DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

ENTERED

MAY 28 2019

MAY 30 2019

MEMORANDUM FOR NEW MEXICO ENVIRONEMNT DEPARTMENT
ATTENTION: MR. JOHN KIELING

FROM: 377 ABW/CC

SUBJECT: Vapor Sampling Work Plan, Bulk Fuels Facility

1. In response to the New Mexico Environment Department's (NMED) letter dated 25 February 2019, Kirtland Air Force Base (KAFB) is submitting the following *Vapor Intrusion Data Gap Soil Solid Waste Management Unit ST-106/SS-111 Vapor Sampling Work Plan, Bulk Fuels Facility*. This Work Plan addresses Item 2 in the letter correspondence regarding the need to provide additional data. The proposed shallow soil vapor investigation will be conducted by an independent contractor to collect data to confirm that there is no vapor intrusion risk in buildings at the Raymond G. Murphy Veterans Administration Medical Center (VA Medical Center) or in the nearby Siesta Hills neighborhood. This data will be used by KAFB to update the Risk Assessment for the vapor intrusion pathway for residential receptors.

2. Sampling Locations and Depths (Attachment 1): Temporary vapor monitoring point locations have been selected within the residential area north of Ridgecrest as well as within the VA Medical Center campus and a location in the utility easement south of Gibson Boulevard SE. These sampling locations and depth intervals were selected in consultation with NMED and advice offered during the 24 April 2019, Technical Working Group meeting. The temporary vapor monitoring points will be drilled at the following locations and sampled at the following depths:

a. Two sampling locations at VA Medical Center parking lots sampled at 5, 10, and 15-foot Depths.

b. Five locations on City of Albuquerque property in and around Bullhead Park, with one location, sampled at 5, 10, and 15-foot depths and the remaining four locations sampled at 5, 10, 15 and 25-foot depths.

c. One sampling location in Lasseter Park sampled at 5, 10, 15, and 25 feet.

d. Additional step-out locations may be added west of San Pedro and north of Siesta Hills residential area if initial sampling results exceed the NMED Vapor Intrusion Screening Levels at monitoring points KAFB-106SV05 and KAFB-106SV06 for a maximum of 8 temporary soil vapor monitoring points.

3. Temporary vapor monitoring point construction (Attachment 2): Each temporary vapor monitoring point will be constructed as a nested monitoring point with individual sample depths

ranging from 5, 10, 15 and 25 feet below ground surface. A full description of temporary vapor monitoring points and completion diagrams can be found in Attachment 2.

4. Soil Vapor Sample Collection and Analysis (Attachment 3): Sample collection will be conducted to minimize sample interference from external sources and collect samples of sufficient quality to compare to the low residential vapor intrusion screening levels. The list of contaminants of potential concern (COPCs) are included in Attachment

5. Soil Vapor Sampling Schedule (Attachment 4): Soil vapor sampling will be conducted in conjunction with activities occurring during the bioventing pilot testing to demonstrate the effects of pilot testing on shallow soil vapor contaminant levels. The attached sampling schedule includes sampling activities occurring in the summer of 2019. The sampling schedule will be updated pending the results of the summer sampling event for potential future sampling in the winter months of 2019/2020.

6. My points of contact for any questions regarding this issue are Mr. Scott Clark at (505) 846-9017 or by email scott.clark@us.af.mil or Mr. Sheen Kottkamp at (505) 846-7674 or by email sheen.kottkamp.1@us.af.mil.

Richard W. Gibbs

RICHARD W. GIBBS, Colonel, USAF
Commander

Attachments:
1. Soil Vapor Monitoring Point Locations
2. Field Sampling Methods
3. Sampling Analysis Plan
4. Field Sampling Schedule

cc:
NMED (Pruett), MFR
NMED-OOTS (McQuillan), MFR and CD
NMED HWB (Kieling), MFR and CD
SAF-IEE (Lynnes), electronic only
AFCEC/CZ (Renaghan, Clark, Kottkamp), electronic only
USACE-ABQ District Office (Simpler, Phaneuf, Dreeland, Kunkel, Sanchez, Salazar), electronic only Public Info Repository, Administrative Record/Information Repository (AR/IR) and File

Attachment 1

Proposed Soil Vapor Monitoring Point Locations

Soil Vapor Monitoring Locations

Proposed locations for the soil vapor monitoring point installations are shown on the site map, attached as **Figure 1**. Proposed locations include two sites on VA Medical Center property in parking areas, five locations on City of Albuquerque property in and around Bullhead Park, and one location on City of Albuquerque property in Lassetter Park north of Ridgecrest Drive. Additional step-out locations may be added west of San Pedro and north of Siesta Hills residential area if initial sampling results exceed the NMED vapor intrusion screening level (VISL) at monitoring points KAFB-106SV05 and KAFB-106SV06. Based upon the currently proposed installation locations, we expect to enter properties owned by the Veteran's Administration and the City of Albuquerque.

In selecting sampling locations care was taken to avoid areas in roadways and parking lots with heavy vehicular traffic for the following reasons:

- Potential sources of benzene, toluene, ethylbenzene, and xylenes (BTEX) may exist in shallow soils beneath roadways that could interfere with the objectives of this sampling event.
- Interference from vehicular traffic during the sampling may impact vapor concentrations in shallow soils under certain barometric conditions giving false positive result.

As a result of these potential sources of interference, the data obtained from these sampling locations may result in data that is not representative for ST-106/SS-111 investigation purposes.

A list of permits and access agreements include, but are not limited to, the list below. Coordination with all agencies and departments will be conducted upon agreement of final monitoring point locations to expedite the sampling schedule and minimize potential scheduling conflicts.

1. City of Albuquerque (COA) Noise Control Permit.
2. COA Excavation Permit.
3. NM 811 Damage Prevention Center - Dig Permitting/Clearance
4. COA Right-of-Way License expires September 2026.
5. Department of Veterans Affairs Permit for right of entry expires January 2021.

Readiness Review Meetings

Readiness review meetings will be conducted with USACE and USAF a minimum of one week in advance of any new field activities. The meeting will be conducted to ensure that all pre-mobilization elements (e.g., approved plans, permits, right-of-way agreements, and community notification) and mobilization elements (e.g., required staffing, equipment, and materials) have been completed.

Mobilization/Demobilization

Since all proposed drilling and monitoring point installation sites are located off Base and in non-secure areas, all equipment and personnel will be mobilized to and from the drill sites daily.

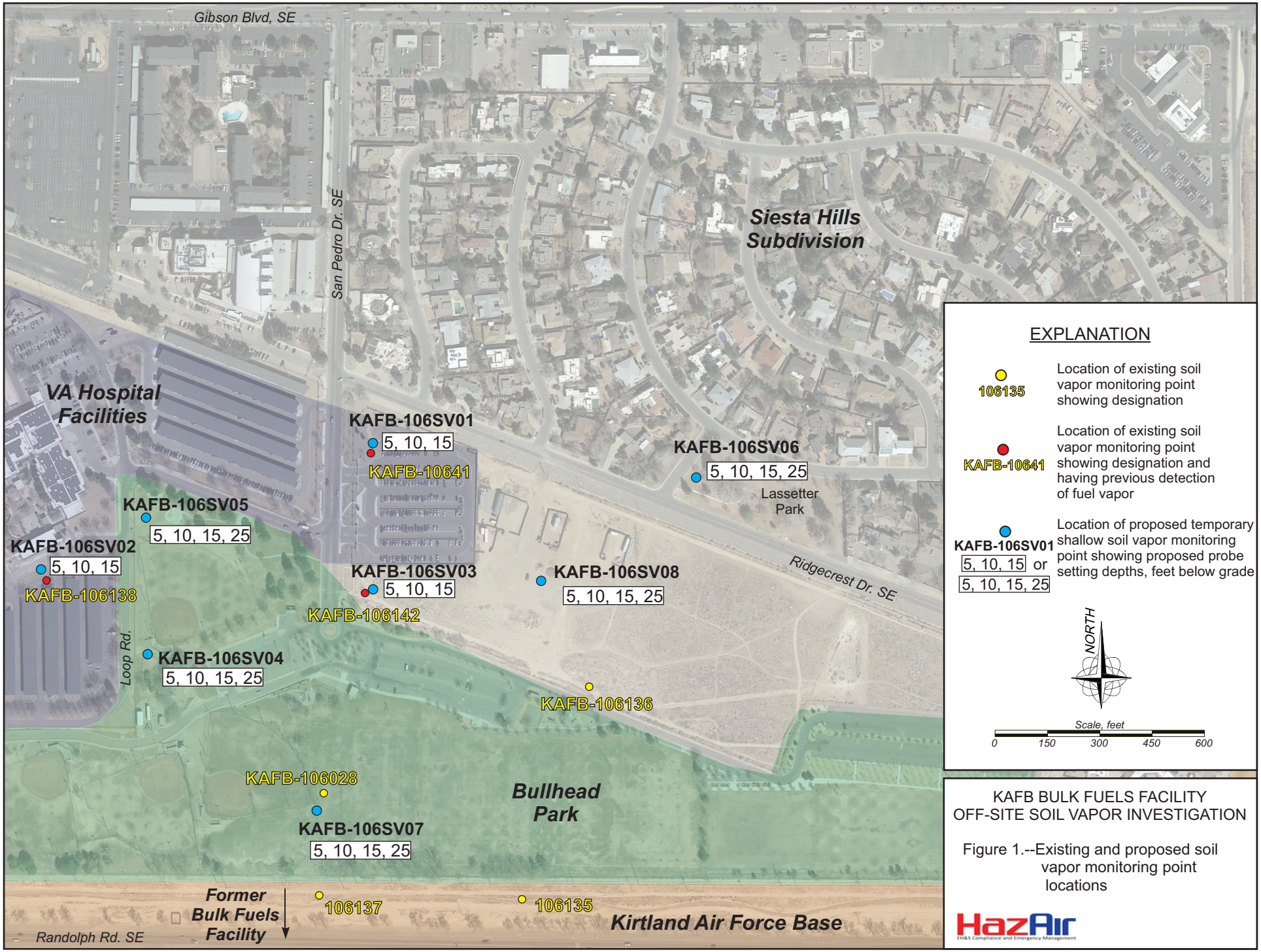
All investigation derived waste will be removed from the sites and monitoring point sites will be covered and secured at the end of each working day. All work sites will be restored to initial conditions and documented with pre- and post-work photographs.

Site Security

Safe and secure construction sites will be maintained during the execution of all activities pursuant to off-site soil vapor monitoring point installation and sampling. HazAir site and safety personnel will coordinate with USACE and USAF points of contact, and the drilling contractor to gain insight into site security issues and safeguards. Plans to control public access and reduce interference with monitoring point sites (traffic control, noise control, and site security) will be implemented and a safe work environment for the field teams and the surrounding community will be established.

Barricading/Traffic Control

Work areas for soil vapor monitoring point drilling and installation will be protected from pedestrian and vehicular access. Barricades, temporary traffic control measures, and detour routes will be established where necessary in accordance with COA Construction Services Division requirements. HazAir will comply with the COA's Construction Coordination Section for work within the public right-of-way, including barricade and excavation permits and fees, and providing data for traffic reports.



KAFB BULK FUELS FACILITY
OFF-SITE SOIL VAPOR INVESTIGATION

Figure 1.--Existing and proposed soil vapor monitoring point locations

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EH&S Compliance and Emergency Management

Attachment 2

Temporary Vapor Monitoring Point Construction

Drilling Equipment and Methods

Temporary vapor monitoring points will be drilled using Direct Push Technology (DPT) when possible. Where DPT methods cannot penetrate to design depths, six-inch hollow-stem auger methods will be used to complete the installations. Proposed drilling equipment is a Geoprobe 7822DT drilling rig. The drilling rig is a rubber tracked rig that is designed to traverse variable terrain with minimal surface disturbance. The rig employs hydraulic ram and percussion hammer technology to advance hollow steel tubing to collect core samples in acetate core tubes and to allow vapor points, tubing, gravel packs and annular seals to be deployed to precise depths. The drilling rig is also equipped to drill with six-inch hollow-stem augers. Proposed DPT drilling will be performed in two penetration passes. Where DPT methods are successful, an initial penetration will be made to total depth (15 feet or 25 feet) using 2.25-inch outside diameter x 48-inch length rods to capture 1.5-inch diameter soil cores in acetate tubes. A second pass will be made to total depth using 3.5 inch outside diameter x 48-inch length rods, to widen the hole and allow deployment of soil vapor probes to the proposed depths and construction of multiple ports, tubing strings, gravel packs and annular seals in the borings. During advancement of the DPT tools, cores will be collected in the lead rod in acetate core tubes on 4-foot intervals and brought to land surface. Acetate core tubes will be cut longitudinally such that retrieved cores may be inspected for lithologic logging and visual inspection. Where DPT methods cannot penetrate to design depths, partial DPT cores will be retained and hollow stem auger cuttings will be collected to complete descriptions of penetrated sediments. Soil cores will be visually inspected and logged in accordance with American Society of Testing and Materials (ASTM) methods.

Proposed Temporary Vapor Monitoring Point Construction

Proposed temporary vapor monitoring point completions are shown on **Figure 2** and **Figure 3**. Figure 2 shows the 3.5-inch DPT boring advanced to a depth of 15 feet and 6-inch soil vapor sampling ports positioned on ¼-inch Teflon tubing at depths of 15 feet, 10 feet and 5 feet below grade. Figure 3 shows the 3.5-inch DPT boring advanced to a depth of 25 feet and 6-inch soil vapor sampling ports positioned on ¼-inch Teflon tubing at depths of 25 feet, 15 feet, 10 feet and 5 feet below grade. Bentonite chips (¼-inch) will be placed in the boring opposite the vapor ports. Intervening sections of the borings between the vapor ports will be filled with dry bentonite power or acceptable alternate to seal the monitoring point between the vapor ports and promote soil vapor sampling in the intended zones at 5 feet, 10 feet, 15 feet and 25 feet below grade.

The soil vapor sampling ports will be connected to lengths of ¼-inch Teflon tubing extending to land surface. After placement of the vapor ports, tubing, gravel packs and annular seals, each Teflon tube will be equipped with a ¼- inch ball valve and ¼- inch hose barbs to allow the ports to be sealed between sampling events and to be connected to purging and sampling train tubing for soil vapor monitoring. It is anticipated that the monitoring points will be constructed as temporary vapor monitoring points and maintained in a protected configuration until results of initial soil vapor sampling have been completed and laboratory analyses are received and evaluated. Proposed temporary completion status is depicted in each figure and includes making a small excavation around the tubing to a few inches below grade, inverting a 2.5-gallon plastic pail over the tubes and valves, covering with soil and leveling to match adjacent grade to hide the monitoring points. Once sampling is complete, the temporary vapor monitoring points will be

abandoned in place using approved abandonment methods. If it is determined that a monitoring point will be made permanent based on sampling results, a 12-inch flush to surface traffic grade vapor monitoring point vault with tamper proof bolts and a 2 ft x 2 ft x 6-inch radially sloped concrete apron will be installed as shown in **Figure 2 and Figure 3**.

Decontamination

All the tools and equipment that are used to penetrate below grade will be decontaminated prior to arriving on site and will be decontaminated after use at each soil vapor monitoring point location. Soil vapor sampling equipment will consist of single use disposable Teflon tubing and dedicated vapor monitoring point sterile hose barbs and flow control valves; therefore, no decontamination of soil vapor sampling equipment will be necessary.

Decontamination of drilling tools will take place in designated decontamination areas specific to the work activity and approved by Kirtland AFB. All decontamination wastewater will be managed in accordance with KAFB waste containment and disposal procedures. The objective of field decontamination is to remove contaminants of concern from the drilling tools to minimize risks of cross contamination and negative impact on study objectives. Specifications for decontamination materials are as follows:

1. Use a standard brand of phosphate-free laboratory detergent, preferably either liquid Liquinox® or powder Alconox®.
2. Use tap water from a municipal water treatment system. Detergent and tap water will remove the gross contamination from the sampling equipment.
3. Use deionized water for the final rinse of sampling equipment that has direct contact to the sampling medium.

Drilling Investigation Derived Waste (IDW)

The DPT drilling method proposed for soil vapor monitoring point installations will not penetrate saturated soils, and will require no liquids to perform. DPT soil coring will produce up to 3.5 gallons of soil core per monitoring point and 15 to 25 lineal feet of acetate core barrel per monitoring point. Derived soil will be 100 percent captured and contained within plastic sheeting or in sealed 5-gallon containers in a field truck. IDW soil from drilling sites will be collected and secured pending receipt of waste characterization profiling results. Investigation derived soil will be characterized for disposal at the Kirtland AFB Construction and Demolition (C&D) Landfill with a 5-point composite IDW sample. Soils will be analyzed for fuel components and toxic metals using Toxicity Characteristic Leaching Procedure (TCLP) methodology. Soil will have to meet the waste acceptance criteria for the Kirtland Construction and Demolition (C&D) Landfill. Once the analytical results for soil tests are received and reviewed, a Request for Disposal letter will be provided to Kirtland AFB for approval to dispose of the soil. All documentation regarding waste characterization and disposal will be provided in the appendices of the document describing the activities during which waste was generated.

Should the petroleum levels exceed what the Kirtland C&D Landfill is allowed to accept (benzene, toluene, ethylbenzene, and toluene >50 milligrams per kilogram [mg/kg], benzene >10 mg/kg, or total petroleum hydrocarbons >100 mg/kg), it will require characterization as “special

waste" and disposed at an offsite permitted landfill under appropriate green-chain documentation.

Borehole Logging

During drilling, each boring will be fully described on the boring log form in accordance with ASTM International D5434 and will include the following, when applicable:

1. Identification number and location of each boring
2. A general description of the drilling equipment used that includes such information as rod size, bit type, pump type, rig manufacturer, and model
3. Date and time of start and completion of boring
4. Name of contractor, driller, and drill site geologist
5. Size and length of casing (soil vapor port and tubing type) used in each borehole
6. Soil classification in accordance with the United Soil Classification System, color, relative density and consistency, soil components, soil moisture, stratification, hardness, grain size and size distribution, and odor will be logged.
7. Mineralogical content of the core (for correlation)
8. Observations during drilling, such as bit chatter, rod binding and rod drops
9. Depth limits, type, and number of each sample taken
10. Observations of visible contamination for each sample

Site Restoration

Site restoration will consist of backfilling and compaction, surface restoration/resurfacing, and landscaping restoration. Work areas will be restored to original conditions; and, in the residential areas, pavement of the type and thickness meeting COA Department of Municipal Development requirements will be replaced.

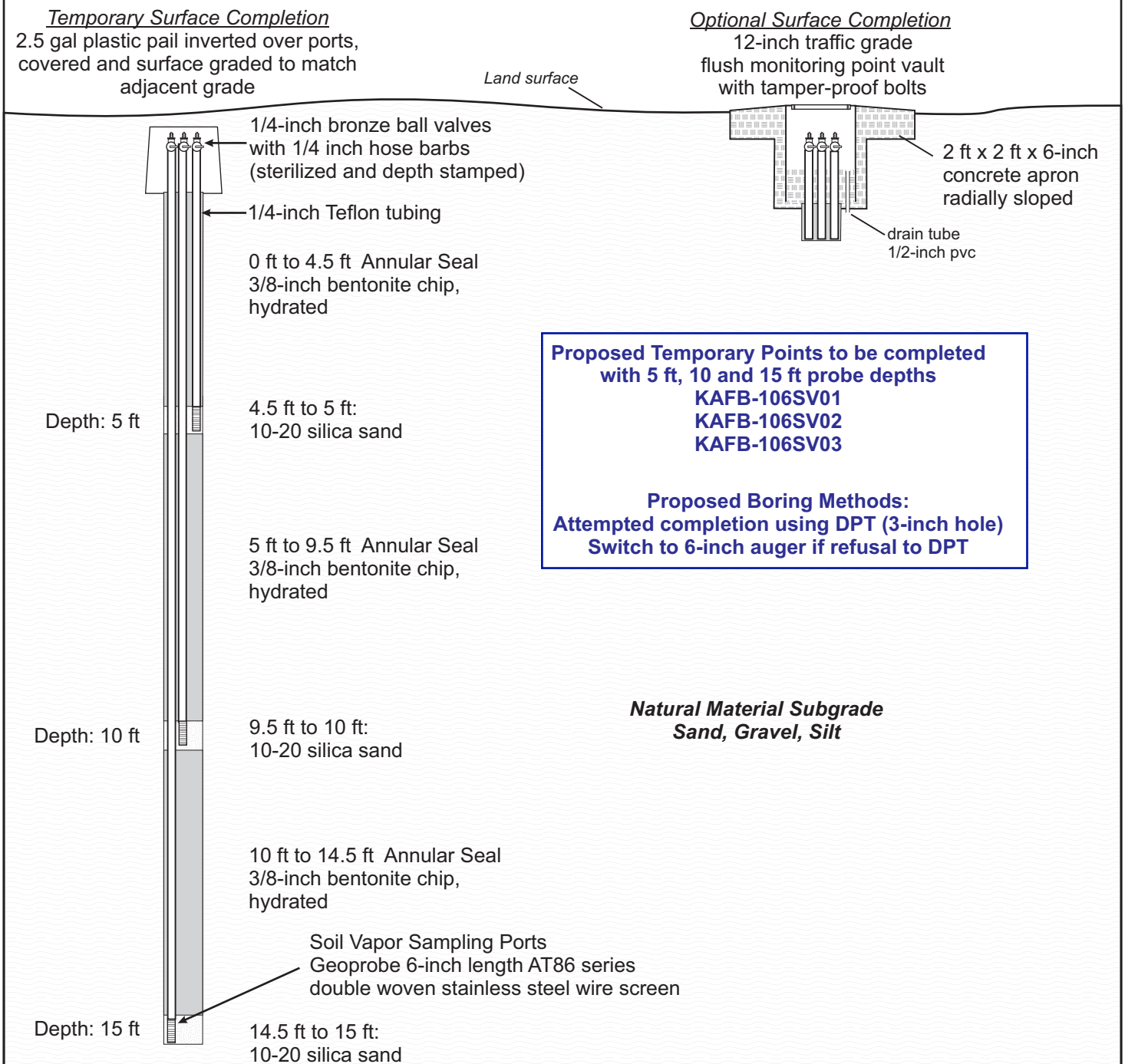
Soil Vapor Monitoring Point Survey

Upon completion, each temporary vapor monitoring point will be surveyed by a Registered Land Surveyor (RLS). The surveys will establish northings, eastings, and elevations within 0.01 foot accuracy at all soil vapor monitoring point locations having permanent and temporary completions, referenced as follows:

1. New Mexico State Plane Coordinate System, Central Zone, North American Datum of 1983
2. North American Vertical Datum 1988

A deliverable document that includes a tabular summary of the XYZ coordinates for each monitoring point, as well as a map showing the locations of the monitoring points and bearing the RLS seal will be prepared.

PROPOSED TEMPORARY SOIL VAPOR SAMPLING POINT CONSTRUCTION
15 FOOT DEPTH
KAFB BFF SITE INVESTIGATION



KAFB BULK FUELS FACILITY
OFF-SITE SOIL VAPOR INVESTIGATION

Figure 2.--Proposed Soil Vapor Monitoring Point Completion - 15 foot Depth

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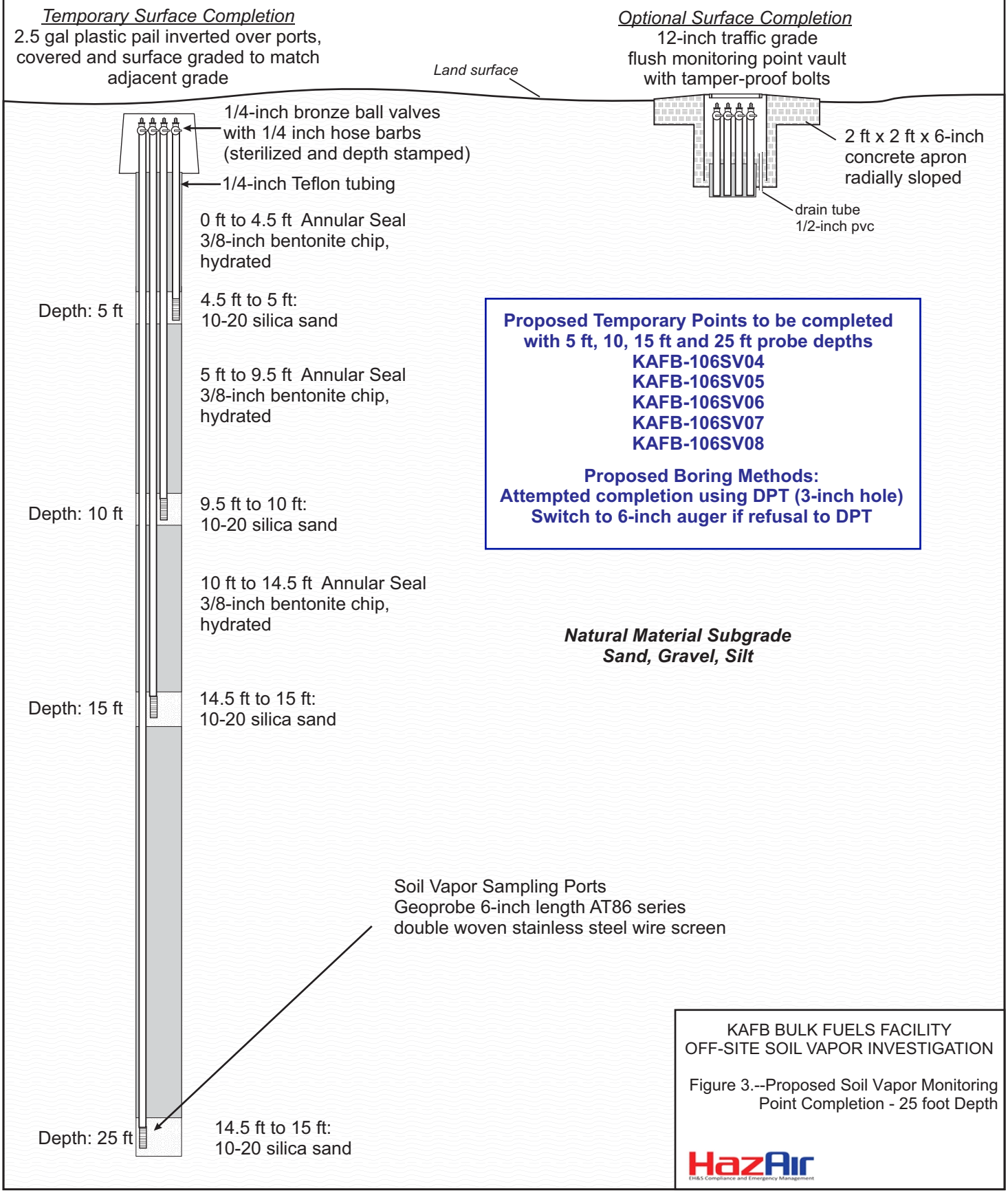
PROPOSED TEMPORARY SOIL VAPOR SAMPLING POINT CONSTRUCTION
25 FOOT DEPTH
KAFB BFF SITE INVESTIGATION



Proposed Temporary Points to be completed with 5 ft, 10, 15 ft and 25 ft probe depths
KAFB-106SV04
KAFB-106SV05
KAFB-106SV06
KAFB-106SV07
KAFB-106SV08

Proposed Boring Methods:
Attempted completion using DPT (3-inch hole)
Switch to 6-inch auger if refusal to DPT

KAFB BULK FUELS FACILITY
OFF-SITE SOIL VAPOR INVESTIGATION

Figure 3.--Proposed Soil Vapor Monitoring Point Completion - 25 foot Depth

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Attachment 3

Sample Collection and Analysis Plan

Soil Vapor Sample Collection and Analysis

Proposed soil vapor sampling will be conducted after each of the proposed temporary vapor monitoring points have been completed and adequate time has elapsed to allow perturbed soil vapor conditions from monitoring point installation to return to ambient conditions (proposed one week minimum). Barometric pressure and trend will be noted during sample collection to assess propensity for air to move into or out of shallow soils during soil vapor sampling. One sampling event is planned for summer 2019 to provide data in support of the risk assessment. A second sampling event will be performed at accessible locations if additional information is needed to meet risk assessment data objectives.

Proposed sampling train and equipment are depicted on **Figure 4**. Proposed equipment includes a vacuum pump to affect purging of the Teflon tubing and vapor ports and production of formation-representative soil vapor samples, as well as sensitive vacuum/pressure gauges to assess pre-purging and pre-sampling subsurface soil pressure/vacuum conditions, as well as to evaluate vacuum propagation during monitoring point purging and evaluation for possible interference between vapor ports in the monitoring point nest. The proposed sampling train includes connections to allow collection of vapor streams during monitoring point purging for testing of purging vapor streams for fixed gases using field instruments, as well as for collection of Suma cannister samples at the conclusion of monitoring point purging. All Teflon tubing proposed for the sample train will be single-use disposable for each individual port at each monitoring point. Hose barb connectors and flow control valves will be sterilized by boiling in deionized water prior to initial use and between uses.

During sampling of each soil vapor monitoring point, field parameters including total ionizable volatile hydrocarbons (TIVC), oxygen (O_2), carbon dioxide (CO_2) and methane (CH_4) will be measured using an RKI Instruments GX6000 and a Landtec GEM 2000 photoionization detector (PID). Prior to beginning of soil vapor sampling each day, the field instruments will be calibrated for air-phase petroleum hydrocarbons and CO_2 against calibration standards of known concentrations in premixed gas cylinders. At the middle of each work day, a calibration check will be performed on each instrument to determine whether the calibration of any of the parameters drifted since the morning calibration. If the calibration check results are outside of 5% of the calibration gas standards, then the instrument will be recalibrated prior to additional sampling.

The proposed sampling train shown in **Figure 4** will consist of new Teflon tubing, disposed upon completion of sampling at each port and each monitoring point. Each gas field instrument will be completely purged with atmospheric air after sampling each soil vapor monitoring port.

Prior to beginning purging, static vapor pressures will be measured in each soil vapor port with Magnahelic gauges. Monitoring point purging, field data and Suma cannister sample collection will be completed in accordance with the proposed parameters and estimated schedules shown on **Figure 4**. Proposed methodology is as follows:

Soil Vapor Point Purging and Suma Cannister Sample Collection

1. Connect the Teflon tubing to the monitoring point port, the Suma cannister, the field gas detectors and the vacuum pump as shown on **Figure 4**.

2. Read static vacuum/pressures on the Magnahelic gauges in the vapor port that is being sampled, as well as the other two vapor ports and record the values.
3. Turn on the vacuum purging pump, verify the proper operation by monitoring pump exhaust flow.
4. Energize the soil vapor purging pump and start timing the purge cycle. Based upon calculated volume of the deepest tubing set and sampling train (25 feet x ¼-inch diameter) and the flow rate of the proposed vacuum pump (0.75 cubic feet per minute(cfm)) the time required to fully purge one bore volume of the tubing is less than one minute. Therefore, the proposed ten minutes of purge time is adequate to purge many bore volumes of the tubing and sample train.
5. Measure and record the O_2, CO_2, and PID readings during purging to ensure that a stable formation-representative soil vapor stream is being produced prior to vapor sample collection.

6. Open the valves on sample train connection and the Suma cannister to allow soil vapor stream to enter the Suma cannister for two minutes. Isolate the vacuum pump from the sample train and turn the pump off. Allow an additional two minutes residual vacuum in the Suma cannister to equalize to ambient soil vacuum and additional soil vapor to enter the cannister. Close the valve on the Suma cannister tightly to ensure sample integrity.
7. Prior to closing the valve on the Suma cannister, check and record the vacuum/pressure in the Suma cannister and sample train tubing.

Suma cannisters will be shipped to the specified laboratory and analyzed for the analytical methods listed in the Work Plan.

QA/QC Samples

In addition to temporary vapor monitoring point sampling, additional QA/QC samples will be collected over the duration of the sampling event. Two blind duplicate samples will be taken during the sampling event to be analyzed by the laboratory to identify potential sampling or laboratory method variances. One time-weighted atmospheric sample will be taken for each day temporary vapor monitoring point sampling is conducted. Finally, two trip blanks will be submitted to the laboratory for analysis for the sampling event.

Laboratory Analysis

HazAir proposes to utilize Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) certified laboratory, Eurofins-Air Toxics LLC Laboratory in Folsom California for analytical services pursuant to this project.

Proposed six-liter Suma cannister samples will be used to analyze for volatile organic compounds and for fixed gases of each sample. Samples will be analyzed for the fixed gases oxygen, carbon dioxide, carbon monoxide, and methane using ASTM Method D1945/D1946, Environmental Protection Agency (EPA) Method 3C. Samples will be analyzed for Volatile organic compounds (VOCs) by method TO15. The contaminants of potential concern (COPCs) are listed in the table below along with the laboratory detection limits and the residential vapor intrusion screening limits.

Table 1: Contaminants of Potential Concern

Analyte	Residential VISL (ug/m3)	LOQ/RL (ug/m3)***	MDL (ug/m3)****
Benzene	1.20E+02	1.6	0.38
tert-Butyl methyl ether (MTBE)	3.60E+03	7.2	0.58
1,2-Dibromoethane	1.56E+00	3.8	0.77
1,2-Dichloroethane	3.60E+01	2.0	0.65
Ethylbenzene	3.74E+02	2.2	0.83
n-Hexane	2.43E+04	1.8	0.71
Naphthalene	2.75E+01	5.2	0.16
Toluene	1.74E+05	1.9	0.60
m-Xylene*	3.48E+03	2.2	0.35
o-Xylene	3.48E+03	2.2	0.35
p-Xylene*	3.48E+03	2.2	0.65
Xylenes**	3.48E+03	4.3	NA
1,2,4-Trimethylbenzene	NA	9.8	1.43
Cyclohexane	NA	1.7	0.28
n-Heptane	NA	8.2	0.45

LOQ Limit of quantification
RL Reporting limit
MDL Maximum detection limit
ug/m^3 micrograms per cubic meter
NA Not applicable
* Reported as m,p-xylene
** Total Xylenes will be reported as the sum of m,p-xylene and o-xylene. No MDL or limit of detection evaluation is performed for Total Xylenes.
*** Does not account for sample dilution from to canister pressurization. Approximately 1.5X for 6L canisters and 2.8X for 1L canisters.
**** MDL values are instrument-specific and may vary slightly at the time of analysis. MDLs cited represent an approximate range of the lab's capabilities.

Table 1 shows 1,2-Dibromoethane (EDB) as the only COPC with an LOQ exceeding the VISL. Although the cited MDL value for EDB is below the VISL, the LOQ and MDL values do not account for dilution from canister pressurization. After the pressurization dilution factor is applied to the base LOQ and MDL, these values are expected to increase by ~1.5X for six-liter samples and ~2.8X for one-liter samples. Consequently, HazAir proposes to collect and analyze six-liter Suma cannister samples to ensure that minimum detection and concentration quantitation levels for EDB will be below the NMED indoor screening level.

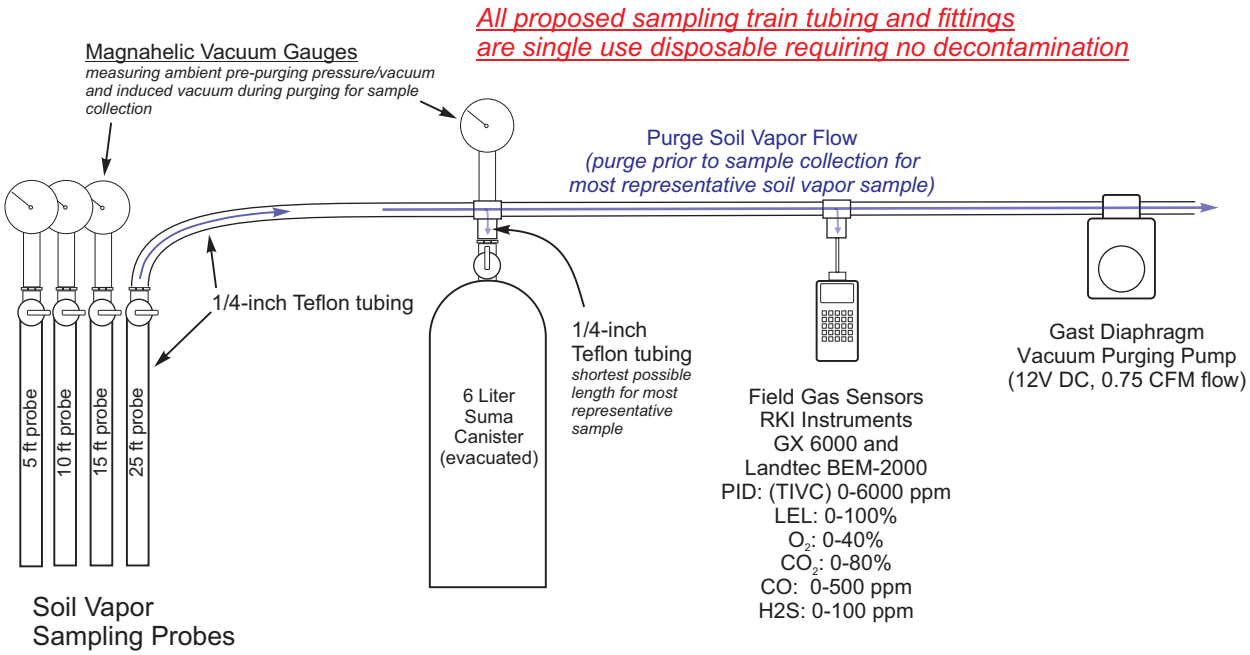
Additionally, soil gas samples typically have elevated VOC concentrations as compared to ambient air samples. If high-level VOCs are present, a secondary dilution may also be required which would result in elevated LOQ for the sample. Where possible, laboratory processes will be used to minimize dilution for any non-COPC analytes so that the COPCs maintain the lowest possible LOQs.

Reporting

A draft technical memorandum will be prepared and submitted within 30 days of data validation. Data validation and summary tables will be prepared for ease of data review. A summary of field activities and screening data will be included in the final report. An electronic copy of the validated analytical data will be included for upload into the Environmental Resources Program Information Management System (ERPIMS). The final deliverable will include:

- Description of field sampling activities and tables with identifier, date and time of all samples Tables shall also include quality control/quality assurance designation for each sample
- Results of field screening data, in tabular format
- Description of vapor point construction and lithologic description
- Text summary of data validation procedures and results
- Soil boring logs, as an attachment/appendix
- Specifications for vapor probe construction, as an attachment/appendix
- Survey data, as an attachment/appendix
- Waste disposal documentation, as an attachment/appendix
- Validated analytical data deliverable in electronic format as Microsoft (MS) Excel, MS Access database or other compatible format.
- Submittal of validated data to ERPIMS

PROPOSED SOIL VAPOR SAMPLING EQUIPMENT AND SETUP
KAFB BFF SITE INVESTIGATION



PROPOSED SOIL VAPOR PURGING PARAMETERS

Probe Depth (ft)	Date-Time	Elapsed Purge Time (min)	Purge Duration (min)	Pre-Purge Ambient Pressure (vacuum) Inches H_2O				Induced Vacuum During Purge (Inches H_2O)				Field Vapor Screening Parameters				Comments
				5 ft probe	10 ft probe	15 ft probe	25 ft probe	5 ft probe	10 ft probe	15 ft probe	25 ft probe	PID (ppm)	CO_2 (%)	O_2 (%)	CH_4 (%)	
15-Foot Completions																
5 ft		-5.0														Pre-purge pressure/vacuum
5 ft		0.0														Begin Purge
5 ft		5.0														
5 ft		10.0														Collect Sample
10 ft		-5.0														Pre-purge pressure/vacuum
10 ft		0.0														Begin Purge
10 ft		5.0														
10 ft		10.0														Collect Sample
15 ft		-5.0														Pre-purge pressure/vacuum
15 ft		0.0														Begin Purge
15 ft		5.0														
15 ft		10.0														Collect Sample
Add For 25-Foot Completions																
25 ft		-5.0														Pre-purge pressure/vacuum
25 ft		0.0														Begin Purge
25 ft		5.0														
25 ft		10.0														Collect Sample

KAFB BULK FUELS FACILITY
OFF-SITE SOIL VAPOR INVESTIGATION

Figure 4.--Proposed Soil Vapor Sampling Equipment, Methods and Purge Parameters

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Attachment 4

Field Sampling Schedule

Field Sampling Schedule

Working Days From Notice To Proceed	Activity
10	Pre-Mobilization Meeting
30	Mobilization – Begin Drilling
35	Mobilization - Begin Sampling
60	Receipt of Sample Results
75	Data Screening
105	Internal Draft Report
150	Final Report