



Air Monitoring Work Plan for the Former Butte Office Stop

55 East Galena Street | Butte | Silver Bow County | Montana
Facility ID 47-03007 (TID 28377) | Release 2692 | Work Plan 35009

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1 EXECUTIVE SUMMARY

The Former Office Stop (Facility) consists of a large three-story building now serving as the Butte Native Wellness Center. The Facility was previously a Firestone Service Center until 1979. Leaky underground storage tanks (USTs) were observed during tank removal in 1995. (Release #2692). Known previous cleanup actions performed include UST removal, stained soil excavation, remedial investigations to assess petroleum impacts on Facility soil, groundwater, and air, and installation of a sub-slab depressurization (SSD) system to reduce indoor air contamination.

DEQ issued a workplan request letter (WPR) dated August 11, 2026, requesting additional corrective action at the Facility. The scope of work outlined in DEQ's WPR includes indoor air sampling and inspection of the current vapor mitigation system. These activities will be conducted in accordance with the Standard Operating Procedures (SOPs) listed below, and any site-specific clarifying notes or proposed deviations from the SOPs are provided in the subsequent sections of this work plan. SOPs are included as **Appendix A**.

- SOP-1: Field Logbook and Forms
- SOP-3: Sample Nomenclature, Documentation, and Chain of Custody
- SOP-4: Sample Package and Shipping
- SOP-15E: Air and Vapor Sampling: Summa Canisters
- SOP-15G: Permanent Sub-Slab Vapor Probe Installation
- SOP-15J: Helium Tracer Leak Test
- SOP-16: Quality Control Sampling

Implementation of this work plan is proposed to begin in November 2026 and take approximately 10 months to complete.

2 FACILITY HISTORY AND RELEASE BACKGROUND

The Facility is located at 55 East Galena Street in Butte, Silver Bow County, Montana and is currently operated as the Butte Native Wellness Center. The Release (#2692) was reported on August 21, 1995 during underground storage tank (UST) removal. A total of six tanks were removed: two of the six tanks were found to be perforated, and soil staining was observed (Weston, 2025). The previous owner, Kenneth Fink, was sent a No Current Corrective Action letter in January 1996. The current Owner is now the Butte Native Wellness Center (BNWC) and they were not informed of the Release by the previous owner (Weston, 2025). The site currently operates as an outpatient clinic and community resource center.

Atlatl completed a Thirty-Day Leak Report for the Release in October 1995, which resulted in approximately 350 cubic yards of petroleum contaminated soil being excavated and disposed of at the Butte Silver Bow County Landfill. Dames & Moore completed a Phase I Environmental Site Assessment (ESA) in 1996. The Phase I ESA indicated that the original owner of the building was Firestone Tire and Rubber Company and was the Firestone Service Center until 1979 (Weston, 2025).

Weston Solutions, Inc. (Weston) completed a Remedial Investigation (RI) in April 2016. No screening level exceedances were noted in the soil boring samples. Groundwater impacts from petroleum were observed but noted as being limited to the perched water bearing zone within the former UST basin (Weston, 2025). Weston also conducted a vapor intrusion (VI) investigation by collecting sub-slab vapor, indoor air, and outdoor air samples. Air-phase petroleum hydrocarbon (APH) impacts were present in indoor air and sub-slab vapor. A sub-slab depressurization (SSD) system was installed in 2017 by Rocky Mountain Radon and concentrations of analytes that previously exceeded screening levels for air decreased. Weston

conducted air monitoring in January 2019, and results were similar to those observed in 2018 after SSD installation.

Concentrations of contaminants in all groundwater samples were below applicable screening levels during the 2017 or 2018 monitoring except one benzene exceedance noted in MW-2 in January 2017 (5.1 µg/L). Weston conducted groundwater monitoring again in August 2023. Groundwater samples were collected from two site wells and no applicable screening levels were exceeded. Air monitoring activities were conducted again in August 2023 and January 2024. One outdoor and three indoor air samples were collected. Several samples exhibited concentrations above applicable screening levels. Weston intended to inspect the SSD mitigation system but was unable to access the roof at the time. Weston was able to inspect the piping in the basement and confirmed those components of the system were in good condition. Weston recommended continued air monitoring and an inspection of the SSD mitigation system to ensure it is functioning properly.

DEQ issued a WPR dated August 11, 2026, requesting additional corrective action at the Facility. The previous consultant for this Facility recommended the following scope of work:

- Inspect the active vapor mitigation system to ensure it is functioning properly and make repairs or adjustments as needed.
- Air sampling and proposing any additional work to resolve the Release.

These proposed actions will help assess current mitigation efforts, inform whether additional remediation is needed, and collect data needed to resolve the release. The remaining sections of this WP detail WET's proposed approach to complete these specified tasks.

3 CURRENT FACILITY CONDITIONS

The Facility is currently the Butte Native Wellness Center. The site consists of a large building and a cement covered area with some landscaping in front of the building. According to the Weston 2025 report, the first floor is 10,680 square feet (sq. ft), the second floor is a 6,024 sq. ft mezzanine, and the basement is 2,952 sq. ft. Soils consist of intermittently stony with gravelly loam or gravelly sandy loam (Weston, 2016). Groundwater occurs at depths greater than 75 feet in bedrock fractures and approximately 10-20 feet below ground surface (ft bgs) in the perched aquifer zone around the former UST basin (Weston, 2016). Groundwater direction is assumed to be south based on the site topography. The site is supplied with drinking water by the Butte Silver Bow municipal water supply system. Contaminants of concern include several volatile organic compounds (VOCs) and APHs. Current exposure risk exists for workers and patrons inside the building due to concentrations of VOCs and APHs in indoor air above screening levels.

4 PURPOSE AND OBJECTIVES

The purpose of the proposed monitoring work is to assess the effectiveness of the current vapor mitigation system and evaluate risk to building receptors. The objectives for the air monitoring and vapor mitigation system inspection are to collect sufficient information and data needed to achieve the purpose.

5 MINIMUM WORK PLAN TASKS

5.1 PROJECT MANAGEMENT

WET personnel will provide Tina Randall (Owner) and DEQ's project manager with updates on ongoing WP tasks and relevant results on an as-needed basis. Other duties associated with this

task include scheduling field work, project reporting administration, monitoring the project budget and deliverables, and any submitted written agreed-upon WP modifications to complete the objectives.

5.2 MOBILIZATION

Up to three mobilizations are estimated for the implementation of this workplan. First, one mobilization for both a senior engineer and staff engineer to conduct an initial site visit and inspect the vapor mitigation system will take place. Access to the roof will be required for the SSD system inspection and WET's safety policy requires two personnel for fall protection implementation. Two mobilizations are required for a staff engineer to conduct air sampling (one mobilization to start the 24-hour sampling and one to collect samples at the end of the 24-hour period. Loading/unloading time is included for each mobilization.

5.3 FIELD WORK - VAPOR MITIGATION SYSTEM INSPECTION

A staff engineer and senior engineer will conduct an initial site visit to assess Facility conditions, determine where sub-slab ports can be installed, verify building construction details, and inspect the current vapor mitigation system. A senior engineer is required due to the technical knowledge and experience required for assessing vapor mitigation systems. The system has not been inspected since August 2023. The rooftop components of the system have not been inspected since August 2021. WET personnel will coordinate with the Owner prior to the site visit to confirm the visit and inspection schedule. WET expects to complete this portion of the WP in the last quarter of 2026 before inclement weather makes roof access unsafe. To access the roof safely, WET will use a safety monitoring system for our fall protection in accordance with 29 CFR 1926.502, which requires two people to be present. Pertinent notes about the status of the SSD system will be recorded in a field logbook as outlined in WET SOP-1: Field Logbook and Field Sampling Forms (**Appendix A**).

5.4 INDOOR AIR MONITORING

A staff engineer will collect three indoor air samples at the Facility in accordance with MDEQ's Vapor Intrusion Guidance (MDEQ, 2021). Prior to sample collection, WET personnel and a building occupant will fill out the Indoor Air Assessment Survey, included as **Appendix B**. Indoor samples will be collected from each inhabitable level of the structure within the breathing zone or approximately three to five feet above the floor. Two indoor air samples will be collected from the main floor, and one indoor air sample will be collected from the basement level according to procedures outlined in WET SOP-15E: Air and Vapor Sampling (**Appendix A**).

Indoor air samples will be collected with 6-liter summa canisters equipped with 24-hour flow controllers supplied by the laboratory. The summa canisters for the indoor air samples will be individually certified. Weather data such as barometric pressure, outside air temperature, wind speed, and wind direction will be recorded on air sampling field sheets as described in the WET SOP-1: Field Logbook and Field Sampling Forms (**Appendix A**). Initial canister vacuums of 25-30 inches Hg are acceptable. Canisters that contain a vacuum of less than 25 inches Hg should be considered unusable, unless otherwise agreed by the DEQ PM. At the conclusion of sampling, a minimum of 5 inches Hg of vacuum left in the canister is preferred. Initial and final vacuums will be recorded on field sheets and the chain of custody.

All air samples will be named, packed, and shipped to Pace Analytical Labs in Mansfield, Massachusetts under standard chain-of-custody protocol according to procedures outlined in WET SOP-3: Sample Nomenclature, Documentation, and Chain of Custody and WET SOP-4: Sample Package and Shipping (**Appendix A**). Samples will be submitted for analysis using EPA Method TO-15 SIM and Air Phase Petroleum Hydrocarbon analysis in accordance with Massachusetts Department of Environmental Protection (MADEP) Methods.

As an additional step of the vapor mitigation system inspection, up to five sub-slab ports will be installed to assess the radius of influence from the current SSD fan and measure vacuums. Potential locations will be determined during the initial site visit described in Section 5.3.

Sub-Slab Vapor Port Installation

Stainless-steel sub-slab ports from Vapor Pin™ will be installed so the air intake is directly underneath the concrete slab. The sub-slab ports will be designed to lie flush on the upper surface of the concrete floor and to “float” in the slab to enable collection of soil gas from sub-slab material in direct contact with the slab or from a pocket of air directly beneath the slab created by sub-slab material subsidence. New stainless-steel Vapor Pins™ will be utilized. WET SOP-15G: Permanent Sub-Slab Vapor Probe Installation (**Appendix A**) describes the installation procedures.

To install a sub-slab port, a rotary hammer drill will be used to drill a 1.125-inch-outer-diameter hole approximately two inches into the floor. The inside of the 1.125-inch-outer-diameter hole will be cleaned with a damp towel and then a 0.625-inch-outer-diameter hole will be drilled through the remainder of the concrete. Once through the concrete, the drill will be allowed to penetrate an additional two to three inches into the sub-slab material. The inner-diameter hole will be cleaned with a bottle brush and damp towel. The outer-diameter hole will be cleaned once more with a damp towel. The Vapor Pins™ will be pressed into the concrete slab and sealed with the supplied non-volatile organic compound silicone sleeve. After the sub-slab port is set, a small aliquot of air (approximately 120 milliliters) will be purged from the sub-slab port to remove the air introduced to the subsurface during the installation process. A protective cap will be placed on the end of the Vapor Pin™ and finished with a stainless-steel thread-on flush-mount cover. Once the sub-slab ports are installed, the ports will be allowed to set for a minimum of 20 minutes to equilibrate prior to sampling and leak testing. These sub-slab ports may remain in place after the initial sampling for use in future sampling events, if needed.

Sub-Slab Port Leak Check

To assess the surface seal and detect surface breakthrough of ambient air during soil gas sample collection, a tracer gas will be introduced around the vapor pin at the ground surface as outlined in WET SOP-15J: Helium Tracer Leak Test (**Appendix A**). Tracer gas procedures will follow MDEQ’s Vapor Intrusion Guidance (MDEQ, 2021) and will include the introduction of high purity helium beneath a shroud that encapsulates the surface completion. Helium concentration will be measured using a helium meter until the measured concentration beneath the shroud is at least 20 percent (%) (200,000 parts per million (ppm)). The helium meter will then be connected to the sub-slab sample tubing to measure helium concentrations during purging. If helium is detected during purging at a concentration less than or equal to 10% of the helium concentration measured under the shroud, the annular seal will be considered adequate and the probe installation complete. A helium detection of greater than 10% of the shroud concentration will

be considered a surface breakthrough. The failed probe will be re-sealed and leak tested. If a second failure occurs, the probe will be abandoned and a replacement will be installed adjacent to the original location.

5.5 LABORATORY ANALYSIS

Indoor air samples will be analyzed for VOCs by TO-15 SIM and APHs by MA-APH, in accordance with the MDEQ's Vapor Intrusion Guidance (MDEQ, 2021).

5.6 QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control (QA/QC) samples including duplicates will be collected at a minimum frequency of 1 per 10 natural samples (10%) as recommended in the MT DEQ VI Guidance (2021). A duplicate air sample will be collected from the same area as the parent sample using two Summa canisters connected to one controller via a splitter provided by the laboratory. QA/QC samples will be analyzed for the same constituents as the natural samples as described in WET SOP-16: Quality Control Sampling.

Pace Analytical Labs will conduct all analyses of collected air samples and provide a laboratory QC report for each analysis. WET personnel will validate all laboratory analytical data using DEQ's Data Validation Summary Form (DVSF). Summary forms will be included in the final report.

6 COST, SCHEDULE, AND REPORTING

6.1 COST

Work effort level has been estimated using best professional judgement and typical scenarios related to work of this type. A detailed cost estimate for the required work is provided in **Appendix C**.

6.2 SCHEDULE

WET will begin implementation of the WP immediately upon DEQ approval. Notification for each event will also be sent to the Facility Owner and the DEQ Project Manager prior to conducting field work. WET expects the SSD system inspection to take place in November 2026 and air sampling to take place in January or February 2027.

6.3 REPORTING

WET will submit an Air Monitoring Report which will contain all of the content outlined in the Monitoring Report format as well as the following:

- Cumulative air tables.
- Maps of historical and current infrastructure, investigative borings and remedial actions.
- Append laboratory analytical data, field data, and completed DVSFs.

7 REFERENCES

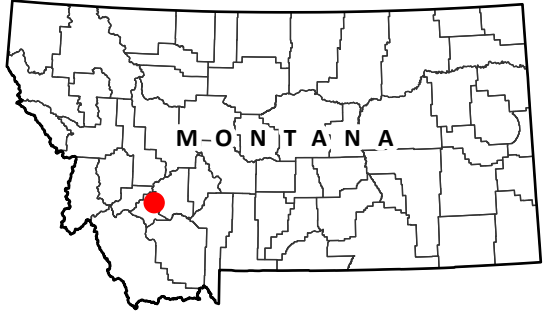
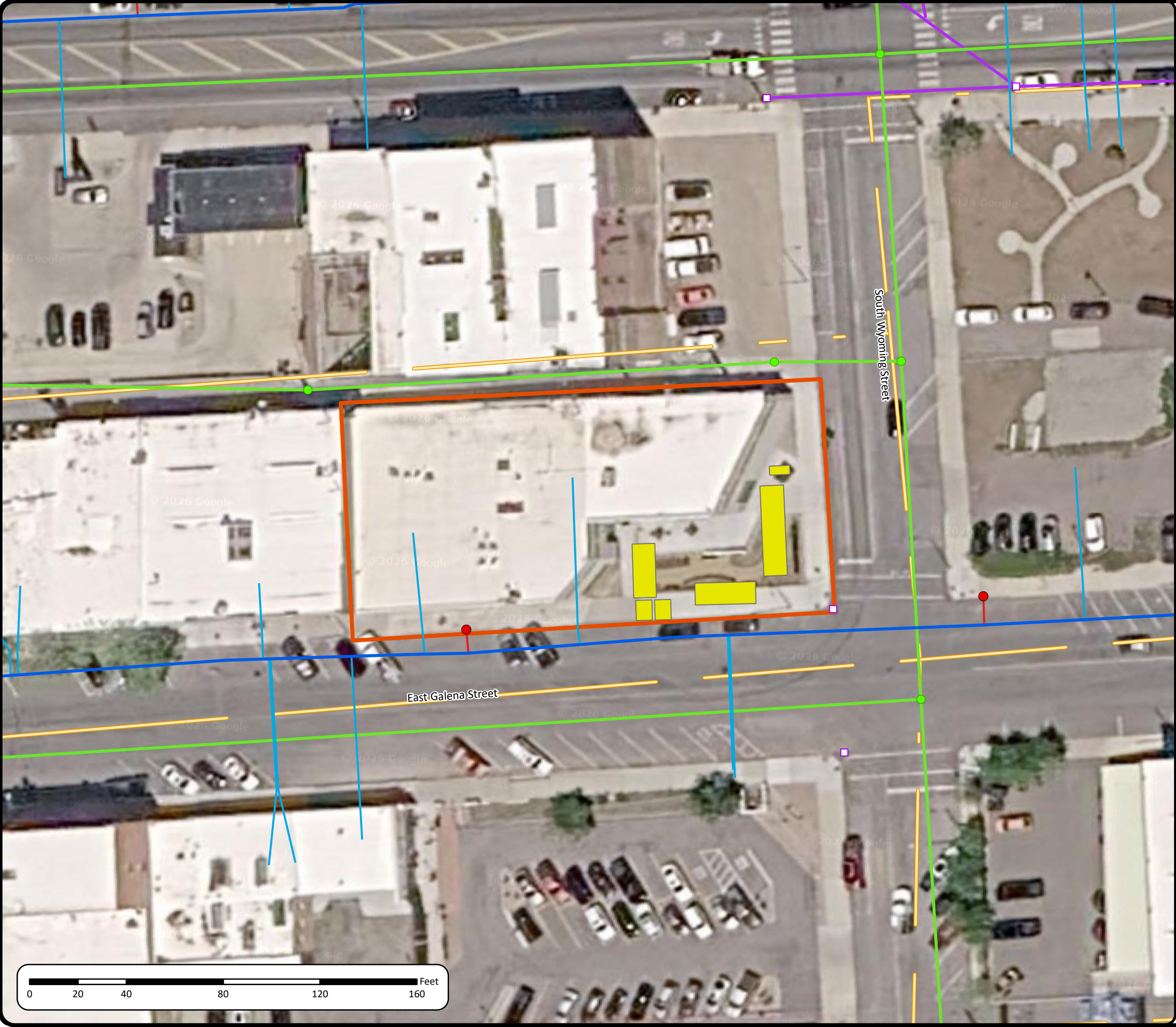
Weston Solutions, Inc. (2025). AR-07 Report for the Petroleum Release at Office Stop, 55 E Galena Street, Butte, Silver Bow County, Montana; Facility ID 47-03007, Release #2692, Work Plan ID #34716.

Weston Solutions, Inc. (2016). Final Remedial Investigation Report: Butte Office Stop, 55 E Galena, Butte, Montana.

Montana DEQ (2021). Montana Vapor Intrusion Guide. *Montana DEQ*.

Figure 1

Site Location



NO.	DESCRIPTION	DATE	DRAFT	REVIEW
1	MAP CREATION	9/3/26	LG	LB
2				
3				
4				
5				

NOTES

SITE LOCATION

BUTTE NATIVE WELLNESS CENTER - 55 E GALENA ST

FIGURE 1



- Tank Location Prior to Removal (Approx.)
- Property Boundary
- Water**
 - Butte-Silver Bow Hydrant
 - Distribution Main
 - Service Line
 - Hydrant Service
- Sewer**
 - Manhole
 - Main Line
- Stormwater**
 - Stormwater Inlet
 - Main Line
- Natural Gas**
 - Main Line

Appendix A

Standard Operating Procedures

FIELD LOGBOOK AND FORMS

All pertinent field investigation and sampling information will be recorded in a field logbook, field form, or a Daily Activity Log (DAL) during each day of the field effort and at each sample site. The field crew leader will be responsible for ensuring that sufficient detail is recorded in the field logbook or DAL. No general rules can specify the extent of information that must be entered in the field logbook or form. However, field logbooks, field forms, or DALs must contain sufficient information such that someone could reconstruct all field activities without relying on the memory of the field crew. All entries shall be made in indelible ink, weather conditions permitting. Each day's or site's entries will be initialed and dated at the end by the author.

At a minimum, entries on the field sheet or in field notebook must include:

- Project information and location
- Project and task number
- Date and applicable times
- Name(s) of field personnel
- Environmental, site, or weather conditions
- Safety briefing attendance
- Details of actual work effort, particularly any deviations from the field work plan or standard operating procedures
- Comments or observations regarding any unusual circumstances
- Any field measurements made (e.g., PID readings, pH, temperature)

For sampling efforts, specific details for each sample should be recorded using a standardized field form designed specifically for the sampling activity being conducted (e.g., low-flow groundwater monitoring, soil gas sampling). Sampling field forms contain fill-in-the-blank type information to ensure that all pertinent information will be recorded. In addition to the items listed above, the following information is recorded on field forms during sampling efforts:

- Sample identification
- Date and time samples were collected
- Sampling methods, particularly any deviations from field work plan or standard operating procedures
- Field data and measurements
- Containers used to collect samples
- Sample preparation (filtration, preservation)
- Analyses and methods requested
- Note any QA/QC samples collected (duplicates, blanks)

Strict custody procedures will be maintained with the field forms. Field forms must always remain with the field team while being used in the field. Upon completion of the field effort, the original field forms will be scanned and copied to the project folder. Original field forms will be filed in an appropriately secure manner.



SAMPLE NOMENCLATURE, DOCUMENTATION, AND CHAIN OF CUSTODY

INTRODUCTION

Sample documentation is an important step to ensure the laboratory, project manager, and field personnel are informed on the status of field samples. Depending on the specifics required for each project, several forms will need to be filled out. Most sample documentation forms are pre-printed carbonless triplicates, enabling copies to be filed or mailed from labs or offices. The forms will be completed by field personnel, who have custody of the samples. The office copy will be kept in the project file and subsequent copies sent to the laboratory, or other designated parties.

Responsibility for completing the forms will be with each field crew leader. It is important that the field crew leader is familiar with the completion process for filling out forms, and the expected information is included.

Potential documents to be completed clearly in indelible ink for each sample generated include:

- Field form(s) or field logbook
- Chain-of-custody forms
- Custody seal(s)

A chain-of-custody form will be generated for all samples collected in the field for laboratory analysis. The sampler may use a project-specific chain-of-custody form or a chain-of-custody form provided by the laboratory. It is of the utmost importance that the chain-of-custody form be filled out correctly. This form is the first thing that third parties and regulators verify when assessing the quality of the job.

FIELD EQUIPMENT

- Indelible ink pen(s)
- Field form(s) or field logbook
- Chain-of-custody form(s)
- Custody seal(s)

PROCEDURES

Sample custody records must be maintained from the time of sample collection until the time of sample delivery to the analytical laboratory and should accompany the sample through analysis and final disposition. The information to be included on the chain-of-custody form will include, but is not limited to:

- Accounting and reporting information
- Project number and/or site name (If there are any questions about this, contact the project manager)
- Sampler's name, information, and signature
- Unique sample identification number or name
- Date and time of sample collection

- Number of containers
- Sample media (e.g., soil, water, vapor, etc.)
- Sample preservative (if applicable)
- Requested analyses
- Comments or special instructions to the laboratory

Each sample will be assigned a unique sample identification number or name. The information on the chain-of-custody form, including the sample identification number or name, must correspond to the information recorded by the sampler on the field forms (refer to SOP-01) and the label on the sample container.

A sample is considered under a person's control when it is in their possession such that tampering is prevented. This includes placing the samples in an area of controlled access such as a building or locking the samples in a vehicle. When custody of a sample is relinquished by the sampler, the sampler will sign and date the chain-of-custody form and note the time that custody was relinquished. The person receiving custody of the sample will also sign and date the form and note the time that the sample was accepted into custody. Samples will be shipped to the analytical laboratory following the procedures in SOP-04. If an overnight shipping service is used to transport the samples to the laboratory, custody of the samples will be relinquished to the shipping service. The shipping service will not sign the chain-of-custody form; however, the samples can be tracked while in the custody of the shipping service. More than one sample may be included on a chain-of-custody form, if all the samples are for the same project. Copies of the chain-of-custody form will be maintained in the project file, in accordance with standardized or project-specific data management procedures.

SAMPLE PACKAGE AND SHIPPING

PACKAGING

All environmental samples collected should be packaged and shipped using the following procedures:

1. Label all sample containers with indelible ink (on the side, not on the cap or lid). Place labeled sample bottles in a high-quality cooler containing an adequate amount of ice (sealed inside two Ziploc bags) to maintain a temperature of 4°C or less inside the cooler. Freeze packs, or “Blue Ice” is NOT to be used. Ensure the cooler drain plug is taped shut.
2. Place the samples in an upright position and wrap the samples with absorbent, cushioning material for stability during transport. Samples should not be loose; the cooler should be able to withstand tough handling during shipment without sample breakage.
3. Fill out the appropriate shipping forms and place in a Ziploc bag then tape it to the inside lid of the shipping container. Shipping forms usually consist of a chain-of-custody form, which documents the samples included in the shipment and specifies the laboratory analyses for each sample.
4. Close and seal the cooler using strapping tape.
5. Place completed sample custody seals on the cooler such that the seals will be broken when the cooler is opened. The custody seal must contain, at minimum, the signature of the person relinquishing custody of the samples and the date the cooler is sealed. Secure the custody seals on the cooler with clear strapping tape.
6. Secure the shipping label with address, phone number, and return address clearly visible.

Note—A chain-of-custody form should be totally unique to a single cooler or shipping container. A cooler should only contain samples that are listed on the chain-of-custody form inside that cooler, and the chain-of-custody form should not list any samples that are not in that cooler. For large sample efforts requiring samples be shipped in two or more coolers, DO NOT fill out a single chain-of-custody form for the entire set of samples and place multiple copies of the same form in multiple coolers. Place only one chain-of-custody in one of the coolers.

SHIPPING HAZARDOUS MATERIALS/WASTE

Hazardous materials need to be shipped using procedures specified under Federal Law. Samples need to be shipped in Ziploc bags or paint cans filled with packing material, depending on the level of hazard. Special package labeling may be needed. Consult the project manager for specific shipping procedures.

AIR AND VAPOR SAMPLING

US Environmental Protection Agency (EPA) guidance for specific sampling procedures, including quality assurance/ quality control (QA/QC) practices, for both criteria and toxic air pollutants, are found at the following web site: <https://www3.epa.gov/ttnamti1/airtox.html>

SUMMA™ CANISTERS

An evacuated canister fitted with a calibrated intake flow controller is opened for a predetermined period to collect air potentially containing VOCs. Subsequent laboratory analysis of the air sample is by GC/MS. The sampling procedure presented below for Summa™ canisters fills the canister to atmospheric pressure. Under normal canister use, most VOCs can be recovered in their original concentrations, with little degradation, transformation, or deposition onto the canister walls.

EQUIPMENT

- Sample labels and pens
- Field logbook or other appropriate field forms
- Chain of custody forms
- Signed access agreements and third-party sample receipts
- Summa™ canisters prepared by the laboratory, filter, and flow controller
- Flexible or stainless-steel tubing of the appropriate diameter to allow sampling in the breathing zone
- Hand pump or personal pump to evacuate tubing, if used
- Support stands, if necessary, to place the inlet in the breathing zone
- Tools and spare parts

PROCEDURES

1. Obtain tubing, stands (if needed), and canisters with flow controllers. The flow controllers should be pre-set by the vendor to allow continuous sampling through the desired time.
2. Unpack the canister from the shipping container and inspect it for damage.
3. Identify sampling location, place a small table or stand at the sampling location, and place the canister on the table or attach the tubing to the stand.
4. Use a hand pump or personal pump to purge the sample port, filter, flow controller, and any tubing to be used.
5. Before sampling, verify initial vacuum of canister using the following steps. These steps will also be used to verify the final vacuum of the canister after sampling.
 - a. Confirm that the valve is closed (the knob should be tightened clockwise).
 - b. Remove the brass cap.
 - c. Attach gauge.
 - d. Attach the brass cap to the side of the gauge tee fitting.
 - e. Open and close the valve quickly.
 - f. Read the vacuum on the gauge.
 - g. Record the gauge reading in the “initial vacuum” column of the chain-of-custody

- form (or record the gauge reading when beginning sampling).
 - h. Verify that the canister valve is closed and remove the gauge.
 - i. Replace the brass cap.
6. Attach particulate matter filter and flow controller and any tubing to be used.
 7. Open the canister valve one-half turn.
 8. Record date and time. Note weather conditions during sampling period, especially any high wind conditions.
 9. Note the condition of the sampling location and the presence of chlorinated hydrocarbon sources (for example, burning garbage).
 10. At the completion of sampling, close the canister valve.
 11. Record date and time.
 12. Remove the filter and flow controller.
 13. Complete the canister sample tag.
 14. Prepare the canister label.
 15. Complete the chain-of-custody form. It is important to note both the canister and flow controller serial numbers on the chain-of-custody form.
 16. Follow sample packaging and shipping procedures outlined in SOP-15F.
 17. The laboratory concentrations may be reported in volumetric units of parts per million (ppm) or parts per billion (ppb). If required, convert these concentrations to mass concentrations of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

PERMANENT SUBSLAB VAPOR PROBE INSTALLATION

US Environmental Protection Agency (EPA) guidance for specific sampling procedures, including quality assurance/ quality control (QA/QC) practices, for both criteria and toxic air pollutants, are found at the following web site: <https://www3.epa.gov/ttnamti1/airtox.html>

Permanent Subslab Vapor Probe Installation

To sample and assess potential subslab vapors, a soil vapor probe must first be installed to Montana DEQ Vapor Intrusion Guidance (DEQ, 2021) specifications. For instances where samples may need to be collected from the same location more than once, permanent probes should be utilized.

Equipment

- Vapor Pin™ kit, including:
 - a. Stainless steel or brass sampling probe
 - b. Stainless steel secure cover
 - c. Installation/extraction tool
 - d. Silicone sleeve
 - e. Probe cap
 - f. Drilling guide
 - g. Secure cover tool
- Dead-blow sand hammer
- Rotary drill with 1.5-inch drill bit
- Hammer drill with 5/8-inch drill bit
- Wet/dry vacuum
- Hand pump or personal pump to evacuate tubing
- Hand tools

Procedures

Probe Installation

1. Choose a location for the vapor probe installation in accordance with the site specific Sampling and Analysis Plan (SAP).
2. Use a rotary drill with a 1.5-inch drill bit to drill approximately a 1.75-inch hole into the foundation slab. Use the wet/dry vacuum to remove drill cuttings from the hole.
3. Place the Vapor Pin drilling guide into the hole. Place the 5/8-inch hammer drill bit into the drilling guide. Using the guide to maintain perpendicularity to the surface, drill to 4 inches below the bottom of the slab. Use the wet/dry vacuum to remove drill cuttings.
4. Place a silicone sleeve on the sampling probe.
5. Place the sampling probe, probe side down, into the 5/8-inch hole. Place the installation

side of the installation/extraction tool over the top of the sampling probe. Using the dead blow hammer, gently pound the sampling probe into place. The silicone sleeve may bulge and bunch up during this process.

6. Use a hand pump or personal pump to purge three sample line volumes from the probe line. To prevent stripping of volatile organic compounds from the subsurface, purge at a rate of <200 mL/min.
7. Place a probe cap on the outlet of the sampling probe. Using the secure cover tool, install a secure cover over the top of the sampling probe.
8. A helium tracer leak test must now be performed before sampling can take place (see SOP 15J).

HELIUM TRACER LEAK TEST

US Environmental Protection Agency (EPA) guidance for specific sampling procedures, including quality assurance/ quality control (QA/QC) practices, for both criteria and toxic air pollutants, are found at the following web site: <https://www3.epa.gov/ttnamti1/airtox.html>

Helium Tracer Leak Test

For subslab vapor and soil gas sampling, a helium tracer leak test to assess the integrity of the probe seal must be performed in accordance with Montana DEQ Vapor Intrusion Guidance (DEQ, 2021) specifications.

Equipment

- Helium shroud
- Helium meter
- Canister of at least 99.99% pure helium
- Low-density polyethylene (LDPE) tubing
- Field book

Procedures

1. Place a pre-made shroud over the top of the vapor or soil gas probe to be checked. Run the sampling line from the probe through a pre-drilled hole on top of the shroud.
2. Place an LDPE line from a canister of at least 99.99% pure helium into a pre-drilled hole on the side of the shroud. Open the canister to allow helium to suffuse into the shroud.
3. Place a helium meter probe into a pre-drilled hole (on the side opposite of the canister) of the shroud. Observe the helium concentration and note when it exceeds 20%. Adjust the rate of the helium canister flow as needed to achieve this concentration.
4. Remove the helium meter probe from the side of the shroud. Place the helium meter probe into the vapor probe sampling line coming out the top of the shroud. Observe and record the highest helium concentration for three purge volumes of the vapor probe sampling line.
5. If helium concentrations from the vapor probe sampling line are <10% of the helium concentration in the shroud, the vapor probe can be considered appropriately sealed.
6. If helium concentrations from the vapor probe sampling line are >10% of the helium concentration in the shroud, the vapor probe is not appropriately sealed. If this occurs, field crews may attempt to re-seal the probe. If this attempt also fails, the hole should be abandoned, and a new one drilled.

QUALITY CONTROL SAMPLING

Quality Control (QC) samples are submitted along with natural samples to provide supporting laboratory data to validate laboratory results. QC samples are submitted blind except for matrix spikes and trip blanks, and do not have any unique identifying codes that would enable the lab or others to bias these samples in any way. Usually, the time or sampling location is modified in a way which will separate blank and standard samples from the rest of the sample train. QC samples are identified only on field forms and in field notebooks. The following codes are typically used:

N	Natural Sample	Soil, water, air, or other of interest material from a field site
SP	Split Sample	A portion of a natural sample collected for independent analysis; used in calculating laboratory precision
D	Duplicate Sample	Two samples taken from the same media under similar conditions; also used to calculate precision Two samples taken from the same media under similar conditions; also used to calculate precision
FB	Field Blank	Deionized water collected in sample bottle; used to detect contamination introduced during the sampling process.
RB	Rinsate Blank	Deionized water run through or over decontaminated equipment; used to verify the effectiveness of equipment decontamination procedures
MS/MSD	Matrix Spike/Matrix Spike Duplicate	Certified materials of known concentration; used to assess Spike Duplicate laboratory precision and accuracy
TB	Trip Blank	Inert material (deionized water or diatomaceous earth) included in sample cooler; sent by the lab, the sample is used to detect any contamination or cross-contamination during handling and transportation.

In general, selected QC samples will be inserted into the sample train within a group of twenty samples. QC samples will be prepared in the field, apart from trip blanks. Trip blanks will be supplied by the laboratory and will accompany each sample cooler containing samples for analysis of volatile organic compounds.

Typical QC sample collection frequencies are presented in the table below. However, at some sites, especially ones where streams or ponds are sampled, QC samples may need to be taken at a higher frequency. Refer to the project-specific sampling and analysis plan or quality assurance plan for the appropriate QC sample frequency. Each field crew leader will be responsible for all QC samples prepared by that crew.

QC Sample	Purpose	Collection Frequency
Field Duplicate	Measure analytical precision	1 per every 20 samples
Matrix Spike/ Matrix Spike Duplicate	Measure analytical accuracy	1 per every 20 samples
Equipment Rinse Blanks	Evaluate effectiveness of equipment decontamination and sample handling procedures.	1 per sampling event per media type
Field Blank	Assess possible cross-contamination of samples due to ambient conditions during sample collection	1 per sampling event
Trip Blank	Evaluate sample preservation, packing, shipping, and storage	1 per cooler containing samples with volatile constituents

Methods for computing data validation statements can be found in EPA documents or obtained from Geomatrix.

Appendix B

Indoor Air Assessment Survey



COMMERCIAL / INDUSTRIAL BUILDING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: _____ Survey / questionnaire completed by: _____

1. Contact Name: _____
 Address: _____ City: _____ State: _____ Zip: _____
 Phone 1: _____ Phone 2: _____ Cell Phone: _____
2. What is the best time to call to speak with you? _____
3. Are you the Owner ☐, Renter ☐, Other ☐ (please specify) _____ of
 this Building/Structure? If you are not the owner, please provide owner contact information
 Owner Name: _____
 Address: _____ City: _____ State: _____ Zip: _____
 Phone 1: _____ Phone 2: _____ Cell Phone: _____
4. Total number of occupants/persons at this location? _____
 Number of Children _____ Ages _____
5. How long have you occupied this location? _____
 How many days per week is the building occupied? _____
 How many hours per day is the building occupied? _____

General Building / Structure Description

6. Type of Building/Structure (check only one): Single Business ☐, Multiple Businesses ☐,
 Other _____
7. Building/Structure Description:
 Number of floors: _____ Area /square footage of main or ground floor: _____ square feet
 Basement ☐ Area /square footage of Basement: _____ square feet
 Crawlspace ☐ Area /square footage of Crawlspace: _____ square feet
 Partial crawlspace/basement ☐ % of foundation footprint of
 each _____
 Slab on grade ☐ Area /square footage of Slab on grade: _____ square feet
 Other ☐ _____
8. Age of Building/Structure: _____ years, Not sure/Unknown ☐

9. General Above-Ground Building/Structure construction (check all that apply):
Wood ☐, Brick ☐, Concrete ☐, Cement Block ☐, Other _____
10. Foundation Construction (check all that apply):
Concrete Slab ☐
Fieldstone ☐
Concrete Block ☐
Elevated Above Ground/Grade ☐
Other ☐ _____
11. Do you have a Private Well ☐ or Cistern ☐
If yes, please describe location, use, GWIC No. (if known) and current condition

12. Do you have a Septic System? Yes ☐ No ☐ Not Used ☐ Unknown ☐
If yes, what is the construction type? _____
Where is it located? _____
When was the last time it was serviced? _____
Do you (or have you ever) use(d) any degreaser for your septic system? Yes ☐ No ☐
If yes, when was the last application? _____
13. Do you have standing water outside of your Building? (pond, ditch, etc.) Yes ☐ No ☐

Basement Description (please check all boxes that apply):

14. Is the basement Finished ☐ or Unfinished ☐?
15. If finished, how many rooms are in the basement? _____
What are rooms used for? Office ☐, Shop ☐, Storage ☐,
Other _____
16. If not finished, do you plan on finishing in the future? Yes ☐ No ☐
17. Is the basement floor (check all that apply) Concrete ☐, Tile ☐, Carpeted ☐, Dirt ☐,
Other ☐ _____
18. Are the basement walls Poured Concrete ☐, Cement Block ☐, Stone ☐, Wood ☐,
Brick ☐, Other ☐ _____
19. Does the basement have a moisture problem?
Yes, frequently (3 or more times/year) ☐
Yes, occasionally (1-2 times/year) ☐
Yes, rarely (less than 1 time/year) ☐
No ☐

Describe the moisture problem _____

20. Does the basement ever flood?
Yes, frequently (3 or more times/year) ☐

Yes, occasionally (1-2 times/year) ☐

Yes, rarely (less than 1 time/year) ☐

No ☐

21. Does the basement have any of the following? Floor Cracks ☐, Wall Cracks ☐, Sump ☐,
Floor Drain ☐, Other Hole/Opening In Floor ☐

Describe _____

22. Are any of the following used or stored in the basement (check all that apply):

Paint ☐, Paint Stripper/Remover ☐, Paint Thinner ☐, Metal Degreaser/Cleaner ☐,

Gasoline ☐, Diesel Fuel ☐, Solvents ☐, Glue ☐, Laundry Spot Removers ☐,

Drain Cleaners ☐, Pesticides ☐,

Other equipment with fuel tanks (chain saw, lawn mower, snow blower, etc.) ☐,

Other products with/containing Volatile Organic Compounds, describe: _____

23. Has the Building / structure recently (within the last six months) had any painting or remodeling?

Yes ☐ No ☐

If yes, specify what was done, where in the Building, and what month:

24. Has new carpeting been installed in the Building / Structure within the last year? Yes ☐ No ☐

If yes, when and where? _____

25. Do any occupants / employees regularly conduct or work in the beauty / hair-dressing business?

Yes, work at a beauty / hair-dressing business ☐

Yes, store supplies for beauty / hair-dressing business ☐ Distance to sample point: _____

Yes, building contains beauty / hair-dressing business ☐ Distance to sample point: _____

Yes, building is near beauty / hair-dressing business ☐ Distance to sample point: _____

No ☐

26. Do any occupants / employees / anyone regularly use or work or conduct a dry cleaning service?

Yes, use dry-cleaning regularly (at least weekly) ☐

Yes, use dry-cleaning infrequently (monthly or less) ☐

Yes, work at a dry cleaning service ☐

Yes, building contains or is near dry cleaning service ☐ Distance to sample point: _____

No ☐

27. Do any occupants / employees / anyone in the Building / structure use solvents at work?

Yes ☐ If yes, how many persons?

No ☐ If no, go to question 29

28. If yes for question 27, are the work clothes washed at Building? Yes ☐ No ☐

29. Does Building / Structure contain a washer/dryer? Yes ☐ No ☐

Where are they located?

Basement ☐

Upstairs ☐

Ground floor ☐

Garage ☐

Other, please specify ☐ _____

30. If Building / Structure contains a dryer, is it vented to the outdoors? Yes ☐ No ☐

31. What type(s) of Building heating do you have (check all that apply)

Fuel type: Gas ☐, Oil ☐, Electric ☐, Wood ☐, Coal ☐,
Other _____

Heat conveyance system: Forced Hot Air ☐ Forced Hot Water ☐ Steam ☐
Radiant Floor Heat ☐ Wood Stove ☐ Coal Furnace ☐ Fireplace ☐
Other ☐ _____

32. Does Building / Structure have (or had in the past) a storage tank for storage of Gasoline ☐,
Fuel Oil ☐, Propane ☐

If yes, where is/was it located? _____

How is/was the tank filled? _____

Is there staining near the tank? Yes ☐ No ☐

33. Does Building / Structure have air conditioning? Yes ☐ No ☐

Central Air Conditioning ☐

Window Air Conditioning Unit(s) ☐

Other (please specify) _____

34. Does Building / Structure have any: Room Fans ☐, Ceiling Fans ☐, Attic Fan ☐

35. Does Building / Structure ventilate using the fan-only mode of your central air conditioning or
forced air heating system? Yes ☐ No ☐

36. Has Building / Structure had termite or other pesticide treatment? Yes ☐ No ☐ Unknown ☐

If yes, please specify type of pest controlled _____

And approximate date of service _____

37. Water heater type: Gas ☐, Electric ☐, by Furnace ☐,

Other (please describe) _____

38. Water heater location: Basement ☐, Upstairs ☐, Ground Floor ☐, Attic ☐,

Other (please specify) _____

39. Does Building / Structure have any cooking appliances? Electric ☐, Gas ☐

Other (please describe) _____

40. Is there a stove exhaust hood present? Yes ☐ No ☐

Does it vent to the outdoors? Yes ☐ No ☐

41. Smoking in Building / Structure:

None ☐, Rare (only guests) ☐, Moderate (occupants, light smokers) ☐,

Heavy (at least one heavy smoker in Building / Structure) ☐

42. If yes to question 41, what do they smoke?

Cigarettes ☐

Cigars ☐

E-Cigarettes(Vaping) ☐

Pipe ☐

Other ☐

43. Does Building / Structure regularly contain/use air fresheners? Yes ☐ No ☐

44. Does anyone in the Building have indoor Building hobbies or crafts involving:

Heating ☐, Soldering ☐, Welding ☐, Model Glues ☐, Paints ☐,

Spray Paint ☐, Wood Finishing ☐, Other ☐ _____

45. General Building / Structure use of industrial / office / consumer products (circle as appropriate). Assume that: Never = never used, Hardly ever = less than once/month, Occasionally = about once/month, Regularly = about once/week, and Often = more than once/week.

Product	Frequency of Use				
Solvents	Never	Hardly ever	Occasionally	Regularly	Often
Aerosol Deodorizers	Never	Hardly ever	Occasionally	Regularly	Often
Insecticides	Never	Hardly ever	Occasionally	Regularly	Often
Disinfectants	Never	Hardly ever	Occasionally	Regularly	Often
Window Cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Ink / Toner Cartridge	Never	Hardly ever	Occasionally	Regularly	Often
Glue / Adhesives	Never	Hardly ever	Occasionally	Regularly	Often
Paint	Never	Hardly ever	Occasionally	Regularly	Often
Petroleum Fuel	Never	Hardly ever	Occasionally	Regularly	Often

46. Please check weekly Building / Structure maintenance, janitorial, and cleaning practices:

Dusting ☐

Dry Sweeping ☐

Vacuuming ☐

Polishing (furniture, etc.) ☐

Washing/Waxing Floors ☐

Other (describe) _____

47. Other comments including items / subjects not covered in this questionnaire yet an issue or concern for the Building / Structure:

48. **Chemical Inventory/Summary**

Chemical/Chemical Product (consumer name)	Amount present in Building / Structure
a)	
b)	
c)	
d)	
e)	
f)	
g)	
h)	
i)	
j)	
k)	
l)	
m)	
n)	
o)	