1R - 266

REPORTS

DATE:

2/26/2002

Tipperary
CORPORATION

633 Seventeenth Street
Suite 1550
Denver, Colorado 80202

February 26, 2002

VIA OVERNIGHT MAIL

Mr. William C. Olson
New Mexico Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87504

RE: Pit Remediation and Closure Report
Satellite #4
Section 12J-T11S-R33E
Lea County, NM

Dear Mr. Olson:

Please find enclosed the Pit Remediation and Closure Report for the subject lined emergency pit. The remediation started January 10, 1997 and was completed September 22, 2001. The data included in the attached report is summarized below:

- Pit closure summary, topographic base map, well site map with surveyed locations of pit and wells, disposal manifest of waste products.
- Before and after photographs of pit closure.
- Pit closure protocol and procedures used.
- Results of all soil and water samples taken with chain of custody.
- Boring logs of monitor wells.
- 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,

Larry G. Sugano
Vice President - Engineering

Enclosure

cc: NMOCD Hobbs Office
Whole Earth Environmental

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South t. Francis Dr.
Santa Fe, NM 87505

Submit 1 copy to appropriate District Office and 1 copy to the Santa Fe Office

(Revised 3/9/94)

PIT REMEDIATION AND CLOSURE REPORT

Operator: Tipperary Corporation Telephone: (303) 293-9379

Address: 633 17th St. Denver CO 80202

Facility Or: Satellite # 4
Well Name

Location: Unit or Qtr/Qtr Sec _____ Sec 12 T 11S R 33E County Lea

Pit Type: Separator _____ Dehydrator _____ Other Emergency Upset

Land Type: BLM _____, State _____, Fee X Other _____

Pit Location: Pit dimensions: length 60', width 60', depth 8'
(Attach diagram)

Reference: wellhead _____, other (See attached plat map)

Footage from reference: _____

Direction from reference: _____ Degrees _____ East North _____ of _____ West South _____

Depth To Ground Water (Vertical distance from contaminants to seasonal high water elevation of ground water.)	Less than 50 feet 50 feet to 99 feet Greater than 100 feet		(20 points) (10 points) (0 points) 20
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources.)		Yes No	(20 points) (0 points) _____
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches.)	Less than 200 feet 200 feet to 1000 feet Greater than 1000 feet		(20 points) (10 points) (0 points) _____
	RANKING SCORE (TOTAL POINTS):		20

Date Remediation Started: 1/10/97 Date completed: 9/22/01

Remediation Method: (Check all appropriate sections.)
Excavation _____ Approx. cubic yards _____
Landfarmed _____ Insitu Bioremediation _____
Other (See attached protocol WEPR-44)

Closure Summary
Tipperary Corporation
Satellite # 4

Legal Description
Fee Lease
T11S R33E Sec. 12
NE / SE

Pit Description
Satellite # 4 is described as a lined emergency upset pt that was used in conjunction with on-site separation and storage. The pit lies approximately 75' east of the separator within a raised berm approximately 2' agl. The pit dimensions were 60' X 60' X 8' in depth. The liner appeared intact upon closure.

There was free product within the pit however there was no evidence of surface staining surrounding the berm. There were no signs of stressed vegetation surrounding the site.

Pit History
The station was erected in late 1967 or early 1968 as part of the Burro Pipeline system. The pit was established to serve as an emergency discharge pit in the event of an upset condition within the treatment process.

Distance to Surface and Ground Waters
The attached plat map demonstrates that the pit was more than 1,000 ft. from any surface water or private or domestic water source. The vertical distance to groundwater is 29'.

Closure Standards
In accordance with the Oil Conservation Division's *Unlined Surface Impoundment Closure Guidelines,* (Feb. '93), the pit has a ranking score of >19 and thus required closure to a TPH concentration of less than 100 ppm.

Remediation Location: Onsite X Offsite _____
(i.e. landfarmed onsite, name and location of offsite facility)

General Description of Remedial Action: _____

Ground Water Encountered: No _____ Yes _____ Depth _____

Final Pit:
Closure Sampling:
(if multiple samples, attach sample results and diagram of sample locations and depths)

Sample location _____

Sample depth _____

Sample Date _____ Sample time _____

Sample Results

Benzene(ppm) _____

Total BTEX(ppm) _____

Field headspace(ppm) _____

TPH _____

Ground Water Sample: Yes X No _____ (If yes, attach sample results)

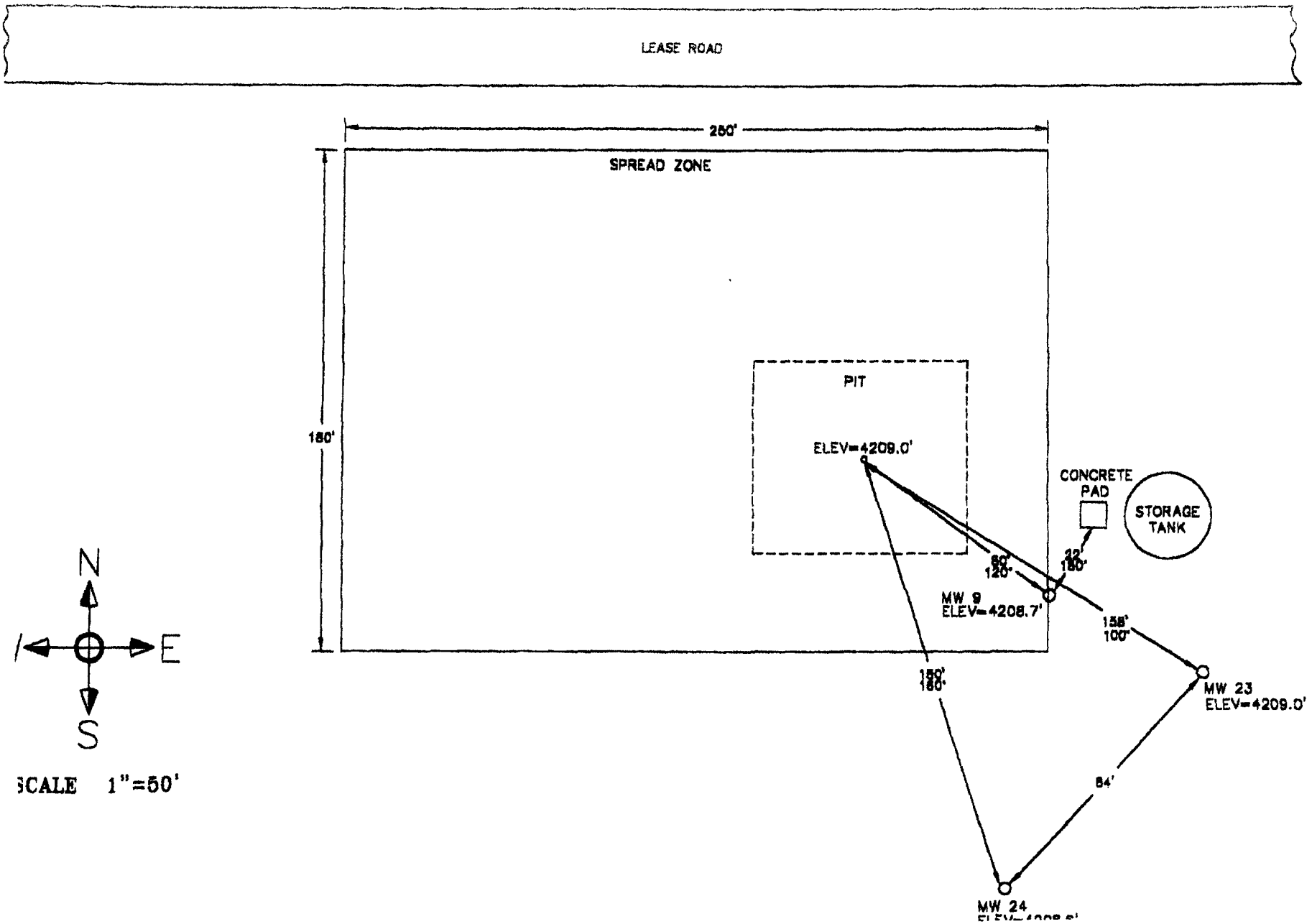
I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Date February 26, 2002

Signature Larry G Sugano

Printed Name and Title Larry G. Sugano VP - Engineering

SAT. 4


LEASE ROAD
250'
SPREAD ZONE
180'
PIT
ELEV=4209.0'
CONCRETE PAD
STORAGE TANK
MW 9
ELEV=4208.7'
MW 23
ELEV=4209.0'
MW 24
N
E
S
SCALE 1"=50'

COORDINATE FILE : TIPARARY.CRD

IST 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 MW31	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 MW17	260	869969.168	761443.837	4283.31
SOHIO STATE 1 MW18	261	870017.865	761533.683	4283.59
SOHIO STATE 1 MW28	262	869892.594	761534.416	4283.21
SOHIO STATE 1 MW30	263	869677.360	761728.469	4281.13
VERA 1 PIT	264	846366.089	752525.766	4289.49
VERA #1 MW5	265	846217.026	752582.067	4298.90
STATE NBF 1 PIT	266	856893.939	764024.682	4266.86
STATE NBF 1 MW8	267	856806.388	764165.403	4259.41
STATE NBF 1 MW15	268	856747.667	764157.788	4259.68
STATE NBF 1 MW16	269	856774.041	764241.604	4259.06
STATE NBF 1 MW26	270	856658.728	764331.675	4258.04
BELL A 1 PIT	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

9/22/97

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

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

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

VERA Total Units. 524 Yards

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 Yards

Origin: SOHIO A#1

Date:	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/23/97	1934	OCD EXEMPT SOILS	Gandy Inc.	7	63	Yards

SOHIO A#1 Total Units. 63 Yards

Origin: SOHIO A#1 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
8/27/97	1940	OCD EXEMPT SOILS	Gandy Inc.	7	84	Yards

SOHIO A#1 STATE Total Units. 400 Yards

EXEMPT OCD Total Yards. 1791 Yards

EXEMPT OCD Total Units. 2336 Units

Tipperary Oil & Gas Total Units. 2336 Units

9/22/97

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

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

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

EXEMPT OCD

Origin: SATALLITE #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
		SATALLITE #4 Total Units.			545 BBLS	
		EXEMPT OCD Total BBLS.			545 BBLS	

Origin: BELL STATE A

Date:	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/16/97	1890	OCD EXEMPT SOILS	Gandy Inc.	7	160	Yards
8/18/97	1892	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 STATE A Total Units.			262 Yards	

Origin: GULF STATION #1

Date:	Ticket No	Discripition:	Transporter	Cell:	Units	Unit Type:
8/30/97	1941	OCD EXEMPT SOILS	Gandy Inc.	7	120	Yards
		GULF ~~STATION~~ STATE #1 Total Units.			120 Yards	

Origin: NBN ~~NMB~~

Date:	Ticket No.	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/22/97	1926	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 Total Units.			106 Yards	

Origin: VERA

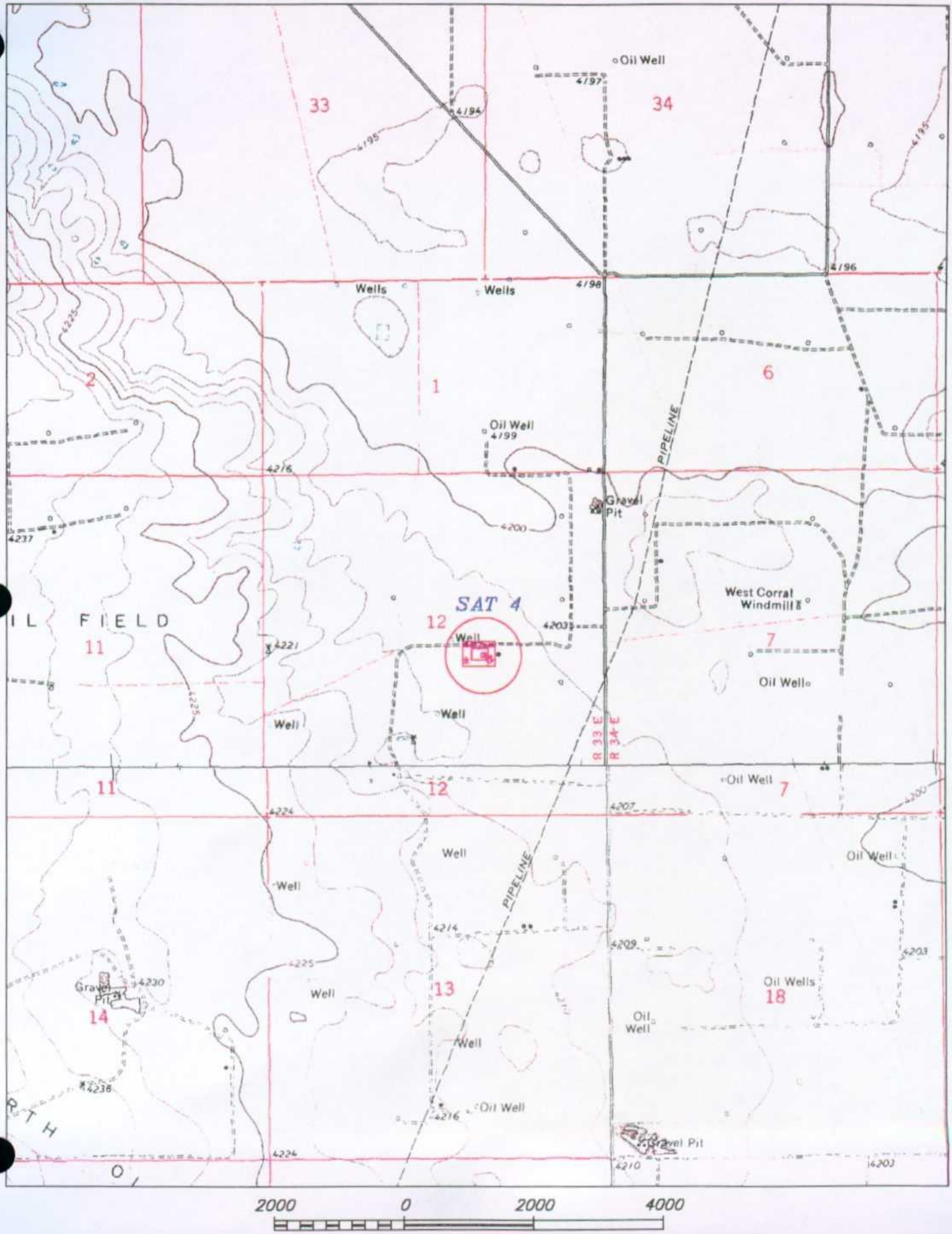
Date:	Ticket No:	Discripition:	Transporter:	Cell:	Units	Unit Type:
8/21/97	1915	OCD EXEMPT SOILS	Gandy Inc.	7	42	Yards
8/21/97	1916	OCD EXEMPT SOILS	Gandy Inc.	7	42	Yards
8/21/97	1917	OCD EXEMPT SOILS	Gandy Inc.	7	42	Yards
8/21/97	1919	OCD EXEMPT SOILS	Gandy Inc.	7	40	Yards
8/22/97	1918	OCD EXEMPT SOILS	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

Photographic Index

This section contains the following photographs:

1. Photograph of the site prior to remediation
2. Photograph of the site at the point of maximum excavation
3. Detail of the liner installation
4. Photograph of the site after backfill and final contouring

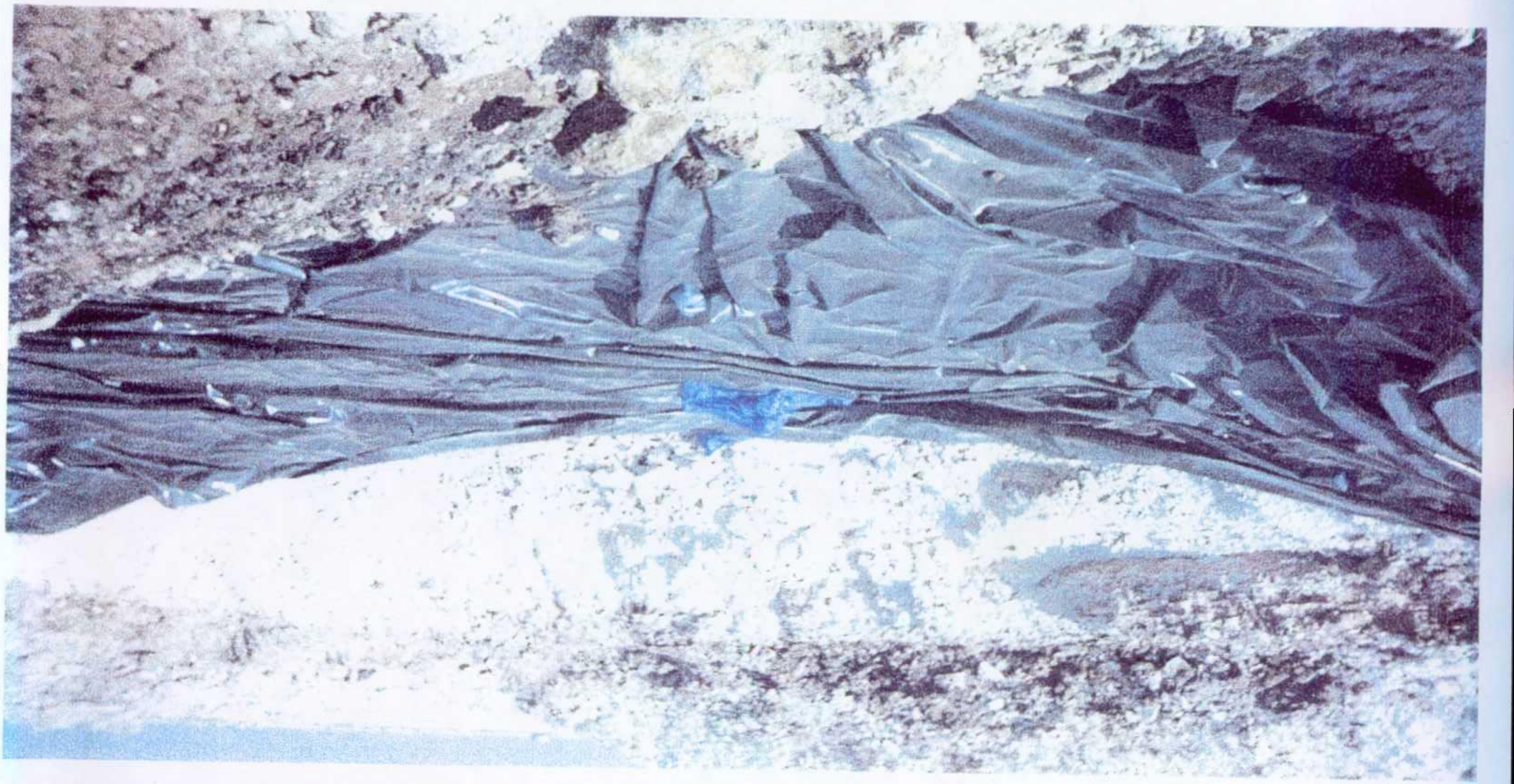
WHOLE EARTH ENVIROMENTAL, INC.



BASIN SURVEYS P.O. BOX 1786 – HOBBS, NEW MEXICO	W.O. Number: 9352	Drawn By: K. GOAD
	Date: 10–21–99	Disk: KJG #122 – WE9352.DWG


Satellite #4


Satellite # 4 at Max.
Excavation Depth



Protocol

This section contains a copy of PR-44, the approved protocol for this project.

Pit Remediation Protocol
Tipperary Corporation
Tatum Pit Closure Project
Satellite # 4

1.0 Purpose

This protocol is provide a detailed outline of the steps to be employed in the remediation and final closure of the Tipperary Satellite # 4 Pit.

2.0 Scope

This protocol is site specific for the Satellite # 4 pit.

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 Tipperary 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 Tipperary Corporation prior to submittal to the Oil Conservation Division.

3.2 Oil Conservation Division Review

3.2.1 Upon client approval, this procedure 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 Tipperary 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, 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 the Gandy / Marley, Inc. Landfarm. 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 5'. All excavated material 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 <100 ppm TPH, <10 ppm benzene and <50 ppm total BTEX.

63 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.

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 deposited into the pit.
- Daily calibration records of each testing instrument
- Shipping manifests and OCD Form C-117-A

Procedures

This section contains a copy of the detailed field sampling and testing 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.

QP-77

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

QP-78

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Obtaining Water Samples (Cased Wells) Using Enviro-Tech ES-60 Pump

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 Lower the ES-60 pump into the monitor well bore taking care to insure that the pump and first 10' of hose and cable does not touch the ground or become cross-contaminated by contact with anything containing hydrocarbon residues. When the pump reaches the bottom of the well bore you will feel the hose and cable assembly go slack. Lift the pump a minimum distance of 18" above the bottom of the well bore and clamp the hose assembly to the top of the well bore by means of vice grips. (Take care to insure that the vice grips are adjusted so as not to "choke" the hose.

5.3 Attach the electrical cable leads to an automobile battery and begin pumping the well bore. If the pump does not bring fluid to the surface within one minute, disconnect the electrical leads, and re-connect for four seconds three times to remove air cavitation.

5.4 The pump has a minimum volume of 2.8 gallons per minute at 60'. Purge the well by pumping for a minimum of 10 minutes before taking a sample.

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 Decontamination

7.1 After removing the pump from the well, use an aerosol spray pump bottle filled with denatured isopropyl alcohol to clean the pump and first 10' of the cable and hose assembly. Rinse the sprayed portion with distilled water to remove the alcohol and dry with a clean rag. Discard the rag after each use. During transport, the pump assembly should be carried in a 2" PVC protective sleeve.

8.0 Documentation

8.1 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 Results

This section contains a copy of the laboratory analytical results for the pit closure and subsequent monitor well testing.

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: 10/28/97
Sample Type: SOIL
Project : TIPPERARY
Project #: TATUM PIT CLOSURE
Project Location: TATUM, NEW MEXICO

Analysis Date: 10/28/97
Sampling Date: 10/27/97
Sample Condition: Intact

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg	TPH mg/kg
12942	Sat. 4 Surface Retest	<0.100	<0.100	<0.100	<0.100	<0.100	100
12943	Sohio State #1 Surface Retest	<0.100	0.238	0.151	0.338	0.146	10
	% IA	88	90	91	88	91	100
	% EA	94	98	99	96	98	117
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: SW 846-8020,5030,EPA 418.1

Michael R. Fowler

10-28-97
Date

Environmental Lab of Texas, Inc.

12600 West I-20 E[illegible] Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: M. Griffin
Phone #: (800) 854-4358
FAX #:
Company Name & Address: Tipperary Corporation
Project #: Tatum Pit Closure
Project Name :
Project Location: Tatum, NM
Sampler Signature: M. Griffin

ANALYSIS REQUEST

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	BTEX 8020/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
12942	Sat. 4 Surface retest	1			✓							✓		10-27	3:15	✓	✓						
12943	Solio State #1 surface retest	1			✓							✓		10-27	3:25	✓	✓						

Relinquished by:	Date:	Time:	Received by:
M. Griffin	10-28-97	0835	J McMurrey
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

Sample Type: Water
Sample Condition: Intact/ Iced/ HCl/ 2.5 deg. C
Project #: None Given
Project Name: Quarterly Sampling
Project Location: Tatum, New Mexico

Sampling Date: 04/05/01
Receiving Date: 04/06/01
Analysis Date: 04/09/01

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
38940	Sohio "A" MW 31	0.105	0.008	0.013	0.042	0.023
38941	GS Source Well	0.417	0.148	0.091	0.582	0.254
38942	GS MW 12	0.394	0.022	0.180	0.767	0.200
38943	GS MW 21	0.014	0.011	0.012	0.021	0.009
38944	GS MW 22	0.085	0.038	0.060	0.076	0.099
38945	GS MW 29	0.009	0.007	0.007	0.022	0.011
38946	Sat 4 MW 9	<0.001	<0.001	<0.001	<0.001	<0.001
38947	23	<0.001	<0.001	<0.001	<0.001	<0.001
38948	24	<0.001	<0.001	<0.001	<0.001	<0.001
%IA		93	98	100	99	100
%EA		102	106	106	104	105
BLANK		<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8021B ,5030

Raland K. Tuttle

4-11-01
Date

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: _____

Company Name: Whole Earth Environmental, Inc.

Company Address: 19606 San Gabriel

City/State/Zip: Houston, Tx. 77084

Telephone No: (800) 854-4368 Fax No: (281) 646-8996

Sampler Signature: _____

Project Name: Quarterly Sampling – Tipperary

Project #: _____

Project Loc: Tatum, New Mexico

PO #: _____

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO_3	HCl	NaOH	H_2SO_4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify):	Analyze For: TCLP: TDS / Cl. / SAR / EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	TOTAL: Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	RUSH TAT (Pre-Schedule)	Standard TAT
38937	Sohio "A" MW 19	4-5	2:30		X		X					X											X		
38938	Sohio "A" MW 20		2:20		X		X					X											X		
38939	Sohio "A" MW 27		2:10		X		X					X											X		
38940	Sohio "A" MW 31		2:00		X		X					X											X		
38941	GS Source Well		2:40		X		X					X											X		
38942	GS MW 12		2:57		X		X					X											X		
38943	GS MW 21		3:10		X		X					X											X		
38944	GS MW 22		3:25		X		X					X											X		
38945	GS MW 29		3:45		X		X					X											X		
38946	Sat. 4 MW 9		9:55		X		X					X											X		

Special Instructions:

Sample Containers Intact? (Y) N
Temperature Upon Receipt: 2.5°C
Laboratory Comments: INV. Tipperary

Relinquished by:	Date	Time	Received by:	Date	Time
M.A. Hill	4-6-01	9:25			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Jeanne Mooney	4-6-01	0925

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: _____ Project Name: Quarterly Sampling

Company Name: Whole Earth Environmental Project #: _____

Company Address: 19606 San Gabriel Project Loc: Tatum, NM

City/State/Zip: Houston, Tx. 77084 PO #: _____

Telephone No: (800) 854-4358 Fax No: (281) 646-8996

Sampler Signature: _____

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO3	HCl	NaOH	H2SO4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify):	Analyze For: TCLP / TOTAL: TDS / CL / SAR / EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	RUSH TAT (Pre-Schedule)	Standard TAT
38947	23	4-5	9:10	2	✓		✓																		
38948	24	4-5	9:20	2	✓		✓																✓		

Special Instructions:

Sample Containers Intact? (Y) N
Temperature Upon Receipt: 2.5°C
Laboratory Comments: inv. Tapeony

Relinquished by:	Date	Time	Received by:	Date	Time
M. Gallegos	4-6-01	9:25			
Relinquished by:	Date	Time	Received by ELOT	Date	Time
			Jeanne McMurray	4-6-01	0925

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: 281-646-8996
FAX: 505-397-3591 (motel)

Sample Type: Water
Sample Condition: Intact/ Iced/ HCl 2 deg C
Project #: None Given
Project Name: Quarterly Sampling
Project Location: Tatum, N.M.

Sampling Date: 07/06/01
Receiving Date: 07/07/01
Analysis Date: 07/09/01

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
0101098-18	Sohio #1 MW 28	0.009	0.002	0.006	0.025	0.007
0101098-19	Sohio #1 MW 30	0.005	0.001	0.004	0.017	0.005
0101098-20	Sohio "A" MW 11	0.035	0.002	0.005	0.018	0.007
0101098-21	Sohio "A" MW 19	0.307	0.001	0.004	0.017	0.005
0101098-22	Sohio "A" MW 20	0.005	<0.001	0.004	0.014	0.004
0101098-23	Sohio "A" MW 27	0.073	<0.001	0.004	0.012	0.004
0101098-24	Sohio "A" MW 31	0.275	0.003	0.007	0.039	0.014
0101098-25	GS Source Well	0.318	0.180	0.133	0.722	0.368
0101098-26	GS MW 12	0.350	0.026	0.150	0.483	0.150
0101098-27	GS MW 21	0.009	0.002	0.007	0.004	0.002
0101098-28	GS MW 22	0.062	0.020	0.046	0.047	0.069
0101098-29	GS MW 29	0.005	0.002	0.004	0.005	0.004
0101098-30	Sat. 4 MW 9	<0.001	<0.001	0.001	0.003	<0.001
0101098-31	Satellite #4 MW 23	<0.001	<0.001	<0.001	<0.001	<0.001
0101098-32	Satellite #4 MW 24	<0.001	<0.001	<0.001	<0.001	<0.001
0101098-33	Collier MW 32	0.537	0.054	0.073	0.077	0.078
0101098-34	Collier MW 33	0.043	0.003	0.005	0.007	0.005
	QUALITY CONTROL	0.092	0.098	0.095	0.186	0.097
	TRUE VALUE	0.100	0.100	0.100	0.200	0.100
	% INSTRUMENT ACCURACY	92	90	95	93	97
	SPIKED AMOUNT	0.100	0.100	0.100	0.200	0.100
	ORIGINAL SAMPLE	0.005	0.001	0.004	0.017	0.005
	SPIKE	0.097	0.090	0.098	0.202	0.101
	SPIKE DUP	0.097	0.091	0.090	0.185	0.090
	% EXTRACTION ACCURACY	92	89	94	93	96
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001
	RPD	0	1	8	9	11

METHODS: EPA SW 846-8021B ,5030

Raland K. Tuttle

7-13-01
Date

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager:

Company Name Whole Earth Environmental, Inc.

Company Address: 19606 San Gabriel

City/State/Zip: Houston, Tx. 77084

Telephone No: (800) 854-4358 **Fax No:** (281) 646-8996

Sampler Signature: M. Gill

Project Name: Quarterly Sampling

Project #:

Project Loc: Tatum, New Mexico

PO #:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	Preservative: HNO_3	Preservative: HCl	Preservative: NaOH	Preservative: H_2SO_4	Preservative: None	Preservative: Other (Specify)	Matrix: Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify):	Analyze For: TCLP: TDS / CL / SAR / EC	TCLP: TPH 418.1	TCLP: TPH TX 1005/1006	TCLP: TPH 8015M GRO/DRO	TCLP: Metals: As Ag Ba Cd Cr Pb Hg Se	TCLP: Volatiles	TCLP: Semivolatiles	TOTAL: BTEX 8021B/5030	RUSH TAT (Pre-Schedule)	Standard TAT
10098-21	Sohio "A" MW 19	6/6/01			X		X					X											X		
22	Sohio "A" MW 20	6/6/01			X		X					X											X		
23	Sohio "A" MW 27	6/6/01			X		X					X											X		
24	Sohio "A" MW 31	6/6/01			X		X					X											X		
25	GS Source Well	6/6/01			X		X					X											X		
26	GS MW 12	6/6/01			X		X					X											X		
27	GS MW 21	6/6/01			X		X					X											X		
28	GS MW 22	6/6/01			X		X					X											X		
29	GS MW 29	6/6/01			X		X					X											X		
30	Sat. 4 MW 9	6/6/01			X		X					X											X		

Special Instructions:

Sample Containers Intact? Y N
Temperature Upon Receipt:
Laboratory Comments:

rec. 2°C.

Relinquished by:	Date	Time	Received by:	Date	Time
M. Gill	7-7-01	11:30			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Rebekah	7-7-01	1130

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager:

Company Name Whole Earth Environmental, Inc.

Company Address: 19606 San Gabriel

City/State/Zip: Houston, Tx. 77084

Telephone No: (800) 854-4358 **Fax No:** (281) 646-8996

Sampler Signature:

Project Name: Quarterly Sampling

Project #:

Project Loc: Tatum, New Mexico

PO #:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	Preservative: HNO_3	Preservative: HCl	Preservative: NaOH	Preservative: H_2SO_4	Preservative: None	Preservative: Other (Specify)	Matrix: Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify):	Analyze For: TCLP: TDS / CL / SAR / EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	Cations / Anions	RUSH TAT (Pre-Schedule)	Standard TAT
10098-31	Satellite # 4 MW 23	6/6/01		2	X		X					X											X			
32	Satellite # 4 MW24	6/6/01		2	X		X					X											X			
33	Collier MW 32	6/6/01		4	X		X					X				X							X	X		
34	CollierMW 33	6/6/01		4	X		X					X				X							X	X		

Special Instructions:

Sample Containers Intact? Y N
Temperature Upon Receipt:
Laboratory Comments:

Relinquished by:	Date	Time	Received by:	Date	Time
	7-7-01	11:30			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
				7-7-01	1130

rec. 2°C.

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: _____ Project Name: Tipperary Satellite 4

Company Name: Whole Earth Environmental, Inc. Project #: _____

Company Address: 19606 San Gabriel Project Loc: Tatum, NM

City/State/Zip: Houston, Tx. 77084 PO #: _____

Telephone No: 800.854.4358 Fax No: 281.646.8996

Sampler Signature: _____

Lab # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	Preservative: HNO_3 *	Preservative: HCl	Preservative: NaOH	Preservative: H_2SO_4	Preservative: None	Preservative: Other (Specify)	Matrix: Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify)	Analyze For: TCLP:	Analyze For: TOTAL: TDS / Cl / SAR / EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	Anions/ Cations	RUSH TAT (Pre-Schedule)	Standard TAT
01	MW-9	9/22/01	12:55	5	X	X						X					X				X	X	X	X	X		
02	MW-23	9/22/01	11:40	5	X	X						X					X				X	X	X	X	X		
03	MW-24	9/22/01	10:35	5	X	X						X					X				X	X	X	X	X		

Special Instructions: Run BTEX & chlorides first. Report results before running other tests.

Sample Containers Intact: _____
Temperature Upon Receipt: _____ °C
Laboratory Comments: _____

Relinquished by:	Date	Time	Received by:	Date	Time
M. Griffin M. Griff.	9/26/01	8:18			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
				9/26/01	815

Add TDS #

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: 281-646-8996

Sample Type: Water
Sample Condition: Intact/ 0.0 deg. C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM
ELT# 0101640-01

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Extraction Date: 09/29/01
Analysis Date: 09/30/01
Field Code: MW-9

EPA 8270 COMPOUNDS	Reporting Limit	MW 9 Concentration mg/L	%DEV	RPD	% EA
N-Nitrosodimethylamine	0.005	ND	3.1		
Aniline	0.005	ND	9.1		
Phenol	0.005	ND	13.4	7	42
Bis (2-chloroethyl)ether	0.005	ND	9.7		
2-Chlorophenol	0.005	ND	6.7	6	40
1,3-Dichlorobenzene	0.005	ND	6.3		
1,4-Dichlorobenzene	0.005	ND	-3.4	1	28
1,2-Dichlorobenzene	0.005	ND	9.1		
Benzyl Alcohol	0.005	ND	9.3		
Bis (2-chloroisopropyl) ether	0.005	ND	7.3		
2-Methylphenol	0.005	ND	-5.0		
n-Nitroso-di-n-propylamine	0.005	ND	-0.7	11	38
4-Methylphenol	0.005	ND	6.4		
Hexachloroethane	0.005	ND	10.0		
Nitrobenzene	0.005	ND	-11.1		
Isophorone	0.005	ND	9.4		
2-Nitrophenol	0.005	ND	-2.1		
2,4 Dimethylphenol	0.005	ND	4.5		
Bis (2-chloroethoxy) methane	0.005	ND	0.4		
2,4 Dichlorophenol	0.005	ND	19.9		
Benzoic acid	0.005	ND	4.8		
1,2,4-Trichlorobenzene	0.005	ND	8.8	4	28
Naphthalene	0.005	ND	7.6		
4-Chloroaniline	0.005	ND	22.4		
Hexachlorobutadiene	0.005	ND	0.1		
4-Chloro-3-methylphenol	0.005	ND	4.9	8	42
2-Methylnaphthalene	0.005	ND	10.2		
Hexachlorocyclopentadiene	0.005	ND	-3 3		
2,4,6-Trichlorophenol	0.005	ND	-1 4		
2,4,5-Trichlorophenol	0.005	ND	-2.1		
2-Chloronaphthalene	0.005	ND	2.6		
2-Nitroaniline	0.005	ND	2.6		
Dimethylphthalate	0.005	ND	7.6		
2,6-Dinitrotoluene	0.005	ND	0.5		

ELT# 0101640-01 MW-9 Page 2 of 2

EPA 8270 COMPOUNDS	Reporting Limits	Concentration mg/L	%DEV	RPD	%EA	
Acenaphthylene	0.005	ND	0.8			
3-Nitroaniline	0.005	ND	6.5			
Acenaphthene	0.005	ND	0.1	1	31	
2,4-Dinitrophenol	0.005	ND	9.0			
4-Nitrophenol	0.005	ND	18.1	5	50	
Dibenzofuran	0.005	ND	0.2			
2,4-Dinitrotoluene	0.005	ND	12.0	6	38	
Diethylphthalate	0.005	ND	6.4			
Fluorene	0.005	ND	1.5			
4-Chlorophenyl phenyl ether	0.005	ND	-0.3			
4-Nitroaniline	0.005	ND	-0.9			
Azobenzene	0.005	ND	-5.9			
4,6-Dinitro-2-methylphenol	0.005	ND	1.3			
n-Nitrosodiphenylamine	0.005	ND	-17.0			
4-Bromophenyl phenyl ether	0.005	ND	3.0			
Hexachlorobenzene	0.005	ND	4.3			
Pentachlorophenol	0.005	ND	-25.3	16	50	
Phenanthrene	0.005	ND	-10.3			
Anthracene	0.005	ND	-4.1			
Carbazole	0.005	ND	-4.8			
Di-n-butylphthalate	0.005	ND	-29.2			
Fluoranthene	0.005	ND	-6.8			
Benzidine	0.005	ND	-63.5#			
Pyrene	0.005	ND	-13.2	10	31	
Butylbenzylphthalate	0.005	ND	-10.1			
Benzo {a} anthracene	0.005	ND	-3.0			
3,3'-Dichlorobenzidine	0.005	ND	3.3			
Chrysene	0.005	ND	1.2			
Bis (2-ethylhexyl) phthalate	0.005	ND	-20.9			
Di-n-octylphthalate	0.005	ND	-9.2			
Benzo {b} fluoranthene	0.005	ND	6.1			
Benzo {k} fluoranthene	0.005	ND	6.4			
Benzo {a} pyrene	0.005	ND	9.3			
Indeno (1,2,3-c,d) pyrene	0.005	ND	7.3			
Dibenzo {a,h} anthracene	0.005	ND	4.8			
Benzo {g,h,i} perylene	0.005	ND	22.3			

SURROGATES	% RECOVERY
2-Fluorophenol SURR	73
Phenol-d5 SURR	62
Nitrobenzene-d5 SURR	71
2-Fluorobiphenyl SURR	82
2,4,6-Tribromophenol SURR	25
Terphenyl-d14 SURR	87

Method: SW 846-8270C

Raland K. Tuttle

10-08-01
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

Sample Type: Water
Sample Condition: Intact/ Iced/ HCl/ 0.0 deg C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 10/01/01
Field Code: MW-24

Volatiles EPA SW 846-8260B, (mg/L) Compounds	ELT# 0101640-03	REPORTING LIMIT	%DEV	Method Blank	% EA	RPD
Dichlorodifluoromethane	ND	0.002	1.3	ND		
Chloromethane	ND	0.002	7.2	ND		
Vinyl chloride	ND	0.002	-5.3	ND		
Bromomethane	ND	0.002	0.3	ND		
Chloroethane	ND	0.002	-0.9	ND		
Trichlorofluoromethane	ND	0.002	0.7	ND		
1,1 Dichloroethene	ND	0.002	-6.9	ND	83	2
Acetone	ND	0.005	6.7	ND		
Iodomethane	ND	0.002	0.3	ND		
Carbon Disulfide	ND	0.002	-0.5	ND		
Methylene Chloride	ND	0.0002	7.9	ND		
trans-1,2-Dichloroethene	ND	0.002	2.1	ND		
Acrylonitrile	ND	0.005	9.2	ND		
1,1-Dichloroethane	ND	0.002	2.4	ND		
Vinyl Acetate	ND	0.002	6.1	ND		
cis-1,2-Dichloroethene	ND	0.002	0.7	ND		
2 Butanone	ND	0.010	14.1	ND		
Bromochloromethane	ND	0.002	2.3	ND		
Chloroform	ND	0.002	1.3	ND		
1,1,1-Trichloroethane	0.033	0.002	1.7	ND		
2,2-Dichloropropane	ND	0.002	-0.9	ND		
Carbon tetrachloride	ND	0.002	-0.3	ND		
1,1-Dichloropropene	ND	0.002	3.0	ND		
1,2-Dichloroethane	ND	0.002	3.6	ND		
Benzene	ND	0.002	1.5	ND	113	3
Trichloroethene	ND	0.002	0.9	ND	89	2
1,2-Dichloropropane	ND	0.002	2.5	ND		
Dibromomethane	ND	0.002	3.1	ND		
Bromodichloromethane	ND	0.002	1.9	ND		
2-Chloroethyl vinyl ether	ND	0.002	-37.5#	ND		
cis-1,3-Dichloropropene	ND	0.002	4.8	ND		
4-Methyl 2-Pentanone	ND	0.010	10.7	ND		
Toluene	ND	0.002	2.0	ND	120	2
trans 1,3-Dichloropropene	ND	0.002	3.7	ND		
1,1,2-Trichloroethane	ND	0.002	8.2	ND		
2-Hexanone	ND	0.010	10.4	ND		

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

Sample Type: Water
Sample Condition: Intact/ Iced/ / HCl/ 0.0 deg C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 10/01/01
Field Code: MW-24

Volatiles EPA SW 846-8260B, (mg/L) Compounds	ELT# 0101640-03	REPORTING LIMIT	%DEV	Method Blank	% EA	RPD
Tetrachloroethene	ND	0.002	13.6	ND		
1,3-Dichloropropane	ND	0.002	1.8	ND		
Dibromochloromethane	ND	0.002	1.4	ND		
1,2-Dibromoethane	ND	0.002	2.7	ND		
Chlorobenzene	ND	0.002	-2.8	ND	116	3
1,1,1,2-Tetrachloroethane	ND	0.002	-1.0	ND		
Ethylbenzene	ND	0.002	-9.4	ND		
m,p-Xylene	ND	0.002	-5.3	ND		
o-Xylene	ND	0.002	-3.1	ND		
Styrene	ND	0.002	-3.5	ND		
Bromoform	ND	0.002	4.1	ND		
trans-1,4-Dichloro-2-butene	ND	0.002	0.5	ND		
Isopropylbenzene	ND	0.002	-7.3	ND		
1,2,3-Trichloropropane	ND	0.002	3.6	ND		
1,1,2,2-Tetrachloroethane	ND	0.002	4.2	ND		
Bromobenzene	ND	0.002	0.8	ND		
n-Propylbenzene	ND	0.002	-6.2	ND		
2-Chlorotoluene	ND	0.002	-0.0	ND		
1,3,5 Trimethylbenzene	ND	0.002	-3.6	ND		
4-Chlorotoluene	ND	0.002	-2.7	ND		
tert-Butylbenzene	ND	0.002	-5.7	ND		
1,2,4-Trimethylbenzene	ND	0.002	-2.5	ND		
sec-Butylbenzene	ND	0.002	-9.7	ND		
1,3 Dichlorobenzene	ND	0.002	2.0	ND		
p-Isopropyltoluene	ND	0.002	-9.8	ND		
1,4-Dichlorobenzene	ND	0.002	0.9	ND		
n-Butylbenzene	ND	0.002	-8.1	ND		
1,2-Dichlorobenzene	ND	0.002	0.7	ND		
1,2-Dibromo-3 chloropropane	ND	0.010	6.8	ND		
1,2,4-Trichlorobenzene	ND	0.002	-1.8	ND		
Hexachlorobutadiene	ND	0.002	-8.7	ND		
Naphthalene	ND	0.002	2.8	ND		
1,2,3-Trichlorobenzene	ND	0.002	4.6	ND		

SYSTEM MONITORING COMPOUNDS	% RECOVERY
Dibromofluoromethane	114
Toluene-d8	115
4-Bromofluorobenzene	114
1,2-dichloroethane-d4	104

ND= < REPORTING LIMIT

Raland K. Tuttle

10-8-01
Date

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: 281-646-8996

Sample Type: Water
Sample Condition: Intact/ 0.0 deg. C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM
ELT# 0101640-02

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Extraction Date: 09/29/01
Analysis Date: 09/30/01
Field Code: MW-23

EPA 8270 COMPOUNDS	Reporting Limit	MW 23 Concentration mg/L	%DEV	RPD	% EA
N-Nitrosodimethylamine	0.005	ND	3.1		
Aniline	0.005	ND	9.1		
Phenol	0.005	ND	13.4	7	42
Bis (2-chloroethyl)ether	0.005	ND	9.7		
2-Chlorophenol	0.005	ND	6.7	6	40
1,3-Dichlorobenzene	0.005	ND	6.3		
1,4-Dichlorobenzene	0.005	ND	-3.4	1	28
1,2-Dichlorobenzene	0.005	ND	9.1		
Benzyl Alcohol	0.005	ND	9.3		
Bis (2-chloroisopropyl) ether	0.005	ND	7.3		
2-Methylphenol	0.005	ND	-5.0		
n-Nitroso-di-n-propylamine	0.005	ND	-0.7	11	38
4-Methylphenol	0.005	ND	6.4		
Hexachloroethane	0.005	ND	10.0		
Nitrobenzene	0.005	ND	-11.1		
Isophorone	0.005	ND	9.4		
2-Nitrophenol	0.005	ND	-2.1		
2,4-Dimethylphenol	0.005	ND	4.5		
Bis (2-chloroethoxy) methane	0.005	ND	0.4		
2,4-Dichlorophenol	0.005	ND	19.9		
Benzoic acid	0.005	ND	4.8		
1,2,4-Trichlorobenzene	0.005	ND	8.8	4	28
Naphthalene	0.005	ND	7.6		
4-Chloroaniline	0.005	ND	22.4		
Hexachlorobutadiene	0.005	ND	0.1		
4-Chloro-3-methylphenol	0.005	ND	4.9	8	42
2-Methylnaphthalene	0.005	ND	10.2		
Hexachlorocyclopentadiene	0.005	ND	-3.3		
2,4,6-Trichlorophenol	0.005	ND	-1.4		
2,4,5-Trichlorophenol	0.005	ND	-2.1		
2-Chloronaphthalene	0.005	ND	2.6		
2-Nitroaniline	0.005	ND	2.6		
Dimethylphthalate	0.005	ND	7.6		
2,6-Dinitrotoluene	0.005	ND	0.5		

ELT# 0101640-02 MW-23 Page 2 of 2

EPA 8270 COMPOUNDS	Reporting Limits	Concentration mg/L	%DEV	RPD	%EA
Acenaphthylene	0.005	ND	0.8		
3-Nitroaniline	0.005	ND	6.5		
Acenaphthene	0.005	ND	0.1	1	31
2,4-Dinitrophenol	0.005	ND	9.0		
4-Nitrophenol	0.005	ND	18.1	5	50
Dibenzofuran	0.005	ND	0.2		
2,4-Dinitrotoluene	0.005	ND	12.0	6	38
Diethylphthalate	0.005	ND	6.4		
Fluorene	0.005	ND	1.5		
4-Chlorophenyl phenyl ether	0.005	ND	-0.3		
4-Nitroaniline	0.005	ND	-0.9		
Azobenzene	0.005	ND	-5.9		
4,6 Dinitro-2-methylphenol	0.005	ND	1.3		
n-Nitrosodiphenylamine	0.005	ND	-17.0		
4-Bromophenyl phenyl ether	0.005	ND	3.0		
Hexachlorobenzene	0.005	ND	4.3		
Pentachlorophenol	0.005	ND	-25.3	16	50
Phenanthrene	0.005	ND	-10.3		
Arthracene	0.005	ND	-4.1		
Carbazole	0.005	ND	-4.8		
Di n-butylphthalate	0.005	ND	-29.2		
Fluoranthene	0.005	ND	-6.8		
Benzidine	0.005	ND	-63.5#		
Pyrene	0.005	ND	-13.2	10	31
Butylbenzylphthalate	0.005	ND	-10.1		
Benzo {a} anthracene	0.005	ND	-3.0		
3,3'-Dichlorobenzidine	0.005	ND	3.3		
Chrysene	0.005	ND	1.2		
Bis (2-ethylhexyl) phthalate	0.005	0.011	-20.9		
Di n-octylphthalate	0.005	ND	-9.2		
Benzo {b} fluoranthene	0.005	ND	6.1		
Benzo {k} fluoranthene	0.005	ND	6.4		
Benzo {a} pyrene	0.005	ND	9.3		
Indeno (1,2,3-c,d) pyrene	0.005	ND	7.3		
Dibenzo {a,h} anthracene	0.005	ND	4.8		
Benzo {g,h,i} perylene	0.005	ND	22.3		

SURROGATES	% RECOVERY
2-Fluorophenol SURR	68
Phenol-d5 SURR	61
Nitrobenzene-d5 SURR	76
2-Fluorobiphenyl SURR	73
2,4,6-Tribromophenol SURR	21
Terphenyl-d14 SURR	78

Method: SW 846-8270C

Raland K. Tuttle

10-08-01
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

Sample Type: Water
Sample Condition: Intact/ Iced/ HCl/ 0.0 deg C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 10/01/01
Field Code: MW-23

Volatiles EPA SW 846-8260B, (mg/L) Compounds	ELT# 0101640-02	REPORTING LIMIT	%DEV	Method Blank	% EA	RPD
Dichlorodifluoromethane	ND	0.002	1.3	ND		
Chloromethane	ND	0.002	7.2	ND		
Vinyl chloride	ND	0.002	-5.3	ND		
Bromomethane	ND	0.002	0.3	ND		
Chloroethane	ND	0.002	-0.9	ND		
Trichlorofluoromethane	ND	0.002	0.7	ND		
1,1-Dichloroethene	ND	0.002	-6.9	ND	83	2
Acetone	ND	0.005	6.7	ND		
Iodomethane	ND	0.002	0.3	ND		
Carbon Disulfide	ND	0.002	-0.5	ND		
Methylene Chloride	ND	0.0002	7.9	ND		
trans-1,2-Dichloroethene	ND	0.002	2.1	ND		
Acrylonitrile	ND	0.005	9.2	ND		
1,1-Dichloroethane	ND	0.002	2.4	ND		
Vinyl Acetate	ND	0.002	6.1	ND		
cis-1,2-Dichloroethene	ND	0.002	0.7	ND		
2-Butanone	ND	0.010	14.1	ND		
Bromochloromethane	ND	0.002	2.3	ND		
Chloroform	ND	0.002	1.3	ND		
1,1,1-Trichloroethane	0.007	0.002	1.7	ND		
2,2-Dichloropropane	ND	0.002	-0.9	ND		
Carbon tetrachloride	ND	0.002	-0.3	ND		
1,1-Dichloropropene	ND	0.002	3.0	ND		
1,2-Dichloroethane	ND	0.002	3.6	ND		
Benzene	ND	0.002	1.5	ND	113	3
Trichloroethene	ND	0.002	0.9	ND	89	2
1,2-Dichloropropane	ND	0.002	2.5	ND		
Dibromomethane	ND	0.002	3.1	ND		
Bromodichloromethane	ND	0.002	1.9	ND		
2-Chloroethyl vinyl ether	ND	0.002	-37.5#	ND		
cis-1,3-Dichloropropene	ND	0.002	4.8	ND		
4-Methyl 2-Pentanone	ND	0.010	10.7	ND		
Toluene	ND	0.002	2.0	ND	120	2
trans 1,3-Dichloropropene	ND	0.002	3.7	ND		
1,1,2-Trichloroethane	ND	0.002	8.2	ND		
2-Hexanone	ND	0.010	10.4	ND		

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

Sample Type: Water
Sample Condition: Intact/ Iced/ / HCl/ 0.0 deg C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 10/01/01
Field Code: MW-23

Volatiles EPA SW 846-8260B, (mg/L) Compounds	ELT# 0101640-02	REPORTING LIMIT	%DEV	Method Blank	% EA	RPD
Tetrachloroethene	ND	0.002	13.6	ND		
1,3-Dichloropropane	ND	0.002	1.8	ND		
Dibromochloromethane	ND	0.002	1.4	ND		
1,2-Dibromoethane	ND	0.002	2.7	ND		
Chlorobenzene	ND	0.002	-2.8	ND	116	3
1,1,1,2-Tetrachloroethane	ND	0.002	-1.0	ND		
Ethylbenzene	ND	0.002	-9.4	ND		
m,p-Xylene	0.002	0.002	-5.3	ND		
o-Xylene	ND	0.002	-3.1	ND		
Styrene	ND	0.002	-3.5	ND		
Bromoform	ND	0.002	4.1	ND		
trans-1,4-Dichloro-2-butene	ND	0.002	0.5	ND		
Isopropylbenzene	ND	0.002	-7.3	ND		
1,2,3-Trichloropropane	ND	0.002	3.6	ND		
1,1,2,2-Tetrachloroethane	ND	0.002	4.2	ND		
Bromobenzene	ND	0.002	0.8	ND		
n-Propylbenzene	ND	0.002	-6.2	ND		
2-Chlorotoluene	ND	0.002	-0.0	ND		
1,3,5-Trimethylbenzene	ND	0.002	-3.6	ND		
4-Chlorotoluene	ND	0.002	-2.7	ND		
tert-Butylbenzene	ND	0.002	-5.7	ND		
1,2,4-Trimethylbenzene	ND	0.002	-2.5	ND		
sec-Butylbenzene	ND	0.002	-9.7	ND		
1,3-Dichlorobenzene	ND	0.002	2.0	ND		
p-Isopropyltoluene	ND	0.002	-9.8	ND		
1,4-Dichlorobenzene	ND	0.002	0.9	ND		
n-Butylbenzene	ND	0.002	-8.1	ND		
1,2-Dichlorobenzene	ND	0.002	0.7	ND		
1,2-Dibromo-3-chloropropane	ND	0.010	6.8	ND		
1,2,4-Trichlorobenzene	ND	0.002	-1.8	ND		
Hexachlorobutadiene	ND	0.002	-8.7	ND		
Naphthalene	ND	0.002	2.8	ND		
1,2,3-Trichlorobenzene	ND	0.002	4.6	ND		

SYSTEM MONITORING COMPOUNDS	% RECOVERY
Dibromofluoromethane	110
Toluene-d8	113
4-Bromofluorobenzene	112
1,2-dichloroethane-d4	98

ND= <REPORTING LIMIT

Raland K. Tuttle

10-8-01
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

Sample Type: Water
Sample Condition: Intact/ Iced/ HCl/ 0.0 deg C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 10/01/01
Field Code: MW-9

Volatiles EPA SW 846-8260B, (mg/L) Compounds	ELT# 0101640-01	REPORTING LIMIT	%DEV	Method Blank	% EA	RPD
Dichlorodifluoromethane	ND	0.002	1.3	ND		
Chloromethane	ND	0.002	7.2	ND		
Vinyl chloride	ND	0.002	-5.3	ND		
Bromomethane	ND	0.002	0.3	ND		
Chloroethane	ND	0.002	-0.9	ND		
Trichlorofluoromethane	ND	0.002	0.7	ND		
1,1-Dichloroethene	ND	0.002	-6.9	ND	83	2
Acetone	ND	0.005	6.7	ND		
Iodomethane	ND	0.002	0.3	ND		
Carbon Disulfide	ND	0.002	-0.5	ND		
Methylene Chloride	ND	0.0002	7.9	ND		
trans-1,2-Dichloroethene	ND	0.002	2.1	ND		
Acrylonitrile	ND	0.005	9.2	ND		
1,1-Dichloroethane	ND	0.002	2.4	ND		
Vinyl Acetate	ND	0.002	6.1	ND		
cis-1,2-Dichloroethene	ND	0.002	0.7	ND		
2-Butanone	ND	0.010	14.1	ND		
Bromochloromethane	ND	0.002	2.3	ND		
Chloroform	ND	0.002	1.3	ND		
1,1,1-Trichloroethane	ND	0.002	1.7	ND		
2,2-Dichloropropane	ND	0.002	-0.9	ND		
Carbon tetrachloride	ND	0.002	-0.3	ND		
1,1-Dichloropropene	ND	0.002	3.0	ND		
1,2-Dichloroethane	ND	0.002	3.6	ND		
Benzene	ND	0.002	1.5	ND	113	3
Trichloroethene	ND	0.002	0.9	ND	89	2
1,2-Dichloropropane	ND	0.002	2.5	ND		
Dibromomethane	ND	0.002	3.1	ND		
Bromodichloromethane	ND	0.002	1.9	ND		
2-Chloroethyl vinyl ether	ND	0.002	-37.5#	ND		
cis-1,3-Dichloropropene	ND	0.002	4.8	ND		
4-Methyl 2-Pentanone	ND	0.010	10.7	ND		
Toluene	ND	0.002	2.0	ND	120	2
trans 1,3-Dichloropropene	ND	0.002	3.7	ND		
1,1,2-Trichloroethane	ND	0.002	8.2	ND		
2-Hexanone	ND	0.010	10.4	ND		

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

Sample Type: Water
Sample Condition: Intact/ Iced/ / HCl/ 0.0 deg C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 10/01/01
Field Code: MW-9

Volatiles EPA SW 846-8260B, (mg/L) Compounds	ELT# 0101640-01	REPORTING LIMIT	%DEV	Method Blank	% EA	RPD
Tetrachloroethene	ND	0.002	13.6	ND		
1,3-Dichloropropane	ND	0.002	1.8	ND		
Dibromochloromethane	ND	0.002	1.4	ND		
1,2-Dibromoethane	ND	0.002	2.7	ND		
Chlorobenzene	ND	0.002	-2.6	ND	116	3
1,1,1,2-Tetrachloroethane	ND	0.002	-1.0	ND		
Ethylbenzene	ND	0.002	-9.4	ND		
m,p-Xylene	ND	0.002	-5.3	ND		
o-Xylene	ND	0.002	-3.1	ND		
Styrene	ND	0.002	-3.5	ND		
Bromoform	ND	0.002	4.1	ND		
trans-1,4-Dichloro-2-butene	ND	0.002	0.5	ND		
Isopropylbenzene	ND	0.002	-7.3	ND		
1,2,3-Trichloropropane	ND	0.002	3.6	ND		
1,1,2,2-Tetrachloroethane	ND	0.002	4.2	ND		
Bromobenzene	ND	0.002	0.8	ND		
n-Propylbenzene	ND	0.002	-6.2	ND		
2-Chlorotoluene	ND	0.002	-0.0	ND		
1,3,5-Trimethylbenzene	ND	0.002	-3.6	ND		
4-Chlorotoluene	ND	0.002	-2.7	ND		
tert-Butylbenzene	ND	0.002	-5.7	ND		
1,2,4-Trimethylbenzene	ND	0.002	-2.5	ND		
sec-Butylbenzene	ND	0.002	-9.7	ND		
1,3-Dichlorobenzene	ND	0.002	2.0	ND		
p-Isopropyltoluene	ND	0.002	-9.8	ND		
1,4-Dichlorobenzene	ND	0.002	0.9	ND		
n-Butylbenzene	ND	0.002	-8.1	ND		
1,2-Dichlorobenzene	ND	0.002	0.7	ND		
1,2-Dibromo-3-chloropropane	ND	0.010	6.8	ND		
1,2,4-Trichlorobenzene	ND	0.002	-1.8	ND		
Hexachlorobutadiene	ND	0.002	-8.7	ND		
Naphthalene	ND	0.002	2.8	ND		
1,2,3-Trichlorobenzene	ND	0.002	4.6	ND		

SYSTEM MONITORING COMPOUNDS	% RECOVERY
Dibromofluoromethane	112
Toluene-d8	115
4-Bromofluorobenzene	115
1,2-dichloroethane-d4	99

ND= <REPORTING LIMIT

Raland K. Tuttle

10-8-01
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

Sample Type: Water
Sample Condition: Intact/ Iced/ 0.0 deg C
Project #: None Given
Project Name: Tipperary Satellite 4
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 10/03/01

ELT#	FIELD CODE	Ca mg/L	K mg/L	Mg mg/L	Na mg/L
0101640-01	MW-9	192	3.00	17.0	66.0
0101640-02	MW-23	157	3.30	12.2	74.3
0101640-03	MW-24	100	2.81	9.55	50.8
	REPORT LIMIT	0.01	0.05	0.001	0.01
	QUALITY CONTROL	1.96	1.73	2.09	1.76
	TRUE VALUE	2.00	2.00	2.00	2.00
	% INSTRUMENT ACCURACY	98	86	105	88
	SPIKED AMOUNT	1.00	1.00	1.00	1.00
	ORIGINAL SAMPLE	<0.01	<0.05	<0.001	<0.01
	SPIKE	1.01	0.832	1.05	0.945
	SPIKE DUP	0.960	0.832	1.04	0.852
	% EXTRACTION ACCURACY	101	83	105	94
	BLANK	<0.01	<0.05	<0.001	<0.01
	RPD	4.78	0.05	2.04	10.3

METHODS: SW846-6010B

Raland K. Tuttle

10-8-01
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL, INC.
ATTN: MR. MIKE GRIFFIN
19606 SAN GABRIEL
HOUSTON, TEXAS 77804
FAX: 281-646-8996

Sample Type: Water
Sample Condition: Intact/ Iced/ 0.0 deg. C
Project #: None Given
Project Name: Tpperary Satellite 4
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: See Below

ELT #	FIELD CODE	Carbonate mg/L	Bicarbonate mg/L	Sulfate mg/L	TDS mg/L
0101640-01	MW-9	<0.10	224	220	731
0101640-02	MW-23	<0.10	177	132	514
0101640-03	MW-24	<0.10	168	69	450
	REPORT LIMIT	0.10	2.00	0.50	5.00
	QUALITY CONTROL	0.02	0.02	44.1	N/A
	TRUE VALUE	0.02	0.02	50.0	N/A
	% INSTRUMENT ACCURACY	100	100	88	N/A
	SPIKED AMOUNT	N/A	N/A	N/A	N/A
	ORIGINAL SAMPLE	N/A	N/A	N/A	N/A
	SPIKE	N/A	N/A	N/A	N/A
	% EXTRACTION ACCURACY	N/A	N/A	N/A	N/A
	BLANK	<0.10	<2.00	<0.50	<5.00
	RPD	*0.90*	*0.90*	*0.63*	*8.39*
	ANALYSIS DATE	10/01/01	10/01/01	10/01/01	9/29/01

METHODS: EPA 310.1, 375.4, 160.1

Raland K. Tuttle

10-8-01
Date

ENVIRONMENTAL LAB OF TEXAS, 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

SampleType: Water
Sample Condition: Intact/ Iced/ 0.0 deg C
Project #: None Given
Project Name: Tipperary Satellite 4
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 09/27/01

ELT #	FIELD CODE	Chloride mg/L
0101640-01	MW-9	74
0101640-02	MW-23	44
0101640-03	MW-24	30

QUALITY CONTROL	5050
TRUE VALUE	5000
% INSTRUMENT ACCURACY	101
SPIKED AMOUNT	500
ORIGINAL SAMPLE	177
SPIKE	674
SPIKE DUP	682
% EXTRACTION ACCURACY	99
BLANK	<5.00
RPD	1.18

METHODS: SW 846-9253

Raland K. Tuttle

9-27-01
Date

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: 281-646-8996

Sample Type: Water
Sample Condition: Intact/ Iced/ HCl/ 0.0 deg C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM

Sampling Date: 09/18/01
Receiving Date: 09/26/01
Analysis Date: 09/26/01

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
0101640-01	MW-9	<0.001	<0.001	<0.001	<0.001	<0.001
0101640-02	MW-23	<0.001	<0.001	<0.001	0.001	<0.001
0101640-03	MW-24	<0.001	<0.001	<0.001	<0.001	<0.001
QUALITY CONTROL		0.097	0.095	0.092	0.186	0.089
TRUE VALUE		0.100	0.100	0.100	0.200	0.100
% IA		97	95	92	93	89
SPIKED AMOUNT		0.100	0.100	0.100	0.200	0.100
ORIGINAL SAMPLE		<0.001	<0.001	<0.001	<0.001	<0.001
SPIKE		0.099	0.098	0.094	0.189	0.090
SPIKE DUP		0.099	0.098	0.095	0.191	0.090
%EA		99	98	94	94	90
BLANK		<0.001	<0.001	<0.001	<0.001	<0.001
RPD		0.00	0.00	1.06	2.10	0.00

METHODS: EPA SW 846-8021B ,5030

Raland K. Tuttle

9-27-01
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

Sample Type: Water
Sample Condition: Intact/ Iced/ HNO3/ 0.0 deg C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Analysis Date: 10/05/01
Analysis Date: Hg 10/08/01

TOTAL METALS (mg/L)

ELT#	Field Code	Ag	As	Ba	Cd	Cr	Hg	Pb	Se
0101640-01	MW-9	0.008	0.021	0.170	0.001	0.016	ND	0.023	0.020
0101640-02	MW-23	0.021	0.117	2.57	0.015	0.101	0.003	0.150	0.089
0101640-03	MW-24	0.005	0.012	0.142	0.001	0.012	0.004	0.023	0.008
	REPORT LIMIT	0.002	0.008	0.001	0.001	0.002	0.002	0.011	0.004
	QUALITY CONTROL	0.994	1.01	1.01	0.980	1.00	0.014	0.995	0.996
	TRUE VALUE	1.00	1.00	1.00	1.00	1.00	0.015	1.00	1.00
	% INSTRUMENT ACCURACY	99	101	101	98	100	97	100	100
	ORIGINAL SAMPLE	0.005	0.017	0.100	<0.001	0.008	<0.002	0.014	0.017
	SPIKED AMOUNT	1.00	0.200	1.00	0.200	1.00	0.015	1.00	0.200
	SPIKE	1.16	0.213	1.06	0.189	0.894	0.015	1.03	0.210
	SPIKE DUP	1.15	0.217	1.08	0.189	0.902	0.014	1.01	0.211
	% EXTRACTION ACCURACY	114	100	97	95	89	98	99	97
	BLANK	<0.002	<0.008	<0.001	<0.001	<0.002	<0.002	<0.011	<0.004
	RPD	1.04	1.77	1.31	0.21	0.91	3.45	1.87	0.28

ND= Not detected at report limit.

METHODS: EPA SW 846- 3015, 7470, 6010B

Raland K. Tuttle

10-08-01
Date

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: 281-646-8996

Sample Type: Water
Sample Condition: Intact/ 0.0 deg. C
Project Name: Tipperary Satellite 4
Project #: None Given
Project Location: Tatum, NM
ELT# 0101640-03

Sampling Date: 09/22/01
Receiving Date: 09/26/01
Extraction Date: 09/29/01
Analysis Date: 09/30/01
Field Code: MW-24

EPA 8270 COMPOUNDS	Reporting Limit	MW-24 Concentration mg/L	%DEV	RPD	% EA
N-Nitrosodimethylamine	0.005	ND	3.1		
Aniline	0.005	ND	9.1		
Phenol	0.005	ND	13.4	7	42
Bis (2-chloroethyl)ether	0.005	ND	9.7		
2-Chlorophenol	0.005	ND	6.7	6	40
1,3-Dichlorobenzene	0.005	ND	6.3		
1,4-Dichlorobenzene	0.005	ND	-3.4	1	28
1,2-Dichlorobenzene	0.005	ND	9.1		
Benzyl Alcohol	0.005	ND	9.3		
Bis (2-chloroisopropyl) ether	0.005	ND	7.3		
2-Methylphenol	0.005	ND	-5.0		
n-Nitroso-di-n-propylamine	0.005	ND	-0.7	11	38
4-Methylphenol	0.005	ND	6.4		
Hexachloroethane	0.005	ND	10.0		
Nitrobenzene	0.005	ND	-11.1		
Isophorone	0.005	ND	9.4		
2-Nitrophenol	0.005	ND	-2.1		
2,4-Dimethylphenol	0.005	ND	4.5		
Bis (2-chloroethoxy) methane	0.005	ND	0.4		
2,4-Dichlorophenol	0.005	ND	19.9		
Benzoic acid	0.005	ND	4.8		
1,2,4-Trichlorobenzene	0.005	ND	8.8	4	28
Naphthalene	0.005	ND	7.6		
4-Chloroaniline	0.005	ND	22.4		
Hexachlorobutadiene	0.005	ND	0.1		
4-Chloro-3-methylphenol	0.005	ND	4.9	8	42
2-Methylnaphthalene	0.005	ND	10.2		
Hexachlorocyclopentadiene	0.005	ND	-3.3		
2,4,6-Trichlorophenol	0.005	ND	-1.4		
2,4,5-Trichlorophenol	0.005	ND	-2.1		
2-Chloronaphthalene	0.005	ND	2.6		
2-Nitroaniline	0.005	ND	2.6		
Dimethylphthalate	0.005	ND	7.6		
2,6-Dinitrotoluene	0.005	ND	0.5		

ELT# 0101640-03 MW-24 Page 2 of 2

EPA 8270 COMPOUNDS	Reporting Limits	Concentration mg/L	%DEV	RPD	%EA
Acenaphthylene	0.005	ND	0.8		
3-Nitroaniline	0.005	ND	6.5		
Acenaphthene	0.005	ND	0.1	1	31
2,4-Dinitrophenol	0.005	ND	9.0		
4-Nitrophenol	0.005	ND	18.1	5	50
Dibenzofuran	0.005	ND	0.2		
2,4-Dinitrotoluene	0.005	ND	12.0	6	38
Diethylphthalate	0.005	ND	6.4		
Fluorene	0.005	ND	1.5		
4-Chlorophenyl phenyl ether	0.005	ND	-0.3		
4-Nitroaniline	0.005	ND	-0.9		
Azobenzene	0.005	ND	-5.9		
4,6-Dinitro-2-methylphenol	0.005	ND	1.3		
n-Nitrosodiphenylamine	0.005	ND	-17.0		
4-Bromophenyl phenyl ether	0.005	ND	3.0		
Hexachlorobenzene	0.005	ND	4.3		
Pentachlorophenol	0.005	ND	-25.3	16	50
Phenanthrene	0.005	ND	-10.3		
Anthracene	0.005	ND	-4.1		
Carbazole	0.005	ND	-4.8		
Di-n-butylphthalate	0.005	ND	-29.2		
Fluoranthene	0.005	ND	-6.8		
Benzidine	0.005	ND	-63.5#		
Pyrene	0.005	ND	-13.2	10	31
Butylbenzylphthalate	0.005	ND	-10.1		
Benzo {a} anthracene	0.005	ND	-3.0		
3,3'-Dichlorobenzidine	0.005	ND	3.3		
Chrysene	0.005	ND	1.2		
Bis (2-ethylhexyl) phthalate	0.005	0.034	-20.9		
Di-n-octylphthalate	0.005	ND	-9.2		
Benzo {b} fluoranthene	0.005	ND	6.1		
Benzo {k} fluoranthene	0.005	ND	6.4		
Benzo {a} pyrene	0.005	ND	9.3		
Indeno (1,2,3-c,d) pyrene	0.005	ND	7.3		
Dibenzo {a,h} anthracene	0.005	ND	4.8		
Benzo {g,h,i} perylene	0.005	ND	22.3		

SURROGATES	% RECOVERY
2-Fluorophenol SURR	68
Phenol-d5 SURR	62
Nitrobenzene-d5 SURR	87
2-Fluorobiphenyl SURR	76
2,4,6-Tribromophenol SURR	21
Terphenyl-d14 SURR	80

Method: SW 846-8270C

Raland K. Tuttle

10-08-01
Date

ENVIRONMENTAL LAB OF TEXAS, INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL, INC.
ATTN: MIKE GRIFFIN
19606 SAN GABRIEL
HOUSTON, TEXAS 77084
FAX: 281-646-8995

Sample Type: Water
Sample Condition: Intact/ Iced/ HCl/ 1.0 deg. C
Project Name: Quarterly Sampling
Project #: None Given
Project Location: Tatum, New Mexico

Sampling Date: 01/29/02
Receiving Date: 01/30/02
Analysis Date: 01/30/02

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
0202510-01	Sat. 4 MW 9	0.001	<0.001	<0.001	<0.001	<0.001
0202510-02	Sat. 4 MW 23	<0.001	<0.001	<0.001	<0.001	<0.001
0202510-03	Sat. 4 MW 24	<0.001	<0.001	<0.001	<0.001	<0.001
	QUALITY CONTROL	0.109	0.106	0.095	0.202	0.090
	TRUE VALUE	0.100	0.100	0.100	0.200	0.100
	% IA	109	106	95	101	90
	SPIKED AMOUNT	0.100	0.100	0.100	0.200	0.100
	ORIGINAL SAMPLE	<0.001	<0.001	<0.001	<0.001	<0.001
	SPIKE	0.110	0.109	0.100	0.213	0.097
	SPIKE DUP	0.111	0.108	0.096	0.202	0.092
	%EA	110	109	100	106	97
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001
	RPD	0.90	0.92	4.08	5.30	5.29

METHODS: EPA SW 846-8021B ,5030

Celey D. Keene
Raland K. Tuttle

01/31/02
Date

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager:
Company Name: Whole Earth Environmental, Inc.
Company Address: 19600 San Gabriel
City/State/Zip: Houston, Tx. 77084
Telephone No: (800) 854-4356 Fax No: (281) 646-8996
Sampler Signature:

Project Name: Quarterly Sampling
Project #:
Project Loc: Tatum, New Mexico
PO #:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO3	HCl	NaOH	H2SO4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify)	Analyze For: TDS / CL / SAR / EC	TPH 418.1	TPH TX 1005/1005	TPH 8015M GRO/DRO	TCLP Metals: As Ag Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semivolatiles	BTEX 8021B/5030	RUSH TAT (Pre-Schedule)	Standard TAT
[illegible]	Sat 4 MW 9	1-29-02	9:15	2	X		X					X											X		
02	Sat 4 MW 23	"	[illegible]	2	X		X					X											X		
03	Sat 4 MW 24	↓	10:35	2	X		X					X											X		
04	Equipment Blank				X		X					X											X		

Special Instructions.

Sample Containers Intact? (Y) N
Temperature Upon Receipt.
Laboratory Comments: 1.0°C
*Call Mike left message about equip blk 1-30-2@ 1150
* No equipment blank as per Mike 1-31-2

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	1-30-02	1135			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
[signature]			[signature]	1-30-	1135

Feb 04 02 09:51a

Boring Logs

This section contains copies of the individual boring logs for each monitoring well at the site.

Atkins Engineering Associates, Inc.
2904 W. 2nd St., Roswell, NM 88202-3156

LOG OF BORING Satenite #4 MW-1

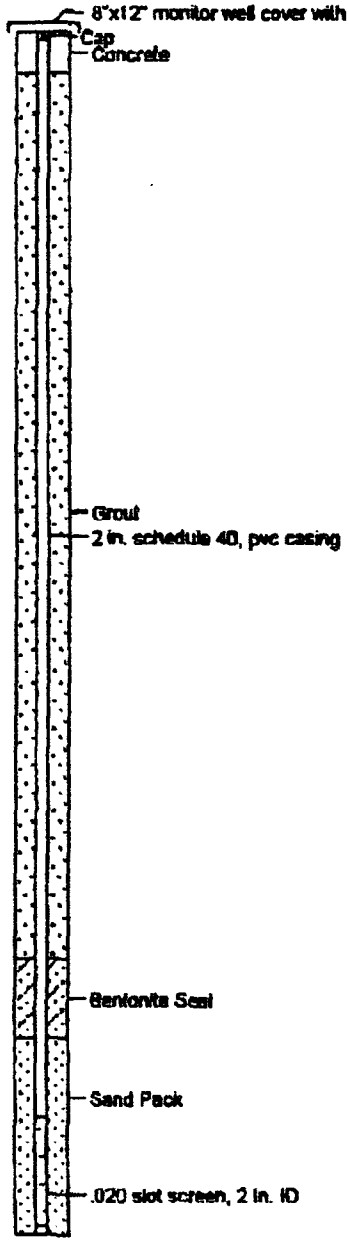
(Page 1 of 2)

Tipperary Oil and Gas Corporation
633 17th St.
Denver, CO 80202
c/o Whole Earth Environmental

Date	: August 30, 1997	Site Location	: 18 mi. W of Tatum, NM
Drill Start	: 1045	Auger Type	: Hollow Stem
Drill End	: 1400	Logged By	: Mint Bates
Boring Location	: Satenite #4, Sec. 12, 50 ft. SE of Center of Pit		

Depth in feet	GRAPHIC	USCS	DESCRIPTION
0			Caliche Rock, clayey, brown, hard, dry
5			
10			Caliche Rock, tan, hard, dry
		CL	Caliche Clay, tan, stiff, dry
15			
		CL	Caliche Clay, sandy, tan, stiff, damp
20			
		SC	Clayey Sand, tan, stiff, damp
25			
30			

Well: MW-1
Elev.:



08-08-1997 c:\mydocs\+1mastdata\+1well.tpl

Atkins Engineering Associates, Inc.
2904 W. 2nd St., Roswell, NM 88202-3156

LOG OF BORING Satenite #4 MW-1

Tipperary Oil and Gas Corporation
533 17th St.
Denver, CO 80202
c/o Whole Earth Environmental

Date	: August 30, 1997	Site Location	: 16 mi. W of Tatum, NM
Drill Start	: 1045	Auger Type	: Hollow Stem
Drill End	: 1400	Logged By	: Mari Bates
Boring Location	: Satenite #4, Sec. 12, 50 ft. SE of Center of Pit		

Depth in feet	GRAPHIC	USCS	DESCRIPTION
30		SC	Sandy Clay, tan, soft, saturated Water Level = 31 ft.
35		CL	
40			TD=42 ft.
45			
50			
55			
60			

Well: MW-1
Elev.:

Sand Pack
.020 slot screen, 2 in. ID

09-08-1997 c:\geodocu~1\tracklog* tlogall.bat

Atkins Engineering Associates, Inc.
P.O. Box 3156
Roswell, New Mexico 88202

LOG OF BORING Satelite #4, MW #2

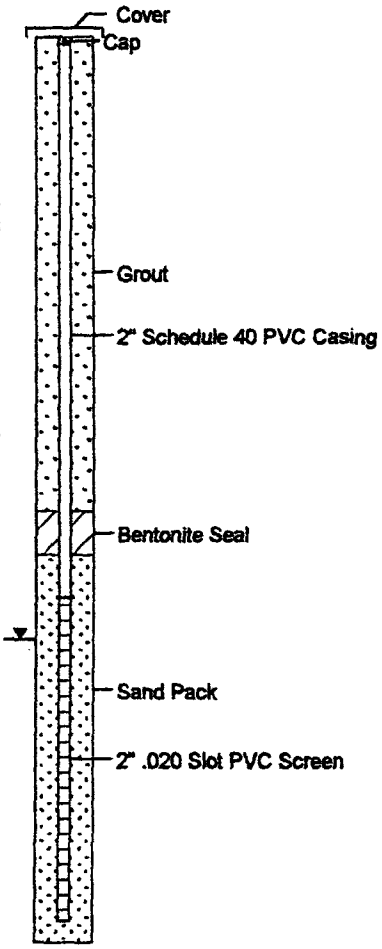
Tipperary Corp. (Whole Earth Environmental)
633 17th Street
Denver, CO 80202

Job #97260

Date Completed	: 10-1-97 / 10-2-97	Site Location	: 13 miles W. of Tatum
Drill Start	: 4:00 p.m. / 7:00 a.m.	Auger Type	: Hollow Stem
Drill End	: 5:00 p.m. / 7:40 a.m.	Logged By	: Mort Bates
Boring Location	: Satelite #4, Sec. 12; 150 ft. E. SE. of Center of Pit		

Depth in feet	GRAPHIC	USCS	DESCRIPTION
0			Caliche Rock w/Silty Clay, Brown, Hard, Damp
5			Caliche w/Silty Clay, Tan, Stiff, Dry
10			
15			
20		SC	Clayey Sand w/Caliche,Tan, Stiff, Damp
25			WL = 28 ft.
30			Sandy Clay, Tan, Loose, Wet to Saturated
35		CL	
40			TD = 42 ft.
45			
50			
55			Bailed and Developed well
60			

Well: MW #2
Elev.:



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Atkins Engineering Associates, Inc.
P.O. Box 3156
Roswell, New Mexico 88202

LOG OF BORING Satelite #4, MW #3

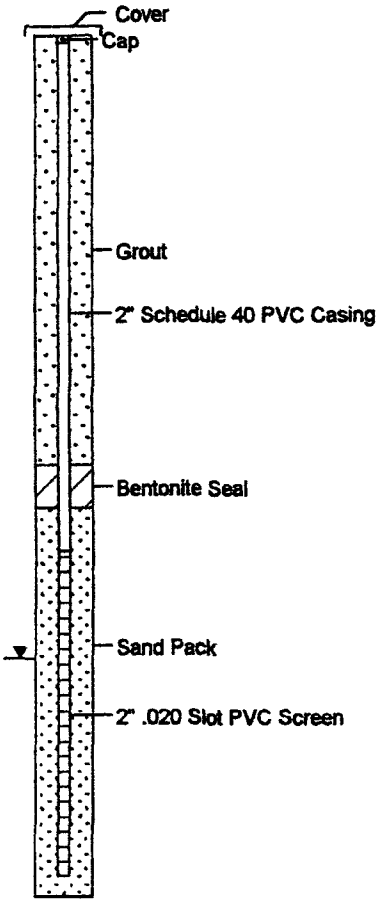
Tipperary Corp. (Whole Earth Environmental)
633 17th Street
Denver, CO 80202

Job #97260

Date Completed	: 10-2-97	Site Location	: 13 miles W. of Tatum
Drill Start	: 7:45 a.m.	Auger Type	: Hollow Stem
Drill End	: 9:30 a.m.	Logged By	: Mort Bates
Boring Location	: Satelite #4, Sec. 12; 150 ft. S. SE. of Center of Pit		

Depth in feet	GRAPHIC	USCS	DESCRIPTION
0			Caliche Rock w/Clay, Brown, Hard, Dry
5			Caliche Rock w/Clay, Tan, Stiff, Dry
10			
15		CL	Clay w/Caliche,Tan, Stiff, Damp
20		SC	Clayey Sand w/Caliche, Tan, Stiff, Moist
25		SC	Clayey Sand w/Gravel, Tan, Stiff, Moist
30		CL	Sandy Clay w/Gravel, Tan, Loose, Moist WL = 28.93 ft.
		CL	Sandy Clay, Tan, Loose, Saturated
35		CL	Sandy Clay w/Gravel, Tan, Stiff, Saturated
40			TD = 40 ft.
45			
50			
55			Bailed and Developed well
60			

Well: MW #3
Elev.:



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10-03-19

VADSAT Modeling

This section contains a copy of the data entry information and modeled results for contaminant migration as determined by VADSAT.

Modeling Data Entry
Satellite # 4

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	14	ft.
Waste Zone Area	2,500	sq. ft.
Ratio of Length to Width	1	
Soil Thickness Above Waste Zone	12	ft.
Contaminant Concentration in Soil / Waste Zone	10	ppm
Hydrocarbon Concentration in Soil / Waste Zone	10,000	ppm

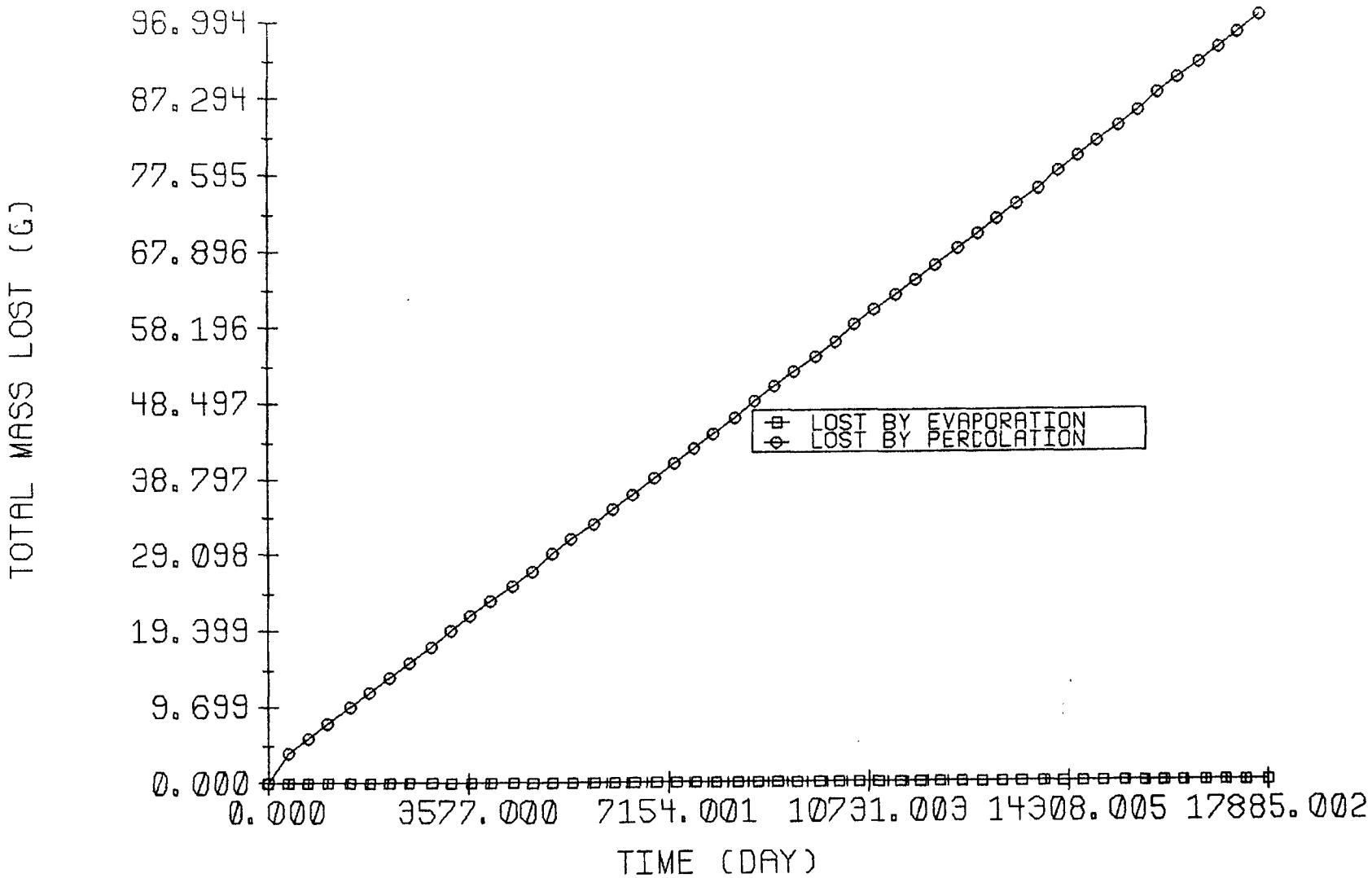
Chemical Data	
Benzene	Yes

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	
Unsaturated Zone Dispersivity	0	Internally

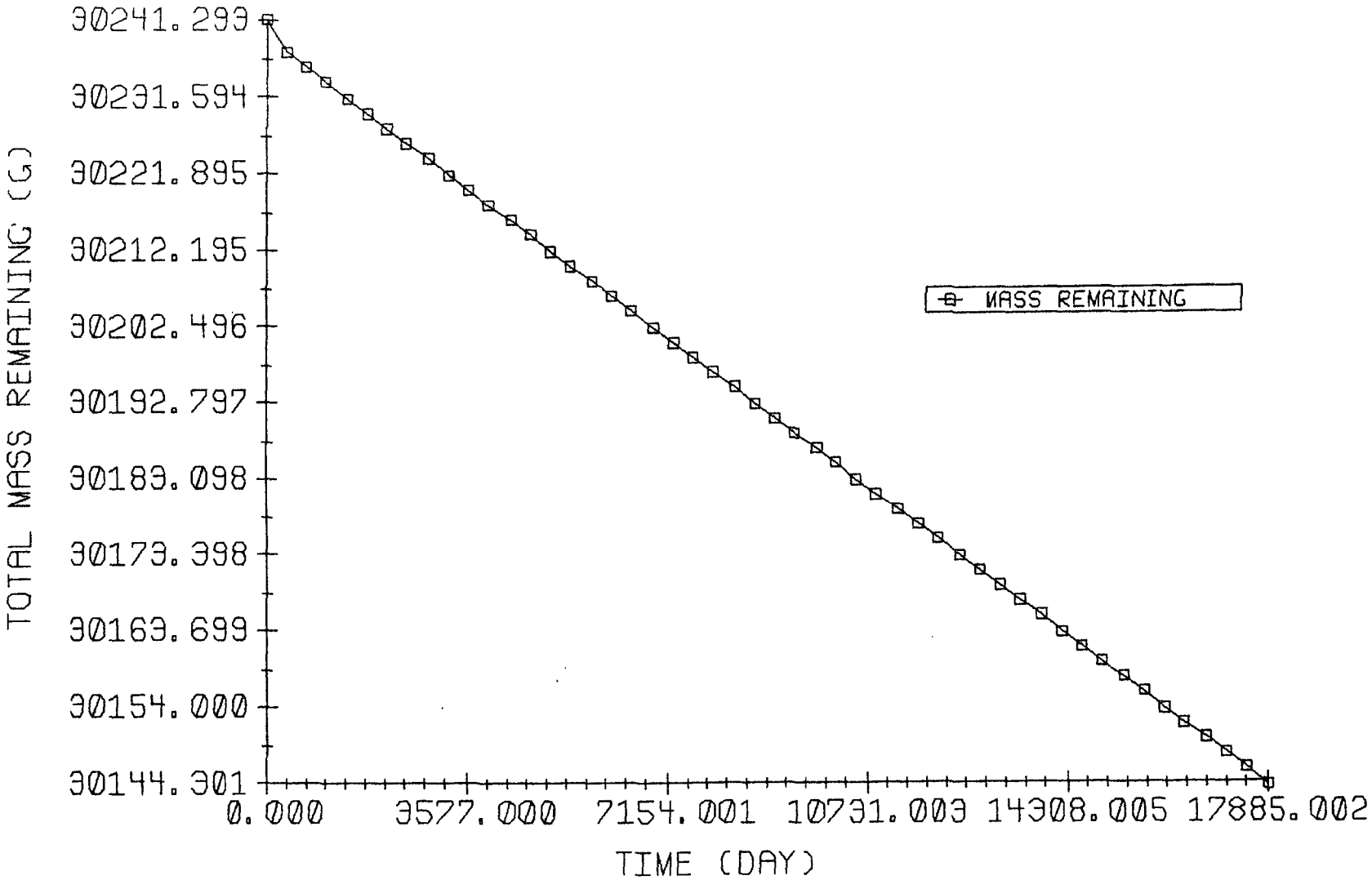
Saturated Zone		
Biodecay Cooefficient	0	
Aquifer Porosity	0.2	(Default)
Organic Carbon Fraction	0	
Longitudinal Dispersivity	0	Internally
Ratio of Long. / Trans. Dispersivities	3	
Ratio of Trans. / Vert. Dispersivities	3	
Hydrological Database	Sedimentary	
Aquifer Thickness	60	ft. / day
Aquifer Gradient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

Net Infiltration Rate	0.00001	ft. / day

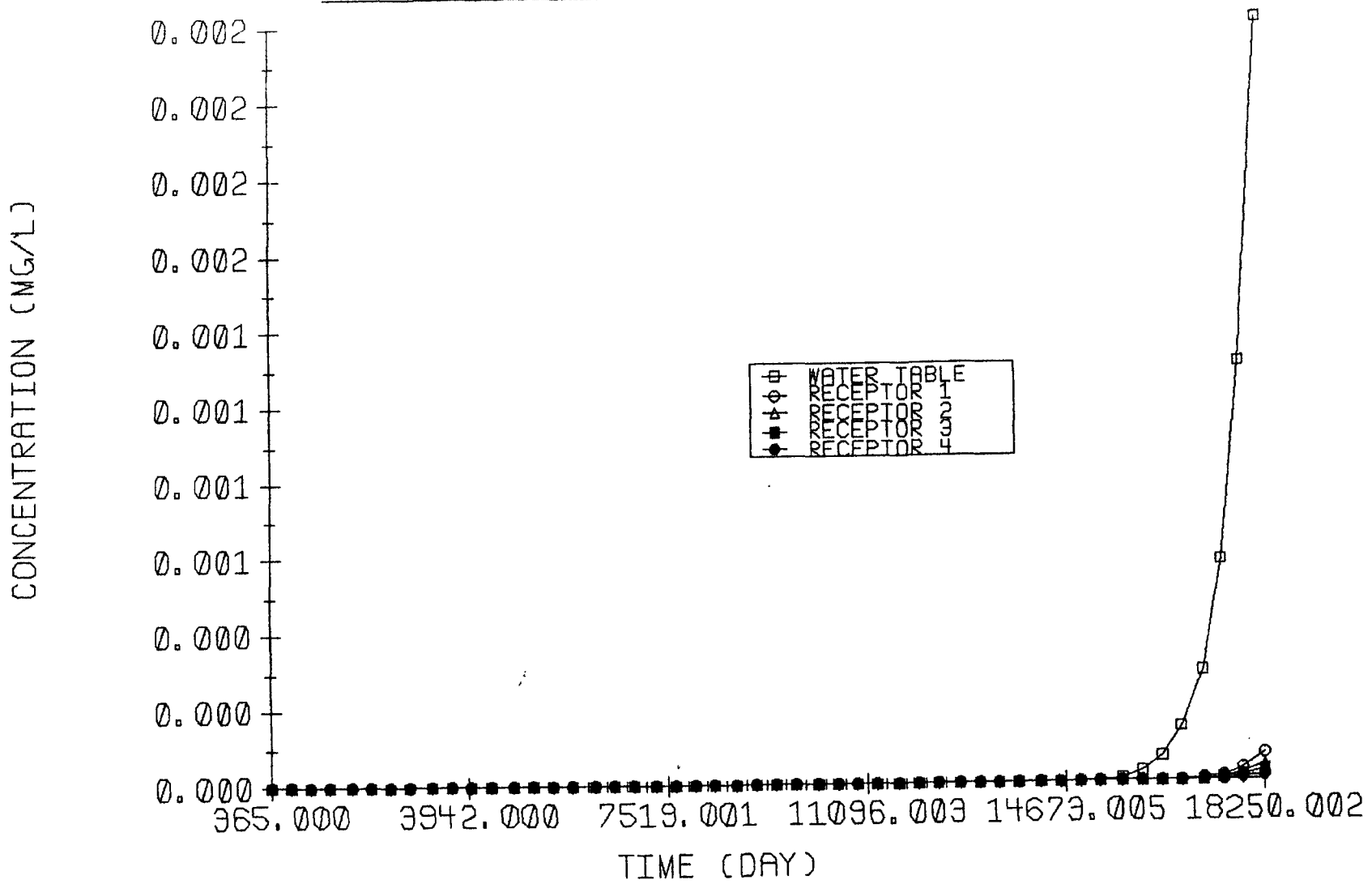
MASS LOST VS TIME



MASS REMAINING VS TIME



CONCENTRATION VS. TIME



Liner Detail

This section contains a copy of the MSDS information of the high density polyethylene liner installed at the site.

Falcon 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 lb/cm3	ASTM D792	57.7 lbs.
Tensile Strength at Yeild	ASTM D638	40 lbs.
Tensile Strength at Break	ASTM D638	88 lbs.
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 D746	<-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 Gl H2O/100 in 2/24 hrs (g H2O/m2/24 hrs.	ASTM E96 Method A73 F, 50% RH	.020 (.022)

Section 4 - PHYSICAL HAZARDS

Stability: Unstable		Conditions to Avoid	Temperatures over 570 F will release combustible gases.
Stable	X		

Incompatibility (Materials to Avoid): None

Hazardous Decomposition Products: The following combustion products may be generated: Carbon dioxide, carbon monoxide, water vapor, and trace volatile organic compounds.

Hazardous Polymerization: May Occur		Conditions to Avoid	N/A
Will not Occ	X		

Section 5 - HEALTH HAZARDS

Threshold Limit Value: N/A

Signs and Symptoms of Exposure

1. Acute Overexposure: Not Determined
2. Chronic Overexposure: Not Determined

Medical Conditions Generally Aggravated by Exposure: There are no known medical conditions aggravated by exposure to this product.

Chemical Listed as Carcinogen or Potential Carcinogen		National Toxicology Program	Not Listed	I.A.R.C. Monographs	Not Listed	OSHA	Not Listed
OSHA Permissible Exposure Limit	None	ACGIH Threshold Limit Value	None	Other Exposur Limit Used	None		

Emergency and First Aid Procedures: Most problems will result from exposure to molten materials.

1. Inhalation: Immediately remove victim from area to fresh air. Seek medical attention.
2. Eyes: If contacted by molten material, immediately flush eyes with plenty of cool water for at least 15 minutes. Do not permit victim to rub eyes. Immediately seek medical attention.
3. Skin: If contact by molten material, cool immediately with cool water. Do not attempt to remove any solidified material. Immdiately seek medical attention.
4. Ingestion: If material is ingested, contact a physician or Poison Control Center as appropriate whenever any foreign object is swallowed.

Section 6 - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): N/A

Ventilation: N/A	Local Exhaust: N/A	Mechanical (General): N/A		Special: N/A	Other: N/A

Protective Gloves: Wear protective gloves during thermal processing.

Eye Protection: Wear eye protection during thermal processing.

Other Protective Clothing or Equipment: Wear protective sleeves when processing material at elevated temperatures to minimize the possibility of thermal burns.

Section 7 - SPECIAL PRECAUTIONS AND SPILL / LEAK PROCEDURES

Precautions to be Taken in Handling and Storage: This product should be stored in a manner that they are not exposed to ultra-violet light, excessive moisture, heat and sources of ignition. A static charge may be present on finished products.

Other Precautions

Steps to be Taken in Case Material is Released or Spilled: Spilled material should be swept up and discarded. Comply with applicable federal, state or local regulations.

Waste Disposal Methods: Dispose in accordance with local regulations

IMPORTANT - Do not leave blank spaces. If information is unavailable, unknown or does not apply, so indicate

TOTAL P.03

MATERIAL SAFETY DATA SHEET

QUICK IDENTIFIER (In Plant Common Name)
RUFCO 2000B, 3000B, 4000B Part No. 2000B, 3000B 4000B

Manufacturer's Name	RAVEN INDUSTRIES INC.	Emergency Telephone Numbers	800-635-3456 605-335-0174
Address	P.O. Box 5107 Sioux Falls, SD 57117	Other Information	1812 "E" Avenue Sioux Falls, SD 57104
Signature of Person Responsible for Preparation		Date Prepared	January 14, 1999

Section 1 - IDENTITY

Common Name (Used on Labels)		CAS Number(s)	26221-73-8 1335-86-4 25213-02-9
(Trade Name & Synonyms): RUFCO 2000B, 3000B, 4000B			
Chemical Name	Copolymer of Ethylene and Octene-1	Chemical Family	Polyolefin
Formula	(CH2 - CH2) n		

Section 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) - Chemical and Common Name(s)	%	Threshold Limit Value (units
None		

Section 3 - PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion Data)

Boiling Point	Not Applicable (N/A)			Specific Gravity	0.93	Vapor Pressure, mmHg	N/A
Percent Volatile by Volume (%)	0	Vapor Density	N/A	Evaporation Rate	N/A		
Solubility in Water	Insoluable in Water			Reactivity in Water	Not Reactive in Water		
Appearance and Odor	Black, odorless plastic film.						
Flash Point	N/A	Flammability Limits in Air, by Volume (%)	Lower N/A	Upper N/A	Auto Ignition Temperature	> 650 F (estimated)	
Extinguisher Media	Use water spray, dry chemical, foam or carbon dioxide						
Special Fire Fighting Procedures	Fire fighters should wear a self-contained breathing apparatus when there is a possibility of exposure to smoke, fumes or hazardous decomposition products. If possible, water should be applied as a spray from a fogging nozzle since this material is a surface burning material.						
Unusual Fire and Explosion Hazards							