PIT
REMEDIATION
PLAN
AND
CLOSURE
REPORT

ENERGEN
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FEB 14 2000

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

January 31, 2000

Donna Williams
New Mexico Oil Conservation Division
District 1 Hobbs
1625 N. French Drive
Hobbs, NM 88241

33-34'

Re: **J. D. Guye #1**
Unit Letter H, Section 22, T11S, R33E
Lea County, NM

Dear Ms. Williams,

Enclosed please find a pit closure and remediation plan for the above referenced site submitted for approval by the NMOCD. This plan has been prepared by Whole Earth Environmental, Inc., who has performed remediation work for other companies in this geographic area. Our contact with Whole Earth has been Mike Griffin, its President.

If additional information is needed, please contact our Production Superintendent, Mr. Terry Lawler at (915) 687-1567.

Sincerely,

Jon M. McLennan
General Manager Permian Basin
Energen Resources Corporation
Midland, TX 79705

Energen Resources Corporation, an Energen Company 3300 North "A" Street, Building 4, Suite 100, Midland, Texas 79705

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FEB 14 2000

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

November 29, 1999

NMOCD District 1
1625 N. French Dr.
Hobbs, NM 88241
Attn.: Donna Williams

Re: Pit Closure and Remediation Plan
J. D. Guye #1
Unit Letter H, Sect. 22, T11S, R33E
Lea County, New Mexico

Ms. Donna Williams,

Energen Resources received Billy Prichard's letter of October 14, requesting that we prepare a pit closure and remediation plan for the above referenced lease.

We have contacted Whole Earth Environmental, Inc. out of Houston, Texas. We understand from Mr. Mike Griffin, President of Whole Earth Environmental, that they have remediated several pits in this area. They are in the process of gathering data from the site to prepare a formal Closure and Remediation Plan for this site.

Energen is planning to utilize Whole Earth Environmental to conduct the Closure and Remediation operations after the Plan is developed and approved. I will keep you apprised of Whole Earth's progress on the Plan. If you have questions or need additional information, I can be contacted at (915) 687-1155.

Very truly yours,

Mike McLennan

Mike McLennan
General Manager
Energen Resources Corporation

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RESOURCES

Tatum Pit Closure Project
J.D. Guye E-7332

RECEIVED

FEB 14 2000

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Whole Earth Environmental
19606 San Gabriel
Houston, Tx. 77084

Site Profile

Location
The site is situated approximately one mile north of Hwy. 380 approximately 17 miles west of Tatum, New Mexico. The geo coordinates are N33^{0} 21.207’ / W103^{0} 35.742’. The legal location is Section 22, Township 11S, Range 33E.

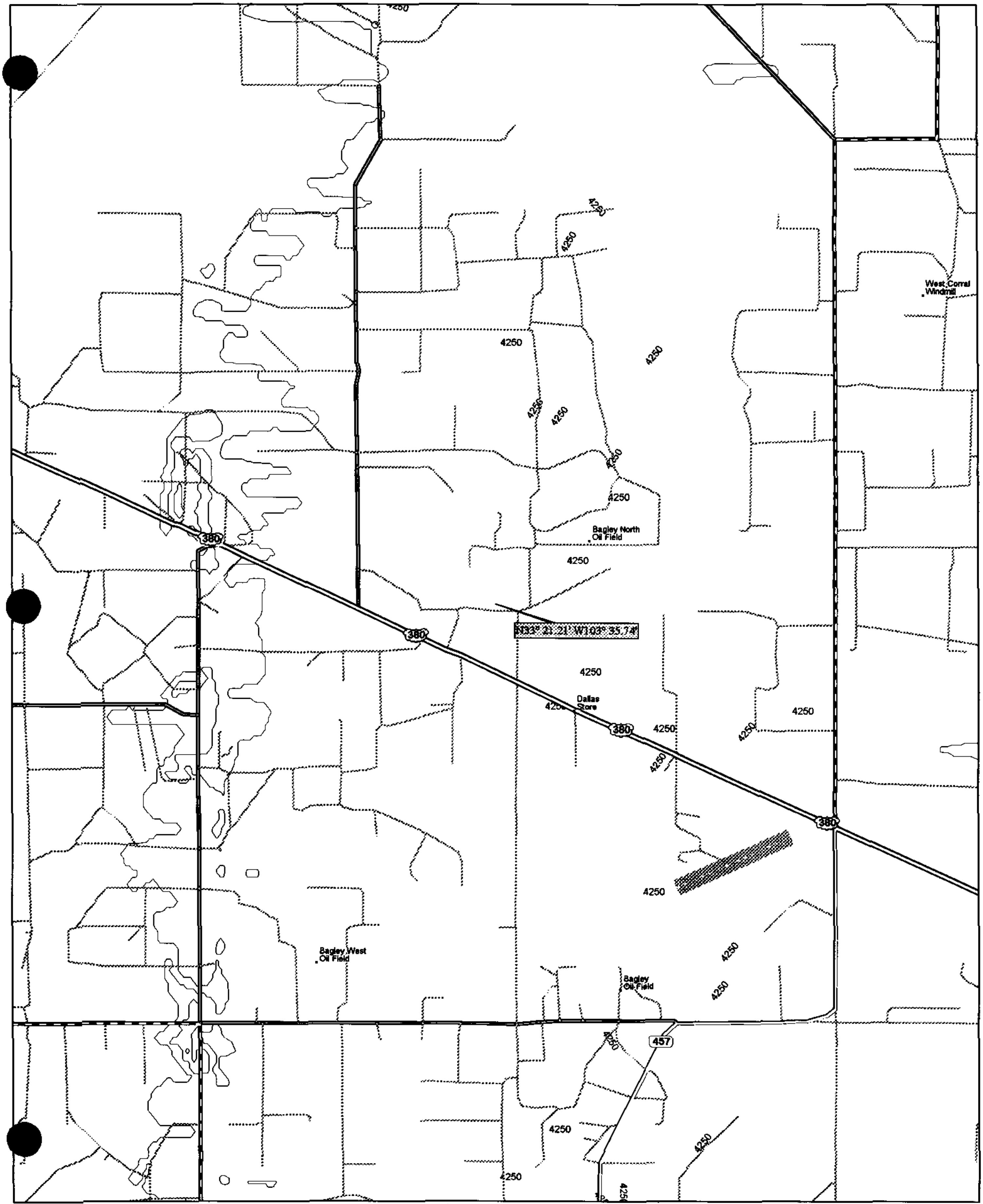
The site is accessible by a well maintained lease road.

Site History
The location has been through at least two acquisitions and lease records are somewhat spotty. Based on the apparent size of the stain area, traditional pumping practices within the area, and proximity to separation and storage equipment, we believe that the pit was used as an emergency overflow impoundment for the adjacent tanks. Often such impoundments were additionally used as a repository for tank bottoms though no direct evidence of such use is apparent.

Other such emergency overflow pits in the area were created by excavating a depression and using the excavated materials to erect the surrounding berms. Traditionally, they were closed by simply pushing the berm walls back into the depression. Over time, the hydrocarbons contained within the pit gradually seep to the surface and “weather-out” into their paraffinic and asphaltic fractions. The lighter fractions either naturally biodegrade or become volatilized into the atmosphere.

Land Use
The primary land usage is for the grazing of cattle. Oil and gas production is the dominant secondary land use. The land belongs to the New Mexico State Land Office.

Distance to Surface and Ground Water
There are no windmills, water pumps or surface waters within one mile of the site. The vertical distance to groundwater is estimated to be between 35-45’.

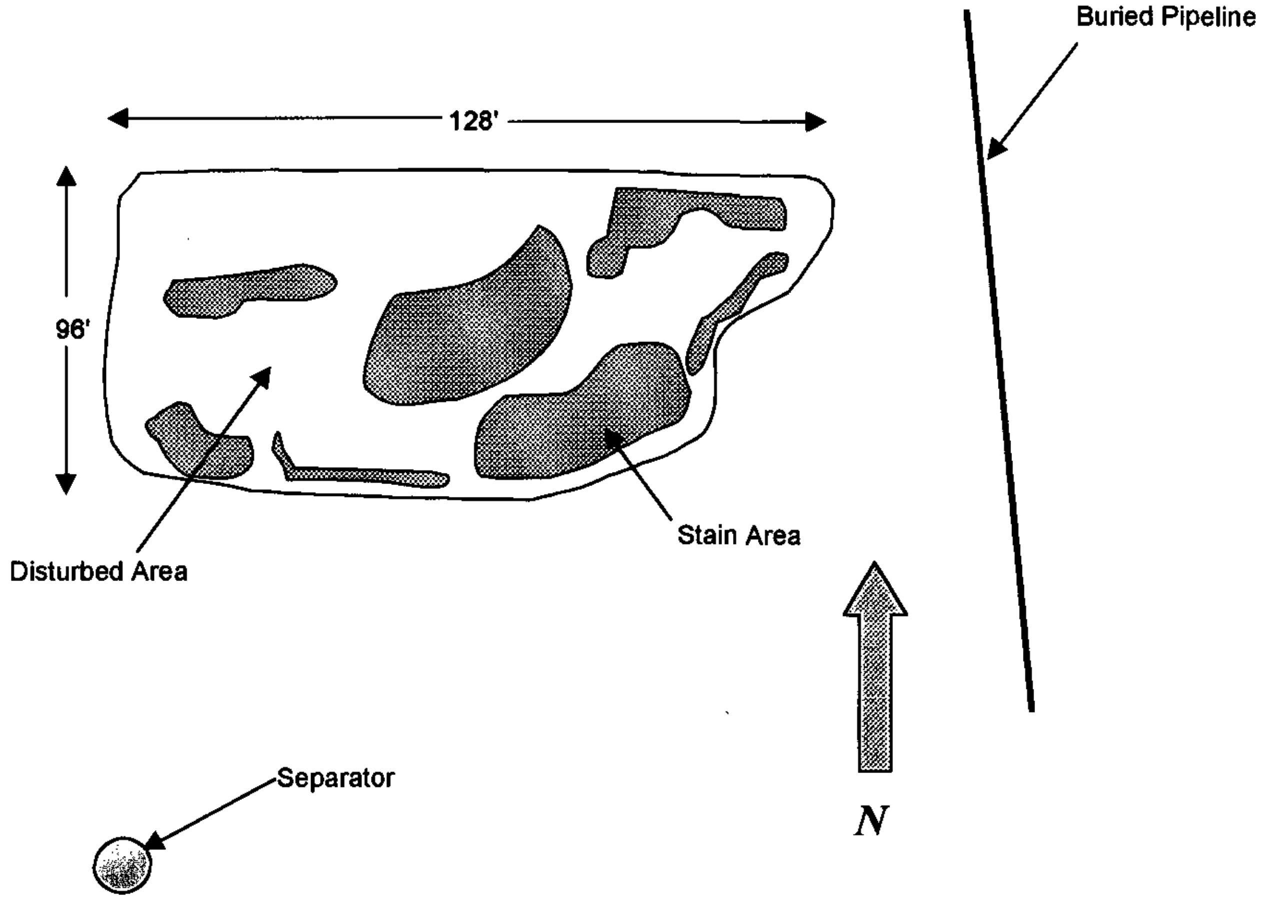


4000 ft

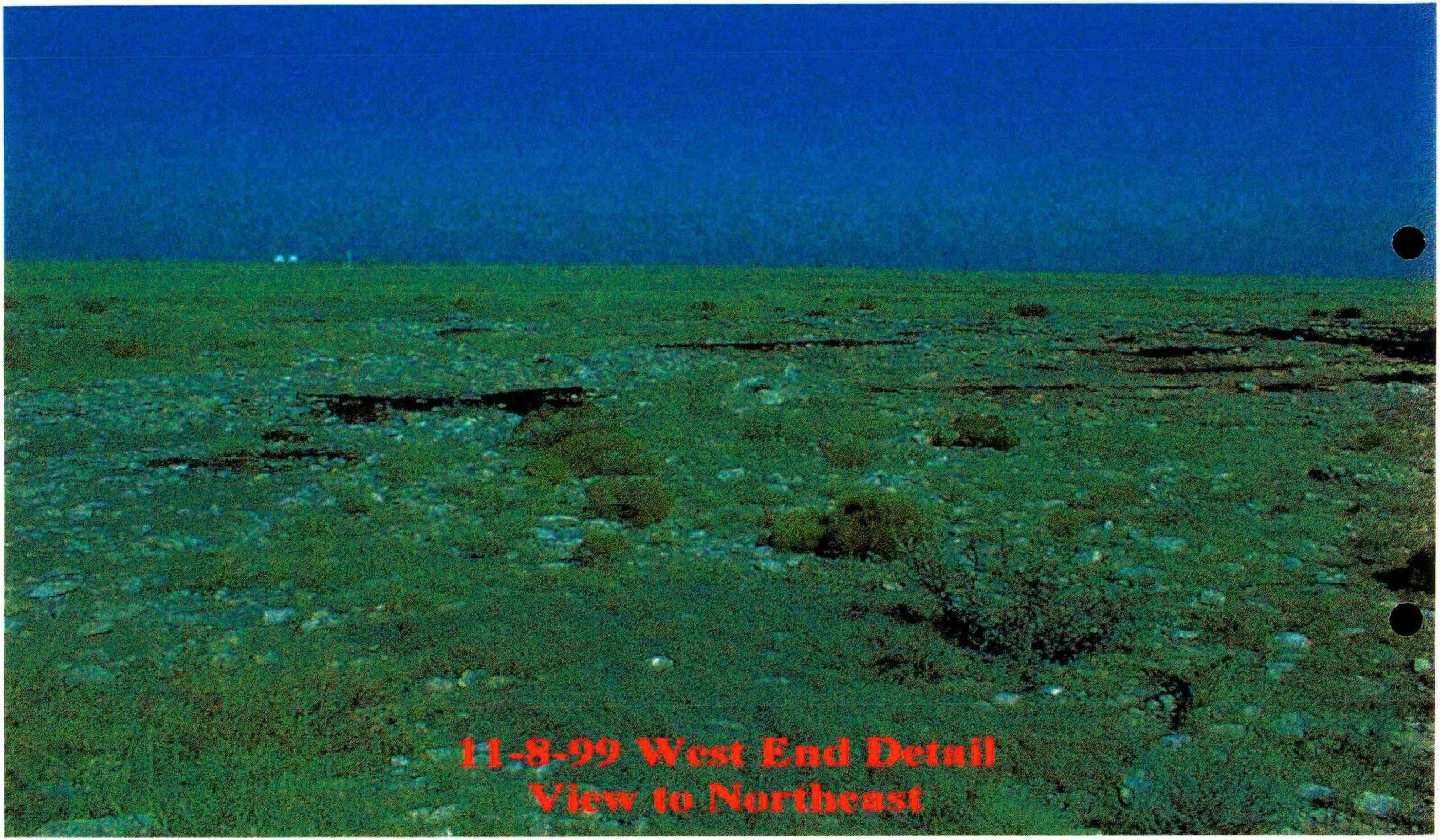
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 50,000 Detail: 12-0

ENERGEN RESOURCES

J.D. Guye E-7332
Emergency Upset Pit Schematic

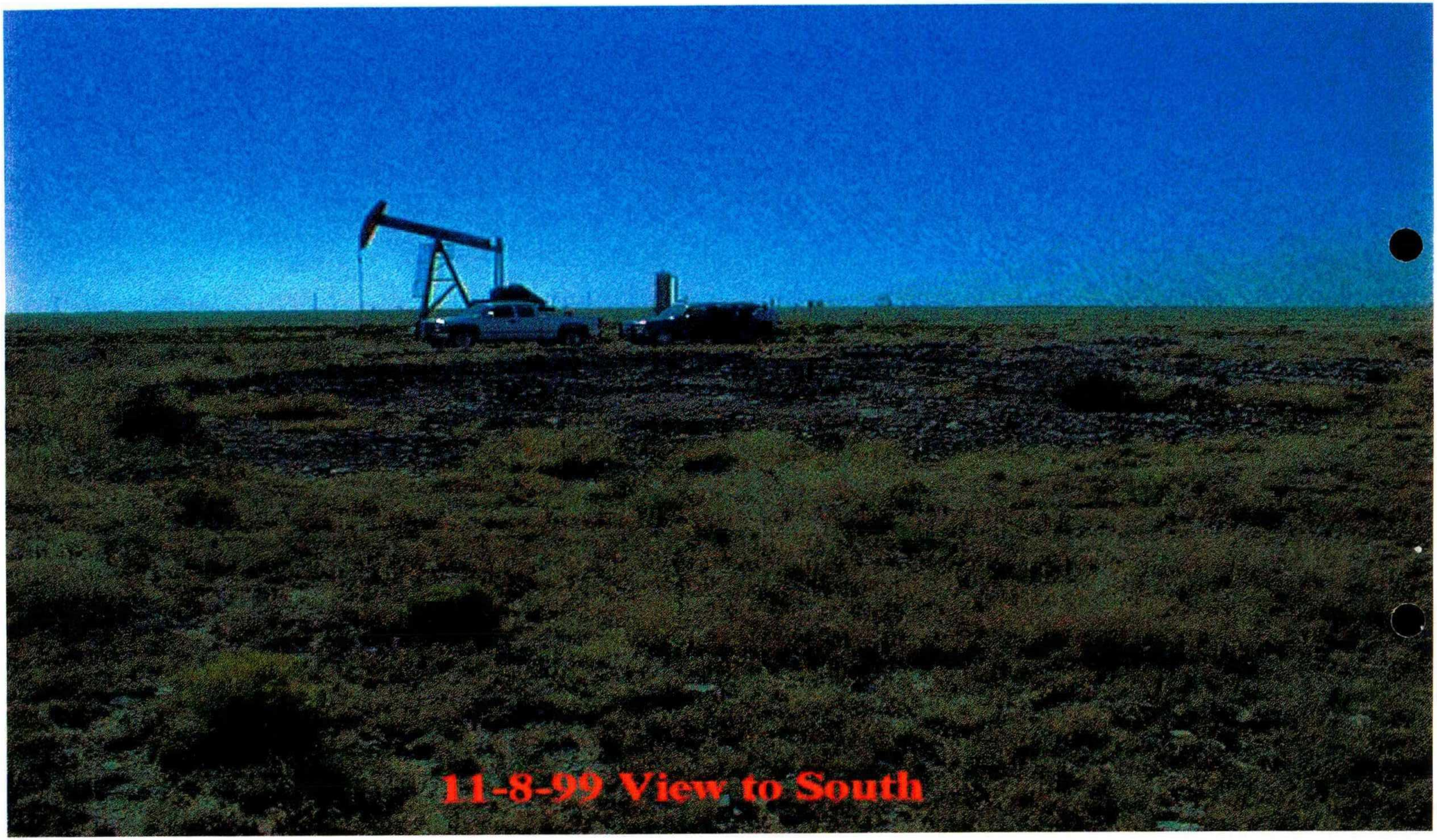


11-8-99 View to Northeast



11-8-99 West End Detail
View to Northeast

11-8-99 View to Southwest



11-8-99 View to South

Protocol

This section contains a copy of the remediation protocol we plan to employ on this project.

PR-27

Remediation Protocol
Energen Resources
J.D. Guye E-7332

1.0 Purpose

This protocol is to provide a detailed outline of the steps to be employed in the remediation of a spill area located west of Tatum, New Mexico.

2.0 Scope

This protocol is site specific for the Energen remediation project.

3.0 Preliminary

Prior to any field operations, Whole Earth Environmental shall conduct the following activities:

3.1 Client Review

3.1.1 Whole Earth shall meet with cognizant personnel within Energen to review this protocol and make any requested modifications or alterations.

3.1.2 Changes to this protocol will be documented and submitted for final review by Energen prior to the initiation of actual field work.

4.0 Safety

4.1 Prior to work on the site, Whole Earth shall obtain the location and phone numbers of the nearest emergency medical treatment facility. We will review all safety related issues with the appropriate Energen personnel, sub-contractors and exchange phone numbers.

4.2 A tailgate safety meeting shall be held and documented each day. All sub-contractors must attend and sign the daily log-in sheet.

4.3 Anyone allowed on to location must be wearing sleeved shirts, steel toed boots, and long pants. Each vehicle must be equipped with two way communication capabilities.

4.4 Prior to any excavation, New Mexico One Call will be notified. The One Call notification number will be included within the closure report. If lines are discovered within the area to be excavated they shall be marked with pin flags on either side of the line at maximum five foot intervals.

>100 ppm by Mike on 3-20-00

5.0 Remediation Procedure

5.1 All soils containing a TPH concentration >1,000 ppm; and all soils containing a benzene concentration>10ppm or a total BTEX concentration >50ppm will be excavated and placed immediately adjacent to the excavation. The side walls and bottom of the excavation will be field tested for TPH and BTEX concentrations in accordance with WEQP-06 and WEQP-19.

level Should be 100 TPH ?

5.2 The Hobbs branch of the OCD will be notified to witness the final confirmation sampling of the side walls and bottom of the excavation. Samples will be collected in accordance with WEQP-77 and analyzed for TPH and BTEX.

5.3 The excavated soils will be mixed and blended with sub-strait materials to achieve a maximum concentration of 5,000 ppm TPH, 10 ppm benzene and 50 ppm total BTEX concentration. A confirmation composite sample will be collected and analyzed in accordance with 5.2 of this protocol.

6.0 Modeling

6.1 The bottom hole benzene concentrations and the depth to ground water will be determined and included within a VADSAT contaminant migration model. The modeled results should project that no benzene concentrations exceeding NMWQCC standards of 10 ppb shall be allowed to impact the ground water within a 100 year model span.

6.2 The modeled results will be submitted to the Sante Fe office of the NMOCD prior to any materials being re-deposited within the excavation.

7.0 Liner

7.1 Upon approval by the NMOCD, Whole Earth will install a 20 mil polyethylene liner within the excavation. The liner will extend up the side walls to a point within 5' of the ground surface. The excavated soils will be replaced within the liner at concentrations not to exceed those described in paragraph 5.2 of this protocol.

7.2 An additional polyethylene top cover will be erected atop the excavation and overlapped with the bowl liner to insure that no surface water will infiltrate the main plume area. The top liner should be slightly domed to accommodate subsidence and to direct a drainage path away from the main plume. The top of the liner shall be at least 3' below ground level.

8.0 Groundwater Investigation

8.1 A 2" investigation well will be drilled at the southeast corner of the site. If free product is encountered within the well bore, the well will be reamed to a four inch diameter and developed and cased as a recovery well. If no free product is found, the well bore will be temporarily cased 2'' and used as a monitor well. If the laboratory analysis of the water indicates that BTEX concentrations are within NMWQCC standards, the well will be plugged and grouted to surface. If the BTEX concentrations within the well bore are in excess of NMWQCC standards, an additional delineation well will be drilled at a minimum distance of 300' down gradient from the initial monitor well. Well construction will be in accordance with NMOCD instructions.

8.2 A windmill will be erected over the recovery well. The windmill will be equipped with a "down hole" oil-water separator. The free phase product will be pumped to surface and directed to an above ground storage tank for subsequent removal for re-processing. The storage tank will be netted to insure that it poses no risk to wildlife.

9.0 Monitoring

9.1 The investigation well will be initially sampled for the presence and concentrations of BTEX and chlorides. Sample collection will be in accordance with WEQP-76. If this sampling indicates concentrations in excess of NMWQCC standards, the well will be additionally sampled for PAH's, major cation and anions, and RCRA 8 metals.

9.2 Both wells will be sampled on a quarterly basis for the presence and concentration of BTEX. After four consecutive quarters in which the BTEX concentrations within the source and monitor wells show BTEX concentrations in accordance with NMWQCC standards, the wells will be re-analyzed for RCRA 8 metals, criteria PAH's, chlorides and major cations and anions. If the test results show concentrations within acceptable NMWQCC standards, Energen will request final site closure. Once approved, the recovery and monitor wells will be grouted to surface and the site re-contoured to match background topography.

10.0 Closure Report

10.1 At the conclusion of the project, Whole Earth shall prepare a closure report which contains the following minimum information:

- Photographs of the location prior to remediation
- Photographs of the location at time of final closure
- Plat map showing sampling locations
- All pre-closure contaminant concentrations
- Contaminant concentrations at the conclusion of the project
- Copies of this protocol and all testing procedures
- Copies of each days tailgate safety meeting
- Copies of daily calibration logs for each instrument
- Independent split sample laboratory analyses
- Copies of the VADSAT contaminate migration model
- MSDS sheets of the liner
- Construction details of the monitor and recovery wells
- A hydrogeological survey map indicating the depth and direction of the groundwater and locations of the recovery and monitor wells

Procedures

This section contains copies of the detailed sample collection and testing procedures we plan to employ on this project.

QP-06 Rev. C

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Conducting Field TPH Analysis

Completed By: Approved By: Effective Date: 02/15/97

1.0 Purpose

To define the procedure to be used in conducting total percentage hydrocarbon testing in accordance with EPA Method 418.1 (modified) using the "MEGA" TPH Analyzer.

2.0 Scope

This procedure is to be used for field testing and on site remediation information.

3.0 Procedure

3.1 The G.A.C. "MEGA" TPH analyzer is an instrument that measures concentrations of aliphatic hydrocarbons by means of infra-red spectrometry. It is manufactured to our specifications and can accurately measure concentrations from two parts per million through 100,000 parts per million. The unit is factory calibrated however minor calibration adjustments may be made in the field. Quality Procedure 25 defines the field calibration methods to be employed.

3.2 Prior to taking the machine into the field, insert a 500 ppm and 5,000 ppm calibration standard into the sample port of the machine. Zero out the Range dial until the instrument records the exact standard reading.

3.3 Once in the field, insert a large and small cuvette filled with clean Freon 113 into the sample port of the machine. Use the range dial to zero in the reading. If the machine does not zero, do not attempt to adjust the span dial. Immediately implement Quality Procedure 25 .

3.4 Place a 100 g. weight standard on the field scale to insure accuracy. Zero out the scale as necessary.

3.5 Tare a clean 100 ml. sample vial with the Teflon cap removed. Add 10 g. (+/- .01 g), of sample soil into the vial taking care to remove rocks or vegetable matter from the sample to be tested. If the sample is wet, add up to 5 g. silica gel or anhydrous sodium sulfate to the sample after weighing.

3.6 Dispense 10 ml. Freon 113 into the sample vial.

3.7 Cap the vial and shake for five minutes.

3.8 Carefully decant the liquid contents of the vial into a filter/desiccant cartridge and affix the cartridge cap. Recap the sample vial and set aside.

3.9 Insert the metal tip of the pressure syringe into the cap opening and slowly pressurize. **WARNING: APPLY ONLY ENOUGH PRESSURE ON THE SYRINGE TO EFFECT FLOW THROUGH THE FILTERS. TOO MUCH PRESSURE MAY CAUSE THE CAP TO SEPARATE FROM THE BODY OF THE CARTRIDGE.** Once flow is established through the cartridge direct the flow into the 5 cm. cuvette until the cuvette is full. Reverse the pressure on the syringe and remove the syringe tip from the cartridge cap. Set the cartridge aside in vertical position.

3.10 The cuvette has two clear and two frosted sides. Hold the cuvette by the frosted sides and carefully insert into the sample port of the machine. Read the right hand digital read-out of the instrument. If the reading is less than 1,000 ppm. the results shall be recorded in the field Soil Analysis Report. If the result is higher than 1,000 ppm, continue with the dilution procedure.

4.0 Dilution Procedure

4.1 When initial readings are greater than 1,000 ppm using the 5 cm. cuvette, pour the contents of the 5 cm. cuvette into a 1 cm. cuvette. Insert the 1. cm cuvette into the metal holder and insert into the test port of the instrument.

4.1 Read the left hand digital read-out of the machine. If the results are less than 10,000 ppm, record the results into the field Soil Analysis Report. If greater than 10,000 ppm, continue the dilution process. **Concentrations >10,000 ppm are to be used for field screen purposes only.**

4.2 Pour the contents of the small cuvette into a graduated glass pipette. Add 10 ml. pure Freon 113 into the pipette. Shake the contents and pour into the 1cm. cuvette. Repeat step 4.2. adding two zeros to the end of the displayed number. If the reported result is greater than 100,000 ppm. the accuracy of further readings through additional dilutions is extremely questionable. **Do not use for reporting purposes.**

4.4 **Pour all sample Freon into the recycling container.**

5.0 Split Samples

5.1 Each tenth test sample shall be a split sample. Decant approximately one half of the extraction solvent through a filter cartridge and insert into the instrument to obtain a concentration reading. Clean and rinse the cuvette and decant the remainder of the fluid to obtain a second concentration reading from the same sample. If the second reading varies by more than 1% from the original, it will be necessary to completely recalibrate the instrument.

QP-19

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Sampling and Testing Protocol
BTEX Speciation in Soil

Completed By:
Approved By:
Effective Date: / /

1.0 Purpose

This procedure is to be used to determine the concentrations of Benzene, Toluene, Ethyl-Benzene and Xylene (BTEX) in soils.

2.0 Scope

This procedure is to be used as the standard field measurement for soil BTEX concentrations. It is not to be used as a substitute for full spectrographic speciation of organic compounds.

3.0 Procedure

3.1 Sample Collection and Preparation

3.1.1 Collect at least 500 g. of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample of soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).

3.1.2 The soil sample(s) shall be immediately inserted into a one quart or larger polyethylene freezer bag and sealed. When sealed, the bag should contain a nearly equal space between the soil sample and trapped air.

3.1.3 The sealed samples shall be allowed to set for a minimum of five minutes at a minimum temperature of 70^0F.

3.1.4 The sealed sample bag should be massaged to break up any clods, and to provide the soil sample with as much exposed surface area as practically possible.

3.2 Sampling Procedure

3.2.1 The instrument to be used in conducting VOC concentration testing shall be a Photovac Ion-chromatograph with BTEX Module. Prior to use the instrument shall be zeroed out in accordance with QP-55.

3.2.2 Carefully open one end of the collection bag and insert the probe tip into the bag taking care that the probe tip not touch the soil sample or the side walls of the bag. If VOC analysis was conducted on the sample prior to BTEX analysis, care should be taken to insure that a sufficient air volume exists in the bag to provide accurate results. **If the available air space within the bag is insufficient to run a full analysis, the sample shall be discarded.**

3.2.3 Set the instrument to retain the highest result reading value. Record the reading onto the Field Analytical Report Form and additionally enter the location code into the instrument data logger.

4.0 After testing, the soil samples shall be returned to the sampling location, and the bags collected for off-site disposal. **IN NO CASE SHALL THE SAME BAG BE USED TWICE. EACH SAMPLE CONTAINER MUST BE DISCARDED AFTER EACH USE.**

QP-25

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Instrument Calibration and Quality Assurance Analysis for General Analysis "MEGA" TPH Analyzer

Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure outlines the methods to be employed in calibrating the GAC MEGA TPH analyzer and for determining and reporting of accuracy curves.

2.0 Scope

This procedure shall be followed each day that the instrument is used.

3.0 Procedure

3.1 Turn the instrument on and allow to warm up with no cuvette in the receptacle. The instrument will take between five and ten minutes to come to equilibrium as can be determined by the concentration display readings moving a maximum of 5 ppm on the low scale. If the instrument continues to display erratic readings greater than 5 ppm, remove the cover and check both the mirrors and chopper to insure cleanliness.

3.2 All TPH standards shall be purchased form Environmental Resources Corporation and as a condition of their manufacture subject to independent certification by third party laboratories. Each standard is received with a calibration certificate.

3.3 Insert the low range (100 ppm) calibration standard into the receiving port and note the result on the right hand digital display. If the displayed reading is less than 98 ppm or greater than 102 ppm, remove the circuit board cover panel and zero out the instrument in accordance with QP-26.

3.4 Repeat the process with the mid range (500 ppm) calibration standard. If the displayed reading is less than 490 ppm or greater than 510 ppm zero out the span as described in QP-26.

3.5 Repeat the process again with the 1,000 and 5,000 ppm calibration standards.

3.6 Pour clean Freon 113 into a filter cartridge and extract into 10 ml cuvette. Insert the cuvette into the receiving port and zero out the instrument reading using the far right adjustment knob on the instrument. Repeat using the 1 ml cuvette and the left hand zero dial.

4.0 Determining & Reporting Instrument Accuracy

4.1 After making the fine adjustment with the zero dials reinsert each calibration standard into the instrument and note the concentration values. ***If <u>any</u> concentration value exceeds 2% of the standard set point, repeat all steps in section 3.0 of this Procedure.*** Note the actual concentration values displayed by the instrument after each calibration standard.

4.2 The four calibration standards shall be used in reporting span deviation as follows:

Standards Range			
100 ppm	**500 ppm**	**1,000 ppm**	**5,000 ppm**
0-250 ppm	251-750 ppm	751-2,500 ppm	2,501-10,000 ppm

4.3 Divide the actual instrument reading value of each calibration sample by the concentration shown on the standard (e.g.. 501 ppm instrument reading / 500 ppm standard = 1.002%). These readings shall be reported for each test performed.

5.0 Re-calibration

5.1 If any sample exceeds the concentration of 1,000 ppm on the 10 ml cuvette or 10,000 ppm on the 1 ml cuvette, the cuvette must be thoroughly rinsed with clean Freon and the instrument re-zeroed in accordance with 3.6 of this procedure.

QP-55

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Instrument Calibration and Quality Assurance Analysis for Photovac Gas Chromatograph

Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure outlines the methods to be employed in calibrating the Photovac analyzer in the BTEX mode and for determining and reporting of accuracy curves.

2.0 Scope

This procedure shall be followed each day that the instrument is used.

3.0 Procedure

Start-up

3.1 Turn the instrument on and press the Battery button. A battery status report will appear on the screen. If the charge level is less than 8.0, either charge the battery or insert a fresh battery pack.

3.2 Open carrier gas valve on right side of instrument. The instrument is now tuning the lamp. If any "boot" problems occur during warm-up, the "chck" symbol will appear on the screen. Pressing TUTOR will prompt the instrument to provide details. The instrument will not progress beyond the start-up mode until all prompts are cleared.

3.3 The next screen display will be "purj" and will last approximately ten minutes. The instrument is purging the column.

Calibrate

3.4 Connect the regulator to cylinder of calibration gas. Connect calibration adapter and tee assembly to both the regulator and instrument. **DO NOT FORCE ANY CONNECTION!**

3.5 Inspect the open end of the tee vent to insure unobstructed flow.

3.6 Enter CAL on the key pad. The instrument will query "benzene?". Following the prompts and using the key pad, set the concentrations to those defined on the calibration gas bottle. Follow the same procedure for toluene, ethyl-benzene and xylene. After each compound, the instrument will read that the next analysis will be a calibration.

3.7 Press ENTER on key pad. The instrument will calibrate itself for the concentrations specified.

Confirmation Sample

3.8 After each calibration, run the calibration gas through the instrument once again. The display readings should be **exactly** those of the concentrations displayed on the calibration gas bottle. **If they are not, the instrument needs factory calibration; do not use.**

4.0 Re-calibration

4.1 The instrument is designed with software that prompts you to recalibrate each day, each thirty minutes of use, and after running a sample with high concentrations of one or more of the detected compounds.

5.0 Reporting Instrument Accuracy

5.1 The instrument accuracy as certified by the factory is 15% within one decade of instrument set point. Lower detection limits are 0.1 ppm for benzene and 1.0 ppm for toluene, ethylbenzene and xylene.

5.2 These standards and detection limits must be shown on all reports in which the instrument is used.

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Obtaining Soil Samples for Transportation to a Laboratory

Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure outlines the methods to be employed when obtaining soil samples to be taken to a laboratory for analysis.

2.0 Scope

This procedure is to be used when collecting soil samples intended for ultimate transfer to a testing laboratory.

3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the soil. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 If collecting TPH, BTEX, RCRA 8 metals, cation / anions or O&G, the sample jar may be a clear 4 oz. container with Teflon lid. If collecting PAH's, use an amber 4 oz. container with Teflon lid.

4.0 Chain of Custody

4.1 Prepare a Sample Plan. The plan will list the number, location and designation of each planned sample and the individual tests to be performed on the sample. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.

4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.

4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

5.0 Sampling Procedure

5.1 Go to the sampling point with the sample container. If not analyzing for ions or metals, use a trowel to obtain the soil. Do not touch the soil with your bare hands. Use new latex gloves with each sample to help minimize any cross-contamination.

5.2 Pack the soil tightly into the container leaving the top slightly domed. Screw the lid down tightly. Enter the time of collection onto the sample collection jar label.

5.3 Place the sample directly on ice for transport to the laboratory.

5.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

6.0 Documentation

6.1 The testing laboratory shall provide the following minimum information:

A. Client, Project and sample name.
B. Signed copy of the original Chain of Custody Form including data on the time the sample was received by the lab.
C. Results of the requested analyses
D. Test Methods employed
E. Quality Control methods and results

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Obtaining Water Samples (Cased Wells) Using One Liter Bailer

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Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure outlines the methods to be employed in obtaining water samples from cased monitoring wells.

2.0 Scope

This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the water. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 The following table shall be used to select the appropriate sampling container, preservative method and holding times for the various elements and compounds to be analyzed.

Compound to be Analyzed	Sample Container Size	Sample Container Description	Cap Requirements	Preservative	Maximum Hold Time
BTEX	40 ml.	VOA Container	Teflon Lined	HCl	7 days
TPH	1 liter	clear glass	Teflon Lined	HCl	28 days
PAH	1 liter	clear glass	Teflon Lined	Ice	7 days
Cation / Anion	1 liter	clear glass	Teflon Lined	None	48 Hrs.
Metals	1 liter	HD polyethylene	Any Plastic	Ice / HNO_3	28 Days
TDS	300 ml.	clear glass	Any Plastic	Ice	7 Days

4.0 Chain of Custody

4.1 Prepare a Sample Plan. The plan will list the well identification and the individual tests to be performed at that location. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.

4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.

4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

5.0 Bailing Procedure

5.1 Identify the well from the site schematics. Place pre-labeled jar(s) next to the well. Remove the bolts from the well cover and place the cover with the bolts nearby. Remove the plastic cap from the well bore by first lifting the metal lever and then unscrewing the entire assembly.

5.2 The well may be equipped with an individual 1 liter bailing tube. If so, use the tube to bail a volume of water from the well bore equal to 10 liters for each 5' of well bore in the water table. (This assumes a 2" dia. well bore).

5.3 Take care to insure that the bailing device and string do not become cross-contaminated. A clean pair of rubber gloves should be used when handling either the retrieval string or bailer. The retrieval string should not be allowed to come into contact with the ground.

6.0 Sampling Procedure

6.1 Once the well has been bailed in accordance with 5.2 of this procedure, a sample may be decanted into the appropriate sample collection jar directly from the bailer. The collection jar should be filled to the brim. Once the jar is sealed, turn the jar over to detect any bubbles that may be present. Add additional water to remove all bubbles from the sample container.

6.2 Note the time of collection on the sample collection jar with a fine Sharpie.

6.3 Place the sample directly on ice for transport to the laboratory. The preceding table shows the maximum hold times between collection and testing for the various analyses.

6.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

7.0 Documentation

7.1 The testing laboratory shall provide the following minimum information:

A. Client, Project and sample name.
B. Signed copy of the original Chain of Custody Form including data on the time the sample was received by the lab.
C. Results of the requested analyses
D. Test Methods employed
E. Quality Control methods and results