

REPORTS





Tipperary Corporation Tatum Pit Closure Project Vera # 1 Closure Report

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ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION



Whole Earth Environmental 19606 San Gabriel Houston, Tx. 77084





633 Seventeenth Street Suite 1550 Denver, Colorado 80202

November 2, 1999

CERTIFIED MAIL

Mr. William C. Olson New Mexico Oil Conservation Division 2040 South Pacheco Santa Fe, NM 87505

RE: Request for Final Pit Closure Vera #1 Sec 32E-T11N-R33E Tatum Pit Closure Project Lea County, NM

Dear Mr. Olson:

Please find enclosed additional data requested in your letter of August 6, 1999 which should allow you to complete your review of our request for final closure of the subject pit. The data included in the attached report is summarized below:

- Summary of pit closure including the OCD Pit Remediation Report, topographic base map, well site map with surveyed locations of pit and wells, water table elevations including a calculation of hydraulic gradient.
- Before and after photographs of pit closure.
- Pit closure protocol and procedures used.
- Results of all soil and water samples taken.
- Boring log of monitor well.
- Disposal manifests of all waste products.
- Vadsat modeling results.
- Liner material information.

We respectfully request final closure of the subject pit project. If you have any questions, please call me at (303) 293-9379.

Very truly yours,

Lawy G Lugano

Larry G. Sugano Vice President - Engineering

cc: NMOCD Hobbs Office Enclosures



Vera # 1 Closure Summary

Legal Description

State Lease K3985 - Unit "E" T11S-R33E-Sec.32 1,980' FNL - 810' FWL

Pit Description

Vera # 1 is described as an unlined emergency upset pit that was used in conjunction with on-site separation and storage. The pit lies approximately 120 feet north of the separator within a raised berm approximately 2' in height. The actual pit dimensions were 50' X 50' x 3' in depth. The pit was covered in bird netting and surrounded by a four strand barbed wire fence.

There was a minor amount of free product within the pit consisting of heavily weathered asphaltic fractions however there is no evidence of surface staining surrounding the berm. There are no signs of stressed vegetation surrounding the pit.

Pit History

Vera # 1was logged on October 15, 1968 and completed shortly thereafter. Burro Pipeline was permitted in October of 1967 and was connected to the wellsite prior to 1970. All emergency discharges to the pit were discontinued prior to 1970.

Distance to Surface & Ground Waters

The attached plat map demonstrates that the pit is more than 1,000 ft. from a surface water body or private domestic water source. The vertical distance to ground water is 58' as determined on January 9, 1997. (See attached 7.5', hydro-geological plat maps and boring logs.)

Closure Standards

In accordance with the Oil Conservation Division <u>Unlined Surface Impoundment Closure</u> <u>Guidelines</u> (Feb. '93) the pit has a total ranking score of >19 and thus must be closed to a TPH concentration of less than 100 ppm.

Sampling Results

On January 10, 1997, Whole Earth supervised the coring of the pit and found hydrocarbon concentrations of less than 1,000 ppm TPH at a depth of between 10-15'. Due to the presence of free product within the pit, the coring was performed at the southeast corner, mid-way up the berm. (See attached field sampling report and plat map.) The field tests were conducted using EPA Method 418.1 (modified) in accordance with Whole Earth Quality Procedures QP-6 and QP-25 (enclosed).

Core samples obtained from the upper vadose zone of the aquifer revealed no detectable concentrations of volatile or semi-volatile compounds. (See attached Environmental Labs of Texas analytical reports.)

Closure Protocol

The pit was closed in accordance with the attached Protocol QP-42. Approximately 524 cubic yards of the most highly contaminated soil was excavated and transported to a licensed landfarm. The remaining contaminated soils were excavated to a total depth of approximately 15' below ground level and remediated by means of aeration and dilution with substrait materials immediately adjacent to the excavation. The side-walls and bottom of the excavation were sampled in accordance with WEQP-77 (enclosed) with the sampling witnessed by Mr. Wayne Price of the NMOCD Hobbs office.

A 20 mil liner was laid atop the excavation and filled with soils remediated to an average TPH and BTEX concentration of >10,000 ppm TPH and >10 ppm benzene concentration.

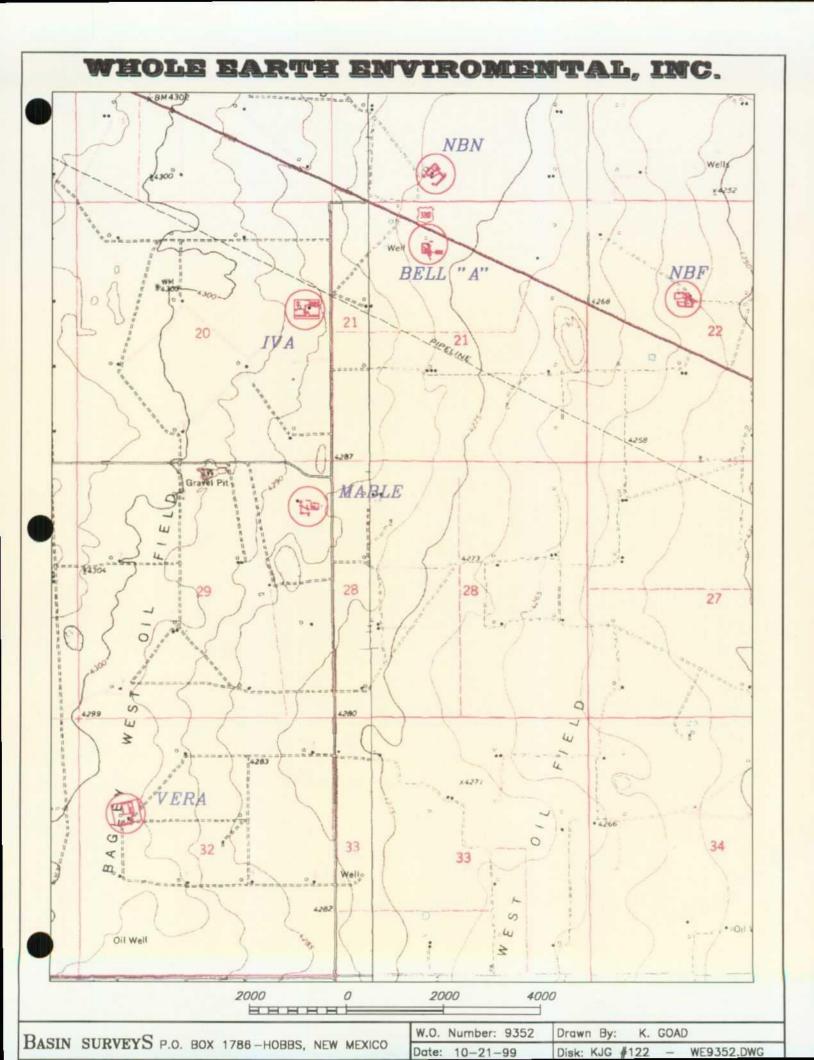
A monitor well was drilled at the southeast corner of the pit and initially sampled for RCRA 8 metals, volatile and semi-volatile compounds and BTEX. A split confirmation sample was collected by the NMOCD and submitted for independent review.

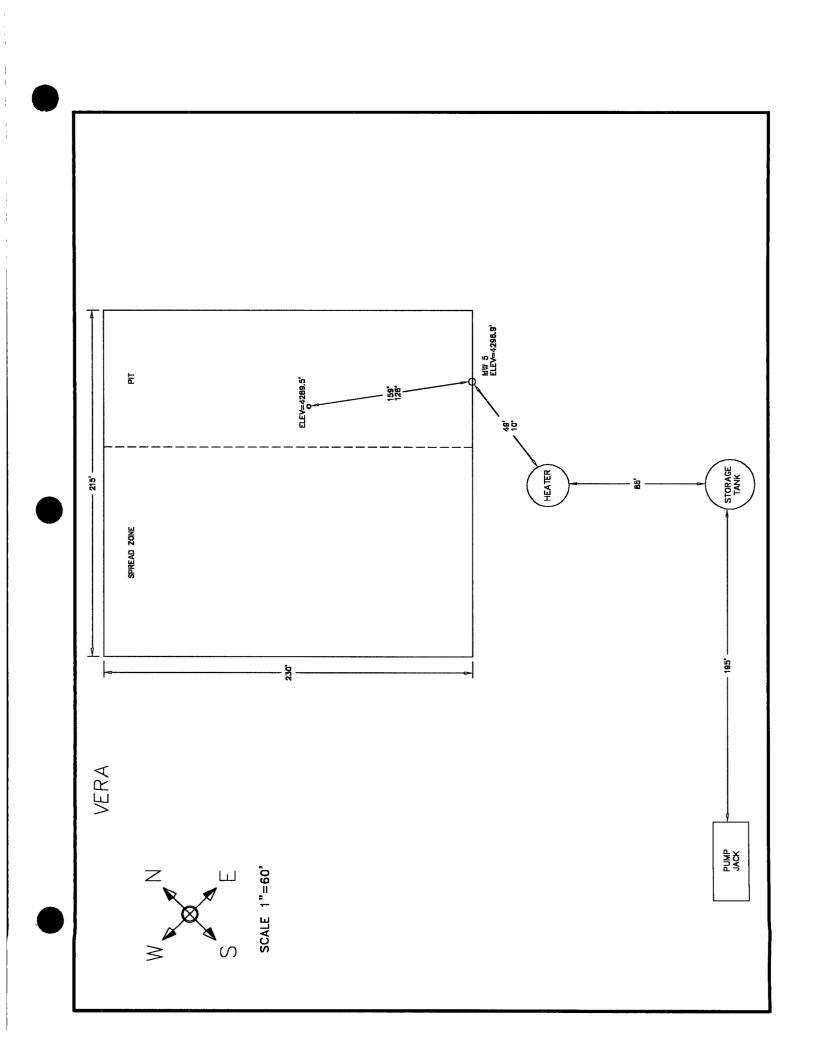
The pit was modeled by means of VADSAT and found to pose no calculated risk to the water table. Six subsequent quarterly BTEX samplings found no criteria contaminant concentration to be in excess of NMWQCC standards.

<u>Pit Remediation and Closure Report</u>

Operator:	Telephone: <u>(303) 293-9379</u>
Address:633 Seventeenth St, Denver, C	
Facility or <u>Vera # 1</u> Well Name	
Location: Unit or Qtr / Qtr Sec.: Sec <u>E</u>	T <u>T11S</u> R <u>33E</u> County <u>Lea</u>
Pit Type: Separator <u>X</u> Dehydrator _	Other
Land Type: BLM <u>X</u> , State	, Fee Other
Pit Location: Pit Dimensions: length	50' width 50' depth 15' other (See Attached Plat Map
Footage from reference : _	
Direction from reference:	Degrees East North
	West South
Depth to Ground Water:	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 points) <u>20</u>
Wellhead Protection Area:	Yes (20 points) No (0 points)
Distance to Surface Water:	Less than 200 feet (20 Points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)
	Ranking Score (Total Points):

Date Remediation Started:	8-10-97 Date Completed:8-20-97
Remediation Method: Excava	ation Approx. cubic yards
Landi	farmed X Insitu Bioremediation
Othe	r
Remediation Location:	Onsite X Offsite
General Description of Remed	ial Action:(See Attached)
Ground Water Encountered:	No <u>X</u> Yes <u>Depth</u>
Final Pit Closure Sampling:	Sample Location <u>(See attached)</u>
	Sample Depth
	Sample Date Sample Time
	Sample Results Benzene (ppm)
	Total BTEX (ppm)
	Field Headspace (ppm)
	TPH
Ground Water Sample: Yes_	
	THE INFORMATION ABOVE IS TRUE AND OF MY KNOWLEDGE OR BELIEF
Date10/17/99	Printed Name
Signature	Title







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Tipperary Corporation Tatum Pit Closure Project Monitor Well Water Elevation Table

FIT Comme (1) T. T	Well	Monitor	Surface	Date Well	-	Water	Water Depth	Water Elev.	Water Depth	Water Elev.	Depth Change		Gradient	Gradient /c+ HOD C+)
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		24	4 208 64		28.9		26.08	4,182.56	26.45					1.90

Nota: Vera, Beil and Satalifte 4 had significant subsidance within the pit area. The red elevations include an added 3.49° (Ave. of seven other sites) Correct elevations noted in column 6. 11

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3-18-99

COORDINATE FILE : TIPARARY.CRD

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JIST COORDINATES

	PT#	NORTH	EAST	ELEV
SOHIO A STATE 1 PIT	253	870084.293	760084.206	4286.84
SOHIO A STATE 1 MW11	254	869981.125	760134.902	4285.88
SOHIO A STATE 1 MW19	255	869974.033	760205.397	4285.97
SOHIO A STATE 1 MW28	256	869892.771	760255.240	4285.61
SOHIO A STATE 1 MW20	257	869667.200	760452.460	4283.54
-SOHIO STATE 1 PIT	258	870105.632	761381.498	4285.42
SOHIO STATE 1 MW10	259	870027.049	761459.334	4283.63
SOHIO STATE 1 MW10 SOHIO STATE 1 MW17	260	869969.168	761443.837	4283.31
SOHIO STATE 1 MW17 SOHIO STATE 1 MW18	261	870017.865	761533.683	4283.59
SOHIO STATE 1 MW18	262	869892.594	761534.416	4283.21
SOHIO STATE 1 MW20	262	869677.360	761728.469	4281.13
VERA 1 PIT	263	846366.089	752525.766	4289.49
VERA 1 PIX	265	846217.026	752582.067	4298.90
	265	856893.939		
STATE NBF 1 PIT State NBF 1 MW8/	266	856806.388	764024.682 764165.403	4266.86
STATE NBF 1 MWO'	267	856747.667		4259.41
		856774.041	764157.788	4259.68
STATE NBF 1 MW16	269		764241.604	4259.06
STATE NBF 1 MW26	270	856658.728	764331.675	4258.04
BELL A 1 PII	271	857796.692	758625.535	4279.64
BELL A 1 MW6	272	857857.556	758583.503	4281.12
BELL A 1 MW13	273	857754.617	758597.054	4280.84
BELL A 1 MW14	274	857821.944	758664.690	4280.80
BELL A 1 MW25	275	857614.080	758714.518	4280.37
GS STATE 1 SOURCE	276	867037.530	755087.975	4307.00
GS STATE 1 MW21	277	866953.249	755213.712	4303.08
GS STATE 1 MW22	278	866905.186	755154.733	4302.77
GS STATE 1 MW29	279	866798.038	755260.271	4303.20
GS STATE 1 MW?	280	867001.862	755131.639	4303.27
MABEL COM 1 SOURCE	281	852659.555	756329.277	4290.55
MABEL COM 1 MW3	282	852517.536	756370.356	4287.22
MABEL COM 1 MW4	283	852592.288	756473.774	4287.46
STATE NBN 1 PIT	284	859499.318	758793.854	4282.45
STATE NBN 1 MW7	285	859397.517	758825.203	4281.59
SATELLITE 4 MW9	286	866587.512	775890.421	4208.66
SATELLITE 4 MW23	287	866507.846	775901.105	4209.03
SATELLITE 4 MW24	288	866562.481	775964.699	4208.64
IVA COM 1 SOURCE	289	856721.216	756252.189	4298.42
IVA COM 1 MW1	290	856654.035	756344.507	4292.10
IVA COM 1 MW2.	291	856695.146	756388.036	4291.93

HORIZONTAL DATUM NAD 83 VERTICAL DATUM NAVD 88



Photographs

This section contains the following photographs:

1. The site prior to excavation

2. The pit at the point of maximum excavation

3. Detail photographs of the liner installation

4. The site after final closure and contouring















Protocol

This section contains the approved remediation protocol that was used at this site.



Pit Remediation Protocol Pits Requiring Modeling

1.0 Purpose

This protocol is to provide a detailed outline of the steps to be employed in the remediation and final closure for pits requiring risk assessment modeling.

2.0 Scope

This protocol is not site specific.

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 Client to review this protocol and make any requested modifications or alterations prior to submittal to the State of New Mexico Oil Conservation Division.
- 3.1.2 Changes to this protocol will be documented and submitted for final review by Client prior to submittal to the Oil Conservation Division.

3.2 Oil Conservation Division Review

3.2.1 Upon client approval, this protocol and associated modeling results will be submitted to the New Mexico Oil Conservation Division for review and comment. Recommended changes will be reviewed by the client prior to implementation.

3.2.2 Any recommended changes effecting costs will require a revised quotation to be issued to the client for approval prior to the commencement of any on-site remediation activity.

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 Client personnel, sub-contractors and exchange phone numbers.

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4.2 A tailgate safety meeting shall be held and documented each day. All subcontractors 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, the area shall be surveyed with a line finder. 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.

5.0 Fluid Removal

Prior to any excavation, the pit fluids shall be removed by vacuum truck and transported to a licensed disposal facility. A shipping manifest and O.C.D. Form C-117-A shall be prepared for each load and included within the final closure report.

6.0 Excavation & Remediation

- 6.1 The site shall be excavated to a minimum depth of 10'. All excavated materials will be deposited immediately adjacent to the pit site.
- 6.2 The bottom of the pit and all four side walls will be tested for TPH and BTEX concentrations using WEQP-06 and WEQP-19. Excavation will continue until such concentrations are <10,000 ppm TPH, <10 ppm benzene and <50 ppm total BTEX.
- **6.3** Upon reaching the required depth and side wall dimensions, the bottom of the pit will be made as smooth as possible with excavation equipment. Sand will be deposited in the bottom of the pit in a minimum thickness of 6".
- 6.4 A polyethylene liner of a minimum thickness of 20 mils will be spread atop the sand to the pit edge and an additional 6" of sand deposited above it.

- 6.5 The excavated materials will be mixed and blended with additional topsoils obtained from the area immediately adjacent to the pit until the hydrocarbon concentrations fall below the maximum limits as described in Paragraph 6.2 of this protocol. The remediated materials will then be replaced into the excavated area, compacted and the surface contoured to provide for positive drainage.
- 6.6 The top two feet of the excavation shall be covered in remediated materials having a maximum TPH concentration of <100 ppm and benzene concentrations of <2 ppm.

7.0 Documentation & Reporting

- 7.1 At the conclusion of the pit remediation project, Whole Earth will prepare a closure report to include the following information:
 - A plat map of the location showing the exact location of the pit, the dimensions prior to excavation and the actual excavated dimensions.
 - Photographs of the pit prior to excavation, at the point of maximum excavation and after final closure
 - Field Sampling Report to include the side wall and pit bottom TPH and BTEX concentrations after excavation.
 - Field Sampling Report to include TPH and BTEX concentrations of all remediated materials deposited into the pit.
 - Daily calibration records of each testing instrument
 - Shipping manifests and OCD Form C-117-A
 - Risk assessment model and supporting documentation
 - M.S.D.S. and permeability certification of liner materials



Procedures

This section contains the copies of the detailed sample collection, testing, instrument calibration and bailing procedures employed 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.



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	1

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 concentration value exceeds 2% of the standard set point, repeat all</u> 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 ррт	500 ррт	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.



WHOLE EARTH ENVIRONMENTAL QUALITY PROCEDURE

Procedure for Developing Cased Water Monitoring Wells

 Completed By:
 Approved By:
 Effective Date:
 /

1.0 Purpose

This procedure outlines the methods to be employed to develop 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 Prior to development, the static water level and height of the water column within the well casing will be measured with the use of an electric D.C. probe or a steel engineer's tape and water sensitive paste.

3.2 All measurements will be recorded within a field log notebook and subsequently reported within the driller's boring log report.

3.3 All equipment used to measure the static water level will be decontaminated after each use by means of Alconox, a phosphate free laboratory detergent, and water to reduce the possibility of crosscontamination. The volume of water in each well casing will be calculated.

4.0 Purging

4.1 Wells will be purged by removing a minimum of three well casing volumes by using a 2" decontaminated submersible pump or dedicated one liter Teflon bailer.

4.2 If a submersible is used the pump will be decontaminated prior to use by scrubbing the outside surface of tubing and wiring with an Alconox-water mixture, pumping an Alconox-water mixture through the pump, and a final flush with fresh water.

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5.0 Water Disposal

5.1 All purge and decontamination water will be temporarily stored within a 60 gallon portable tank and then pumped into a permanent storage tank to be later disposed of in an appropriate manner.



QP-76 (Rev. A)

WHOLE EARTH ENVIRONMENTAL QUALITY PROCEDURE

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

Completed By:	Approved By:	Effective Date: / /	
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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	HCI	7 days
ТРН	1 liter	clear glass	Teflon Lined	HCI	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	lce	7 Days

Page 2

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 layer and then uncertaining the entire assembly.
- 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 crosscontaminated. 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.

QP-76

- 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

Page 3



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 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 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.

Page 2

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



Laboratory Analytical Reports

This section contains the following laboratory analytical results and associated chains of custody:

1. Side wall and bottom hole TPH and BTEX results (ELT Nos. 12256-12260) sampled 8/20/97.

2. Composite composite analysis of final top cover material (ELT No. 12423) sampled 8/29/97.

3. Volatile and semi-volatile compound analysis of monitor well (ELT No. 9910) sampled 1/9/97.

4. Quarterly BTEX sampling results of monitor well (ELT Nos. 12487, 13184, 14061, 14660, 15992, 16599) sampled 9/5/97, 12/3/97, 2/23/97, 6/25/98, 10/1/98 and1/6/99 respectively.

5. Analysis of RCRA 8 metals from the monitoring well (ELT No. 12487) sampled 9/6/97.

6. OCD run confirmation BTEX analysis of monitor well (AEN No. 9709051649) sampled 9/5/97.

7. Spreadsheet summary of BTEX analyses conducted at Vera Monitoring Well # 5.

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL ATTN: MR. MIKE GRIFFIN 19606 SAN GABRIEL HOUSTON, TEXAS 77084 FAX: 1-281-646-8996

Receiving Date: 08/21/97 Sample Type: SOIL Project : TIPPERARY Project Location: NONE GIVEN Analysis Date: BTEX 08/21/97 Analysis Date: DRO 08/22/97 Sampling Date: 08/20/97 Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg	DRO (C10-C28)
			•				
12249	NBF BOTM	<.100	<.100	<.100	0.390	0.247	3,547
12250	MABLE EAST (RE-TEST)	<.100	1.657	0.444	3.185	3.531	7,398
12251	BELL NORTH	<.100	0.841	0.376	1.917	2.475	5,746
12252	BELL SOUTH	<.100	<.100	<.100	0.18	<.100	<10
12253	BELL EAST	<.100	<.100	<.100	<.100	<.100	163
12254	BELL WEST	<.100	<.100	<.100	<.100	<.100	147
12255	BELL BOTTOM	<.100	0.186	<.100	0.250	0.391	3, 9 51
12256	VERA NORTH	<.100	<.100	<.100	<.100	<.100	122
12257	VERA SOUTH	<.100	<.100	<.100	0.200	0.279	10
12258	VERA EAST	<.100	<.100	<.100	<.100	<.100	2,302
12259	VERA WEST	<.100	<.100	<.100	<.100	<.100	571
12260	VERA BOTTOM	<.100	<.100	<.100	<.100	<.100	89
	% IA	93	88	89	86	88	108
	% EA	111	104	100	96	100	100
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: SW 846-8020,5030,8015m DRO

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Michael R. Fowler

<u>10-77</u>97 Date

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ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL ATTN: MR. MIKE GRIFFIN 19606 SAN GABRIEL HOUSTON, TEXAS 77084 FAX: 1-281-646-8996

Receiving Date: 09/01/97 Sample Type: SOIL Project: TIPPERARY Project Location: TATUM,N.M. Analysis Date: 09/02/97 Sampling Date: 08/29/97 Sample Condition: Intact/load

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C) 7#	FIELD CODE	BENZENE	TOLUENE	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg	(C10-C28) mg/kg
ELT#	FIELD CODE	mg/kg	mg/kg	myray	1172 84	many	
12421	IVA FINAL	<.100	<.100	<.100	0.105	<.100	<10
12422	MABLE FINAL	<.100	0.165	0.129	0.255	<.100	11
12423	VERA FINAL	<.100	0.126	<.100	0.192	<.100	10
12424	BELL FINAL	<.100	<.100	<.100	<.100	<.100	24
12425	NBN FINAL	<.100	<.100	<.100	<.100	<.100	103
12426	NBF FINAL	<.100	<.100	<.100	<.100	<.100	<10
12427	SOHIO A FINAL	0.186	0.312	0.232	0.737	0.580	6,702
12428	SOHIO 1 FINAL	<.100	0.373	0.142	0.463	0.342	15,016
12429	G.S. FINAL	<.100	<.100	<.100	<.100	<.100	15
12430	SAT. 4 FINAL	*	*	. *	*	*	*
12431	G.S. BOTTOM (RE TEST)	<.100	<.100	<.100	0.217	0.166	2,963
	% IA	98	95	96	95	99	107
	% EA	93	85	81	78	80	93
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

* NOTE SAMPLE CONTAINER WAS EMPTY.

METHODS: SW 846-8020,5030,8015m DRO

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Michael R. Fowler

Date

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ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL ATTN: MR. MIKE GRIFFIN 19606 SAN GABRIEL HOUSTON, TEXAS 77084 FAX: 800-854-4358

Receiving Date: 01/10/97 Reporting Date: 01/23/97 Project Name: TATUM PIT SAMPLING Project Location: WEST OF TATUM, NM Field Code: VERA #1 Analysis Date: 01/22/97 Sampling Date: 01/09/97 Sample Type: SOIL Sample Condition: C&I

Volatiles EPA SW 846-8240, (ppm) Compounds	ELT# 9910	PQL	% IA	Method Blank	% EA
Chloromethane	210	0.1	110	ND	
	ND ND	0.1	110	ND	
Vinyl chloride		0.1	101	ND	
Bromomethane	ND	0.1	100	ND	
Chloroethane Tricklaneftus romethane	ND	0.1	105	ND	
Trichlorofluoromethane	ND	0.1	102	ND	
Acetone	ND	0.1	100	ND	
1,1-Dichloroethane	ND	0.1	95	ND	69
lodomethane	ND	1.0	92	ND	
Vinyl Acetate	ND	1.0	107	ND	
Carbon Disulfide	ND	0.1	100	ND	
Methylene Chloride	ND	0.1	110	ND	
trans-1,2-Dichloroethene	ND	0.1	98	ND	
1,1-Dichloroethane	ND	0.1	102	ND	
2-Butanone	3.651	1.0	108	ND	
Chloroform	ND	0.1	106	ND	
1,1,1-Trichloroethane	ND	0.1	91	ND	
Carbon Tetrachloride	ND	0.1	94	ND	
Benzene	ND	0.1	96	NĎ	110
1,2 Dichloroethane	ND	0.1	97	ND	
Trichloroethene	ND	0.1	83	ND	108
1,2-Dichloropropane	ND	0.1	95	ND	
Dibromomethane	ND	0.1	115	ND	
Bromochloromethane	ND	0.1	124	ND	
2-Chloroethyl Vinyl ether	ND	1.0	123	ND	
4-Methyl 2-Pentanone	ND	1.0	120	ND	
cis 1,3 Dichloropropene	ND	0.1	105	ND	
Toluene	ND	0.1	96	ND	119
trans 1,3-Dichloropropene	ND	0.1	89	ND	
1,1,2-Trichloroethane	ND	0.1	98	ND	
Dibromochloromethane	ND	0.1	105	ND	
Tetrachloroethene	ND	0.1	107	ND	
Chlorobenzene	ND	0.1	98	ND	107



WHOLE EARTH ENVIRONMENTAL
ATTN: MR. MIKE GRIFFIN
19606 SAN GABRIEL
HOUSTON, TEXAS 77084
FAX: 800-854-4358

Receiving Date: 01/10/97 Reporting Date: 01/23/97 Project Name: TATUM PIT SAMPLING Project Location: WEST OF TATUM, NM Field Code: VERA #1 Analysis Date: 01/22/97 Sampling Date: 01/09/97 Sample Type: SOIL Sample Condition: C&I

Volatiles EPA SW 846-8240, (ppm) Compounds	ELT# 9910	PQL	% IA	Method Blank	% EA
Ethylbenzene	ND	0.1	89	ND	
m&p Xylene	ND	0.1	87	ND	
o-Xylene	ND	0.1	90	ND	
Styrene	ND	0.1	95	ND	
Bromoform	ND	0.1	113	ND	
1,1,2,2-Tetrachloroethane	ND	0.1	87	ND	
1,2,3-Trichloropropane	ND	0.1	108	ND	

SYSTEM MONITORING COMPOUNDS	% RECOVERY
Dibromofluoromethane	96
Toluene-d8	100
4-Bromofluorobenzene	65

ND=<PQL

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Michael R. Fowler

1-27-91 Date



Page 2 of 2

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL ATTN: MR. MIKE GRIFFIN 19606 SAN GABRIEL HOUSTON, TEXAS 77084 FAX: 800-854-4358

Receiving Date: 01/10/97 Sample Type: SOIL Project : TATUM PIT SAMPLING Project Location: WEST OF TATUM, NM Field Code: VERA #1

Analysis Date: 01/19/97 Sampling Date: 01/09/97 Sample Condition: Intact/Iced

ELT# 9910	REPORTING	SAMPLE Concentration				
8270 COMPOUNDS	LIMIT	ррп	QC	RPD	% EA	96 IA
N-Nitrosodimethylamine	0.01	ND				
2-Picoline	0.01	ND				
Methyl methanesulfonate	0.01	ND				
Ethyl methanesulfonate	0.01	ND				
Phenol	0.01	ND	91	11	84	95
Aniline	0.05	ND				
bis(2-Chloroethyl)ether	0.05	ND				
2-Chlorophenol	0.05	ND		8	74	
1,3-Dichlorobenzene	0.01	ND				
1,4-Dichlorobenzene	0.01	ND	94	10	73	93
Benzyi alchohol	0.05	ND				
1,2-Dichlorobenzene	0.01	ND				
2-Methylphenol	0.01	ND				
bis(2-Chloroisopropyl)ether	0.05	ND				
4-Methylphenol/3-Methylphenol	0.01	ND				
Acetophenone	0.05	ND				
n-Nitrosodi-n-propylamine	0.01	ND		5	79	
Hexachloroethane	0.01	ND				
Nitrobenzene	0.01	ND	•			
N-Nitrosopiperidine	0.05	ND				
Isophorone	0.05	ND				
2-Nitrophenol	0.05	ND	93			94
2,4-Dimethylphenol	0.05	ND				
bis(2-Chloroethoxy)methane	0.01	ND				
Benzoic acid	0.1	ND				
2.4-Dichlorophenol	0.05	ND	87			96
1,2,4-Trichlorobenzene	0.01	ND		9	7 9	
a,a Dimethylphenethylamine	0.1	ND				
Naphthalene	0.01	ND				
4-Chloroaniline	0.05	ND				
2,6-Dichlorophenol	0.05	ND				
Hexachlorobutadiene	0.01	ND	95			97
N-Nitroso-di-n-butylamine	0.05	ND				
4-Chloro-3-methylphenol	0.05	ND	97	12	81	93





ELT# 9910		SAMPLE			Page 2 of 3	•
	Reporting		······	ſ	T	
8270 COMPOUNDS	Limits	ppm	QC	RPD	%EA	%IA
2-Methylnaphthalene	0.01	ND				
1,2,4,5-Tetrachlorobenzene	0.01	ND				
Hexachlorocyclopentadiene	0.01	ND				
2,4,6-Trichlorophenol	0.05	ND	86			94
2,4,5-Trichlorophenol	0.05	ND				
2-Chloronaphthalene	0.01	ND				
1,-Chloronaphthalene	0.01	ND				
2-Nitroaniline	0.05	ND				
Dimethylphthalate	0.01	ND				
Acenaphthylene	0.01	ND				
2.6-Dinitrotoluene	0.01	ND				
3-Nitroaniline	0.05	ND				
Acenaphthene	0.01	ND	97	3	81	92
2.4-Dinitrophenol	0.05	ND				
Dibenzofuran	0.05	ND				
Pentachlorobenzene	0.01	ND				
4-Nitrophenol	0.05	ND		4	80	
I-Napthylamine	0.05	ND				
2,4-Dinitrotoluene	0.01	ND		6	79	
2-Napthylamine	0.05	ND				
2.3.4.6-Tetrachlorophenol	0.05	ND				
Fluorene	0.01	ND				
Diethylphthalate	0.01	ND				
4-Chiorophenyl-phenylether	0.01	ND				
4-Nitroaniline	0.05	ND				
4.6-Dinitro-2-methylphenol	0.01	ND				
n-Nitrosodipenlamine & Diphenylar	0.01	ND	93			90
Diphenylhydrazine	0.05	ND				
4-Bromophenyi-phenylether	0.01	ND				
Phenacetin	0.05	ND				
Hexachlorobenzene	0.01	ND				
4-Aminobiphenyl	0.05	ND				
Pentachlorophenol	0.05	ND	89	6	79	95
Pentachloronitrobenzene	0.05	ND				
Pronamide	0.01	ND				
Phenanthrene	0.01	ND				
Anthracene	0.01	ND				
Di-n-butylphthalate	0.01	ND				
Fluoranthene	0.01	ND	92			95
Benzidine	0.1	ND				
Pyrene	0.01	ND		6	88	
Dimethylaminoazobenzene	0.01	ND				
Butylbenzylphthalate	0.01	ND				





ELT# 9910		SAMPLE			· -g · ·	
	Reporting	Concentration		1		
8270 COMPOUNDS	Limits	ppm	QC	RPD	%EA	%IA
Di-n-octiphthalate	0.01	ND	89			92
Benzo[b]fluoranthene	0.01	ND				
7,12-Dimethylbenz(a)anthracene	0.01	ND				
Benzo[k]fluoranthene	0.01	ND				
Benzo (a) pyrene	0.01	ND	96			91
3-Methylcholanthrene	0.01	ND				
Dibenzo (a.j) acridine	0.01	ND				
indeno [1,2,3-cd] pyrene	0.01	ND				
Dibenz [a,h] anthracene	0.01	ND				
Benzo [g.h.i] perylene	0.01	ND				

% RECOVERY

METHOD: EPA SW 846-8270, 3551 SURROGATES

2-Fluorophenol SURR	87
Phenol-d6 SURR	79
Nitrobenzene-d5 SURR	92
2-Fluorobiphenyl SURR	96
2,4,6-Tribromophenol SURR	82
Terphenyl-d14 SURR	91

Aluchard R. Jank

Michael R. Fowler

-2791 Date



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Page 3 of 3

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ENVIRONMENTAL LAB OF \checkmark > , Inc.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL ATTN: MR. MIKE GRIFFIN 19606 SAN GABRIEL HOUSTON, TEXAS 77084 FAX: 281-646-8996

Receiving Date: 09/08/97 Sample Type: WATER Project #: TIPPERARY Project Name: TIPPERARY Project Location: TATUM

Analysis Date: 09/12 THRU 9/22 Sampling Date: 9/5 & 9/6/97 Sample Condition: Intact/loed

		Ca	Mg	Na	κ	CI	SO4	CO3	HCO3	
ELT#	FIELD CODE	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/i	
12477	IVA COM SW	48	19	1,853	961	1,702	<1	<1	2.037	
12478	GS #12	232	54	782	180	1,595	43	<1	671	
12481	BELL #6	28	10	791	134	1,064	245	<1	647	
12482	NBN #7	57	12	51	134	85	113	<1	244	
12483	SOHIO 1 #10	437	125	762	23	2,127	52	<1	317	
12484	SOHIO A #11	2,477	303	1,872	413	7.551	105	<1	85	
12485	SAT. 4 #9	70	16	92	24	156	75	<1	317	
12486	NBF #8	84	13	46	22	67	125	<1	232	
12487	VERA #5	**	••	**	••	106	85	<1	403	
QUALITY	CONTROL	2.041	0.501	1.973	2.079	9572	55			
TRUE VA	LUE	2.000	0.500	2.000	2.000	10000	50			
% PRECI	SION	102	100	99	104	96	110			

Methods: EPA SW 7140, 7450, 7770, 7610, 9252. 9038, EPA 310.2

** NOTE: NOT ENOUGH SAMPLE.

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9-22-97 Date

Michael R. Fowler

P.03

Environmental	Environmental Lab of Texas, Inc. 1260 West P. Bast (915) 561-1880	Inc. 12600 Wert 1-20 East (915) 542-1890		Oderta, Tatar 79763 FAX (015) 563-1713				NY REC	CHAIN OF CUSTODY RECORD AND ANALYSIS RUDIES	11 M M M		·	
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ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

TIPPERARY ATTN: MR. VICTOR A. VICE P.O. BOX 857 TATUM, NM 88267 FAX: 800-854-4358

Receiving Date: 12/03/97 Sample Type: WATERS Project : TATUM, NM Project Location: TATUM, NM Analysis Date: 12/03/97 Sampling Date: 12/03/97 Sample Condition: Intact/Iced P.02

elt#	FIELD CODE	BENZENE (mg/l)	TOLUENE (mg/i)	ETHYLBÉNZENE (mg/b	m.p-XYLENE (mg/l)	o-XYLENE (ng/)
13184	VERA MW-5	0.002	0.001	0.003	0.614	0.005
13185	G.S. STATE MW-21	0.166	0.013	0.059	0.705	0.010
13186	SOHIO STATE "1" MW-10	2.148	0.082	0.173	0.930	0.313
13187	SOHIO STATE "1" MW-17	1.409	0.053	0.116	0.535	0.192
18188	SUNO STATE "1" MW-10	2.063	0.178	0.118	<0.001	<0.001
13189	SOHIO STATE "A" MW-19	0.009	0.002	0.003	0.541	0.318
13190	SOHIO STATE "A" MW-20	0.284	0.005	0.008	0.044	0.004
13191	8AT "4" MW-9	0.067	0.009	0.006	0.033	0.008
13192	SAT "4" MW-23	0.040	0.012	0.009	0.042	0.019
13193	SAT "4" MW-84	0.017	0.006	0.005	0.025	0.011
	% IA	93	93	93	92	95
	% EA	101	101	103	102	104
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

Michael R. Fowler

125-9 Date



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VIRONMENTAL LAB OF the , INC.

"Don't Treat Your Soil Like Dirt!"

TIPPERARY ATTN: MR. VICTORIA, VICE P.O. BOX 857 TATUM, NM 88267 FAX: 281-646-8996

Receiving Date: 03/24/98 Sample Type: WATER Project : TATUM, NM Project Location: TATUM, NM

Analysis Date: 3/24/98 Sampling Date: 3/23/98 Sample Condition: Intact/Iced

ELTH	FIELD CODE	BENZENE	TOLUENE	ETHYLBENZENE (mg/)	m.p-XYLENE (mg/)	o-XYLENE
14045	Satelite #4 MW #23	0.071	0.004	0.012	0.017	0.002
14046	Satelite #4 MW #24	0.001	<0.001	<0.001	0.003	0.001
14047	Bell "A" MW #13	0.011	0.007	0.004	0.011	0.004
14048	. Bell "A" MW #14	0.904	0.002	0.004	0.006	0.002
14049	NBF MW #15	1.470	1.230	0.384	1.058	0.466
14050	NBF MW #16	1.029	0.086	0.084	0.173	0.047
14051	Sohio State #1 MW #17	1.101	0,108	0.130	0.376	0.148
14052	Sohio State #1 MW #18	1.396	0.269	0.159	0.823	0.366
14053	Sohio State A MW #18	0.042	0.017	0.010	0.034	0.017
14054	Sohio State A MW #20	0.539	0.016	0.014	0.075	0.014
14055	G.S. State #1 MW #21	0.233	0.019	0.067	0.221	0.014
14056	G.S. State #1 MW #22	0.050	0.017	0.016	0,086	0.026
14057	ha Com MW#1	0.003	0.003	0.001	0.007	0.008
14058	Iva Com MW #2	0.002	0.001	<0.001	0.005	0.002
14059	Mable Com MW #3	0.006	0.006	0.007	0.029	0.006
14060	Mable Com MW #4	0.019	0.004	500.0	0.019	0.003
14061	Vera MW #5	0.003	0.001	<0.001	0.004	0.002
14062	Bell "A" MW #6	0.236	0.002	0.019	0.016	0.008
14063	NBN MW #7	0.009	0.001	0.001	0.004	0.002
14064	NBN MW #8	0.048	0.036	0.013	0.038	0.011
	% IA	96	92	90	90	92
	% EA	110	104	101	103	103
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

1753 CELAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST	AVALYSIS REQUEST					_		0 #8 0) #8	9 6 9 V 9 V	81 V 8V / 6V / 6V	1.814 alaish (elais (elais	ВС! 102 102 107 107 107 107 107 107 107 107 107 107											REMARKS			
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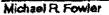
"Don'I Treat Your Soil Like Dirt!"

TIPPERARY ATTN: MR. VICTOR A. VICE P.O. BOX 857 TATUM, NM 88267 FAX: 1-281-846-8996

Receiving Date: 06/26/98 Sample Type: WATER Project : TATUM. NM Project Location: TATUM, NM Analysis Date: 06/26/98 Sampling Date: 06/25/98 Sample Condition: Intact/Iced

ELTA	FIELD CODE	BENZENE (mg/i)	TOLUENE (mg/l)	ETHYLBENZENE	m.p-XVLENE (mg/i)	o-XYLENE
14657	NA COM MW #1	0.005	0.005	0.002	0.008	0.009 ··
14658	MABLE COM M/W #3	0.009	0.011	0.009	0.033	0.009 -/
14659	MABLE COM MW #4	0.020	0.006	0.003	0:015	0.005
14660	VERA MAW #5	0.007	0.006	0.005	0.011	0.008
14661	BELL A MAN #6	0.203	0.008	0.015	0.017	0.006
14662	NBH MW #7	0.009	0.007	0.007	0.016	0.009
14663	NBF MAN NB	0,034	0.003	0.007	0.011	0.003
14684	SATELITE #4 M/W #9	0.055	0.003	0.010	0.011	0.002
14665	SOHIO STATE #1 MAW #10	1.313	0.113	0.206	0.611 ×	0.180
14666	SOHIO STATE A MW #11	0.093	0.009	0.005	0.020	0.014
14667	BELL A M/W #13	0.016	0.014	0.005	0.015	0.006
14668	BELLA M/W #14	0,735	0.009 4	0.005	0.011	0.004
14669	NBF M/W #15	1.415	1.165X	0.270	0.927	0.412
14670	NBF MW #16	1.058	0,113	0.070	0.145	0.050
14671	SOHEO STATE #1 M/W #17	1.111	0,138	0.118	0.379	0.174
14672	SOHIO STATE #1 M/W #18	1.357	0.272	0.131	0.589 시	0.252
14673	SOHIO STATE A #1 MW #19	0.029	0,010	0.007	0.022	0.011
14674	SOHIO STATE A #1 MW/ #20	0.517	0.009	0.008	0.061	0.009
14675	QS STATE #1 MW #21	0.047	0.009	0.019	0.086	0.038
14676	GS STATE #1 MW #22	0.183	0.012	0.062	0.077	0.010
14677	BATELITE NA MAN #23	0.002	<.001	0.001	0.003	0.001
14672	BATELITE NA NAW 1124	0.003	0.003	0.002	0.006	0.003
14679	IVA COM WINDMILL BW #1	1.174	1.290	0.265	1.262	1,241
	% IA	99	95	82	90	94
	% EA	98	95	94	92	95
	BLANK	<0.001	<0.001	<0.001	<0.001	<0,001

METHODS: SW 846-8020,5030



6-29-99

Date

Envir	Environmental Lab of Texas, Inc.	of Texas,		12600 West 1-20 East (915) 563-1800	West 1-20 East (915) 543-1800	10 Ea		(16) X	Odeser, Teras 79763 FAX (915) 561-1713		avec	ő	cusi	700,	Jaz	CRAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST	TYNY Q	15157	redu	EST	
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"Don't Treat Your Soil Like Dirt!"

TIPPERARY ATTN: MR. VICTOR A. VICE P.O. BOX 857 TATUM. NM 88287 FAX: 505-398-6510 FAX: 281-646-8996

Receiving Date: 09/30/98 Sample Type: Water Project : None Given Project Location: Tatum, New Mexico

Analysis Date: 9/30 & 10/01/98 Sampling Date: 09/29/98 Sample Condition: Intact/Iced

ELTH	FIELD CODE	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYLBENZENE (mg/l)	m.p-XYLENE (mg/l)	o-XYLENE (mg/l)
15590	Na Com M/W #1	0.004	0.004	0.002	0.006	0.007
15591	Meble Com M/W #3	0.010	0.015	0.010	0.041	0,017
15592	Vera M/W #5	0.003	0.003	0,001	0.004	0.004
15593	Bell A MW NB	0.130	0.002	0.003	D,004	0.002
15594	NBN M/W #7	0.006	0.007	0.001	0.006	0.003
15595	NBF M/W #8	0.005	0.004	0.001	0.004	0.004
15596	Salelite #4 M/W #9	0.036	0.002	0.005	0.003	0.001
15597	Sohio SI. #1 M/W #10	2.541	0.106	0.182	0,167	0,098
15598	Schlo St. "A" M/W #11	0.070	0.010	0.003	0.014	0.011
15599	Bell A M/W #13	0.003	0.002	0.002	0.004	0.002
15600	NBF M/W #15	3.027	1.630	0.225	0.811	0.393
15601	Sohio St. #1 M/W #17	0.872	0.105	0.071	0.242	0.129
15602	Sonio St. "A" MW #19	0.033	0.015	0.005	0.018	0.011
15603	G.S. Sinte M/W #21	0,128	0.005	0.069	0.030	0.008
15604	Saleike #4 M/W #23	0.048	0.023	0.001	0.004	0.002
15605	Na Com M/W #2	E00.0	0.002	<0.001	0.003	0.001
15606	Mable Com M/W #4	0.007	0.002	<0.001	0.002	0.001
15607	Bel A M/W #14	0.175	0.002	0.001	0.002	0.001
15608	NBF M/W #18	1.046	0.065	0.037	0.100	0.039
15609	Sohio SI, #1 MAW #18	0.542	0.072	0.025	0.093	0.054
15610	Sohio 81. "A" M/W #20	0.464	0.011	0.008	0.045	0.011
15611	Q.8. Slate M/W #22	0.049	0.011	0.028	0.040	0.018
15612	Satelite #4 M/W #24	0.002	0.001	<0.001	0.002	<0.001
	% IA	100	94	91	90	95
	% EA	88	97	93	91	93
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

- dK Jul



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Environmental Lab of Texas, Inc.	Lab of Tera		West 1-20 East Odd	12600 West I-20 East Odesta, Tezas 79763 (915) 563-1800 FAX (915) 563-1713	CEAL	105-50-1	ydotki	RECORI	cealin-of-cuistody record and analysis request	N SISAT	sanda
hungar V. A. V. A.		Paret: TAS II:	: 505 - 50 5 -	398-6507 -398-6610			32	AVALYSIS REQUEST	1220		Ł
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LAB# FIELD	1810 CODE	Vohume/V MATER SOIL SIR		avone other date amit	XƏTA HqT		101	8CI 103		 -	
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MOT DESI	_] ¢						_				
19591 Mable Com M/W	2						_				1
Ueca #											+
Kell A	MW #6										
NGN	M/W # 7										
ISS 45 NBF MI	W/W # D										
155 96 SATILITE 44 MW 7	MW										
122411 Solio 51.4 MW #0											
H	M(w#1								· .		
1	M/W 13 # 4										
8	Mu # 15 # 16		Resolved by	REM	REMARKS						
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ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

TIPPERARY ATTN: MR. VICTOR A. VICE P.O. BOX 857 TATUM, NM 88267 FAX: 505-398-6510 FAX: 281-848-8998

Receiving Date: 01/08/99 Sample Type: Water Project : None Given Project Location: Tatum, New Mexico \$8237 Analysis Date: 01/08/99 Sampling Date: 01/06 & 01/07/99 Sample Condition: intact/iced/HCI

1-11-99

Date

ELT#	FIELD CODE	BENZEME (mgr)	TOLUENE (III)	ETHYLBENZENE (mg/)	m.p-XYLENE	o-XYLENE (MD/A
16587	8ohio 51.#1 - #17	0.878	0,136	0.094	0.339	0.163
16588	Sohio Si. #1 - #18	1.10	0.247	0.107	0.415	0.203
16589	Sohio Sta. MAW #12	0.043	0.014	0.006	0.021	0.013
18590	Sohio Sal. M/W #20	0.341	0.010	0.005	0.028	0.008
78591·	GS State WW #21	0.133	0.010	0.054	0.056	0.006
16592	G8 State M/W #22	0.039	0:010	0.020	0.048	0.017
16593	Sat. 44 M/W #23	0.004	0.003	0.001	0.004	0.002
16594	8at. 44 M/W 424	0.004	0.003	<0.001	0.002	<0.001
16595	Ma Com. MW #1	0.003	0.001	<0.001	0.002	0.004
16596	NA Com. M/W #2	0.004	0.001	<0.001	0.003	0.001
16597	Mebie Com. M/W #3	<0.001	0.002	0.012	0.042	0.016
18598	Mable Com. MAN #4	0.007	0.002	0.002	0.006	0.002
16599	Vera MW #5	0.002	0.002	0.001	0.004	0.002
16600	Bell A M/W/#B	0.127	0.001	0.003	0.005	0.001
16601	NBN M/W #7	0.003	<0.001	<0.001	0.002	<0.001
16602	NBF MAN #9	0.028	0.001	0.003	0.003	<0.001
16603	Set 4 M/W HO	0.034	0.003	0.008	0.005	0.001
16604	Bohio St. #1 M/W #10	1.00	0.067	0.156	0.214	0.095
16805	Sohio Bie. M/W #11	0.061	0,011	0.005	0.018	0.012
16606	Bell A MAW #13	0.001	<0.001	<0.001	0.003	0.001
16607	Bel A WW #14	0.154	<0.001	0.002	0.003	0.001
16608	NBF MW #15	1.63	1.49	0.182	0.728	0.350
16609	NBP MW #16	1.47	0.122	0.047	0.144	0.082
	% IA	86	85	87	85	87
	% EA	90	90	89	88	90
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

Kaland K how Raland K. Tuttle

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Environmental Lab of Texas, Inc.	Lab of Texa	S, I	DC		103	Vert US S	West I-20 East (915) 563-1800	100 Est	P S S	12608 West I-20 East Odenta, Tazus 79763 (915) 563-1800 FAX (915) 563-1713	161-131		MAC	ð z	No.	TOD	K REC	cealin-of-custody record and analysis request	N ON	SX TH	NS RI	SQUE	ह	
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LAB # FIELD CODE				ANTER MATER	50V	OTHER BLUDGE	HCL	CONH	NOME ICE	N3HTO '	BING	TIME	16H 178'	TCLP Mebb	Total Mctats	LCFb 2004 A	\$01	ระเ						
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P.03



"Don't Treat Your Soil Like Dirt!"

metals

WHOLE EARTH ENVIRONMENTAL ATTN: MR. MIKE GRIFFIN 19606 SAN GABRIEL HOUSTON, TEXAS 77084 FAX: 281-646-8996

Receiving Date: 09/08/97 Sample Type: WATER Project : TIPPERARY Project Location: NONE GIVEN Analysis Date: 09/15-09/17/97 Sampling Date: 09/05-09/06/97 Sample Condition: Intact/Iced

				TOTAL	METAL	6 (ppm)			
ELT#	Field Code	Ăg	As	Ba	<i>к</i> С н	<u> </u>	Hg	Рb	Se
12477	IVA COM SW	<0.01	<0.002	<0.10	0.011	<0.03	<0.001	<0.10	<0.002
12478	GS #12	<0.01	<0.002	<0.10	<0.005	<0.03	<0.001	<0.10	<0.002
12481	BELL#6	<0.01	<0.002	<0.10	<0.005	<0.03	<0.001	<0.10	<0.002
12482	NBN # 7	0.01	<0.002	<0.10	<0.005	<0.03	<0.001	<0.10	0.004
12483	SOHIO 1 #10	0.01	<0.002	<0.10	0.009	0.37	<0.001	<0.10	<0.002
12484	SOHIO A #11	0.04	<0.002	<0.10	0.034	0.07	<0.001	0.19	<0.002
12485	SAT. 4 #9	0.04	<0.002	<0.10	<0.005	<0.03	<0.001	<0.10	<0.002
12486	NBF # 8	<0.01	<0.002	<0.10	<0.005	<0.03	0.001	<0.10	0.002
12487	VERA # 5	<0.01	<0.002	<0.10	<0.005	<0.03	<0.001	<0.10	<0.002
	Minimum Detection Limit (MDL)	0.01	0.002	0.10	0.002	0.03	0.001	0.1	0.002
	% IA	103	94	98	104	103	100	96	112
	% EA	109	106	94	108	102	88	103	105

METHODS: EPA SW 846-3005, 7760, 7062, 7080, 7130, 7190, 7470, 7420, 7742

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Michael R. Fowler

10-14-97

American Environmental Network , Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST CLIENT	: BTEX, MTBE (E : NMED-OCD	EPA 8020)			AEN I.D.	: 709315
PROJECT #	: (none)	•				
PROJECT NAME	: TIPPERARY PI	T CLOSURE				
SAMPLE			DATE	DATE	DATE	DIL.
ID. # CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
04 VERACOM M	W#1 9709051649	AQUEOUS	9/5/97	NA	9/9/97	1
PARAMETER	DET. LIMIT		UNITS	04		
BENZENE	0.5		UG/L	< 0.5		
TOLUENE	0.5		UG/L	1.1		
ETHYLBENZENE	0.5		UG/L	4.2		
TOTAL XYLENES	0.5		UG/L	47		
METHYL-t-BUTYL ETHER	2.5		UG/L	< 2.5		
BROMOFLUOROBENZEN	E (%)			106		
SURROGATE LIMITS	(80 - 120)					

CHEMIST NOTES: N/A

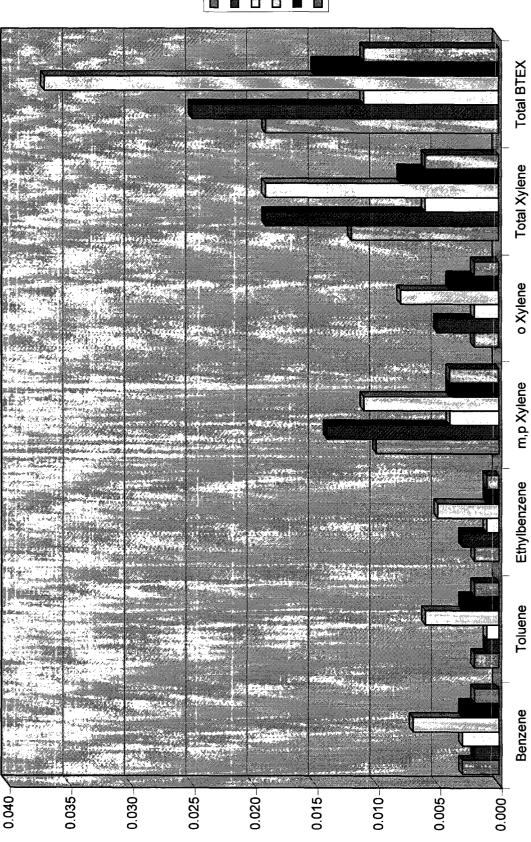
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	14 N.	RCRA Metals by TCLP (Method 1311)								 			Time	Date.						Ĩ
		RCRA Metals (8)								 			Ē							
N.		Target Analyte List Metals (10)			┝──					 		t Fi				N.		Sale -		y - AE
		Priority Pollutarit Metals (13)								 				ane		H				anar
		(#191 25 X 5901 X07H)	$\mathbf{\nabla}$							 		Ň	Signature	Printed Name	Company	10.4				DISTRIBUTION: White, Canary - AEN
		General Chemistry:								 			Sign	Print	L S			1		Š
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	R	Base/Neutral/Acid Compounds CC/MS (625/8270)	\mathbf{t}		<u> </u>					 		1.00	wlas	J E						RIBI
Ц.	REQUEST	Herbicides (615/8150)								 		1 A 6	3							DISI
Z	<u>S</u>	Pesticides/PCB (608/8080)								 			Time:	Date	7		Time:	Date:		
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. .	N	Volatile Organics (624/8240) GC/MS										19		Ë				ä		ĺ
	N	Polynuclear Aromatics (610/8310)										EN	ie E	j zg			ture:	Printed Name	Company:	ĺ
D [®]		204 EDB 🗌 \ DBCb 🗌											J.	line .	Compa		Signature	Printe	Com	l
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U		BTEX/MTBE/EDC & EDB (8020/8010/Short)	_	L								HI.	(NORMAL)			than's	15	121		101
		BTEX & Chlorinated Aromatics (602/8020)										PRC	Ö N			Ø	3			tew Mexico 87107
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		Gasoline/BTEX & MTBE (M8015/8020)		 	ļ					 		1.				Ň			ź	Mo
Z M	1.62	(M8015) Gas/Purge & Trap		 						 		1. (.)		ō		ア	15	54		Ŀ
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Solur					5. A.						1999 A.	JUNG OVER LOT OF A CORE A	🗆 72hr	NN		+ - RUN Chlorid	A.A.		n	n Fre
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ITTUCT LUMIT LINUTINUTINUTION INCLUOTR (IVIVI), INC uquerque • Anix • Pensacola • Portland • Pleasant Hills • Columbia	PROJECT MANAGER:	COMPANY: ADDRESS: PHONE: FAX: BILL TO: COMPANY: ADDRESS: SAMMEN	NERA	0		2						an a	PROJ. NO.:	PROJ. NAME. TIPEFARY	PRO-1106-CLOSOPE		10	1		4/1/96
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Monitor Well # 5





Monitor Well # 5 Vera # 1 Sampling Results

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16599	0.002	0.002	0.001	0.004	0.002	0.006	0.011
15592 10/1/98	0.003	0.003	0.001	0.004	0.004	0.008	0.015
14660 6/25/98	200.0	900'0	200.0	0.011	800'0	0.019	0.037
14061 2/23/98	0.003	0.001	0.001	0.004	0.002	0.006	0.011
13184	0.002	0.001	0.003	0.014	0.005	0.019	0.025
12487 9/5/97	0.003	0.002	0.002	0.010	0.002	0.012	0.019
Lab:# Sample Date	Benzene	Toluene	Ethylbenzene	m,p Xylene	o Xylene	Total Xylene	Total BTEX

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Boring Log

This section contains the boring log for the monitoring well at this site.

01.29.1997 08:36 P.04 FROM TIPPERARY CORP. PAGE 1 OF 2 DATE: ORAL START: **BORING LOG** 8:15 AN URILL STOP: 1-9-97 1:20 PM ATKINS ENGINEERING ASSOCIATES, INC SITE LOCATION: Caprock, New Mexico 2904 West Second Street, Roswell, New Mexico 58202 \$158 PROJECT NAME: Tipperary Corp. - Whole Earth Environmental. Inc. Mike Griffin BORING LOCATION: S. of NM Huy. 380 he Com Job #98464.00 Vera CASING ELEVATION: AUGER TYPE: TH NUMBER: 3 HOLLOW STEM N/A DRILLED BY: LOGGED BY: Detaita Lab Analysia New **PID Reading** (Feet) Symbol Construction ab Analysis 5 ATCHE PRODUCED THE Nort Bater ASSOCIATES, Inc. STRATUM DESCRIPTION Silty Cley w/Caliche, Brown, Firm, Dry Slity Clay w/Calloho, Tan, Firm, Dry Calleho w/Silky Clay, Ten, Hard, Dry 45 . -90 Calicho, Gray, Hard, Dry Silty Clay w/Caliche, Tan, Firm, Dry 25

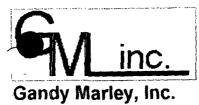
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BO	RIN	à L	ÔG			PAGE	2 (DF 2		DATE:		DREL START:	8:45
				CIATES, INC		l				t- 9-97		DRILL STOP;	1:30
				,,,,,	168	SITE	LOC	ATIO	dr Cr	uproek, Na	w Mas	deo	
PROJ	ect nam		operary C Like Griff ob #9044		mental, Ino.	BOR	ing l	.0CA	TION	s. of NI Jon Cor Vera	li Hwy N	. 380	
TA	FUMBE	Rı	5	AUGER TYPE: HOLLOW STEM	CASING ELEVATION	DN:						1	
 	(Feet)	5	8	DRILLED BY:	LOCCED BY:		Tew N	Б	Bļie	ġ	aie	-j	
Depth	Ę	07	Symbol	ATKINS REGIMERING ASSOCIATES, Inc.	Mort Bates		5	Construction	Details	PID Reading	Lab Analyais	Lab Analysis	
				BTHATUM	DESCRIPTION		1						
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-65				Calicha, Gray, Hard, Dry									
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		1		Silly Clay w/Calloho, Tan,	Firm, Saturated						t		-t
<u> </u>				TD = ±59 ft.					1				╋╼╍
				Lost 35 feet of centur rod	i with center bit.					 			+
1		1	1	Damaged 35 feet of Auge	ł		1	1	1	<u> </u>	I	1	1



Disposal Manifests

This section contains the treatment cell location and disposal manifests of all wastes removed from the site.

	- Contaminated Sails Shipmont	Manifast	1. Manifest D		. No.		² .Page of
	Contaminated Soils Shipment N		105871	-97			·/
	2 Generator's Name and Mailing Address				4. G	enerator Phone	No.
~	Tipperary Oil & Gas P. O. Box 857	•			ľ	505-398	-6509
,	Tatum, NM 88267				5. G	enerator Contac	a
						Vic Vic	e
I	6. Transporter 1 Company Name	<u></u>			7. ID) No.	
	Gandy Corporation				s.	c.¢. 14	225
	8. Transporter 2 Company Name			·	9. 10		
	10. Designated Disposal Facility Name and Site Address				11. F	acility Permit	Number
	Gandy Marley, Inc. Contamina	ted Soils Landfa	m				
	7200 East Second	Street		,	12 1	acility Phone 1	No
	PO Box 165				12.1	-	98 - 4960
	Roswell, NM 8	5201				(303) 3	70 - 4700
~	13. Description of Waste			14. Co	ntainers	15. Total	16. Unit
G E				No.	Туре	Quantity	Wt/Vol
N	Contaminated soils and sl	udges from				524.	
E R	Vera #1	uuges iiom		1	dt1		yds
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T	b.						
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_	c. .						
1.							,]
	17. Special Handling Instructions and Additional Information	· .					
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			·····				
	18. Generator's Certification: I hereby declare that the care classified, packed, may to applicable federal, state	rked, and labeled, and	are in all respe				
	FURTHER, 1 represent and Conservation and Recover laboratory analysis done in	y Act of 1976, OR has	been characteri	zed as no	on-hazarda		
	Printed/Typed Name Vic Vice	Signature	Tree			Date	9081919
T	19. Transporter 1 Acknowledgement of Receipt of Materials	······································					
R A N	Printed/Typed Name	Signature	<u></u>			Date	
S P	Rue Mauk	Ku	e M.	auch		D	90897
O R	20. Transporter 2 Acknowledgement of Receipt of Materials	1	··				
т К	Printed/Typed Name	Signature			÷	Date	
2-	21 Nicessen L.C	<u> </u>					
	21. Discrepancy Information						
G M							
•		· · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	······	
	Constant Continuation of receipt of mater	ais described on this n	ianilest except a	as noted	in item 21		



Tipperary Oil & Gas P.O. Box 857 Tatum, NM 88267

9/22/97

Detailed Report of material received between 8-1-97 and 8-31-97

P.O. Box 1658 Roswell, NM 88202 Phone 505-625-9206 Fax 505-625-9706

EXEMPT OCD

	,					
Origin:	SATALLITE #4	4				
Date:	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/18 / 97	1897	OCD EXEMPT SLUDGES	Gandy Inc.	7	185	BBLS
8/19/97	1942	OCD EXEMPT SLUDGES	Gandy Inc.	7	360	BBLS
		SATALLIT	E #4 Total Units.		545 BE	BLS
		E	XEMPT OCD Total BE	BLS.	545 BE	BLS
Origin:	BELL STATE	A				
Date:	Ticket No:	Discripition:	Transporter:	Cell	Units	Unit Type:
8/16/97		OCD EXEMPT SOILS	Gandy Inc.	7	160	Yards
8/18/97	189?	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/18/97	1893	OCD EXEMPT SOILS	Gandy Inc.	7	14	Yards
8/18/97	1895	OCD EXEMPT SOILS	Gandy Inc.	7	60	Yards
		BELL STA	TEA Total Units.		262 Ya	ards
Jrigin:	GULF STATIC	ON #1				
Date:	Ticket No:	Discripition:	Transporter:	Cell	Units	Unit Type:
8/30/97		OCD EXEMPT SOILS	Gandy Inc	7	120	Yards
	o . (ATION #1 Total Units	-	120 Ya	ards
Origin:	NBN					
Date:	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/22/97		OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/22/97	1928	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/22/97	1929	OCD EXEMPT SOILS	Gandy Inc.	7	22	Yards
8/22/97	1931	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
		NMB Tota	al Units.		106 Ya	ards
Origin:	VERA					
Date	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/21/97	1915	OCD EXEMPT SOILS	Gandy Inc.	7	42	Yards
8/21/97	1916	OCD EXEMPT SOILS	Gandy Inc.	7	42	Yards
8/21/97	1917	OCD EXEMPT SOILS	Gandy Inc.	7	42	Yards
8/21/97	1919	OCD EXEMPT SOILS	Gandy Inc.	7	40	Yards
8/22/97	1918	OCD EXEMPT SOILS	Gandy Inc.	7	246	Yards
8/22/97	1920	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/22/97	1921	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/22/97	1922	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/22/97	1924	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards

1

HVL	INC. ey, Inc.
TIVL	

Tipperary Oil & Gas P.O. Box 857 Tatum, NM 88267 9/22/97

Detailed Report of material received between 8-1-97 and 8-31-97

P.O. Box 1658 Roswell, NM 88202 Phone 505-625-9206 Fax 505-625-9706

Phone 50	2-022-9200	5 Fax 505-025-9706				
		PVERA Tot	tal Units.		524 Ya	irds
Origin:	SATALLITE #	4				
Date:	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/18/97	1894	OCD EXEMPT SOILS	Gandy Inc.	7	56	Yards
8/18 / 97	1896	OCD EXEMPT SOILS	Gandy Inc.	7	42	Yards
8/18/97	1898	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/20/97	1943	OCD EXEMPT SOILS	Gandy Inc.	7	190	Yards
		SATALLITE	#4 Total Units.		316 Ya	irds
Origin:	SOHIO A#1					
Date:	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/23/97	1934	OCD EXEMPT SOILS	Gandy Inc.	7	ങ	Yards
		SOHIO A#1	Total Units.		63 Ya	irds
Origin:	SOHIO A#1 S	STATE				
Date:	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/22/97	1923	OCD EXEMPT SOILS	Gandy Inc.	7	22	Yards
8/22/97	1925	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/22/97	1927	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/22/97	1930	OCD EXEMPT SOILS	Gandy Inc.	7	14	Yards
8/22/97	1932	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/23/97	1935	OCD EXEMPT SOILS	Gandy Inc.	7	56	Yards
8/23/97	1937	OCD EXEMPT SOILS	Gandy Inc.	7	56	Yards
8/23/97	1938	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/27/97	1933	OCD EXEMPT SOILS	Gandy Inc.	7	28	Yards
8/27/97	1936	OCD EXEMPT SOILS	Gandy Inc.	7	14	Yards
8 / 27/97	1939	OCD EXEMPT SOILS	Gandy Inc.	7	14	Yards
8/27 <i>1</i> 97	1940	OCD EXEMPT SOILS	Gandy Inc.	7	84	Yards
		SOHIO A#1	STATE Total Units.		400 Ya	rds
		EXE	EMPT OCD Total Yards.		1791 Ya	irds
		EXE	EMPT OCD Total Units.		2336 Un	iits
Tippera	ry Oil & G	Gas Total Units.			2336 Un	its



VADSAT Modeling

This section contains the original contaminant migration model used in the preparation of the remediation protocol for this site.

Modeling Data Entry Vera # 1

Control Data	Entry U/M
Deterministic	Yes
Monte Carlo	No
Evaporation	No
Biodecay	No
Low Permeability Layer Below Contamination	No

Source Data		
Waste Zone Thickness	48	ft.
Waste Zone Area	2,500	sq. ft.
Ratio of Length to Width	1	
Soil Thickness above Waste Zone	10	ft.
Contaminant Concentration in Soil / Waste Zone	10	ppm
Hydrocarbon Concentration in Soil / Waste Zone	10,000	ppm

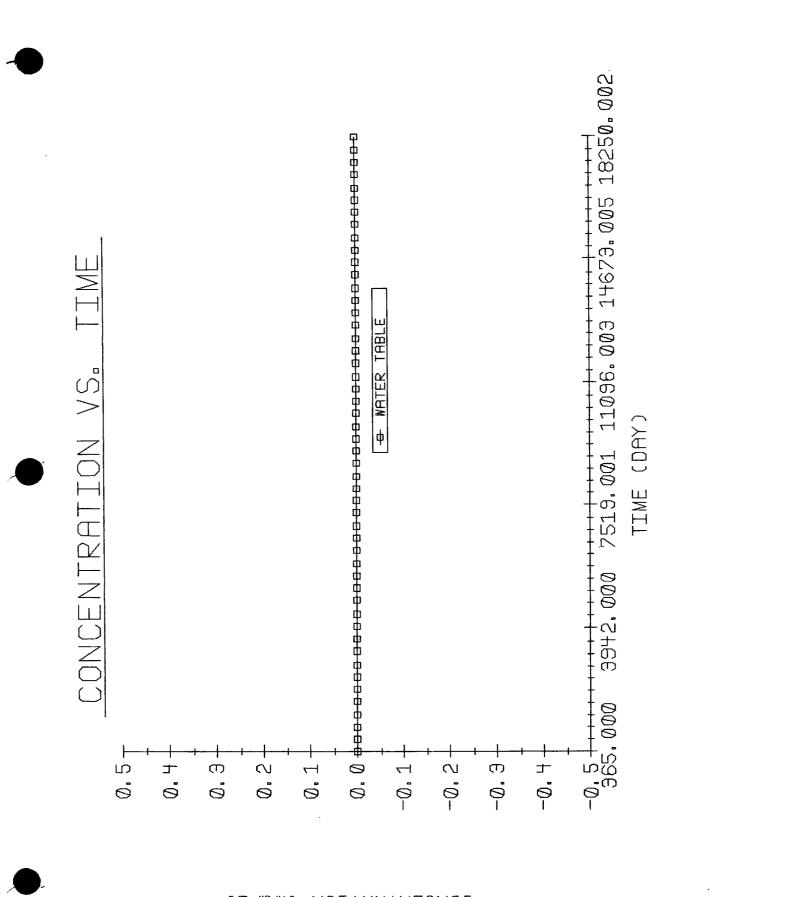


Chemical Data Yes Benzene

Unsaturated Zone		
Biodecay Cooefficient	0	
Organic Carbon Fraction	0	
Soil Database	Clay	
Hydrological Database	Sedimentary	
Unsaturated Zone Thickness	1	meter
Soil Database	Clay	
van Genuchten n	1.09	(Default)
Residual Water Content	0.01001	l
Unsaturated Zone Dispersivity	0	Internally

Saturated Zone		
Biodecay Cooefficient	0	
Aquifer Porosity	0.2	(Default)
Organic Carbon Fraction	0	
Longitudinal Dispersivity	0	Internally
Ratio of Long. / Trans. Dispersivities	3	
Ratio of Trans. / Vert. Dispersivities	3	
Hydrological Database	Sedimentary	
Aquifer Thickness	60	ft.
Aquifer Gradient	0.00357	
Saturated Hydraulic Conductivity	0.0986	ft / day
	0.00004	A (Jay)
Net Infiltration Rate	0.00001	π/ day

Net Infiltration	Rate		0.000



I

CONCENTRATION (MG/L)



Liner Details

This section contains the MSDS and technical description of the liner material used in this project.

FALCON ENVIRON



Environmental Lining Systems, Inc.

P.O. Box 4306 Odessa, Texas 79760 5200 Johnson Rd. 79764

Phone: (915) 366-2611

1-800-842-0945 FAX: (915) 366-2999

TECHNICAL SPECIFICATION SHEET 20 MIL BLACK POLYETHYLENE

PROPERTIES	TEST METHOD	VALUE
Thickness mils	ASTM D 1593	20
Density Ib/cm3	ASTM D792	57.7 lbs.
Tensile Strength at Yeild	ASTM D638	40 lbs.
Tensile Strength at Break	ASTM D638	adi 88
Elongation at Break	ASTM D638	700 %
Hydrostatic Resistance	ASTM D751	122
Puncture Resistance	FTMS 101 C	36
Tear Resistance	ASTM D1004	13
Volatile Loss	ASTM 1203	<1%
Resistance to Soil Burial	ASTM G22	-4%
Low Temp, Failure	ASTM D745	<-94
Dimensional Stability %Change	ASTM D1204	<2
Environmental Stress Crack Resistance Hours to failure	ASTM D5397 Method A	>400
Carbon Black %	ASTM D1603	2.75
WVTR GH2O/100 in 2/24 hrs (g H2O/m2/24 hrs.	ASTM E96 Method A73 F, 50% RH	.020 (.022)

2002

Ed. Fail Number: 2000F3 4000F3 Stable X Consultance Imperiative over 570 F will release combusible gases. Stable X to Avoid Comparation comparation The following combustion products may be generated. Carbon dioxide, carbon comparating products comparating Products monoxide, water vapor, and trace volutile organic componends. Not Determined paration Mill not Det X Combines paration Not Determined Not Determined Organization owid Not Determined 2. Chrome Not Determined owid Not Determined Not Determined Unit Product. owid Stabio Science Not Determined Unit Pr	/18/99 MON	15.26 FA	X 915 366 2999	FAI	CON ENVIRON			
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