21031-1124

Expires: **03-May-2020**

Certificate Number:

L0478209328

John Monforte, *Acting Cabinet Secretary*

THIS CERTIFICATE IS NOT TRANSFERABLE

Bill Richardson
Governor

STATE OF NEW MEXICO
Taxation and Revenue Department

Rick Homans
Secretary

EA ENGNERNG SCNCE & TECH INC
11019 MCCORMICK ROAD
HUNT VALLEY MD 21031

November 18, 2008
CRS ID: 02-280770-00-5
Letter ID: L1158435968

STATE OF NEW MEXICO TAXATION AND REVENUE DEPARTMENT
REGISTRATION CERTIFICATE

Date ID Issued	IDENTIFICATION NUMBER	Business Start Date
15-Mar-1995	**02-280770-00-5**	**06-Jan-1995**
Business Location		Business End Date
11019 MCCORMICK ROAD		
City and State		Zip Code
HUNT VALLEY, MD		**21031**
Taxpayer Name		Taxpayer Type
EA ENGNERNG SCNCE & TECH INC		**CORPORATION**
Firm Name		Filing Frequency
EA ENGNERNG SCNCE & TECH INC		**QUARTERLY**
Mailing Address		
11019 MCCORMICK ROAD		
City and State		Zip Code
HUNT VALLEY, MD		**21031**

This Registration Certificate is issued pursuant to Section 7-1-12 NMSA 1978 for Gross Receipts, County Gross Receipts, Municipal Gross Receipts, Compensating and Withholding Taxes. This copy must be displayed conspicuously in the place of business. Any purchaser of the registrant's business is subject to certain requirements under Section 7-1-61 NMSA 1978.

Audit and Compliance Division Director

By Phillip Salazar

Any inquiries concerning your Identification Number should be addressed to the Audit & Compliance Division, P.O. Box 630, Santa Fe, New Mexico 87504-0630

Form Revised 02/2003

THIS CERTIFICATE IS NOT TRANSFERABLE

STATE OF NEW MEXICO TAXATION AND REVENUE DEPARTMENT
REGISTRATION CERTIFICATE

Date ID Issued	IDENTIFICATION NUMBER	Business Start Date
15-Mar-1995	**02-280770-00-5**	**06-Jan-1995**
Business Location		Business End Date
11019 MCCORMICK ROAD		
City and State		Zip Code
HUNT VALLEY, MD		**21031**
Taxpayer Name		Taxpayer Type
EA ENGNERNG SCNCE & TECH INC		**CORPORATION**
Firm Name		Filing Frequency
EA ENGNERNG SCNCE & TECH INC		**QUARTERLY**
Mailing Address		
11019 MCCORMICK ROAD		
City and State		Zip Code
HUNT VALLEY, MD		**21031**

This Registration Certificate is issued pursuant to Section 7-1-12 NMSA 1978 for Gross Receipts, County Gross Receipts, Municipal Gross Receipts, Compensating and Withholding Taxes. This copy must be displayed conspicuously in the place of business. Any purchaser of the registrant's business is subject to certain requirements under Section 7-1-61 NMSA 1978.

Audit and Compliance Division Director

By Phillip Salazar

Any inquiries concerning your Identification Number should be addressed to the Audit & Compliance Division, P.O. Box 630, Santa Fe, New Mexico 87504-0630

Form Revised 02/2003

THIS CERTIFICATE IS NOT TRANSFERABLE

TAB L

Resident Veterans Preference Certification (If Applicable)

EA Engineering, Science, and Technology, Inc., PBC

TAB L RESIDENT VETERANS PREFERENCE CERTIFICATION

EA Engineering, Science, and Technology, Inc., PBC is not a Resident Veteran Contractor.

TAB M

Anti- Collusion Notarized Affidavit

ANTI-COLLUSION STATEMENT

I hereby affirm, under penalty of perjury, that I have participated and will continue to participate in the competitive contractor selection process as described in this Request for Proposals, the Petroleum Storage Tank Regulations,20.5.123.2308 NMAC, and Section 74-6B-7C NMSA 1978 without misrepresentation and without collusion with other contractors during the entire solicitation, evaluation and selection process.

Signature 12-19-18 Date

State of New Mexico
County of Bernalillo

This instrument was signed and affirmed before me on 12/19/18 (date) by Jay T. Snyder (name).

SEAL

Sergio Reyes-Dzul
Notary Public
My commission expires: 09/24/22

OFFICIAL SEAL
Sergio Reyes-Dzul
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 09-24-22

TAB N

Subcontractor Information

EA Engineering, Science, and Technology, Inc., PBC

TABLE N-1
SUBCONTRACTORS

	Location	Experience and Capabilities
Drillers		
Cascade Drilling Services	Peralta, New Mexico	Hollow stem auger, rotary - air and mud, sonic, ODEX, direct push, well plugging and abandonment, amendment injection
Enviro-Drill, Inc.	Albuquerque, New Mexico	Hollow stem auger, rotary drilling - air and mud, , direct push drilling, and well plugging and abandonment
Vendors		
Regenesis	San Clemente, California	Innovative technologies and services to treat a wide range of contaminants, including petroleum hydrocarbons and chlorinated solvents, via enhanced bioremediation, chemical oxidation, desorption and metals immobilization
Environmental Services		
Rhino Environmental Services	El Paso, Texas	Excavation services, trenching, underground system construction, system decommissioning, contaminated water and soil disposal
Laboratories		
Hall Environmental Analysis Laboratory	Albuquerque, New Mexico	Analytical laboratory familiar with PSTB sampling and analytical requirements, can provide rapid turn around if required
Microbial Insights	Knoxville, Tenneessee	Broad spectrum of Molecular Biological Tools (MBTs) and Site Logic services with the goal of aiding in characterizing, understanding, and managing biological processes
Eurofins Air Toxics	Folsom, California	Analytical laboratory specializing in air, vapor, and soil gas samples

Key Subcontractors

Cascade has been selected to provide drilling and injection services. Cascade will advance direct push borings and handle, mix, and inject remediation fluids. EA has injected groundwater amendments with Cascade's project manager T. J. Halley on two superfund sites in Texas. Cascade has the equipment and capacity to complete the field in less than one month, which is crucial given how busy this area is. Cascade was founded in 1991 and provides environmental and geotechnical drilling, advanced site characterization, and in-situ and ex-situ remediation applications. Cascade has the in-house capabilities and expertise to support high-resolution site characterization, thermal source treatment, injection of oxidants, reductants, and bio amendments. Delivery technologies include pneumatic and hydraulic emplacement, injection, and shallow mixing. For ex-situ remediation, Cascade offers chemical, biological, and thermal applications. Cascade has extensive experience with the in-situ remediation. Cascade employs knowledgeable managers, superintendents, and field personal and owns drill rigs, pumps, compressors, mixers, trailers, manifolds, valves, gauges, and other equipment to successfully implement the injection at the Santa Fe County Judicial Complex site.

Enviro-Drill, Inc. (EDI) has been selected to provide soil boring and monitoring well drilling services, if such services are needed for additional site characterization and/or contaminant extent or destruction confirmation. EDI was founded in 1955 hold a Driller License in the state of New Mexico and other Southwest States and provides drilling services for environmental and geotechnical purposes throughout the Southwest. EDI capabilities include drilling and installation of monitoring, cluster, air sparge, SVE, ozone and peroxide injection, and cathodic protection wells, landfill and soil gas sampling probes, well sampling, and well abandonment. EDI has capabilities of hollow stem auger, air and mud rotary, ODEX, direct push, wireline coring, rock core drilling, limited access drilling, and Earth Probe drilling.

Other Drilling Subcontractors (as needed) – EA uses a number of drilling companies, including Rogers Drilling, Peterson, Enviro-Drill, Geomechanics, Harrison-Cooper, and Terracon.

Regenesis has been seen selected to provide the PetroFix remediation product to remediate hot stops at the site. Regenesis is a global company conducting research, development, commercialization of technology-based solutions for the environment. It specializes in scientifically proven products and services-based solutions for groundwater and soil remediation. Regenesis has over 20 years of environmental remediation experience and has completed over 26,000 projects in over 28 countries. Regenesis has developed and commercialized the PetroFix product for application at the sites impacted by releases from fuel hydrocarbons. Regenesis has capabilities to adjust product formulation to meet site-specific conditions and goals.

Rhino Environmental Services, Inc. (RES) has been selected to handle general waste that may be generated during application of PetroFix. RES holds the GS-29 Remediation Contractors license as well as a GB-98 General Contractors License in New Mexico and has experience assisting in emergency response activities. Jay Snyder, Teri McMillan, and Vener Mustafin and RES have collaborated on numerous "dig and hauls" including: Allsup's # 137, Los Chaves (13,500 cy), City of Belen Maintenance Yard (7,700 cy), Bazen Site (13,600 cy), Nick's Chevron, Belen (8,400 cy), Holiday Chevron, Tucumcari (11,304 cy), Auto Clinic (16,000 cy) and Santa Fe/Nimitz, Grants (7,000 cy).

Hall Environmental Analysis Laboratory (HEAL) has been selected to provide analytical services for soil and groundwater samples. HEAL is a nationally certified through the National Environmental Laboratory Accreditation Program (NELAC), the State of New Mexico Drinking Water, and the State of Arizona. HEAL offers volatile organic, semi-volatile, and metals analyses in-house. It is a locally owned small business that was established in 1991 to serve the New Mexico environmental testing market. HEAL is experienced in the analysis of air, soil, water, oil, sludge, wastes, and solid materials. HEAL's clients

include local, state, and federal governmental agencies, private consultants, commercial and industrial business, as well as individual homeowners. HEAL has performed analysis for the National Laboratories, the Army Corps of Engineers, Kirtland Air Force Base, and the Air Force Committee on Environmental Excellence.

Microbial Insights, Inc. (MI) has been selected to provide specialized services to assist with optimizing remediation fluids amendment with bacteria to enhance in-situ biological degradation of fuel contaminants. MI is woman-owned small business specializing in the development and application of cutting edge molecular biological tools (MBTs) to describe and quantify microbial communities. MI is dedicated to providing superior genetic and chemical diagnostic tools to aid clients in understanding and managing biological processes for a wide range of areas including environmental remediation, microbial-induced corrosion, and microbial source tracking. MI analysis assist with determining if desired microbial processes are active, monitor the distribution of contaminant degrading populations, demonstrate the feasibility of monitored natural attenuation (MNA), quantitatively evaluate remedial action alternatives, monitor the effectiveness of implemented bioremediation strategy, optimize corrective actions. Corrective action strategies include reductive dechlorination, co-metabolic oxidation, MNA, aerobic, anaerobic treatment of BTEX and PAHs and MTBE, and chemical oxidation. Tools include quantitative polymerase chain reaction (qPCR), QuantArray, Compound Specific Isotope Analysis (CSIA), next-generation DNA sequencing (NGS), phospholipid fatty acids (PLFA), Stable Isotope Probing, In-Situ Microcosm Studies (Bio-Trap Samples),

Eurofins was selected to analyze soil gas and soil vapor samples associated with evaluating soil vapor concentrations in subsurface soil and vapor intrusion in the District Attorney building of any other structures at the site. Eurofins is an international environmental testing laboratory that provides a wide range of testing of water, air, soil, waste, and other products to assess their quality and impact on health and environment. Air testing services include emissions, air monitoring, soil gas, industrial hygiene, indoor air, calibration of measuring systems. Eurofins supplies and analyses samples using SUMMA canisters to determine precise concentrations of constituents. Analyses include BTEX, VOCs, TPH, fixed gases, energy content, and other.

TAB O

Organization Health and Safety Plan

Site Name: Laguna Mart	**Site Contact:** Vener Mustafin	**Telephone:** 505-224-9013 x1513
Location: Laguna, NM	**Client Contact:** Vener Mustafin	**Telephone:** 505-224-9013 x1513
EPA I.D. No.: N/A	**Prepared By:** Tyler Curley	**Date:** April 23, 2014
Project No. 6236201	**Date of Proposed Activities:** 2014	

Objectives:

All personnel working on this site are trained in accordance with 29 CFR 1910.120 and are currently active in a medical monitoring program to perform work on a hazardous waste site. The objective of this health and safety plan (HSP) is to list the site-specific hazards and the hazards controls to be used to ensure worker safety for the following activities:

- Installation of 15 soil borings
- Installation of 82 sparge drive points
- Installation of 2 shallow zone SVE wells
- Installation of 7 deep zone vent wells
- System construction

Site Type: *Check as many as applicable.*

- ☒ Active
- ☐ Inactive
- ☐ Secure
- ☒ Unsecure
- ☐ Industrial Waste
- ☐ Landfill
- ☐ Confined space **(must use long form)**
- ☐ Uncontrolled Waste **(must use long form)**
- ☐ Well field
- ☒ Underground storage tank
- ☐ Unknown **(must use long form)**
- ☐ Other *(Egg Farm)*

Note: A site map, definitions, and additional information about this form are provided on the last three pages of this form.

Site Description/History and Site Activities:

The Former Laguna Mart was located on the south side of New Mexico State Route 124, in Laguna Pueblo, Cibola County, New Mexico Figure 1). The Rio San Jose is located along the eastern edge of the site and flows in a northern direction until it joins the Rio Puerco. Previously, the Laguna Mart served as a grocery store and retail fuel facility but the facility has since been razed.

- In April 2002, after the Laguna Mart was closed, the USTs were removed.
- In 2003 the building was razed and 14,000 cubic yards of contaminated soil were excavated and 14,000 gallons of contaminated water/NAPL were extracted. In addition, a passive bioremediation system consisting of four 100-foot long 4-inch PVC drain lines was installed in the excavation. This system was never operated.
- In 2003 and 2005 additional borings and monitoring wells were installed at the site.
- Although the source was removed in 2003, residual contamination extended approximately 100 feet north and down-gradient under North State Road 124. Assessment of the residual contamination revealed two contaminated water bearing zones: (1) the shallow zone, and (2) a deeper zone beneath a clay aquitard. In the deep zone, dark staining and a very high head space (>1,000 ppmv) indicated the presence of gross contamination perhaps a NAPL zone due to historically lower groundwater levels.
- In 2008, a remediation system was installed. The system consisted of (1) groundwater extraction, (2) groundwater treatment using an air stripper, (3) injection of amended treated water into the aquifer, and (4) soil bioventing to address dissolved phase and vadose zone contamination. Monitored natural attenuation (MNA) was utilized in the distal portions of the plume contemporary with active remediation.
- In summer - fall 2011, remediation wells were rehabilitated, a new remediation well RW-3D was installed and screened in the deep zone, and treated effluent was connected to the infiltration gallery.
- In May-June 2013, EA conducted shallow zone air sparging pilot testing and additional investigation of contaminant extent in both shallow and deep zones. Results of shallow zone air sparge pilot testing indicated that air sparging would enhance remediation of the shallow zone. Results of the additional investigation indicated that extent of contamination in both shallow and deep zones was more extensive that was previously known.

Waste Management Practices:

Soil cuttings will be spread onsite and allowed to naturally attenuate.
Development and purge water will be discharged to ground surface in the vicinity of the wells.

Waste Types:	☒ Liquid	☒ Solid	☐ Sludge	☐ Gas
Waste / Chemical Characteristics:	☐ Corrosive	☐ Oxidizer	☒ Flammable	
☒ Toxic	☐ Explosive	☒ Volatile	☐ Radioactive	
☐ Reactive	☐ Inert		☐ Other *(specify)* _____	

Chemical / Health Hazards of Concern:

☐ Explosion or fire hazard – monitor with combustible gas meter	☐ Inorganic chemicals (nitrate and chloride)
☐ Oxygen deficiency – monitor with oxygen meter	☐ Organic chemicals (PCP)
☐ Landfill gases – monitor with methane and hydrogen sulfide meter	☒ Petroleum Hydrocarbons (as TPH DRO)
☐ Surface tanks	☐ Underground storage tanks
☐ Potential inhalation or skin absorption hazard that is immediately dangerous to life and health (IDLH) – **must use long form**	☐ Other *(specify)* _____

Explosion or Fire Potential:	☐ High	☐ Medium	☒ Low	☐ Unknown

Radiological Hazards of Concern:

- ☐ Ionizing radiation (Radioactive materials, X-ray) **(must use long form)**
- ☐ Non-ionizing radiation (ultraviolet, lasers)

Safety Hazards of Concern: (Based on anticipated clean-up operations)

- ☒ Heavy Equipment
- ☒ Pinch points
- ☒ Energized and rotating equipment (drill rig)
- ☐ Steam cleaning equipment
- ☐ Excavations
- ☐ Welding or torch cutting (Hot work)
- ☒ Sharp Objects
- ☒ Hazardous energy sources (electrical, hydraulic)
- ☒ Vehicle Traffic (traffic control as per TCP, cones, barriers)
- ☒ Buried utilities
- ☒ Overhead utilities
- ☐ Suspended loads
- ☐ Buried drums
- ☐ Work over or near water
- ☐ Work from elevated platforms
- ☒ Manual Lifting
- ☒ Other *(specify)* Heavy traffic

Physical Hazards of Concern:

- ☒ Heat stress
- ☒ Cold stress
- ☒ Slips, trips, falls
- ☐ Illumination
- ☐ Vibration
- ☒ Noise
- ☒ Solar (sunburn)
- ☐ Unstable or steep terrain
- ☒ Other *(specify) Traffic*_____

Biological Hazards of Concern:

- ☐ Poisonous plants (poison ivy, poison oak)
- ☒ Spiders (black widow or brown recluse spiders)
- ☐ Medical waste
- ☒ Snakes (rattlesnakes)
- ☒ Stinging insects (bees, wasps)
- ☒ Animals (feral dogs, mountain lions, etc.)
- ☐ Blood or other body fluids

Unexploded Ordnance:

- ☐ Unexploded Ordnance (UXO) **(must use long form)**
- ☐ Chemical Warfare Materials (CWM) **(must use long form)**
- ☐ Explosive ordnance waste (OEW) **(must use long form)**

Chemical Products EA Engineering Will Use or Store On Site: (Attach a Material Safety Data Sheet [MSDS] for each item.)

☒ Alconox® or Liquinox®

☐ Hydrochloric acid (HCl)

☐ Nitric Acid (HNO_3)

☐ Sodium hydroxide (NaOH)

☐ Sulfuric Acid (H_2SO_4)

☐ Other *(specify)* _____

☐ Other *(specify)* _____

☐ Other *(specify)* _____

☐ Other *(specify)* _____

☐ Other *(specify)* _____

☐ Other *(specify)* _____

Chemicals Present at Site	Highest Observed Concentration (specify units and media)	PEL/TLV (specify ppm or mg/m^3)	IDLH Level (specify ppm or mg/m^3)	Symptoms and Effects of Acute Exposure	Photo-ionization Potential (eV)
Benzene	1000 ug/L	1 ppm (PEL)	500 ppm CARC	Severe irritant (skin, eye); reproductive toxin; CNS narcotic	9.24
Toluene	300 ug/L	100 ppm	500 ppm	Severe irritant (skin, eye); reproductive toxin; CNS narcotic; fatigue, weakness, dizziness; headache	8.82
Ethylbenzene	250 ug/L	100 ppm	800 ppm	Severe irritant (skin, eye, mucous membranes); headache; narcosis	8.76
Xylenes (o, m, and p)	100 ug/L	100 ppm	900 ppm	Irritant (skin, eye, throat); reproductive toxin, CNS narcotic	8.44 – 8.56
Diesel Fuel	NA	NA	NA	Irritant (respiratory tract); possible carcinogen; possible mutagen	NA
Gasoline	NA	300 ppm	CARC	Irritant (skin, eye, mucous membrane); CNS narcotic	NA

Notes: NIOSH Pocket Guide to Chemical Hazards, September 2005

CARC = Carcinogenic
eV = Electron volt
GW = Ground water
IDLH = Immediately dangerous to life or health
mg/L = Milligram per liter
mg/m^3 = Milligram per cubic meter
NA = Not available
PEL = Permissible exposure limit
ppm = Part per million
TLV = Threshold limit value

Field Activities Covered Under This Plan:

Task Description	Type	Level of Protection: Primary	Level of Protection: Contingency	Date of Activities
1 Drilling borings/monitoring wells and installing air sparge drive points	☒ Intrusive ☐ Nonintrusive	☐ C ☒ D	☐ C ☐ D	2014-2015
2 System installation	☒ Intrusive ☐ Nonintrusive	☐ C ☒ D	☐ C ☐ D	2014-2015

Site Personnel and Responsibilities (include subcontractors):

Employee Name and Office Code	Task	Responsibilities
Vener Mustafin	1,2	Project Manager or Designated Leader: Directs project activities, makes site safety coordinator (SSC) aware of pertinent project developments and plans, and maintains communications with client as necessary.
Tyler Curley, David Werth, Alex Spiller	1,2	Site Safety Coordinator (SSC): Ensures that appropriate personal protective equipment (PPE) is available, enforces proper utilization of PPE by on-site personnel, suspends investigative work if he or she believes that site personnel are or may be exposed to an immediate health hazard, implements the health and safety plan, and reports any observed deviations from anticipated conditions described in the health and safety plan to the health and safety representative.
Tyler Curley, David Werth, Alex Spiller, and other EA personnel	1,2	Field Personnel: Complete tasks as directed by the program manager, field team leader, and SSC and follow all procedures and guidelines established in the EA Engineering Health and Safety Manual.

Protective Equipment: **(**Indicate type or material as necessary for each task; attach additional sheets as necessary)

Task: ☒ 1 ☐ 2	Task: ☐ 1 ☒ 2
Level: ☐ C ☒ D	Level: ☐ C ☒ D
☒ Primary ☐ Contingency	☐ Primary ☐ Contingency
RESPIRATORY	RESPIRATORY
☒ Not needed	☒ Not needed
☐ APR: _____	☐ APR: _____
☐ Cartridge: _____	☐ Cartridge: _____
☐ Escape mask: _____	☐ Escape mask: _____
☐ Other: _____	☐ Other: _____
PROTECTIVE CLOTHING	PROTECTIVE CLOTHING
☒ Not needed	☒ Not needed
☐ Tyvek® coveralls: _____	☐ Tyvek® coveralls: _____
☐ Saranex® coveralls: _____	☐ Saranex® coveralls: _____
☐ Coveralls: _____	☐ Coveralls: _____
☐ Other: _____	☐ Other: _____
HEAD AND EYE	HEAD AND EYE
☐ Not needed	☐ Not needed
☒ Safety glasses: _____	☒ Safety glasses: _____
☐ Face shield: _____	☐ Face shield: _____
☐ Goggles: _____	☐ Goggles: _____
☒ Hard hat: _____	☒ Hard hat: _____
☐ Other: _____	☐ Other: _____
GLOVES	GLOVES
☐ Not needed	☐ Not needed
☐ Undergloves: _____	☐ Undergloves: _____
☒ Gloves: Nitrile_____	☒ Gloves: Nitrile_____
☐ Overgloves: _____	☐ Overgloves: _____
FIRST AID EQUIPMENT	FIRST AID EQUIPMENT
☐ Not needed	☐ Not needed
☒ Standard First Aid kit	☒ Standard First Aid kit
☐ Portable eyewash	☐ Portable eyewash
BOOTS	BOOTS
☐ Not needed	☐ Not needed
☒ Work boots: Steel Toed	☒ Work boots: _____
☐ Overboots: _____	☐ Overboots: _____
OTHER	OTHER
☐ (specify): _____	☐ (specify): _____

Note: APR = Air purifying respirator

Monitoring Equipment: (Specify instruments needed for each task; attach additional sheets as necessary)				
Instrument	Task	Instrument Reading	Action Guideline	Comments
Combustible gas indicator model:	☐ 1	0 to 10% LEL	No explosion hazard	☒ Not needed
	☐ 2	10 to 25% LEL	Potential explosion hazard; notify SSC	
		> 25% LEL	Explosion hazard; interrupt task; evacuate site, notify SSC	
O2 meter model:	☐ 1	> 23.5% O2	Potential fire hazard; evacuate site	☒ Not needed
	☐ 2	23.5 to 19.5% O2	Oxygen level normal	
		< 19.5% O2	Oxygen deficiency; interrupt task; evacuate site; notify SSC	
Photoionization detector model: ☐ 11.7 eV ☒ 10.6 eV ☐ 9.8 eV ☐ ____eV	☒ 1	>0 to 5 ppm above background	Level D	☐ Not needed
	☐ 2	>5 to 50 ppm above background	Level C	
		>50 ppm above background	Evacuate site; notify SSC	
Flame ionization detector model:	☐ 1	>0 to 5 ppm above background	Level D	☒ Not needed
	☐ 2	>5 to 50 ppm above background	Level C	
		>50 ppm above background	Evacuate site; notify SSC	
Detector tubes models:	☐ 1 ☐ 2	Specify:	Specify:	Note: This action level for upgrading the level of protection is one-half of the contaminant's PEL. If the PEL is reached, evacuate the site and notify the SSC. ☒ Not needed
Respirable dust monitor model:	☐ 1 ☐ 2	Specify:	Specify:	☒ Not needed
Other: (specify):	☐ 1 ☐ 2	Specify:	Specify:	☒ Not needed

Notes: eV = Electron volt PEL = Permissible exposure limit LEL = Lower explosive limit ppm = Part per million O_2 = Oxygen

Site Map (if available):

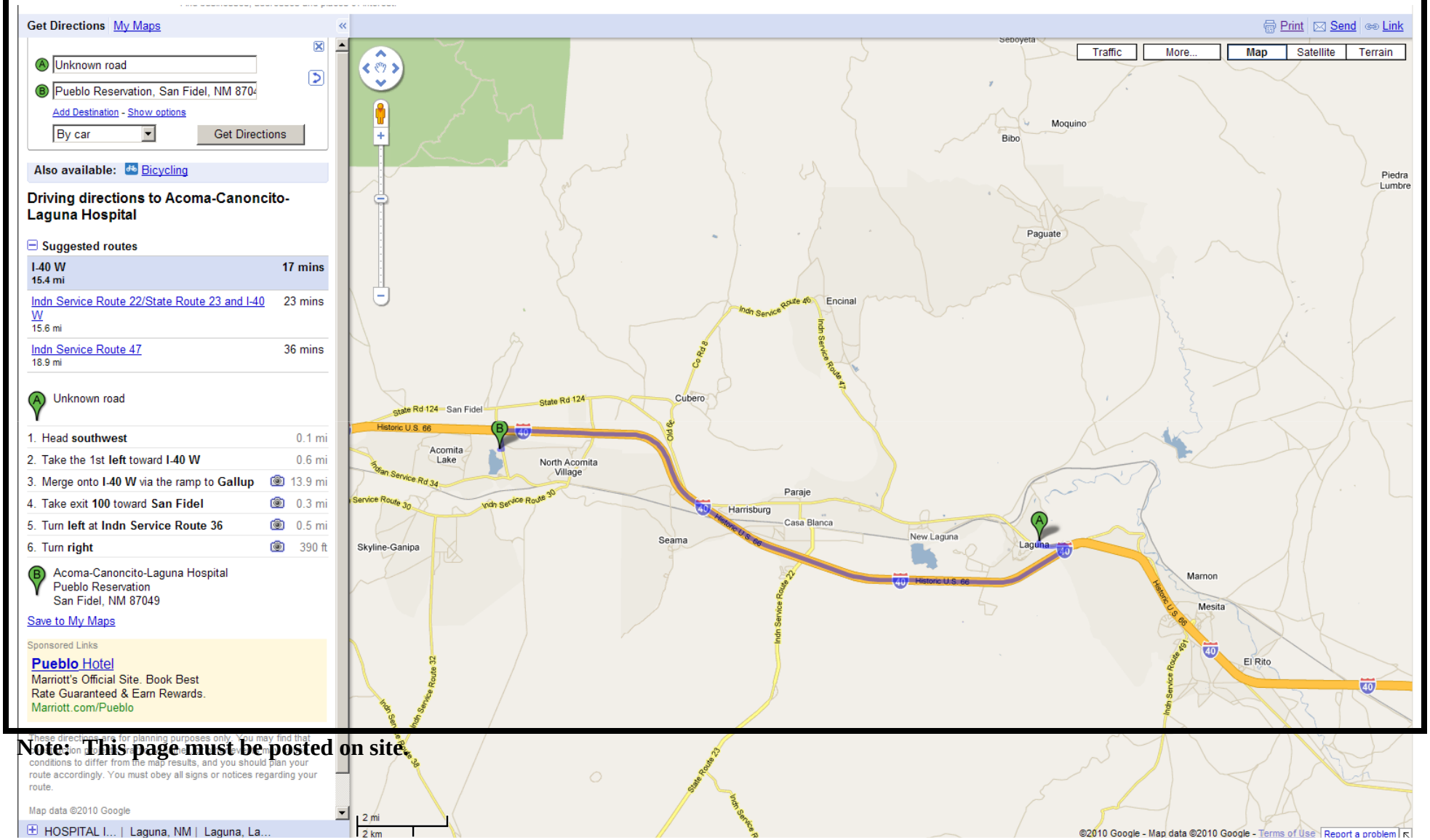
See Attachment

Additional Comments:	**Emergency Contacts:**	**Telephone**
EA Engineering site workers will contain and absorb any chemicals used or transferred on site.	U.S. Coast Guard National Response Center	800/424-8802
	InfoTrac	800/535-5053
	Fire department	911
	Police department	911
	EA Engineering Personnel:	
	Corporate Human Resource Manager: Michele Bailey	410/584-7000
	Corporate Health & Safety Manager: Pete Garger	410/527-2412
	Office Health & Safety Coordinator: Teri McMillan	505/259-6779 410/527-2425
	Program Manager: Fritz Meyer	505/259-6779
	Site Safety Coordinator: Tyler Curley	719-688-9558

Personnel Decontamination and Disposal Method:	**Medical Emergency:**	
Personnel will follow the U.S. Environmental Protection Agency's "Standard Operating Safety Guides" for decontamination procedures for Level D personal protection. The following decontamination stations should be set up in each decontamination zone: • All equipment will be decontaminated in a designated area All disposable equipment and gloves will be double-bagged or containerized in an acceptable manner and disposed of in accordance with local regulations.	**Acoma-Canoncito-Laguna Hospital** Pueblo Reservation San Fidel, NM 87049 **(505) 552-5300** 1. Head southwest towards I-40 2. Take the 1st right toward I-40 West 3. Merge onto I-40 W via the ramp to Gallup - 13.9 miles 4. Take exit 100 toward San Fidel - 0.3 mile 5. Turn left at Indian Service Route 36 - 0.5 mile 6. Turn right - 400 feet:	**University of New Mexico Health Sciences Center: UNM Hospital** 2211 Lomas Blvd NE Albuquerque, NM 87106 (505) 272-2121 1. Head southwest towards I-40. 2. Take the ramp onto I-40 East – 44.7 miles 3. Take exit 159B to merge onto I-25S towards Las Cruses – 1.4 miles 4. Take exit 224B toward Dr. Martin Luther King Jr. Avenue/Central Ave/Historic US 66 – 0.2 mile 5. Merge onto Locust St, NE – 0.1 mile 6. Turn Left at Dr. Martin Luther King Jr. Avenue, NE/Grand Avenue NE – 367 feet 7. Take the 1st left onto Oak Street, NE – 0.5 mile 8. Turn right at Lomas Blvd, NE – 1.0 mile 9. Make a U-turn 295 feet

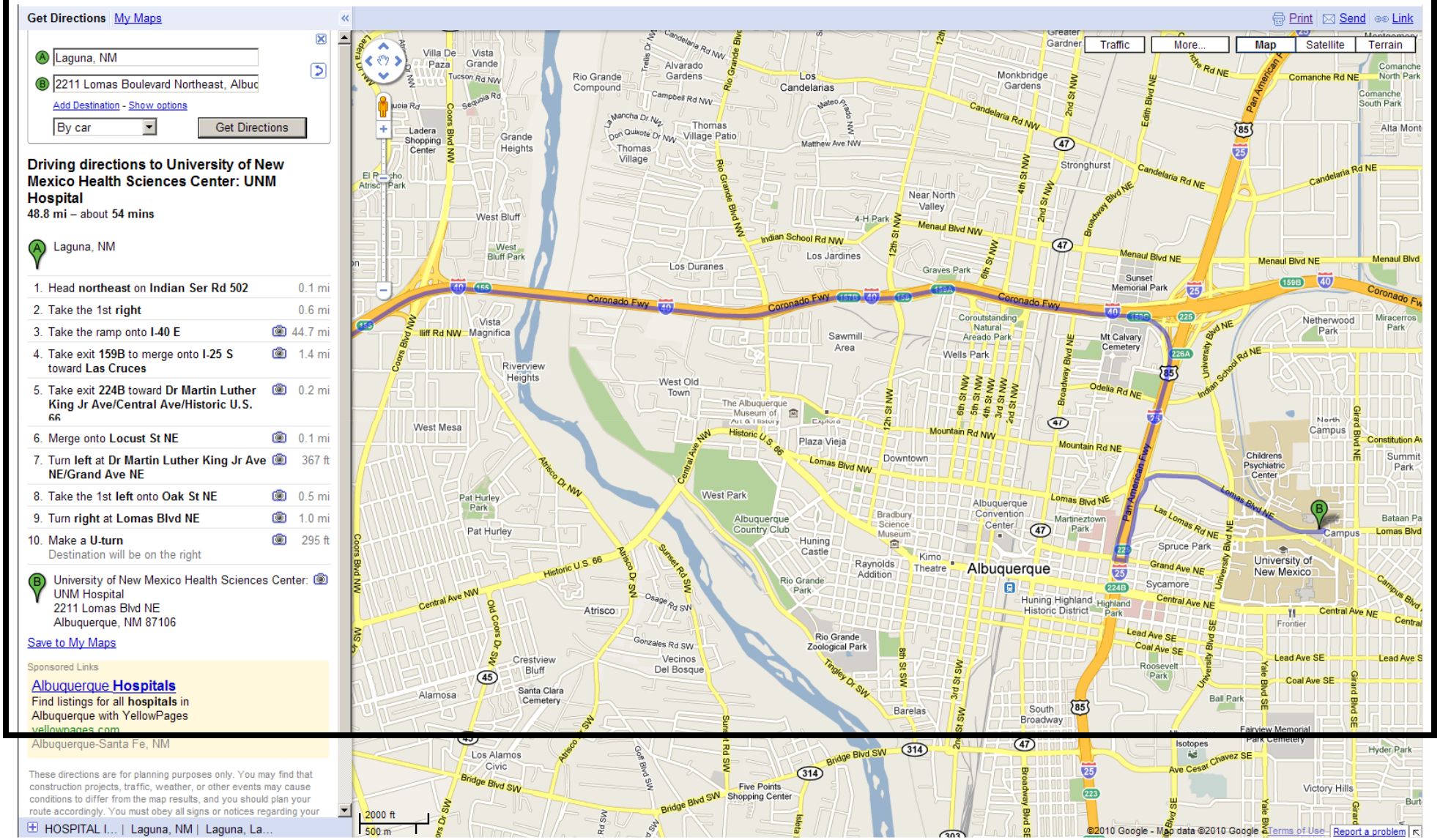
Note: This page must be posted on site.

Hospital Route Map (if available):



Note: This page must be posted on site.

Hospital Route Map (to UNM Hospital):



APPROVAL AND SIGN-OFF FORM

Project Nos. 6236201

I have read, understood, and agree with the information set forth in this Health and Safety Plan and will follow the direction of the Site Safety Coordinator as well as procedures and guidelines established in the EA Engineering Health and Safety Manual. I understand the training and medical requirements for conducting field work and have met these requirements.

Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date

APPROVALS: (Two Signatures Required)

Site Safety Coordinator	Date
Health and Safety Coordinator	Date

DEFINITIONS

Intrusive - Work involving excavation to any depth, drilling, opening of monitoring wells, most sampling, and Geoprobe® work

Nonintrusive - Generally refers to site walk-throughs or field reconnaissance

Levels of Protection

Level D - Hard hat, safety boots, and glasses, may include protective clothing such as gloves, boot covers, and Tyvek® or Saranex® coveralls

Level C - Hard hat, safety boots, glasses, and air purifying respirators with appropriate cartridges, **PLUS** protective clothing such as gloves, boot covers, and Tyvek® or Saranex® coveralls

Emergency Contacts

InfoTrac - For issues related to incidents involving the transportation of hazardous chemicals; this hotline provides accident assistance 24 hours per day, 7 days per week

U.S. Coast Guard National Response Center - For issues related to spill containment, cleanup, and damage assessment; this hotline will direct spill information to the appropriate state or region

Health and Safety Plan Short Form

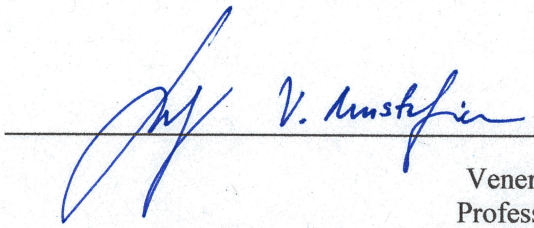
- Used for field projects of limited duration and with relatively limited activities; may be filled in with handwritten text
- Limitations:
  - No Level B or A work
  - Limited number of tasks
  - No confined space entry
  - No unexploded ordnance work or radiation hazard

TAB P

Professional Engineering Licensure

STATEMENT OF QUALIFICATIONS

I Vener Mustafin, P.E. (NM 17630), am currently a staff member at EA Engineering, Science, and Technology, Inc., PBC (EA) and can contractually bind EA. I am in compliance with the Professional Engineer rules, Parts 8 and 9 of 16.39 NMAC.



Vener Mustafin, P.E.
Professional Engineer
EA Engineering, Science, and Technology, Inc., PBC

Board of Licensure for Professional Engineers & Professional Surveyors

This is to certify that

Vener Mustafin

has complied with all requirements of the Board including the Professional Development Program and is duly licensed as a Professional Engineer and is hereby authorized to practice as such in the State of New Mexico until 12/31/2018.

17630

Signature	License No.
Ronald Bohannan, PE	**David Cooper, PS**
Board Chair	**Board Secretary**

Vener Mustafin
10316 Dunbar Street NW
Albuquerque, NM 87114

State of New Mexico

The New Mexico Board of Licensure for

Professional Engineers & Professional Surveyors

Santa Fe, New Mexico

This is certify that

Vener Mustafin *License No.:* **17630**

Having given evidence of the necessary qualification, as required by Sections 61-23-1 through 61-23-33 NMSA (1978), has been duly licensed and is hereby authorized to practice in the State of New Mexico as a

Professional Engineer

Issue Date: **07/10/2006** *Expiration Date:* **12/31/2018**

THIS CERTIFICATE IS FOR DISPLAY PURPOSES ONLY.

State of New Mexico

State Board of Licensure
For Professional Engineers and Surveyors

This is to Certify that Vener Mustafin, PE

having given evidence of the necessary qualifications, as required by Sections 6123-1 through 6123-32 NMSA (1978), has been duly licensed and is hereby authorized to practice

Professional Engineering

in the state of New Mexico

License No. 17630

in Testimony Whereof, Witness *the signature of the Chairman and Secretary under seal of the Board*

dated 10 July 2006

Chairman

Secretary

TAB Q

Construction Industries Division License

Bill Richardson
Governor

Edward J. Lopez
Superintendent

State of New Mexico

Regulation and Licensing Department

CONSTRUCTION INDUSTRIES DIVISION

2550 Cerillos Rd.
Santa Fe, New Mexico 87505

Lisa D. Martinez
Director

This is to certify that: **EA ENGINEERING, SCIENCE AND**

PERMANENT LICENSE #359538

Located at: **11019 MCCORMICK RD, HUNT VALLEY, MD 21031**

Has complied with all the requirements of the law and is hereby licensed as a contractor, to operate under the classification(s) of:

GS29

And to permit or contract projects singly in New Mexico of a dollar amount up to:

UNLIMITED

Given under my signature and the seal of the Construction Industries Division at Santa Fe, New Mexico on

12/15/2008

Signature of Contractor

Lisa D. Martinez
Director

NOTE: This Certificate is now and shall remain the property of the CONSTRUCTION INDUSTRIES DIVISION and shall be surrendered at any time upon demand. This certificate is not transferable

STATE OF NEW MEXICO

CONSTRUCTION INDUSTRIES DIVISION

EA ENGINEERING, SCIENCE AND TECHNOLOGY,

LICENSE NUMBER

359538

EXPIRES

12/31/2020

Qualifying Party(S)

SNYDER JAY

CLASSIFICATION(S)

GS29

DIRECTOR

This card is the property of the CID and shall be surrendered upon demand

TAB R

Pay Equity Reporting

EA Engineering, Science,
and Technology, Inc., PBC

TAB R PAY EQUITY REPORTING

EA Engineering, Science, and Technology, Inc., PBC agree with the requirements of reporting as defined in Section II.C (31).

TAB S

Insurance

EA Engineering, Science, and Technology, Inc., PBC

INSURANCE

EA Engineering, Science, and Technology, Inc., PBC shall maintain insurance for this contract as follows. Furthermore, EA agrees to the terms and conditions contained herein and in the contract:

A. EA shall furnish general comprehensive liability insurance for property damage in the amount of $2,000,000.00 for each occurrence (annual), as well as $1,000,000.00 for bodily injury, each person, to a maximum of $2,000,000.00 each occurrence (annual).

B. EA shall furnish evidence that all equipment to be used pursuant to this Contract is covered by public liability and property damage insurance with a good and reputable insurance company, authorized to do business in New Mexico. The Contractor shall furnish evidence that each motor vehicle to be used by the Contractor pursuant to this Contract is covered in the minimum amount of $500,000.00 for bodily injury to, or death of, one person in any one accident, and subject to said limit for one person. In addition, a limit of $1,000,000.00 for bodily injury to, or destruction of property of others in any one accident must be provided.

C. The insurance company issuing EA's general comprehensive liability insurance coverage shall furnish NMED with a certificate of such insurance with the provision that the policies are not subject to cancellation during the term of the Contract except upon thirty (30) days written notice to NMED. The above requirements shall become an integral part of this Contract.

D. The Contractor shall furnish evidence that operators, employed by the Contractor to operate equipment needed to meet the requirements of this Contract, are covered by Worker's Compensation Insurance as provided by the New Mexico Worker's Compensation Act.

E. If NMED does not ask to see or to receive the aforementioned policies, such failure to act shall not operate as a waiver of the Contract term.

Jay T. Snyder
Vice President, Albuquerque Operations Manager