



Environmental Resources

P.O. Box 5305, Bozeman, Montana 59717 Phone (406) 582-8491 email: ruwaller@gmail.com

September 20, 2019

Mr. Richard Seiler
Valley County Courthouse
501 Court Square Box 1
Glasgow, Montana 59230

Subject: Corrective Action Work Plan
A-Frame Gas Station, Glasgow, MT
DEQ Facility ID No. 53-00630
DEQ Release No. 3495 Work Plan ID 33868

Dear Mr. Seiler:

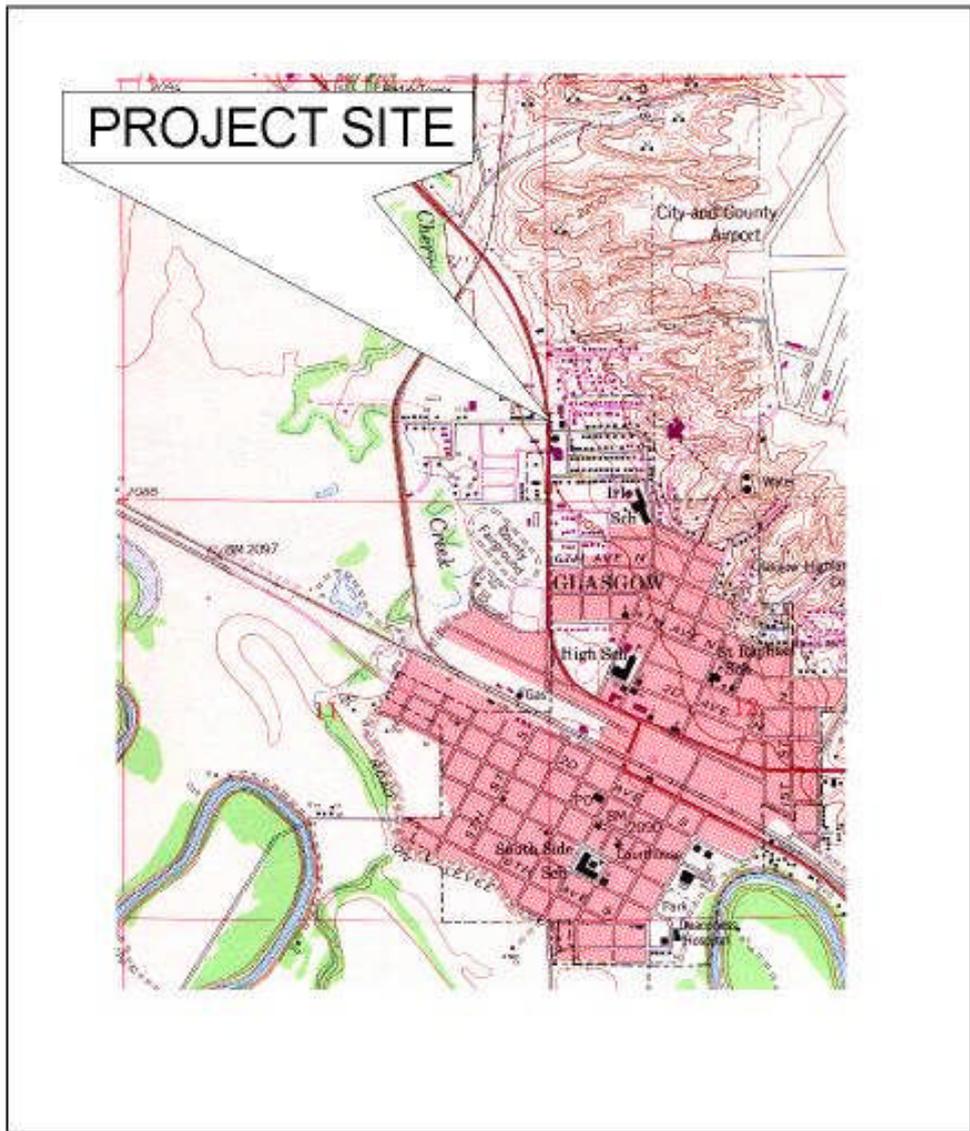
Environmental Resources is pleased to submit this document to outline activities associated with pilot testing to determine the radius of influence of a remediation system intended to mitigate subsurface petroleum contamination at the above referenced petroleum release site. Pilot testing will consist of installing an air injection (AI) well and a soil vapor extraction (SVE) well and connecting the wells to pilot test SVE/ AI equipment.

Site Location

The former A-Frame Gas project site is situated in the northwest quarter of the northwest quarter of Section 12, Township 28 North, Range 39 East, Montana Principal Meridian as shown in Figure 1. The project site is situated at the northeast corner of the intersection of U.S. Highway 2 and Valley View Drive within the city limits of Glasgow, MT.

Site Geology/Hydrogeology

Soils at the project site consist of fine-grained fluvial sediments associated with the Milk River, which is situated approximately one mile south of the project site. Local bedrock consists of the Cretaceous Bearpaw Shale. Groundwater is first encountered at approximately 12 feet below ground surface. Highly plastic, dense silty clay and sandy clay interbedded with fine- to coarse-grained sand intervals is encountered from 0-20 feet below ground surface. The local groundwater flow direction measured at the project site appears to be northwesterly toward the Milk River.



SCALE: 1" = 1200'



**ENVIRONMENTAL RESOURCE
MANAGEMENT, INC.**
Consulting Geologists and Environmental Scientists

**A-FRAME GAS
GLASGOW, MONTANA
SITE INVESTIGATION**
FIGURE 1, REGIONAL SITE LOCATION MAP

Scope of Work

Proposed tasks to be performed include installing one additional groundwater monitoring well, installing and operating a pilot scale (SVE/ AS) system, data collection, system design and reporting. These tasks are designed to gain further knowledge regarding the expected radius of influence of a SVE/ AI system that may be used to mitigate the petroleum release at the project site.

Groundwater Monitoring Well Installation

One groundwater monitoring well will be installed at the location shown on Figure 2 using a hollow-stem auger drilling rig to further define the extent and magnitude of soil and groundwater contamination. The groundwater monitoring well will be installed to approximately 30 feet below ground surface and will be completed with two-inch diameter Schedule 40 flush-threaded well screen and casing. The well will be screened from 30-10 feet below ground surface and completed with a flush mounted access cover.

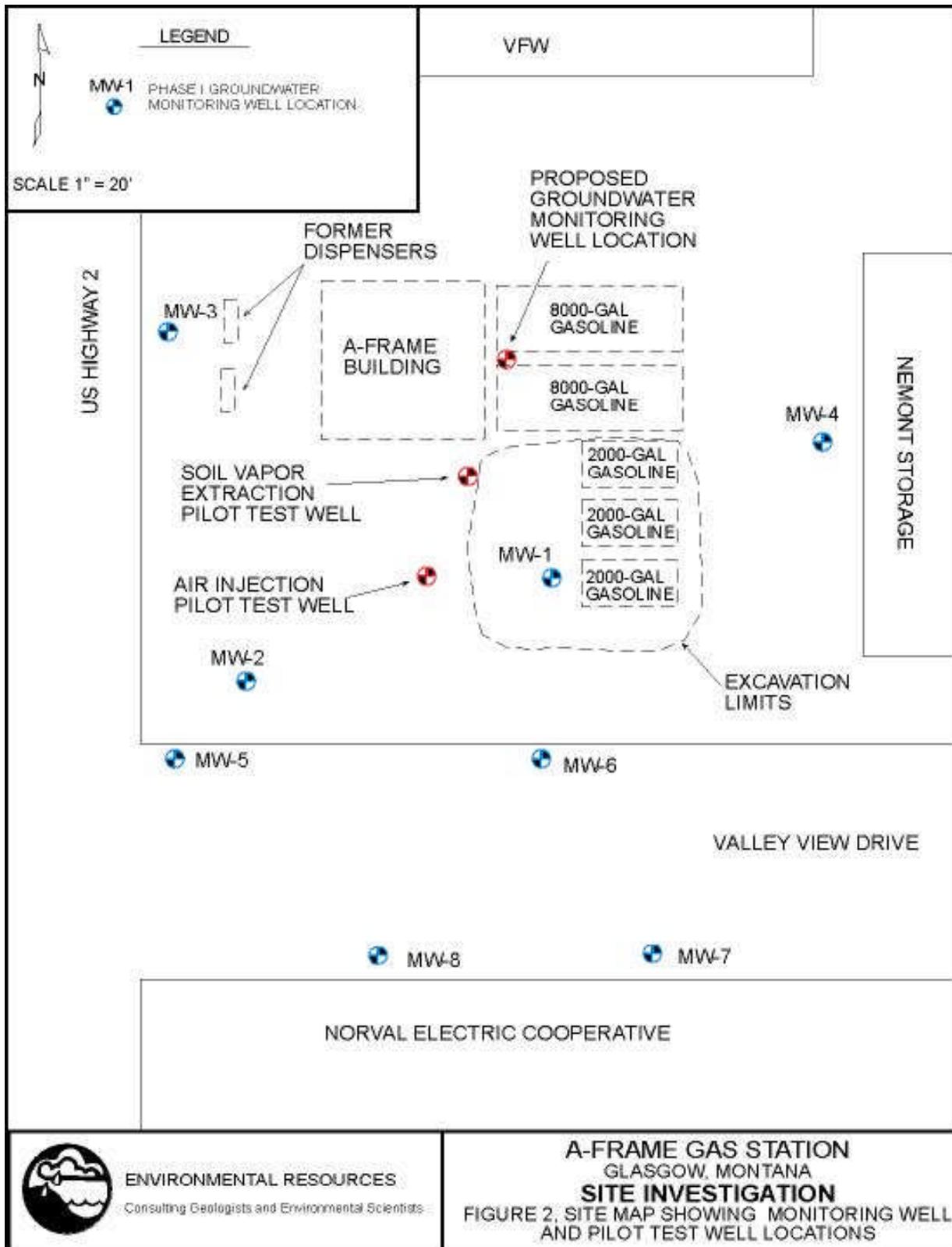
Well Development/Surveying

Each well will be developed for a minimum of one hour using a submersible pump until at least ten well volumes of groundwater are removed and no further improvements in water clarity are noted. Static water levels will be measured in all of the newly installed monitoring wells following a 24 hour equilibration period after development. Water level measurements will be obtained using a Keck ET-89 electronic water level indicator.

All newly installed and existing monitoring wells will be surveyed for elevation within ± 0.01 feet by a Montana Registered Land Surveyor and referenced to a local USGS benchmark.

Material Sampling

Drill cores will be logged for lithology, texture, color, moisture and volatile petroleum content. All soil samples will be visually classified for texture using the Unified Soil Classification System (USCS) according to ASTM-D-2488. Soil samples from two foot intervals and from obvious areas of petroleum discoloration will be analyzed for volatile petroleum hydrocarbons using a Photovac 2020 photo ionization detector (PID) with a standard heated jar headspace method. One soil sample corresponding to the interval that exhibits the highest headspace reading and/or one sample from the air-water interface will be analyzed for VPH at Alpine Analytical in Helena, Montana.



Remediation Well Installation

One air injection well and one soil vapor extraction well will be installed at the locations shown on Figure 2 using a hollow-stem auger drilling rig.

The air injection well will be completed at 30 feet below ground surface with one foot of two-inch diameter 0.020" slotted Schedule 40 PVC screen and 29 feet of blank casing. The soil vapor extraction well will be completed at 22 feet below ground surface with ten feet of four-inch diameter 0.020" slotted Schedule 40 PVC screen and 12 feet of blank casing.

The bentonite seals in both of the pilot test wells will be allowed to hydrate for at least five days prior to operation of the pilot test.

SVE/AI Pilot Testing

Service piping will be connected to the pilot test wells aboveground. The pilot test will be operated for a total period of one week. During the initial SVE operation, negative pressure will be measured in monitoring wells MW-1, MW-2 and MW-3 using a set of magnehelic gauges. Volatile petroleum hydrocarbon production will be measured using a Photovac 2020 photo ionization detector (PID). Airflow will be measured using a TSI handheld air velocity meter. Data collection will be conducted every hour for the first eight hours, then daily for three days and at the end of the week testing period.

If, after the SVE pilot test is considered successful, the AI component will be activated. Volatile petroleum hydrocarbon production will be measured in the system effluent and dissolved oxygen content will be measured in the surrounding monitoring wells. Data collection will be conducted every hour for the first eight hours and then daily for three days.

Data Collection

Groundwater samples will be collected from monitoring wells MW-1-9 prior to conducting the pilot testing and again 30 days following completion of the pilot testing. All of the well covers will be opened and the locking compression caps will be removed upon arrival at the project site. The wells will be allowed to equilibrate to the atmosphere for at least 30 minutes prior to measuring static water levels. Following the equilibration period, a thoroughly decontaminated electronic water level indicator will be used to measure the static water level in each well casing. The water level indicator tip will be scrubbed in an Alconox or similar wash solution and triple rinsed with de-ionized water prior to and following each measurement. All of the depth to water measurements will be collected from a reference point used to determine the casing elevation for each well.

Groundwater Sample Collection and Analysis

Following collection of all of the static water level measurements, groundwater sample purging will commence using a low flow submersible pump. Purge water from each monitoring well will be constantly monitored for ORP, pH, conductivity, temperature and dissolved oxygen content using Hanna Instruments field meters. Groundwater sample collection will begin when the all or the majority of the indicator parameter values stabilize and at least three well casing volumes of groundwater have been removed.

Groundwater samples will be analyzed for VPH, for 1,2 ethylene dibromide (EDB) using EPA Method 8011 and for Intrinsic Biodegradation Indicators (IBIs). Groundwater samples will be properly preserved and placed on ice while awaiting shipment to the analytical laboratory. Sample shipment will occur through Fed Ex originating from the Bozeman, Montana. All of the collected groundwater samples will be analyzed at Alpine Analytical in Helena, Montana.

Reporting

The Release Closure Plan (RCP) will be updated and included in a Standardized Abbreviated Generic Applications Report (AR-07).

Investigative Methods

Methods practiced during this investigation will follow generally accepted practices of similar consulting firms in the same geographical area. Quality Assurance/ Quality Control methods will be employed throughout all phases of this investigation to ensure meaningful and reproducible results and data.

Health and Safety

Health and safety issues will be addressed throughout this investigation to prevent exposure of site workers and other onsite personnel to potentially hazardous situations and chemical compounds. Several physical hazards will inherently be present throughout the field investigation while heavy equipment is being utilized for soil borings and monitoring well installation. Site specific health and safety precautions and information will be contained in a Health and Safety Plan which will remain onsite during all field activities.

Investigation Derived Waste

Drill cuttings, excess sample materials, drilling fluids, and water removed from a well during installation, development, and aquifer testing and all other investigation derived wastes will be disposed of according to all applicable local, state and federal laws.

Project Costs

Task 1-Well Installation

Project management	4.0 hrs @ \$134/hr	\$536.00
AC-07 CAP preparation	10.0 hrs @ \$134/hr	1340.00
Drillhole logging	20.0 hrs @ \$118/hr	2360.00
PID rental	2 days @ \$90/day	180.00
Laboratory analysis	2 VPH soil @ \$135 ea.	270.00
Sample handling fee	2 samples @ \$10 ea.	20.00
Mobilization, RT from Bozeman	13.0 hrs @ \$118/hr	1534.00
Mileage, 4WD	720 miles @ \$0.63/mile	453.60
Per Diem	4 days @ \$30.50/day	122.00
Lodging	3 nights @ \$120/night	360.00
Drilling services	Haztech bid	7232.00
Surveying	estimated	900.00
Well development	3.0 hrs @ \$118/hr	354.00

Task 1-Subtotal

\$15,661.60

Task 2-SVE/AS Pilot Testing

SVE/AS equipment installation	10.0 hrs @ \$118/hr	\$1180.00
Groundwater sample collection	9 samples @ \$186/sample	1674.00
Sampling fee	9 samples @ \$10/sample	90.00
System monitoring, data collection	20.0 hrs @ \$118/hr	2360.00
PID rental	2 weeks @ \$360/week	720.00
Mobilization, RT from Bozeman	13.0 hrs @ \$118/hr	1534.00
Mileage, 4WD	720 miles @ \$0.63/mile	453.60
Per Diem	3 days @ \$30.50/day	91.50
Lodging	3 nights @ \$100/night	300.00
Pilot test remediation equipment	TSD estimate	22,230.31
TO15/APH air sample	1 sample @ \$325 ea	325.00
Magnehelic gauge rental	2 weeks @ \$192/week	384.00
Air flow meter rental	2 weeks @ \$192/week	384.00
Electrical services		2500.00
Plumbing services and supplies		500.00

Task 2 Subtotal

\$34,342.41

Task 3-Groundwater Monitoring

Groundwater sample collection	9 samples @ \$186/sample	\$1674.00
Sampling fee	9 samples @ \$10/sample	90.00
Mobilization, RT from Bozeman	13.0 hrs @ \$118/hr	1534.00
Mileage, 4WD	720 miles @ \$0.63/mile	453.60
Per Diem	2 days @ \$30.50/day	61.00
Lodging	1 night @ \$100/night	100.00

Task 3 Subtotal

\$3912.60

Task 4-Reporting

AR-07 Report prep	40.0 hrs @ \$134/hr	\$5360.00
Review	2.0 hrs @ \$150/hr	300.00
RCP update	2.0 hrs @ \$134/hr	268.00
Data validation	2.0 hrs @ \$134/hr	268.00

Task 4-Subtotal

\$6196.00

Pilot Test Work Plan
A-Frame Gas, Glasgow, MT
Facility ID No. 53-00630
Page 8

Project Total

\$60,832.61

Limitations

This work was performed in accordance with generally accepted practices of other consulting firms conducting similar studies. Environmental Resources, LLC observed that degree of care and skill generally exercised by other consultants under similar conditions. Our findings and conclusions must not be considered as scientific certainties, but as opinions based upon our professional judgment based upon the data gathered during the course of this investigation. Other than this, no warranty is implied or intended.

Submitted by
Environmental Resources, LLC

Robert H. Waller
Project Geologist

cc: DEQ-PTCS
MPTRCB

attachments: Drilling bids

HAZ TECH Drilling, Inc.



P.O. Box 30622
 2910 Hannon Road, Suite #6
 Billings, MT 59107
 Phone: 406-896-1164 or 800-359-1502
 Fax: 406-896-1462

Proposal

TO: Environmental Resource Management, Inc.
 ATTN: Bob Waller
 P.O. Box 5305
 Bozeman, MT 59717
 Ph-406-582-8491-Cell

DATE: 8/24/2019

PROJECT: Project 95-153
 Glasgow, MT

Description:

1-2" well to 30' with 20' of .020 screen, 1-2" well to 30' with 1' of .020 screen and 1- 2" well to 22' with 10' of .020 screen. All wells will have flush mount covers.

TERMS: Net 30 Days

	UNITS EST.	UNIT PRICE	AMOUNT EST.
	*****	*****	*****
Mob/ Demob, Per Mile	580	\$3.25	\$1,885.00
Support Truck, Per Day	3	\$150.00	\$450.00
Per diem, Per Crew Day	3	\$46.00	\$138.00
Lodging, Per Night, Estimated	2	\$250.00	\$500.00
Auger Drilling, Per Ft	82	\$20.00	\$1,640.00
2" Well Installation, Per Ft	82	\$29.50	\$2,419.00
8" X 12" Flush Mount Vaults, Each	2	\$100.00	\$200.00

ESTIMATED TOTAL: \$7,232.00

Notes:

- 1) Client is responsible to clear location of utilities.
- 2) Client is responsible for disposal of drill cuttings.
- 3) Client will be invoiced only the amounts used.
- 4) We assume that site is accessible by truck mount drill rig.

Proposal By: Paul Bray

Petroleum Tank Release Compensation Board

Soil Boring/Monitoring Well Installation Unit Cost Worksheet

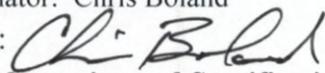
Contractor Information

Company Name: Boland Drilling

Address: 4701 N Star Blvd

City, State, Zip: Great Falls, MT 59405

Cost Estimator: Chris Boland

Signature: 

Phone: 406-761-1063

8/22/2019

Project Information and Specifications

Glasgow

Facility ID #

Release #

WP ID # 98-153

Type of Drilling Equipment

Hollow-Stem Augers

x

Air Rotary

Direct Push

Other (please specify)

Soil Boring

Number of Borings

3

Boring Diameter (inches)

8

Depth (per boring - ft)

22 - 30

Surface: Concrete Asphalt Barren

Soil Disposal: Onsite Stockpile Drums

Abandonment: Bentonite Soil Cuttings

Soil Sampling

Continuous Soil Sampling

Interval Soil Sampling (specify interval)

No Sampling

Cost Estimate Explanation:

(1) Mobilization/Demobilization: Includes all costs and mileage to transport equipment, materials, and personnel to and from the site location. More than one mobilization event of either the drilling rig or support vehicle will require justification and pre-approval by the DEQ-PRS and Board staffs. This item should be estimated on a per mile unit rate

(2) Soil Boring Installation: Includes all costs (labor, equipment, and materials) to drill, collect soil samples and abandon soil borings, as well as decontaminate equipment. Drilling costs should be estimated using a per foot unit rate. Unit cost should include handling of contaminated soil by stockpiling or placing in drums. Assume level "C" personal protective equipment.

(3) Monitoring Well Installation: Includes all costs (labor, equipment, and materials) to drill, collect soil samples, and complete monitoring well to specifications and according to Montana Well Drillers Board rules, as well as decontaminate equipment. Drilling costs should be estimated using a per foot unit rate. Unit cost should include handling of contaminated soil by stockpiling or placing in drums. Assume level "C" personal protective equipment.

(4) Drilling Standby: Drilling standby should be estimated on an hourly basis. Prior approval and justification for accumulating standby time is needed prior to billing.

(5) Well Development: Includes all costs (labor, equipment, and materials) to develop monitoring wells. This task should be estimated using a per well unit rate.

(6) Monitoring Well Abandonment: Includes all costs (labor, equipment, and materials) to properly abandon a well location according to the Montana Well Drillers Board rules. Abandonment costs should be estimated using a per well unit rate.

Monitoring Well Specifications

Number of Wells

3

Surface: Concrete Asphalt Barren

Depth (per well)

22 - 30

Estimated Depth to Groundwater (ft)

Boring Diameter (inches)

8

Casing Diameter and type (inches)

2" pvc

Surface Completion: Flush Mount Aboveground

Soil Boring/Monitoring Well Installation Unit Cost Worksheet

TASK		UNIT COST	NUMBER OF UNITS	TOTAL COST
Mobilization/Demobilization (1)				
Mobilization/Demobilization: Drilling Rig	\$	2.00 /mile	550	\$ 1,100.00
Mobilization/Demobilization: Support Vehicle	\$	1.50 /mile	550	\$ 825.00
Soil Boring Installation (2)				
Drilling (0'-50' range per boring)	\$	30.00 /foot	82	\$ 2,460.00
Drilling (50'-100' range per boring)		/foot		\$ -
Other (please specify) _____				\$ -
Monitoring Well Installation (3)				
Drilling (0'-50' range per well)	\$	30.00 /foot	82	\$ 2,460.00
Drilling (50'-100' range per well)		/foot		\$ -
Other (please specify) _____				\$ -
Drilling Standby (4)				
-prior approval needed	\$	125.00 /hour		\$ -
Well Development (5)				
Well Development	\$	150.00 /hour		\$ -
Monitoring Well Abandonment (6)				
Abandonment	\$	350.00 /well		\$ -
Lodging may only be paid at actual costs when documented by receipts.				
Per Diem				
Lodging: number of individuals =	2	\$ 110.00 /person per day	2	\$ 440.00
Food: number of individuals =	2	\$ 30.50 /person per day	2	\$ 122.00
(Breakfast 5.00, Lunch 6.00, Dinner 12.00)				
TOTAL PROJECT EXPENSE				\$ 7,407.00

D.O.T. Drums

\$95.00

Additional Conditions/Comments/Costs:

Drill 1- 20' and 2- 30' soil borings and construct 2" diameter wells at Glasgow site/project # 98-153

If you require assistance, call 406-841-5090.

Submit completed form to:

Petroleum Tank Release Compensation Board PO Box 200902, Helena MT 59620-0902