April 18, 2025

Mr. Kendall Gustafson
Montana Department of Transportation
Environmental Services Bureau, Remediation and Assessment
2701 Prospect Avenue
Helena, Montana 59620

Delivered via email kgustafson@mt.gov

SUBJECT: Work Plan for Cleanup of Petroleum-Contaminated Media
Ingomar Section Yard
U.S. Highway 12 Milespost 230, Rosebud County, Montana
MDEQ Facility ID# 44-09687 (TID 27681); Release 934 and Work Plan 34930;
Tetra Tech Project No. 117-023947-25002

Dear Mr. Gustafson:

Tetra Tech, Inc. (Tetra Tech) is pleased to submit this work plan for cleanup of petroleum-contaminated media at the above-referenced site (Figures 1 and 2). This work plan was required by Mr. Jay Shearer of the Montana Department of Environmental Quality (MDEQ) in correspondence dated September 25, 2024 (MDEQ, 2024). In Mr. Shearer's correspondence MDEQ required the following tasks:

- *Cean up of the petroleum-contaminated media associated with the release to the extent practicable via soil excavation and application of amendments;*
- *Install source area and downgradient monitoring wells;*
- *Conduct groundwater monitoring*
- *Screen for potential petroleum-vapor intrusion*
- *Update the Release Closure Plan;*
- *And propose additional work needed to resolve the Release.*

BACKGROUND INFORMATION

The MDT Ingomar facility is located at approximately milepost 230 on the north side of US Highway 12, approximately 0.3 miles north of Ingomar, Montana. The MDT Ingomar facility was constructed in the 1960s. Two buildings are located at the site consisting of a single-story metal sided shop building and a metal Quonset style sand storage house (Figure 2).

A background summary of the site and release history is summarized in the December 22, 2023 *Subsurface Remedial Investigation Report* prepared for MDT Environmental Services and prepared by West Central Environmental Consultants, Inc. (WCEC 2023). Release numbers 934 and 3486 have been reported for this site.

Release number 934 is related to one 1,000-gallon diesel UST and one 500-gallon gasoline UST

that were located approximately 30 feet east of the shop building (Figure 2). These USTs were removed in October 1991. Approximately 75 to 80 cubic yards of petroleum impacted soil was excavated from the tank basin and was landfarmed at the site. Confirmation soil samples were not collected from the bottom of the excavation; however, field screening with a photionization detector (PID) indicated that petroleum impacted soil was left in place (WCEC 2023).

A subsurface investigation consisting of three soil borings (SB-1 through SB-3) drilled in the vicinity of the former tank basin was performed in 1991. Petroleum impacts were observed in soil samples collected from the borings. A passive subsurface venting system was installed 1992 and was operated until 1997 (WCEC 2023).

Release 3486 was reported from the site on April 27, 1998 when a leak was observed near the base of the gasoline dispenser for a 2,000-gallon capacity gasoline UST. This tank and a 2,000-gallon diesel UST were located approximately 40 feet south of the southwest corner of the sand storage building. These USTs were removed from the site during January 2000. Confirmation soil samples collected under the gasoline UST did not contain detectable petroleum by Volatile Petroleum Hydrocarbon (VPH); however, no sampling was conducted beneath the fuel dispenser building. Additional excavation activities were performed under the fuel dispenser building up to 12 feet below ground surface (bgs). Soil samples collected from the excavation that were submitted for VPH laboratory analyses. DEQ risk-based screening levels (RBSLs) were not exceeded in the samples. Release No. 3486 was closed by DEQ on December 30, 2010 (WCEC 2023).

In April 2008, MDT installed seven borings (SB1 – SB7), completing four borings as 2-inch monitoring wells (MW1, MW2, MW3, and MW6) (Figure 2). During May 13-14, 2009, MDT completed another four hollow stem auger soil borings and converted them into groundwater monitoring wells (MW8, MW9, MW10, and MW11) (Figure 2). At this point, the groundwater monitoring well network generally defined the extent and magnitude of soil and groundwater contamination. Monitoring wells MW10 and MW11 have since either been lost or abandoned and are no longer present (WCEC 2023).

High resolution subsurface remedial investigation activities were performed by WCEC on August 15 through 18, 2023. These activities consisted of using a laser-induced fluorescence (LIF) ultra-violet optical screening tool (UVOST) equipped with an electrical conductivity (EC) probe and membrane interface probe (MIP) combined with the hydraulic profiling tool (HPT) technologies. Three UVOST borings, 14 MIHPT boreholes, and 12 soil boreholes were installed during the investigation. Based on the results of the investigation, WCEC recommended a limited source area removal excavation of up to 400 cubic yards and the application of oxygen release compound (ORC) or carbon-based amendment to the floor of the excavation as a remedial action.

PROPOSED SCOPE OF WORK

The objective of the proposed scope of work is to perform a limited source area removal of petroleum hydrocarbon impacted soil, apply ORC to the floor of the excavation, install replacement and downgradient monitoring wells, and perform one round of groundwater sampling. This work plan will describe the tasks for the excavation, disposal of impacted soil, backfill of the excavation, restoration of the site, monitoring well installation, monitoring well sampling and reporting. These tasks are described below.

Work Plan Preparation and Project Management

These tasks include preparing this work plan, and project management time necessary for coordination and scheduling of the project. In addition, a site-specific health and safety plan (HASP) will be prepared to address activities in this work plan prior to conducting any on-site activities.

Utility Locates

Tetra Tech will submit a utility locate request with Montana 811 to locate public utilities at the site. A private utility locator will also be employed to locate utilities within the excavation area and the proposed groundwater monitoring well installation areas.

Excavation and Backfill

The following section presents activities related to site security, monitoring well abandonment, excavation and disposal of petroleum impacted soil, soil testing, confirmation soil sampling, remediation amendment application, and backfilling and compaction. A Tetra Tech project scientist will be on-site for these activities. Contractor estimates for excavation, disposal, and backfill are presented in Attachment A.

Security and Sanitation

Temporary fencing or barricades will be installed by the contractor on the perimeter of the excavation area to limit vehicle and pedestrian access to the site. The temporary fencing or barricades will remain onsite until the excavation is completely backfilled.

A portable toilet will be placed at the jobsite for the duration of the excavation and backfilling activities. A local toilet rental company will service the toilet equipment weekly.

Monitoring Well Abandonment

Monitoring well MW-1 is located north of the proposed excavation area and monitoring well MW-2 is located within the proposed excavation area. Monitoring well MW-1 will be abandoned if it appears that excavation activities will destroy the well. Monitoring well MW-2 will be abandoned prior to beginning excavation activities. Abandonment logs will be prepared and submitted for all monitoring wells abandoned for the excavation activities.

Excavation Procedure

The excavation will be conducted using a large track-mounted excavator and one or two loaders for moving the soil. Attempts will be made to direct haul impacted soil to the Custer County Landfill for disposal, but soil may be temporarily stockpiled on the site. The areal extent of the excavation is anticipated to be limited to MW2 to the north, BH8 to the west, and BH-7 to the south and east (Figure 2). Impacted soils are anticipated to be observed at approximately 8 feet below site grades (bsg). The depth of the excavation is expected to range from approximately 14 feet bsg at BH7 to 20 feet bsg at BH8. The maximum excavation volume is estimated at 1,600 cubic yards, of which 400 cubic yards is anticipated to be impacted.

In order to excavate the impacted soil from the former tank basin in the water table fluctuation area or smear zone, the clean clay overburden will be excavated and stockpiled onsite. The volume of overburden soil is estimated at 1,200 bank cubic yards. Impacted soil will be hauled

to the disposal site as it is excavated and possibly temporarily stockpiled onsite if immediate transportation is not available.

The overburden will be stockpiled on site for re-use as backfill. This soil may need to be moisture conditioned onsite so that it will be suitable for backfilling and compaction. Backfilling will begin after a portion of the site is excavated, sampled and application of ORC.

Soil Testing During Excavation

Tetra Tech will field screen the excavated soil to segregate the impacted from the non-impacted soil. Tetra Tech will also field screen the excavation walls and floor during the excavation to determine the relative quantitative volatile organic concentration of the soil. This soil testing will determine if the excavated soil is impacted thus requiring disposal at the landfill or if the soil is clean and can be stockpiled onsite and reused as backfill. The soil testing will be conducted by collecting an approximate four-ounce soil sample in a Ziplock plastic bag, slightly heating the sealed sample bag, then measuring the air space in the bag with a PID or flame ionization detector (FID). Soil with a field screen result of 100 ppmv or higher will be segregated from overburden soil for transportation and disposal at Custer County Landfill. Soil with field screen results of less than 100 ppmv will be considered clean overburden and will be used to back fill the excavation.

Confirmation Soil Sampling

After completion of the excavation, Tetra Tech will collect soil samples from the floor and walls of the excavation. Two grab samples will be collected for every 900 square feet of the excavation floor and two grab soil samples will be collected for every 30 linear feet of wall. The wall sample will be collected at mid-depth of the zone of the vertical impacts of the wall. Each grab soil sample will be collected into laboratory-supplied containers, placed into an iced cooler, and submitted to Energy Laboratories in Billings, Montana for volatile petroleum hydrocarbons (VPH) analysis using the Massachusetts Department of Environmental Protection (MDEP; 2008a) method. All soil data will be validated using MDEQ's Data Validation Summary form.

Remediation Amendment Application

Regenisis® ORC or similar material will be spread to the base of the excavation in areas of remaining petroleum hydrocarbon impacts following soil sample collection to assist in reduction of residual petroleum hydrocarbon impacts. The ORC material is in solid powder form and shipped in 50-pound sacks. The material will be placed in a skid steer or backhoe loader bucket and thin spread in the appropriate areas within the saturated zone. Water may mixed with the ORC if necessary. The estimate for ORC is included in Attachment B.

Backfill Placement and Compaction

The depth of the excavation is anticipated to range from approximately 14 to 20 feet bgs. The seasonal water saturated zone is expected to be approximately 15 feet bgs. Imported fill consisting of ¾ inch gravel will be used to backfill the saturated zone of the excavation.

The clean clay overburden will be used as backfill from the top of the gravel to approximately 1 foot below ground surface. Each backfill lift will be 8 inches or less and compacted using compaction equipment. Each backfill lift will be approximately 8-inch thick and compacted to achieve a 95% standard proctor density and tested using a nuclear densitometer gauge.

Surface restoration shall consist of 1 foot of crush aggregate course material.

Subsurface Investigation

The soil boring and monitoring well installation scope of work will consist of the following:

- Drill up to five soil borings using direct push drilling techniques in the areas indicated on Figure 2. One soil boring will be installed to replace monitoring well MW1, if it was abandoned prior to excavation activities, and one soil boring will be installed to replace monitoring well MW2. Three soil borings, MW12 through MW14, will be installed south of monitoring wells MW6 and MW9. Exact locations will be determined after an on-site assessment of site-specific access, underground utility locates, overhead power lines, and safety. The borings will be advanced to a depth of up to 35 feet below ground surface (bgs) to assess petroleum hydrocarbon impacts in soil. The drilling bids are presented in Attachment C.
- Collect soil samples from each borehole continuously and log each sample for soil type, density, moisture content, color, and evidence of petroleum hydrocarbon staining and odor.
- Each sample will be screened for petroleum hydrocarbon impacts using visual observations of staining, odor, and standard headspace screening techniques with a PID or FID.
- Soil samples will be collected from the zone of greatest petroleum impacts (as identified during field screening) and from the top of the saturated zone in each boring. However, if impacts are not observed in the soil column, only the groundwater interface sample will be collected for laboratory analysis. For cost estimation purposes, it is assumed that two soil samples will be collected from each boring. Each soil sample will be placed in clean laboratory-supplied containers and submitted to Energy Laboratories in Billings, Montana. The soil samples will be analyzed for VPH.
- Impacted drill cuttings identified by field screening will be containerized on-site in 55-gallon drums. A soil sample will be collected from the containerized soil and submitted for laboratory analysis of VPH, Resource Conservation and Recovery Act (RCRA) eight Toxicity Characteristic Leaching Procedure (TCLP) metals per landfill disposal requirements, and paint filter test.

MONITORING WELL INSTALLATION

- Each soil boring will be completed as a monitoring well with 2-inch diameter Schedule 40 PVC materials (Figure 2). The well screen piping will be 0.010 slot size prepacked well screen and installed from 10 to approximately 15 feet bgs within the groundwater zones. A threaded cap will be installed on the bottom of the screen piping. Bentonite chips will be placed from above the top of the screen to two feet bgs. The monitoring wells will be completed with an 8-inch diameter flush-mount traffic rated well vault concreted in place. The top of the PVC casings will be fitted with 2-inch diameter water-tight locking plugs.
- Each monitoring well will be developed using a surge block and water pumping technique. The well will be surged and pumped until the pumped water is sediment-free and clear. Development water will be containerized by the *Disposal of Untreated Water from Monitoring Wells Flow Chart* and disposed of appropriately following receipt of laboratory results (MDEQ, 2015).
- The vertical elevation of each new and existing monitoring well PVC casing will be surveyed by and overseen by a licensed engineer or a licensed surveyor to an accuracy of 0.01 feet and mean sea level datum.

GROUNDWATER MONITORING

- One groundwater monitoring event will be conducted to assess conditions at the site. For cost estimating purposes, it is assumed that groundwater samples will be collected from the monitoring wells MW1 through MW3, MW6, MW8, MW9 and newly-installed wells MW12 through MW14.
- Depth to groundwater will be measured for each monitoring well using an electronic oil/water interface meter. The meter will be decontaminated between each well measurement using Liquinox® soap solution and clean potable water rinse.
- Each monitoring well will be purged with low-flow slow-purge pumping method using a peristaltic pump or bladder pump. Dedicated polyethylene tubing will be used during sampling. During purging, field instruments will analyze the water for pH, temperature, dissolved oxygen, specific conductivity, oxidation-reduction potential, and turbidity. Purge water will be containerized by the *Disposal of Untreated Water from Monitoring Wells Flow Chart* and disposed of appropriately following receipt of laboratory results (MDEQ, 2015). The pump will be decontaminated between wells using a Liquinox solution followed by a triple rinse technique. Additionally, a new bladder will be installed between each well.
- Groundwater samples collected from each monitoring well will be analyzed for VPH by the Montana Method based on the MADEP method. The groundwater samples will also be analyzed for ethylene dibromide (EDB) by EPA method 8260.

DATA VALIDATION

Each analytical data package will include a summary report that cross-references the sample identification with the laboratory identification and identifies variations from standard operating procedures; laboratory analytical results; quality control data, which may include but is not limited to surrogate recoveries, initial and continuing calibration blanks and spikes, method blanks, laboratory control blanks and spikes, and matrix spike and matrix spike duplicates; FID chromatograms; chain of custody form(s); and a sample receipt checklist. Additionally, data validation will be included with the investigation report and will follow MDEQ's data validation guideline as per https//deq.mt.gov/Portals/112/Land/StateSuperfund/Documents/DataValidationReport.pdf. It is anticipated that up to three separate data validations will need to be completed for this project.

Petroleum Vapor Intrusion Screening Analysis

Tetra Tech will complete a Petroleum Vapor Intrusion (PVI) Screening analysis following MDEQ's Vapor Intrusion Guide.

Reporting

Following receipt of the laboratory analytical reports, Tetra Tech will prepare and submit to MDEQ a report summarizing the excavation, disposal, backfill, soil testing, soil sampling, monitoring well installation, and groundwater sampling results. Also included will be a map of the excavation extents, soil sampling results, laboratory reports, remediation enhancements volume, disposal volume, backfill volumes by material type, and compaction testing results. Tetra Tech will also prepare a Release Closure Plan, which will be attached to the report to evaluate the potential for release closure.

SCHEDULE

We will schedule this work upon receiving approval from the MDEQ. Excavation and backfilling of the impacted soils is anticipated to occur during August 2025 and is estimated to last approximately two weeks. Monitoring well installation and sampling is scheduled to be completed by the end of October 2025. Tetra Tech will prepare and complete a report summarizing field activities and sample results approximately four weeks following the receipt of the final laboratory analytical report.

BUDGET

Tetra Tech's estimated project costs are shown on the estimated cost worksheet included in Attachment D. Please note we have named the tasks according to the Montana Petroleum Tank Release and Compensation Board guidance for Standard Corrective Action Task Names. Subcontractor bids are included as Attachments A through C.

AUTHORIZATION

This work will be conducted in general accordance with the Terms and Conditions presented in the MDT contract #315808 MDT Ingomar Maintenance Facility Cleanup.

We appreciate the opportunity to provide this work plan and look forward to working with you on this project. If you have any questions or comments regarding this work plan, please do not hesitate to call me in our Billings, Montana office at (406) 248-9161.

Respectfully Submitted,

Tetra Tech, Inc.

Steven Marie
Senior Engineer

Jacob Conver
Project Manager

SM/JC

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Enclosures:
Figures
Attachment A: Excavation Bids
Attachment B: ORC Estimate
Attachment C: Drilling Bids
Attachment D: Tetra Tech Cost Estimate

cc: Jay Shearer, MDEQ jshearer@mt.gov
Montana Petroleum Tank Release Compensation Board

REFERENCES

MDEQ, 2024. Work Plan Requested to Cleanup Petroleum-Contaminated Media at the Department of Transportation's Ingomar Section Yard, U.S. Highway 12 Milepost 230, Rosebud County, Montana, Facility ID 44-09687 (TID 27681), Petroleum Release 934, Work Plan 34930. September 25.

MDEQ, 2018. Montana Tier 1 Risk-Based Corrective Action Guidance for Petroleum Releases. May.

MDEP, 2008a. Massachusetts Department of Environmental Protection (MADEP), 2008. Method for Determination of Volatile Petroleum Hydrocarbons (VPH). Revision 1.1. May.

MDEP, 2008b. Massachusetts Department of Environmental Protection (MADEP), 2008. Method for Determination of Extractable Petroleum Hydrocarbons (EPH). Revision 1.1.

West Central Environmental Consultants, Inc. 2023. Subsurface Remedial Investigation Report, MDT Ingomar Maintenance Facility, US Highway 12, Milepost 230, Ingomar, Montana. December 22.

FIGURES

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SITE LOCATION

ROSEBUD COUNTY

SITE LOCATION MAP

MDT INGOMAR MAINTENANCE FACILITY

US HIGHWAY 12, MILE POST 230

INGOMAR, MONTANA

FIGURE 1

TETRA TECH

PROJECT #: 117-083457-25001

ORIGINAL BY: GAB

Date : 4/10/2025 10:00 AM

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0 1 3

Miles

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LEGEND

- Monitor Well
- Proposed Well
- Soil Borehole -2008
- Soil Borehole -2023
- Underground Electric (Inferred Location)
- Approximate Extent of Proposed Excavation
- Approximate Site Boundary

SITE MAP

MDT INGOMAR MAINTENANCE FACILITY
US HIGHWAY 12, MILE POST 230
INGOMAR, MONTANA
FIGURE 2

TETRA TECH

PROJECT #: 117-083457-25001
ORIGINAL BY: GAB
Date : 4/14/2025 1:41 PM

N

0 25 50

Feet

TETRA TECH

ATTACHMENT A

Excavation Bids