AP - 007

STAGE 1 & 2 REPORTS

DATE:

Feb. 2001

SITE INVESTIGATION REPORT

(Pursuant to Stage 1 Abatement Plan)

Prepared for:

Darr Angell #3/4
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LIST OF ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
bgs	below ground surface
°C	degrees Celsius
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm/sec	centimeters per second
COC	chain of custody
DOT	Department of Transportation
DQO	data quality objective
EC	electrical conductivity
EPA	Environmental Protection Agency
FID	flame ionization detector
FSP	Field Sampling Plan
ft	foot or feet
g/cm^3	grams per cubic centimeter
G	glass
gal/ft^3	gallons per cubic foot
H_2SO_4	sulfuric acid
HCl	hydrochloric acid
HNO_3	nitric acid
HSP	Health and Safety Plan
lbs/gal	pounds per gallon
mL	milliliter
mL/L	milliliters per liter
MS/MSD	matrix spike/matrix spike duplicate
$Na_2S_2O_3$	sodium thiosulfate
NCP	National Contingency Plan
NTU	nephelometric turbidity unit
OD	outside diameter
OSHA	Occupational Safety and Health Administration
OVA	organic vapor analyzer

P	polyethylene
PID	photoionization detector
PO_4^{-3}	phosphate
PPE	personal protective equipment
PVC	polyvinyl chloride
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RI/FS	remedial investigation/feasibility study
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SO_4^{-2}	sulfate
SOW	statement of work
SP	spontaneous potential
SVOC	semivolatile organic compound
T	California brass
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbon
USCS	Unified Soil Classification System
USGS	U.S. Geological Survey
VOC	volatile organic compound
WP	work plan
µm	micrometer
3-D	three-dimensional

EXECUTIVE SUMMARY

This report describes the activities involved in the delineation of the hydrocarbon impact for the pipeline release at the Darr Angell #3/4 site by Environmental Technology Group, Inc. (ETGI) for EOTT Energy Corporation (EOTT). The pipeline release was reported to the New Mexico Oil Conservation Division (NMOCD) on November 9, 1999. This investigation was conducted in accordance with NMOCD rules and guidelines.

The time period covered by this report begins in July 2000 when seven soil borings were advanced to delineate hydrocarbon impact. The installation of three monitoring and four recovery wells was also completed to monitor groundwater impact. The period covered in this report ended on July 18, 2000 with the sampling of the three monitoring wells and one recovery well, RW-1, to monitor groundwater impact.

Investigation of the site has determined that the groundwater has been impacted at the site as a function of the pipeline release. One recovery well was installed immediately adjacent to the leak site. Phase separated hydrocarbon (PSH) has been measured in this well as well as at recovery wells RW-2 and RW-4, with the greatest thickness observed on recovery well RW-3. This well is located approximately 20 feet southeast of the leak site. The PSH plume appears to have migrated past recovery well RW-4, which is located 215 feet southwest of recovery well RW-1. Data collected from monitoring well MW-3, located 220 feet southeast of recovery well RW-3, indicates dissolved phase petroleum constituents.

Data collected from monitoring well MW-2, located 205 feet southwest from recovery well RW-4, indicates that there is no PSH or dissolved phase petroleum constituents at this time in the groundwater.

Automated recovery systems will be installed on recovery wells, RW-2, RW-3 and RW-4, to facilitate removal of PSH from the water table. These systems will be installed within the next sixty days at the site.

On completion of PSH removal at this site, the soils at the site will be evaluated. A site-specific plan will be developed and submitted to NMOCD to address soil remediation if needed. On completion of any necessary soil remediation, a No Further Action (NFA) closure request will be submitted to the NMOCD.

1.0 INTRODUCTION

1.1 PROJECT PURPOSE AND SCOPE

The purpose of this site investigation report is to describe the extent of impacted soil and groundwater as a result of the hydrocarbon release from the EOTT pipeline at the Darr Angell #3 site, located in rural Lea County, New Mexico. This report covers the investigation of the soils at the site and any groundwater impact in compliance with 19 NMAC 15.A19.E(3) and NMOCD *Guidelines for Remediation of Leaks, Spills and Releases*, 1993.

1.1.1 Objectives

The objectives for this site investigation were to 1) delineate the extent of hydrocarbon impact in the soils in the immediate release area via soil borings, sampling and laboratory analysis, 2) investigate any impact to the groundwater from the release via monitoring well installation, sampling and laboratory analysis, 3) continue monitoring the groundwater for further impact via sampling and laboratory analysis and 4) provide for recovery of any PSH observed in the groundwater via recovery wells.

1.1.2 Field Activities

Table 1-2

Field Activities Summary

Location	Activity	Number
Adjacent to EOTT line	Soil borings to depths of 60' with sampling at five foot intervals	9
Adjacent to EOTT line	Product recovery wells to facilitate removal of PSH from the water table	4
Surrounding the site	Monitoring wells to delineate and monitor any movement of PSH within the site's groundwater	3
Monitoring wells	Quarterly sampling and laboratory analysis of monitoring wells to identify and monitor any movement of PSH within the site's groundwater	3

Site investigation began with the advancement of nine soil borings (SB), SB-1 through SB-9, surrounding the release site. Samples were collected at five-foot intervals from each boring.

Laboratory analysis of the samples was performed to give an accurate delineation of any impacted areas. The soil samples were analyzed for Total Petroleum Hydrocarbons (TPH), Method SW 846-8015M. Any sample producing a field reading over 100ppm for Volatile Organic Compounds (VOC) with a Photoionization Detector (PID) was also tested in the laboratory for Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX), Method SW 846-8021B.

Three monitoring wells (MW-1, MW-2 and MW-3) were installed to investigate any movement of PSH within the groundwater. During the installation on these wells the soils were also sampled at five-foot intervals and the samples were submitted for TPH analysis as well as BTEX analysis if the field PID reading was over 100ppm for VOC. When conducting the borings or installation of monitoring wells, if observable PSH was encountered in the groundwater, a recovery well (RW) was installed facilitate removal of any product. Soil borings SB-2 and SB-4 were completed as recovery wells RW-1 and RW-2. Two additional recovery wells were also installed (RW-3 and RW-4).

1.2 PROJECT ORGANIZATION AND RESPONSIBILITY

Beth Aldrich, Geologist, conducted overall project management for this site with assistance from Ken Dutton, Operations Manager. Beth Aldrich also performed the collation and assessment of data obtained from fieldwork as well as from laboratory analysis.

Beth Aldrich, Simon Casas and Ken Dutton conducted field activities, i.e. sampling of soils and water and drilling supervision. Simon Casas and Danny Stevens performed the sampling and gauging of all monitoring and recovery wells.

1.2.1 Subcontractors

Subcontractors involved in this project included Eades Drilling (Eades) of Hobbs, New Mexico, who drilled and/or installed the soil borings, monitoring wells and recovery wells. Eades was also responsible for the decontamination the drilling equipment, installation the monitoring well and recovery well hardware and collection and containment of cuttings from the above-mentioned activities.

The soil and groundwater samples that were collected were processed and analyzed by Environmental Laboratory of Texas (ELOT), based out of Odessa, Texas, who conducted all required testing of both the soils and groundwater and submitted reports to ETGI.

John West Surveying Company of Hobbs, New Mexico, a certified land surveyor, surveyed the site, including all soil borings, monitoring wells and recovery wells. A survey plat was provided upon completion of the survey.

2.0 SITE DESCRIPTION

2.1 SITE HISTORY

2.1.1 Operational History

The release point was located on a buried north-south trending steel 8" pipeline. The pipeline is currently operated by EOTT. The release was reported to the NMOCD on November 9, 1999.

2.1.2 Nature of Current Release

On November 9, 1999, approximately 10 barrels of crude oil was released from an 8" EOTT pipeline (See Figure 2). EOTT personnel immediately responded, initiating shutdown procedures to terminate the flow of oil from the line failure point. No crude oil was recovered from the site. Internal corrosion was identified as the cause of the failure of the line.

2.1.3 Summary of Previous Investigations

There have been no previous investigations at the site. An area immediately adjacent to the point of failure was excavated to a depth of approximately six feet below ground surface (bgs) to facilitate repair of the pipeline. The excavated area has been enclosed with a temporary fence.

2.2 ENVIRONMENTAL SETTING

2.2.1 Physical Location, Topography, and Site Layout

As shown in the U.S. Geological Survey (USGS) quadrangle map in Figure 1, the site is located south of US Highway 82 at Latitude 033° 01' 59.5" N and Longitude 103° 10' 03.1" W, in Section 11, Township 15 South, Range 37 East in rural Lea County, New Mexico. Generally, the surface of the site consists of unconsolidated sand covered by moderate to sparse grasses. Oil and gas production facilities are located in the surrounding area. The site is currently in a rural area with no development.

The site is located at an elevation of approximately 3,785 feet above mean sea level (msl). The topography is relatively flat terrain, sloping to the southeast. Storm water runoff from the site is minimal, trending to the southeast. The surface runoff that does occur is localized into marginally depressed areas on the site. Known utilities on the site consist of electricity in overhead lines as well as crude oil gathering and transportation lines. A layout of the site is presented in Figure 2, Site Plan.

2.2.2 Receptor Identification

As previously discussed, the site is located in a rural area. In the vicinity of the site, access is unrestricted via the adjacent lease roads. Based on the aforementioned site conditions, the following onsite and offsite potential receptor populations were identified for this risk assessment.

- Onsite:
    - Environmental/Sampling Technician
    - Remedial/Construction worker
- Offsite:
    - Adult Trespasser
    - Adolescent Trespasser (7 to 15 years of age)

The onsite environmental/sampling technician was considered a potential receptor due to the possibility of exposures from periodic, non-intrusive, maintenance-related operations performed by that receptor at the site. Currently, activities that are conducted by the environmental/sampling technician include site inspections, monitoring and maintenance of the PSH recovery systems, sampling onsite monitoring wells and loading recovered groundwater into a tank mounted on a trailer. Site inspections occur once a week and are done in two hours or less unless maintenance is required on the PSH recovery systems. Groundwater sampling is conducted on a quarterly basis, and requires approximately twelve manhours per sampling event, with recovered groundwater loading occurring at this time. All current site activities are conducted in accordance with a site Health and Safety Plan that is designed to minimize the potential for exposure to contaminants at the site.

There are no construction plans for the site at this time. However, installation of automated recovery systems will include construction of fencing and the installation of storage tanks, pads and buildings to house the systems. Future activities may include excavation. Therefore, a construction worker or remedial worker (intrusive scenario) will be considered in this risk assessment. All site activities will be conducted in accordance with the site Health and Safety Plan that is designed to minimize the potential for exposure to contaminants at the site.

Sampling data indicate that contaminants are present in soils and groundwater at the site. Therefore, in addition to the aforementioned onsite receptor, offsite receptors could potentially be exposed to contamination.

Due to the fact that the site has access via adjacent lease roads and oil and gas activities surround the site, adult, and less likely, adolescent trespassers were included as potential receptors in this risk assessment. These receptors were considered to be potentially exposed to petroleum-based constituents that were primarily detected in near surface soils at the site. Due to the locks placed on each monitoring well and recovery well at the site, it is extremely difficult for potential offsite receptors to encounter any groundwater at the site. Site controls (well locks) will be maintained at the site as a part of the ongoing assessment that will further limit unauthorized access.

2.3 GEOLOGY AND HYDROGEOLOGY

The site is located in rural Lea County, New Mexico, east of the town of Lovington, New Mexico. The surface of the site consists of unconsolidated, wind blown sands and finer materials with elevations between 3,783 and 3,787 msl. The topography is predominantly a flat terrain, sloping slightly to the southeast. There is no surface water, not including manmade excavations, within 1,000 feet of the site. The nearest water well is in excess of one half mile away, to the southeast.

2.3.1 Soils

According to the U.S. Department of Agriculture (USDA) Soil Conservation Service soil survey, the soils at the site consist of the Kimbrough-Lea association, with a 0 to 3 percent slope. The soils of the Kimbrough-Lea association are nearly level and gently sloping, gravelly and loamy soils that are very shallow to moderately deep to indurated caliche. The soils are located mainly in the northern half of Lea County.

The surface layer ranges from 6 to 20 inches thick. Color ranges from dark grayish-brown to brown and the soil is mildly alkaline. The texture of the surface layer is loam or loamy sand.

The subsurface layer is from 6 to 40 inches thick. Color ranges from grayish-brown to brown. The texture is gravelly loam or loamy sand, which can be as much as 60 percent by volume. The underlying material is indurated caliche, a very pale tan calcareous sand or unconsolidated red sand. The caliche layer is discontinuous.

Kimbrough-Lea association soils have slow to rapid surface drainage, with permeability that is moderate to moderately rapid. Soil blowing is a slight to severe hazard. Runoff is slow to rapid.

Kimbrough gravelly loam, 0 to 3 percent slopes, soil occurs on prairie uplands and is locally known as "scabland" and is locally interbedded with fragmented caliche. Stegall loam, 0 to 1 percent slopes, soil occurs on uplands in northern Lea County, mixed with Kimbrough-Lea series soils and has a sub angular, blocky structure. Included in the area near the site are patches of Portales loam, 0 to 1 percent slopes and Portales fine sandy loam, 1 to 3 percent slopes.

2.3.2 Regional Geology

The Lea County surface topography consists of unconsolidated, wind blown sands and finer materials associated with the Tertiary Ogalalla Formation, which serves as a major aquifer for southeastern New Mexico and several high plains states. The Triassic Dockum Group, commonly referred to as the "red beds", underlies the Ogalalla. While there are sand lenses within the Dockum Group, it is more typically characterized by red silts and red shales in which detectable groundwater is often absent or of limited extent.

2.3.3 Site Geology

Based on the results of the site investigation, as well as a review of geologic maps, the site appears to lie within the Ogalalla Formation. The uppermost unit was a tan-brown to brown, very fine grained loamy sand with a few calcareous fragment and deposits and was from 2 to 10 feet thick. This unit is underlain by a red to red-brown very fine grained, well-sorted sand with none to abundant caliche nodules and was from 8 to 20 feet thick. That unit was underlain by a tan to white, very hard, calcareous sandstone, which was from 3 to 5 feet thick. The next underlying unit was very fine grained, well sorted, red to red-brown sand with slight moisture at the water table and none to few sandstone fragments with a thickness of between 12 and 32 feet. At depths of 26.5 feet to 36 feet bgs lays a discontinuous layer of well-indurated sandstone with calcareous cement, which varies in thickness from 4 to 5 feet.

2.3.4 Regional Hydrogeology

The primary water-bearing formation in Lea County is the Tertiary Ogalalla Formation, which serves as a major aquifer for southeastern New Mexico. Alluvial, unconfined groundwater is typically present in these sands at varying depths and generally flows from north to south. These aquifers are typically characterized by relatively high hydraulic conductivity and transmissivity.

2.3.5 Local Hydrogeology

Shallow groundwater at the site occurs near the unconformity between the underlying red clay of the Dockum Formation and the unconsolidated sands associated with the overlying Ogallala Formation. At the site, this unconformity is present at depths that range between 58 to 60 feet bgs. The movement of fluids, including groundwater and PSH, is enhanced where the groundwater occurs in the sand. However, the movement of fluids is significantly retarded in areas where the groundwater occurs within the red clay (C.W. Fetter, *Applied Hydrogeology*, 1988). The groundwater observed at this depth is considered to be of beneficial use based on the site-specific concentration of total dissolved solids (TDS) and criteria included in the NMOCD regulations.

2.3.6 Water Well Inventory

For the site investigation report a water well search was performed of the New Mexico Office of the State Engineer's water well database (See Appendix B). The search was conducted on a one-mile radius surrounding the site. The closest water well was found in excess of half-mile away, to the southeast. This information was verified during the field investigation.

2.4 SURFACE HYDROLOGY

2.4.1 Distance to Nearest Surface Water Body

Based on site reconnaissance and a review of the USGS topographic maps in this area, there are no natural surface bodies of water, either standing (ponds, lakes) or free flowing (rivers or streams) within a half-mile radius of the site.

2.4.2 Seasonal Stream Flow Characteristics

There are no streams within a half-mile radius of the site area; therefore impact from any seasonal flow would be negligible. Seasonal rainfall is negligible, as the area is classified as dry upland.

2.4.3 Groundwater/Surface Water Relationships

As there are no surface water impoundments in the site area, a relationship between surface water and groundwater does not exist. Pooling of rainfall may occur on an intermittent basis, but the arid climate and rapid evaporation associated with it precludes any percolation to the groundwater table.

3.0 FIELD OPERATIONS

3.1 GEOLOGIC STANDARDS

The lithologic descriptions for unconsolidated materials (soils [engineering usage] or deposits) used the name of the predominant particle size (e.g., silt, fine sand, etc.). The dimensions of the predominant and secondary sizes were recorded using the metric system. The grain size and name of the deposit were accompanied by the predominant mineral content, accessory minerals, color, particle angularity, and any other characteristics. The clastic deposit descriptions included, as a supplement, symbols of the Unified Soil Classification System. The color descriptions were designated by the Munsell Color System.

The scales for maps, cross sections, or 3-D diagrams were selected in accordance with the geologic and hydrologic complexity of the area and the purposes of the illustrations. Maps are oriented with North toward the top, unless the shape of the area dictates otherwise. Orientation is indicated with a North arrow.

3.2 SITE RECONNAISSANCE, PREPARATION, AND RESTORATION PROCEDURES

Site investigation and field sampling was conducted by ETGI personnel utilizing mobile units (pickup trucks). Each unit is equipped with a first aid kit and a portable fire extinguisher. Onsite personnel were equipped with hardhat, safety glasses, personal H_2S monitor and safety boots. In addition, portable cellular telephones were onsite to facilitate emergency access in the event of fire or accident.

3.3 BOREHOLE DRILLING, LITHOLOGIC SAMPLING, LOGGING, AND ABANDONMENT

3.3.1 General Drilling Procedures

All drilling activities conformed to state and local regulations, were performed by licensed well driller, and were supervised by a geologist. All permits, applications, and other documents required by state and local authorities were obtained.

The location of all borings was coordinated, in writing, with the EOTT Project Manager before drilling commenced. When boreholes were drilled through more than one water bearing zone or aquifer, measures were taken to prevent cross-connection or cross-contamination of the zones or aquifers.

The drilling rig was cleaned and decontaminated in accordance with the procedure in Section 3.7. The drilling rig did not leak any fluids that might have entered the borehole or contaminated equipment placed in the hole.

A log of drilling activities was kept in a bound field notebook. Information in the log book included location, time on site, personnel and equipment present, down time, materials used, samples collected,

measurements taken, and any other observations or information necessary to reconstruct field activities at a later date. At the end of each day of drilling, the drilling supervisor completed a Daily Drilling Log.

The drilling contractor disposed of all trash, waste grout, cuttings, and drilling fluids as coordinated with the EOTT Project Manager or designated representative.

3.3.2 Sampling and Logging

The lithology in all boreholes was logged. The boring log was used for recording the lithologic logging information. Information on the boring log sheet includes the borehole location; drilling information; sampling information such as sample intervals, and recovery; and sample description information. Copies of the boring logs are included the Appendices.

Unconsolidated samples for lithologic description were obtained continuously. Lithologic descriptions of unconsolidated materials encountered in the boreholes was described in accordance with both the New Mexico Oil Conservation Division *Guidelines for Remediation of Leaks, Spills and Releases* and American Society for Testing and Materials (ASTM) D-2488-90 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) (ASTM, 1990). Descriptive information recorded in the field included: (1) identification of the predominant particles size and range of particle sizes, (2) percent of gravel, sand, fines, or all three, (3) description of grading and sorting of coarse particles, (4) particle angularity and shape, and (5) maximum particle size or dimension. In addition, the unconsolidated materials were ranked as either highly contaminated or saturated soils (based on observable free phase hydrocarbons or immiscible phases and gross staining) or unsaturated contaminated soils (based on PID readings), as applicable.

Identification of the Unified Soil Classification System (USCS) group symbol was used for clastic material. Additional information recorded included the depth to the water table, caving or sloughing of the borehole, changes in drilling rate, depths of samples collected, presence of organic materials, presence of fractures or voids in consolidated materials, and other noteworthy observations or conditions, such as the locations of geologic boundaries.

All samples were monitored with a PID. The samples were handled in such a way as to minimize the loss of volatiles, and these procedures shall be described in Section 4.0. Cuttings were examined for their hazardous characteristics. Materials suspected to be hazardous because of abnormal color, odor, or organic vapor monitor readings were containerized in conformance with the Resource Conservation and Recovery Act (RCRA) and the state and local requirements.

3.3.3 Abandonment

Boreholes that were not converted to monitoring wells were abandoned in accordance with applicable federal, state and local requirements. Appropriate paperwork was filed with the correct New Mexico department. If slurry was used, a mud balance and/or Marsh Funnel was used to ensure the density (lbs/gal) of the abandonment mud mixture conforms to the manufacturer's specifications. The slurry was emplaced from the bottom to the top of the hole using a tremie pipe.

All abandoned boreholes were checked 24 to 48 hours after mud/solid bentonite emplacement to determine whether curing was occurring properly. If more specific curing specifications were recommended by the manufacturer, these were followed. If settling occurred, a sufficient amount of mud/solid bentonite was added to fill the hole to the ground surface. These curing checks and any addition of mud/solid bentonite were recorded in the field log.

3.4 MONITORING WELL CONSTRUCTION

All monitoring wells were constructed in accordance with criteria set forth in *Guidelines For Remediation of Leaks, Spills and Releases*, 1993 by the NMOCD. The well construction materials were selected according to industry standards, are chemically resistant to the monitored contaminants and were installed without the use of glues/adhesives. The monitoring wells were constructed according to NMOCD approved industry standards to prevent migration of contaminant along the well casing. The monitoring wells were constructed with a minimum of fifteen feet of well screen, at least five feet of which was above the water table to accommodate seasonal fluctuations in the water table.

3.5 MONITORING WELL DEVELOPMENT

The objective of monitoring well development is to repair damage done to the formation by the drilling operation so that the natural hydraulic properties of the formation are restored and to remove any fluids introduced into the formation that could jeopardize the integrity of the sample.

Monitoring well development is accomplished by purging the well a minimum of nine well volumes of groundwater. The pH and specific conductivity of the fluid in the well should be stabilized and the turbidity should be reduced to the greatest extent possible before sampling is begun.

3.6 SURVEYING

All surveying locations of field activities were measured by a certified land surveyor as the distance in feet from a reference location that was tied to the state plane system. The surveys were third order (cf. Urquhart, L.C., *1962 Civil Engineering Handbook*, 4th Edition, p. 96 and 97). A XY-coordinate system was used to identify locations. The X-coordinate was the East-West axis; the Y-coordinate was the North-South axis. The reference location was the origin. All surveyed

locations were reported using the state plane coordinate system. The survey plat gives the X and Y coordinates in state plane coordinate values and the elevation of the ground surface.

3.7 EQUIPMENT DECONTAMINATION

Cleaning of drilling equipment was the responsibility of the drilling company. In general, the cleaning procedures consisted of using high-pressure steam to wash the drilling and sampling equipment prior to drilling and prior to starting each hole.

Prior to use, the sampling equipment was cleaned with Liqui-Nox detergent and rinsed with distilled water. The following procedure was used to decontaminate sampling and drilling devices, such as split spoons, bailers and augers that can be hand-manipulated. For sampling and smaller drilling devices, the equipment was scrubbed with a solution of potable water and Alconox. Then the equipment was rinsed with copious quantities of potable water followed by an ASTM Type II Reagent Water. The equipment was air dried on a clean surface or rack, such as Teflon®, stainless steel, or oil-free aluminum elevated at least two feet above ground. If the sampling device was not used immediately after being decontaminated, it was wrapped in oil-free aluminum foil, or placed it in a closed stainless steel, glass, or Teflon® container.

3.8 INVESTIGATION DERIVED WASTE HANDLING

3.8.1 General Waste Handling Procedures

Non-investigative waste, such as litter and household garbage, was collected on an as-needed basis to maintain each site in a clean and orderly manner. This waste was containerized and transported to the designated sanitary landfill or collection bin. Acceptable containers were sealed boxes or plastic garbage bags.

Investigation derived waste was properly containerized and temporarily stored at each site, prior to transportation. Depending on the constituents of concern, fencing or other special marking was used as required. The number of containers was estimated on an as-needed basis. Acceptable containers were sealed, U.S. Department of Transportation (DOT)-approved steel 55-gallon drums. The containers were transported in such a manner to prevent spillage or particulate loss to the atmosphere.

The investigative derived waste was segregated at the site according to matrix (solid or liquid) and as to how it was derived (drill cuttings, drilling fluid, decontamination fluids, and purged groundwater). Each container was properly labeled with a tracking number, and with site and source identification, sampling point, depth, matrix, constituents of concern, and other pertinent information for handling.

4.0 ENVIRONMENTAL SAMPLING

4.1 SAMPLING PROCEDURES

All purging and sampling equipment was decontaminated according to the specifications in Section 3.7 prior to any sampling activities and was protected from contamination until ready for use.

4.1.1 Groundwater Sampling

When numerous monitoring wells were sampled in succession, those wells expected to have low levels of contamination or no contamination were sampled prior to those wells expected to have higher levels of contamination. This practice helped reduce the potential for cross contamination between wells. All sampling activities were recorded in the field logbook. Additionally, all sampling data were recorded on a well sampling form.

The following information was recorded each time a well was purged and sampled: (1) depth to water before and after purging, (2) well bore volume calculation, (3) sounded total depth of the monitoring well, (4) the condition of each well, (5) the thickness of any nonaqueous layer, and (6) field parameters, such as turbidity.

4.1.1.1 Water Level Measurement

The groundwater level was then measured to the nearest 0.01 foot using an electric water level indicator. Water levels were measured from the top of the well casing. Following water level measurement, the total depth of the well from the top of the casing was determined and recorded on the well sampling form. The length of well casing above the ground surface was then measured and subtracted from the total depth to obtain a depth of water and total well depth from the ground surface. All water level and total depth measuring devices were routinely checked with a tape measure to ensure measurements were accurate.

4.1.1.2 Purging Prior to Sampling

Purging of monitoring wells was performed to evacuate water that has been stagnant in the well and may not be representative of the aquifer. Purging was accomplished using a Teflon® bailer.

At least three well volumes were removed from the well before it is sampled. The well bore volume is defined as the volume of submerged casing and screen. One well volume can be calculated using the following equation (reference: Ohio EPA Technical Guidance Manual for Hydrogeologic Investigations and Groundwater Monitoring Programs, June 1993):

$$V = H \times F$$

where V = one well volume

H = the difference between the depth of well and depth to water (ft)
F = factor for volume of one foot section of casing (gallons) from Table 4.1

Table 4.1 Volume of Water in One-Foot Section of Well Casing

Diameter of Casing (inches)	F Factor (gallons)
1.5	0.09
2	0.16
3	0.37
4	0.65
6	1.47

F can also be calculated from the formula:

$$F = \Pi (D/2)^2 \times 7.48 \text{ gal/ft}^3$$

where D = the inside diameter of the well casing (feet).

Wells with yields too low to produce three well volumes before the well goes dry were purged to dryness. Water removed from the well during purging was containerized. Detailed information concerning investigative derived wastes is presented in Section 3.8.

4.1.1.3 Sample Collection

Samples were not taken within 24 hours of monitoring well development. Except as noted, at least three well volumes were removed from the well before it was sampled.

The sample was collected after three well volumes were removed. Field equipment was calibrated in accordance with the QAPP of this site investigation report. VOCs samples were collected as soon as possible after purging, and not more than two hours after purging was completed. If a monitoring well was bailed or pumped dry before three well volumes were obtained, the sample was collected when a sufficient volume of water had accumulated in the well.

Before collecting groundwater samples, the sampler put on clean, phthalate-free protective gloves. Samples were collected first using a Teflon® bailer. Disposable nylon rope was used to lower and retrieve the bailers. A new length of nylon rope was used for each well, and the rope was disposed of following the sampling activities. Each bailer was equipped with a dedicated stainless steel or Teflon® coated leader so that the nylon rope did not contact the water in the well.

Groundwater sample containers were filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers will be filled first and PAH containers second). Groundwater samples, collected for

BTEX analysis, were placed in 40 ml glass VOA vials equipped with Teflon® -lined caps. The sample containers were provided by the analytical laboratory. The vials were filled to a positive meniscus, sealed, and visually checked to ensure the absence of air bubbles.

Groundwater samples, collected for PAH analysis, were filled to capacity in sterile, 1-liter glass containers equipped with Teflon® lined caps. Groundwater samples, collected for metals analysis, were filled to capacity in sterile, 1-liter plastic containers equipped with Teflon® lined caps. The sample containers were provided by the analytical laboratory.

The filled containers were labeled and placed on ice in an insulated cooler. The cooler was sealed for transportation to the analytical laboratory. Proper chain-of-custody documentation was maintained throughout the sampling process.

Required sample containers, preservation methods, volumes and holding times are given in Section 4.2.2 and Table 4.2.2-1. Sampling equipment shall be decontaminated in accordance with Section 3.7 upon completion of sampling activities.

4.1.2 Subsurface Soil Sampling

Soil samples were collected at five-foot intervals from the surface to the total depth of the boring. Split spoon sampling was the preferred method of sample collection, however, due to local lithology, grab sampling from the cuttings at the measured depth was utilized as a backup method.

4.1.2.1 Split-Spoon Samples

When soil samples were to be submitted for laboratory analysis, they were collected using stainless steel, continuous drive, California modified split-spoon samplers. These samplers are 24 inches in length and have an outside diameter (OD) of 3 inches.

As soon as the split-spoon was opened, samples for field VOC analysis were collected and placed in a resealable plastic bag to facilitate field headspace analysis utilizing a Photoionization Detector (PID). The field monitoring results were recorded on the boring log and in the field logbook. If the field PID reading was over 100ppm, the sample was additionally tested for BTEX at the laboratory.

Samples to be tested were collected by extruding the soil out of the split spoon sampler into a 4 ounce, laboratory cleaned glass containers with Teflon® lined lids. This was done using clean stainless steel sampling tools. The sample was then sealed, labeled, and place in an iced cooler held at a temperature below 4°C.

4.1.3 Surface Soil Sampling

Surface soil samples were collected from the land surface to 6 inches below the surface. The sample was homogenized and quartered before being containerized. Stainless steel scoops or trowels, glass

jars with Teflon® lids or equivalent equipment compatible with the chemical analyses proposed were used to collect and store samples.

Unusual surface conditions that may have affected the chemical analyses were recorded in the logbook, such as the following: (1) evidence of dumping or spillage of chemicals, (2) soil discoloration, and/or (3) unusual condition of growing plants, etc.

4.2 SAMPLE HANDLING

4.2.1 Sample Containers

Sample containers were purchased precleaned and treated according to EPA specifications for the methods. Containers were stored in clean areas to prevent exposure to fuels, solvents, and other contaminants. Amber glass bottles were used for SVOCs and other constituents that may be sensitive to exposure to light.

4.2.2 Sample Volumes, Container Types, and Preservation Requirements

Sample volumes, container types, and preservation requirements for the analytical methods performed on the samples were listed in Table 4.2.2-1.

Sample holding time tracking began with the collection of samples and continued until the analysis is complete. Holding times for methods are specified in Table 4.2.2-1.

Table 4.2.2-1 Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

Name	Analytical Methods	Container[a]	Preservation[b,c]	Minimum Sample Volume or Weight	Maximum Holding Time
Conductance	SW 846 Method 9050	P, G	None required	N/A	Analyze immediately
Temperature	E170.1	P, G	None required	N/A	Analyze immediately
Dissolved oxygen	E360.1	G	None required	500 mL	Analyze immediately
Turbidity	E180.1	P, G	4°C	N/A	48 hours
Total Dissolved Solids (TDS)	E160.1	P, G	4°C	N/A	7 days
Metals (except chromium (VI) and mercury)	SW 846 Method 6010B	P, G, T	HNO_3 to pH < 2, 4°C	500 mL or 8 ounces	180 days (water)
Polynuclear Aromatic Hydrocarbons	SW 846 Method 8270C	G, Teflon®-lined cap, T	4°C, 0.008% $Na_2S_2O_3$	1 liter or 8 ounces	7 days until extraction and 40 days after extraction (water);
TPH	SW 846 Method 8015M	P, Teflon®-lined cap, T	Cool, 4°C	4 or 8 ounces	14 days until extraction and 40 days after extraction (water);
BTEX	SW 846 Method 8021B	G, Teflon®-lined septum, T	4°C, 0.008% $Na_2S_2O_3$ (HCl to pH < 2 for volatile aromatics by SW8240 and SW8260)[b]	2 x 40 mL or 4 ounces	14 days (water and soil); 7 days if unpreserved by acid
TCLP/SPLP	SW 846 Method 1311/ 1312	G, Teflon®-lined cap, T	Cool, 4°C	1 liter or 8 ounces	14 days to TCLP/SPLP extraction and 14 days after extraction (volatiles); 14 days to TCLP extraction and 40 days after extraction (semivolatiles); 28 days to TCLP/SPLP extraction and 28 days after extraction (mercury); 180 days to TCLP/SPLS extraction and 180 days after extraction (metals)

a. Polyethylene (P); glass (G); brass sleeves in the sample barrel, sometimes called California brass (T).
b. No pH adjustment for soil.

4.2.3 Sample Identification

Field soil samples were assigned numbers based upon their origin, i.e. Soil boring SB-1, Monitoring well MW-1, the chronology of the event, i.e., -1, -2, -3, and the depth from which they were obtained. Water samples were assigned numbers based upon their originating monitoring well, for example MW-1.

4.3 FIELD MEASUREMENTS

4.3.1 PARAMETERS

Field measurements to be conducted include VOC readings of field soil samples, water level measurements in monitoring wells and PSH measurements in recovery wells and tanks. Field VOC readings were measured with a PID. Field water and PSH levels were measured with an Interface Probe/Water Monitor.

4.3.2 EQUIPMENT CALIBRATION AND QUALITY CONTROL

The PID that was used or field VOC measurements is a MultiRAE Plus manufactured by RAE Systems Inc. of Sunnyvale, CA. This monitor is calibrated using Portagas Specialty gas mixtures. The calibration date is recorded within the monitor's system.

The Interface Probe/Water Monitor used for water and PSH level measurements is a Solinst Interface Probe and Water Monitor manufactured by Solinst Canada Corp. of Georgetown, Ontario, Canada. The fluid level alarm on the interface probe is verified by pressing the test button and confirming its operation prior to each use.

4.3.3 EQUIPMENT MAINTENANCE AND DECONTAMINATION

All field measurement equipment was decontaminated according to the specifications in Section 3.7 prior to any measurement activities and was protected from contamination until ready for use.

4.3.4 FIELD MONITORING MEASUREMENTS

4.3.4.1 Groundwater Level Measurements

Water-level measurements were taken in all wells to determine the elevation of the groundwater level at least once within a single 24-hour period. These measurements were taken after all wells have been installed and developed and their water levels recovered completely. Any conditions (e.g., barometric pressure) that would have affected water levels were recorded in the field log. The field log also included the previous water level measurement for each well (to determine if current water level was reasonable).

Water-level measurements were taken with electric water level monitors. All measuring equipment was decontaminated according to the specifications in Section 4.3.3 and 3.7. Groundwater level was measured to the nearest 0.01 foot. (Two or more sequential measurements were taken at each location until two measurements agree to within + or - 0.01 foot.)

Static water levels were measured each time a well was sampled, and before any equipment entered the well.

4.4 SAMPLE CUSTODY

Procedures to ensure the custody and integrity of the samples were begun at the time of sampling and continued through transport, sample receipt, preparation, analysis and storage, data generation and reporting, and sample disposal. Records concerning the custody and condition of the samples were maintained in field and laboratory records.

ETGI maintained chain-of-custody records for all field and field QC samples. A sample is defined as being under a person's custody if any of the following conditions exist: (1) it is in their possession, (2) it is in their view, after being in their possession, (3) it was in their possession and they locked it up, or (4) it is in a designated secure area. All sample containers were sealed in a manner that prevented or detected tampering.

The following minimum information concerning the sample was documented on the chain of custody (COC) form:

- Unique sample identification
- Date and time of sample collection
- Source of sample (including name, location, and sample type)
- Preservative used
- Analyses required
- Name of collector(s)
- Pertinent field data
- Custody transfer signatures and dates and times of sample transfer from the field to transporters and to the laboratory or laboratories

All samples were uniquely identified, labeled, and documented in the field at the time of collection in accordance with Section 4.2.3 of the site investigation report.

Samples collected in the field were transported to the laboratory. When a 4°C requirement for preserving the sample was indicated, the samples were packed in ice to keep them cool during collection and transportation.

5.0 SAMPLE ANALYSIS SUMMARY

Table 1-1
Sample Analysis Summary

Method (prep/analytical)	Matrix	Total # of Samples
TPH - 8015M	Soil	189
BTEX – 8021B	Soil	15
BTEX – 8021B	Water	4
Metals – 6010B	Water	4
PAH – 8270C	Water	4
Cations/Anions/TDS375.4,325.3,310,160.1	Water	4

6.0 DATA QA/QC REVIEW AND EVALUATION

6.1 DATA QA/QC REVIEW

The laboratory was responsible for proper QA/QC procedures after signing the chain-of-custody form. These procedures were either transmitted with the laboratory reports or are on file at the laboratory. A review of the QA/QC data, transmitted with the laboratory reports, was performed by ETGI personnel. All instrumentation and extraction accuracy ranges were within acceptable limits.

6.2 DATA EVALUATION

As constituents were detected in the various media sampled at the site (soil and groundwater), ongoing evaluations for determining contaminants was performed. For the purposes of this risk assessment, contamination levels will be based upon criteria set forth in the NMOCD guidelines for soils. The contamination levels for groundwater will follow criteria set forth in the New Mexico Water Quality Control Commission (NMWQCC) guidelines.

Due to the nature of ongoing pipeline operations, it is assumed that the constituents that were detected in the soil originated from the pipeline release.

Nine soil borings were advanced at the site, with a total of 120 soil samples taken. The samples were analyzed for TPH using SW 846 Method 8015M and BTEX by SW 846 Method 8021B if the field PID reading exceeded 100ppm. Two of these soil borings were completed as recovery wells. Three monitoring wells were advanced at the site, with a total of 41 soil samples taken. The samples were analyzed for TPH using SW 846 Method 8015M and BTEX by SW 846 Method 8021B if the field PID reading exceeded 100ppm.. Two additional product recovery wells were advanced at the site, with a total of 28 soil samples taken. The samples were analyzed for TPH using SW 846 Method 8015M and BTEX by SW 846 Method 8021B if the field PID reading exceeded 100ppm.

Once the three monitoring wells were installed, a groundwater samples was taken in each well from the first permeable zone (56 to 58 feet bgs) to determine if the contamination had migrated to the groundwater. The samples were analyzed for BTEX by SW 846 Method 8021B, Metals by SW 846 Method 6010B, Polynuclear Aromatic Hydrocarbons (PAH) by SW 846 Method 8270 and Cations, Anions and Total Dissolved Solids (TDS) by Methods 375.4, 325.3, 310 and 160.1. Additionally, a groundwater sample was also taken from recovery well RW-1 and submitted for the same analysis as the monitoring well samples.

7.0 SUMMARY OF RESULTS

7.1 DELINEATION OF NATURE, EXTENT, AND MAGNITUDE OF CONTAMINATION

The presence of petroleum-impacted soil was detected in the unsaturated and capillary fringe zones in both recovery wells RW-3 and RW-4. Petroleum impacted soil was also detected in the capillary fringe zone of recovery wells RW-1 and RW-2.

The greatest impact in the unsaturated zone was detected at the depth of 28 to 30 feet bgs in recovery well RW-3, adjacent to the release site, where a TPH concentration of 16,351 mg/kg was measured in the soil sample (See Table 1). Visual observations of the soil sample indicated that this soil would qualify as Highly Contaminated/Saturated Soils as per NMOCD guidelines.

Elevated levels of TPH were observed in the 58 to 60 feet bgs in samples from the soil boring SB-7. Additionally, elevated levels of TPH were observed in the 48 to 60 feet bgs in samples from the soil boring SB-9. None of these samples appear to qualify as Highly Contaminated/Saturated Soils as described above.

The petroleum impacted soil samples detected in recovery well RW-1 at the 58 to 60 feet bgs level do not appear to qualify as Highly Contaminated/Saturated Soils. The petroleum impacted soil samples detected in recovery well RW-2 at the 58 to 60 feet bgs level do not appear to qualify as Highly Contaminated/Saturated Soils. The petroleum impacted soil samples detected in recovery well RW-4 at the 43 to 65 feet bgs level do not appear to qualify as Highly Contaminated/Saturated Soils. With the exception of the soil sample from the 28 to 30 bgs level in recovery well RW-3, the petroleum impacted soil samples detected from the surface to 35 feet bgs and 58 to 65 feet bgs levels do not appear to qualify as Highly Contaminated/Saturated soils as per NMOCD guidelines.

With the exception of recovery wells and soil borings SB-7 and SB-9, Highly Contaminated/Saturated and Unsaturated/Contaminated Soils were not observed in any of the other soil samples. Therefore, it is assumed that the Highly Contaminated/Saturated Soils and Unsaturated Contaminated Soils are limited to the area immediately adjacent to the release site.

The greatest soil impact within the capillary fringe zone was detected at the recovery well RW-3 location where the TPH concentration in the sample collected from 58 to 60 feet bgs was 7,221 mg/kg (See Table 1).

7.1.1 Highly Contaminated/Saturated Soils

During the site investigation, soils that may be characterized by NMOCD guidelines as Highly Contaminated/Saturated Soils were observed in recovery well RW-3, adjacent to the pipeline at the leak site. These soils occurred at a depth of 28 to 30 feet bgs.

7.1.2 Unsaturated Contaminated Soils

The petroleum impacted soil samples detected in recovery well RW-1 at the 58 to 60 feet bgs level do not appear to qualify as Highly Contaminated/Saturated Soils. The petroleum impacted soil samples detected in recovery well RW-2 at the 58 to 60 feet bgs level do not appear to qualify as Highly Contaminated/Saturated Soils. The petroleum impacted soil samples detected in recovery well RW-4 at the 438 to 65 feet bgs level do not appear to qualify as Highly Contaminated/Saturated Soils. With the exception of the soil sample from the 28 to 30 bgs level in recovery well RW-3, the petroleum impacted soil samples detected from the surface to 35 feet bgs and 58 to 65 feet bgs levels do not appear to qualify as Highly Contaminated/Saturated soils as per NMOCD guidelines. These soils qualify as Unsaturated Contaminated Soils under NMOCD guidelines.

Elevated levels of TPH were observed in the 58 to 60 feet bgs in samples from the soil boring SB-7. Additionally, elevated levels of TPH were observed in the 48 to 60 feet bgs in samples from the soil boring SB-9. These samples showed evidence of contamination that could be classified as Unsaturated Contaminated Soils under NMOCD guidelines.

7.1.3 Groundwater Contamination

The groundwater gradient, as depicted on Figure 3, slopes to the east-southeast at approximately 0.00117 feet per foot. The variations in gradient, as depicted on the map, are most likely a function of variations in lithology at the water table, and the presence of PSH within portions of the mapped area.

A plume of PSH is distributed in the subsurface from the point of release past recovery well RW-4, southeast of the release site (See Figures 4,5,6). Recovery well RW-4 is located approximately 215 feet southwest from the release site. The thickness of PSH is greatest at recovery well RW-3, where measured PSH thickness is 6.46 feet. A thickness of 2.97 feet of PSH was detected in recovery well RW-4 when measured on July 31, 2000.

Dissolved phase petroleum constituents were detected in the sample from one of the monitoring wells, MW-3. The sample was above the NMOCD standard for benzene. This well is located down gradient of recovery well RW-3. None of the other groundwater samples were in excess of New Mexico Water Quality Control Commission (NMWQCC) standards for other petroleum constituents including naphthalene (see Tables 2, 3, 4).

Samples collected from monitoring wells MW-1, MW-2, and MW-3 were in excess of NMWQCC standards for iron. Groundwater samples from monitoring wells MW-2 and MW-3 had levels of aluminum and chromium above the NMWQCC standard. The groundwater sample from monitoring well MW-2 also had levels of chlorides and manganese slightly above the NMWQCC standard.

All of the groundwater samples were non-detect for benzo-a-pyrene, however the laboratory detection limit was 0.005 mg/L while the regulatory limit is 0.0007 mg/L. The analytical method used for this analysis is acceptable to the NMOCD and this detection limit is a function of this method. Therefore, it cannot be concluded that groundwater at the site does not exceed the regulatory limit for benzo-a-pyrene.

In the site monitoring well groundwater samples, TDS concentrations range from 417 mg/L to 912 mg/L. New Mexico WQCC statute 20.6.2 Subpart III.3101 and NMOCD Rule 19 NMAC 15.A.19.A state that groundwater with a TDS concentration of less than 10,000 mg/L is considered to be of beneficial use and subject to abatement. Since all of the TDS sample concentrations from the site are below this value, the site groundwater qualifies for beneficial use and is subject to abatement.

7.1.4 Background (Up gradient) Sample Results

The groundwater sample from monitoring well MW-1, the up gradient well, was in excess of NMWQCC standards for iron (See Table 4).

7.2 IDENTIFICATION OF REMEDIAL ACTION LEVELS

7.2.1 Highly Contaminated/Saturated and Unsaturated Contaminated Soils

During the site investigation, soils that may be characterized by NMOCD guidelines as Highly Contaminated/Saturated Soils were observed in recovery well RW-3, adjacent to the pipeline at the leak site. These soils were identified in the unsaturated zone of the recovery well at 28 to 30 feet bgs.

Soils that may be characterized by NMOCD guidelines as Unsaturated Contaminated Soils were observed in recovery wells RW-1 at the 58 to 60 feet bgs level, RW-2 at the 58 to 60 feet bgs level RW-4 at the 43 to 65 feet bgs level. With the exception of the soil sample from the 28 to 30 bgs level in recovery well RW-3, the petroleum impacted soil samples detected from the surface to 35 feet bgs and 58 to 65 feet bgs levels qualify as Unsaturated Contaminated Soils under NMOCD guidelines.

Elevated levels of TPH were observed in the 58 to 60 feet bgs in samples from the soil boring SB-7. Additionally, elevated levels of TPH were observed in the 48 to 60 feet bgs in samples from the soil boring SB-9. These samples showed evidence of contamination that could be classified as Unsaturated Contaminated Soils under NMOCD guidelines.

7.2.1.1 Site Ranking

The groundwater table occurs at a depth of approximately 56 to 58 feet bgs, however the presence of PSH on the groundwater in recovery wells RW-2, RW-3 and RW-4 has been observed. Following NMOCD ranking guidelines, the site will have a ranking greater than 19 points.

The nearest water well is to the southeast, in excess of one-half mile away. The distance to the nearest surface water, not including man made excavations, is greater than 1,000 feet from the site. Therefore, these parameters have no bearing on determining the NMOCD ranking.

7.2.1.2 Remedial Action Levels

As per the NMOCD Guidelines (1993), the soil remediation action levels for a site with a Ranking Score of greater than 19 are as follows:

- Benzene - 10 ppm
- BTEX - 50 ppm
- TPH - 100 ppm

7.2.2 Groundwater

The presence of PSH on the water table in recovery wells RW-2, RW-3 and RW-4 indicates the need for groundwater remediation. The NMWQCC groundwater remediation levels are as follows:

- Benzene – 0.01 mg/L
- Toluene – 0.75 mg/L
- Ethyl Benzene – 0.75 mg/L
- Total Xylenes – 0.62 mg/L
- PAHs (total naphthalene) – 0.03 mg/L
- Benzo-a-pyrene – 0.0007 mg/L

7.3 COMPARISON TO REMEDIAL ACTION LEVELS

7.3.1 Highly Contaminated/Saturated and Unsaturated Contaminated Soils

The soil sample classified as Highly Contaminated/Saturated Soils, collected from recovery well RW-3, had a TPH level of 16,351 mg/kg, a BTEX concentration of 120.32 mg/kg and a Benzene concentration of 2.52 mg/kg. These levels far exceed the NMOCD regulatory action levels for this site of 100 ppm (mg/kg) for TPH and 50 ppm for BTEX. However, it does not exceed the NMOCD action level of 10 ppm for Benzene.

The soil samples classified as Unsaturated Contaminated Soils, collected from soil borings SB-7 and SB-9 had indicated TPH levels of less than 102 mg/kg to 817 mg/kg, BTEX concentrations of zero to less than 0.558 mg/kg and Benzene concentrations of zero to less than 0.10 mg/kg. The NMOCD regulatory action levels for this site are 100 ppm for TPH, 50 ppm for BTEX and 10 ppm for Benzene.

Soils that may be characterized by NMOCD guidelines as Unsaturated Contaminated Soils were observed in recovery wells RW-1 at the 58 to 60 feet bgs level, RW-2 at the 58 to 60 feet bgs level RW-4 at the 43 to 65 feet bgs level. With the exception of the soil sample from the 28 to 30 bgs level in recovery well RW-3, the petroleum impacted soil samples detected from the surface to 35 feet bgs and 58 to 65 feet bgs levels qualify as Unsaturated Contaminated Soils under NMOCD guidelines. These soils had indicated TPH levels of less than 243 mg/kg to 7,221 mg/kg, BTEX concentrations of less than 0.558 mg/kg to 153.47 mg/kg and Benzene concentrations of less than 0.10 mg/kg to 5.37 mg/kg. The NMOCD regulatory action levels for this site are 100 ppm for TPH, 50 ppm for BTEX and 10 ppm for Benzene.

7.3.2 Groundwater

The groundwater is impacted at recovery wells RW-2, RW-3 and RW-4, where PSH levels of 0.92 feet, 6.46 feet and 2.97 feet were measured on the water table (See Table 5). At recovery well RW-1, the dissolved phase concentration of Benzene is 0.016 mg/L, and the BTEX concentration is 0.33 mg/L. The NMWQCC regulatory limit in groundwater for Benzene is 0.01 mg/l and for BTEX is 2.13 mg/L (See Figures 4, 5, 6).

At monitoring well MW-3, the dissolved phase concentration of Benzene is 0.359 mg/L, and the BTEX concentration is 0.435 mg/L. The NMWQCC regulatory limit in groundwater for Benzene is 0.01 mg/l and for BTEX is 2.13 mg/L. The occurrence of dissolved phase hydrocarbons in monitoring well MW-3 exceeds the NMWQCC regulatory limits (See Figures 5 and 6).

8.0 CONCLUSIONS

8.1 DELINEATION OF CONTAMINANT IMPACTS/PLUME (S)

PSH has been encountered in the recovery wells, RW-2, RW-3 and RW-4. The greatest level of impact is in recovery well RW-3, adjacent to the release point. PSH thickness is measured at 6.46 feet in recovery well RW-3, trending to 0.92 feet in measured thickness at recovery well RW-2 (See Figure 6).

Monitoring well MW-3, which is located 220 feet southeast (down gradient) from recovery well RW-3, has exhibited elevated levels of dissolved phase hydrocarbons (Benzene) in the groundwater (See Figure 4).

8.1.1 Onsite Impacts from Release

Localized groundwater contamination and PSH impact have been observed across the site, in three of the four recovery wells, as well as the down gradient monitoring well, MW-3. The prevailing up gradient monitoring well, MW-4, is devoid of any hydrocarbon impact (See Figure 6).

8.1.2 Offsite Impacts from Release

No offsite impacts have been identified in monitoring wells at this time.

8.1.3 Impacts from Up gradient/Offsite Releases

The lack of identified petroleum-based contaminants in the prevailing up gradient monitoring well, MW-1, indicates that there is no up gradient source causing impact to the referenced site.

8.1.4 Evaluation of Appropriate Plume(s) Boundaries

Based upon the analytical data obtained from the recovery wells RW-2, RW-3 and RW-4 and the monitoring wells, MW-1, MW-2, and MW-3, the down gradient as well as the up gradient extent of the PSH plume has been inferred. An estimation of the width of the plume was also made with the existing data. The inferred plume at the site is depicted on Figure 6, Inferred PSH Thickness Map.

8.2 MIGRATION OF CONTAMINANT PLUME (S)

8.2.1 Future Extent of Contamination

The installation of automated recovery systems for the PSH observed in recovery wells RW-2, RW-3 and RW-4 will remove the PSH that is present on the water table at the site. This reduction in source contamination will slow or halt the extension of the PSH plume further down gradient.

Further monitoring of the groundwater in the prevailing down gradient monitoring well, MW-3, will identify any change in the contaminant plume size.

8.2.2 Evaluation of Future Offsite Impacts

Ongoing monitoring of the down gradient monitoring wells will identify any spread of the PSH and/or dissolved phase hydrocarbons. The installation of up gradient recovery systems for the PSH observed in the recovery wells will limit the source of contamination. This action will limit or halt the spread of the contaminate plume.

8.3 EXPOSURE ASSESSMENT

8.3.1 Current Exposures

8.3.1.1 Onsite Receptors

Potential pathways for onsite receptors include direct contact with groundwater. The exposure routes are as follows:

- Direct Contact with Groundwater:

It has been determined that groundwater at the site is contaminated. Sampling/environmental technicians have the potential to come in direct contact with the groundwater when sampling an/or gauging occurs. Therefore, the pathway is considered potentially complete for sampling/environmental technicians.

8.3.1.2 Offsite Receptors

No offsite impact to the groundwater has occurred at the site. Therefore, no potential pathways for offsite exposure exist at this time.

If future unrestricted use residents draw irrigation water from this shallow aquifer, they could be exposed to contamination. Therefore, this pathway must be considered potentially complete. Because residents do not live in the site area, exposure to humans via this pathway is not currently viable.

8.3.2 Future Potential Exposures

8.3.2.1 Onsite Receptors

- Direct Contact with Groundwater:

It has been determined that groundwater at the site is contaminated. Until remediation removes the identified contaminates from the groundwater, sampling/environmental technicians have the potential to come in direct contact with the groundwater when sampling an/or gauging occurs. Therefore, the pathway is considered potentially complete for sampling/environmental technicians.

8.3.2.2 *Offsite Receptors*

At this time, no offsite impact to the groundwater has occurred at the site. Pending the outcome of the PSH recovery systems effectiveness, the potential for offsite exposure exist and the potential pathways are as follows:

- Infiltration/Migration to Shallow Groundwater:

At this time, contamination of shallow groundwater does not exist offsite. The documented plume of contamination has not spread down gradient to any domestic use water wells. Therefore, the pathway is considered incomplete.

- Infiltration/Migration to a Potable Aquifer:

Based upon NMWQCC guidelines the groundwater at the site is considered of beneficial use and therefore a potable aquifer. At this time, no contamination of the shallow groundwater exists offsite. The documented plume of contamination has not spread down gradient to any domestic use water wells. Therefore, the pathway is considered incomplete.

If future unrestricted use residents draw irrigation water from this shallow aquifer, they could be exposed to contamination. Therefore, this pathway must be considered potentially complete.

These pathways were thoroughly evaluated for completeness and applicability based on known and potential receptor behavior patterns. However, significant data gaps are present. Once information is supplied to fill the data gaps, modification of the exposure pathways may occur.

CONCLUSIONS

This exposure assessment is intended to evaluate the potential for site-specific receptors to be exposed to the contaminants at the site. Based on the analytical data, the assumed contaminants are TPH and BTEX. Several different receptor populations were addressed based on the likely activities that are currently conducted or may be conducted in the future at the site or in areas impacted by contamination generated at the site. Based on the assumptions in the text, the following list highlights the exposure pathways by which each receptor could be exposed.

- A sampling/environmental technician could only be exposed to the contaminants via exposure to groundwater when sampling and/or gauging occurs.
- No complete pathways are present for recreational users.
- A future unrestricted use resident could only be exposed to the contaminants via infiltration/migration to shallow groundwater and uptake/assimilation via shallow groundwater from onsite irrigation of plants/crops.

Only the complete pathways listed above need to be considered in the quantitative risk assessment

that follows this exposure assessment. These pathways are predicated on the accuracy of the assumptions listed in the text. Once the accuracy has been determined, these exposure pathways will be finalized.

8.3.3 Site Conceptual Exposure Model

Based on the field activities, the contamination delineation, soil and groundwater classification, receptor and migration pathway identification, past history, and land use information documented in this report, a site conceptual exposure model (SCEM) was developed and is presented as Figure 7, current exposure. All potentially complete exposure pathways are addressed qualitatively, based on current and realistic future exposure scenarios.

An exposure pathway describes a specific environmental transport pathway by which receptor populations can be potentially exposed to the contaminates present at or originating from the site. An exposure pathway consists of four necessary elements:

- A source and mechanism of chemical release to the environment
- An environmental retention or transport medium for the released chemical
- A point of potential human contact with the medium and the receptors located at these points
- A human uptake route (intake of media containing site-related chemicals) at the point of exposure

All four elements must be present for an exposure pathway to be complete and for exposure to occur. If any one of the four elements is absent, the pathway is incomplete and no exposure can occur. A quantitative assessment of exposure will occur at a later date based on this exposure assessment and the results of subsequent field activities.

The results of the qualitative and quantitative exposure assessments will be used to make health risk-based decisions at the site.

9.0 RECOMMENDATIONS

9.1 MONITORING PROGRAM

All site monitoring wells will be gauged and sampled on a quarterly basis. Each well will be measured for the depth to PSH and/or groundwater. All of the groundwater monitoring wells, with the exception of those with measurable PSH on the water table, will be purged and sampled for BTEX and TPH.

After purging the wells, groundwater samples will be collected with a disposable Teflon® sampler and polyethylene line by personnel wearing clean, disposable gloves. Groundwater sample containers will be filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers will be filled first and PAH containers second).

Groundwater samples collected for BTEX analysis will be placed in 40 ml glass VOA vials equipped with Teflon® lined caps. The analytical laboratory will provide the containers. The vials will be filled to a positive meniscus, sealed, and visually checked to ensure the absence of air bubbles. The analytical laboratory will provide the containers.

The filled containers will be labeled and placed on ice in an insulated cooler. The cooler will be sealed for transportation to the analytical laboratory. Proper chain-of-custody documentation will be maintained throughout the sampling process.

The groundwater samples will be analyzed as follows:

- BTEX concentrations in accordance with EPA Method 8021B, 5030
- TPH concentrations in accordance with modified EPA Method 8015-GRO/DRO

The quarterly data will be compiled and summarized in an annual report. The annual report will be submitted prior to April 1 of the following year.

9.2 FUTURE ACTIVITIES

At the present time, installation of automated skimmer systems is ongoing in the recovery wells, RW-2, RW-3 and RW-4. These recovery systems will allow the removal of PSH from these wells on a 24-hour basis once power is provided to the site. This system will be operational by Spring 2001 and will continue until measurable PSH has been removed from the site's recovery wells.

The first quarterly sampling event of the monitoring wells is scheduled for August 2000. A subsequent quarterly sampling event will be conducted in November of the year 2000. The annual report will be provided to the NMOCD prior to April 1, 2001.

A Stage 2 abatement report, which will address the impacted soil and groundwater, will be provided

in the near future. Based on site conditions, future activities will include the abatement and groundwater and the remediation of soil as appropriate. Details of these remedial activities will be provided under separate cover.

Upon completion of all remedial activities at the site, a NFA closure request will be submitted to the NMOCD for approval.

10. REFERENCES

1. NMOCD *Guidelines For Remediation of Leaks, Spills and Releases*, August 1993 (NMOCD, 1993)
2. Title 19 NMAC 15.A.19
3. Title 20 NMAC 6.2.III.3103

DISTRIBUTION

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Jean Ann Dunn
Quality Control Review

TABLES

Table 1

SUMMARY OF SOIL CHEMISTRY

EOTT Energy Corp.
DARR ANGELL #3
LEA COUNTY, NM
ETGI Project # EOT2059C

All concentrations are in mg/kg

SAMPLE DATE	SAMPLE LOCATION	Methods: EPA SW 846-8021B, 5030			SW 846-8021B, 5030					
		GRO C_6-C_{10}	DRO >C_{10}-C_{28}	TPH C_6-C_{28}	BENZENE	TOLUENE	ETHYL-BENZENE	M,P-XYLENES	O-XYLENES	BTEX
07/03/2000	SB1 3-5' C	<10	<10	<20						
	SB1 8-10' C	<10	<10	<20						
	SB1 13-15' C	<10	<10	<20						
	SB1 18-20' C	<10	<10	<20						
	SB1 23-25' C	<10	<10	<20						
	SB1 28-30' SS	<10	<10	<20						
	SB1 33-35' SS	<10	<10	<20						
	SB1 38-40' SS	<10	<10	<20						
	SB1 43-45' SS	<10	<10	<20						
	SB1 48-50' SS	<10	<10	<20						
	SB1 53-55' SS	<10	<10	<20						
	SB1 58-60' SS	<10	<10	<20						
07/05/2000	SB2 0-2' C	<10	<10	<20						
	SB2 3-5' C	<10	<10	<20						
	SB2 8-10' C	<10	<10	<20						
	SB2 13-15' C	<10	<10	<20						
	SB2 18-20' C	<10	<10	<20						
	SB2 23-25' C	<10	<10	<20						
	SB2 28-30' SS	<10	<10	<20						
	SB2 33-35' C	<10	<10	<20						
	SB2 38-40' SS	<10	<10	<20						
	SB2 43-45' SS	<10	<10	<20						
	SB2 48-50' SS	<10	<10	<20						
	SB2 53-55' SS	<10	<10	<20						
	SB2 58-60' SS	562	1007	1569	<0.100	7.55	3.64	13.4	4.71	29.3
	SB2 63-65' C	<10	<10	<20						
07/06/2000	SB3 0-2' C	<10	<10	<20						
	SB3 3-5' C	<10	<10	<20						
	SB3 8-10' C	<10	<10	<20						
	SB3 13-15' C	<10	<10	<20						
	SB3 18-20' C	<10	<10	<20						
	SB3 23-25' C	<10	<10	<20						
	SB3 28-30' C	<10	<10	<20						
	SB3 33-35' C	<10	<10	<20						
	SB3 38-40' C	<10	<10	<20						
	SB3 43-45' C	<10	<10	<20						
	SB3 48-50' C	<10	<10	<20						
	SB3 53-55' C	<10	<10	<20						
	SB3 58-60' SS	<10	<10	<20						
07/06/2000	SB4 0-2' C	<10	<10	<20						
	SB4 3-5' C	<10	<10	<20						
	SB4 8-10' C	<10	<10	<20						
	SB4 13-15' C	<10	<10	<20						
	SB4 18-20' C	<10	<10	<20						
	SB4 23-25' C	<10	<10	<20						
	SB4 28-30' C	<10	<10	<20						
	SB4 33-35' C	<10	<10	<20						
	SB4 38-40' C	<10	<10	<20						
	SB4 43-45' C	<10	<10	<20						

SUMMARY OF SOIL CHEMISTRY

EOTT Energy Corp.
DARR ANGELL #3
LEA COUNTY, NM
ETGI Project # EOT2059C

All concentrations are in mg/kg

SAMPLE DATE	SAMPLE LOCATION	Methods: EPA SW 846-8021B, 5030			SW 846-8021B, 5030					
		GRO C_6-C_{10}	DRO >C_{10}-C_{28}	TPH C_6-C_{28}	BENZENE	TOLUENE	ETHYL-BENZENE	M,P-XYLENES	O-XYLENES	BTEX
	SB4 48-50' C	<10	<10	<20						
	SB4 53-55' C	<10	<10	<20						
	SB4 58-60' SS	<10	137	137	<0.100	0.739	0.53	2.51	0.939	4.718
07/07/2000	SB5 0-2' C	<10	<10	<20						
	SB5 3-5' C	<10	<10	<20						
	SB5 8-10' C	<10	<10	<20						
	SB5 13-15' C	<10	<10	<20						
	SB5 18-20' C	<10	<10	<20						
	SB5 23-25' C	<10	<10	<20						
	SB5 28-30' C	<10	<10	<20						
	SB5 33-35' C	<10	<10	<20						
	SB5 38-40' C	<10	<10	<20						
	SB5 43-45' C	<10	<10	<20						
	SB5 48-50' C	<10	<10	<20						
	SB5 53-55' C	<10	<10	<20						
	SB5 58-60' C	<10	<10	<20						
07/07/2000	SB6 0-2' C	<10	<10	<20						
	SB6 3-5' C	<10	<10	<20						
	SB6 8-10' C	<10	<10	<20						
	SB6 13-15' C	<10	<10	<20						
	SB6 18-20' C	<10	<10	<20						
	SB6 23-25' C	<10	<10	<20						
	SB6 28-30' C	<10	<10	<20						
	SB6 33-35' C	<10	<10	<20						
	SB6 38-40' C	<10	<10	<20						
	SB6 43-45' C	<10	<10	<20						
	SB6 48-50' C	<10	<10	<20						
	SB6 53-55' C	<10	<10	<20						
	SB6 58-60' SS	<10	<10	<20						
07/07/2000	SB7 0-2' C	<10	<10	<20						
	SB7 3-5' C	<10	<10	<20						
	SB7 8-10' C	<10	<10	<20						
	SB7 13-15' C	<10	<10	<20						
	SB7 18-20' C	<10	<10	<20						
	SB7 23-25' C	<10	<10	<20						
	SB7 28-30' C	<10	<10	<20						
	SB7 33-35' C	<10	<10	<20						
	SB7 38-40' C	<10	<10	<20						
	SB7 43-45' C	<10	<10	<20						
	SB7 48-50' C	<10	<10	<20						
	SB7 53-55' C	<10	<10	<20						
	SB7 58-60' SS	87	730	817						
	SB7 60-62' SS	<10	<10	<20	<0.100	<0.100	<0.100	0.158	<0.100	0.158
07/13/2000	MW1 0-2'	<10	75	75						
	MW1 3-5'	<10	<10	<20						
	MW1 8-10'	<10	<10	<20						
	MW1 13-15'	<10	<10	<20						
	MW1 18-20'	<10	<10	<20						
	MW1 23-25'	<10	<10	<20						
	MW1 28-30'	<10	<10	<20						
	MW1 33-35'	<10	<10	<20						

SUMMARY OF SOIL CHEMISTRY

EOTT Energy Corp.
DARR ANGELL #3
LEA COUNTY, NM
ETGI Project # EOT2059C

All concentrations are in mg/kg

SAMPLE DATE	SAMPLE LOCATION	Methods: EPA SW 846-8021B, 5030			SW 846-8021B, 5030					
		GRO C_6-C_{10}	DRO >C_{10}-C_{28}	TPH C_6-C_{28}	BENZENE	TOLUENE	ETHYL-BENZENE	M,P-XYLENES	O-XYLENES	BTEX
	MW1 38-40'	<10	<10	<20						
	MW1 43-45'	<10	<10	<20						
	MW1 48-50'	<10	<10	<20						
	MW1 53-55'	<10	<10	<20						
	MW1 58-60'	<10	<10	<20						
07/14/2000	MW2 0-2'	<10	<10	<20						
	MW2 3-5'	<10	<10	<20						
	MW2 8-10'	<10	<10	<20						
	MW2 13-15'	<10	<10	<20						
	MW2 18-20'	<10	<10	<20						
	MW2 23-25'	<10	<10	<20						
	MW2 28-30'	<10	<10	<20						
	MW2 33-35'	<10	<10	<20						
	MW2 38-40'	<10	<10	<20						
	MW2 43-45'	<10	<10	<20						
	MW2 48-50'	<10	<10	<20						
	MW2 53-55'	<10	<10	<20						
	MW2 58-60'	<10	<10	<20						
	MW2 63-65'	<10	<10	<20						
07/17/2000	MW3 0-2'	<10	<10	<20						
	MW3 3-5'	<10	<10	<20						
	MW3 8-10'	<10	<10	<20						
	MW3 13-15'	<10	<10	<20						
	MW3 18-20'	<10	<10	<20						
	MW3 23-25'	<10	<10	<20						
	MW3 28-30'	<10	<10	<20						
	MW3 33-35'	<10	<10	<20						
	MW3 38-40'	<10	<10	<20						
	MW3 43-45'	<10	<10	<20						
	MW3 48-50'	<10	<10	<20						
	MW3 53-55'	<10	<10	<20						
	MW3 58-60'	<10	<10	<20						
	MW3 63-65'	<10	<10	<20						
07/11/2000	SB8 0-2'	<10	<10	<20						
	SB8 3-5'	<10	<10	<20						
	SB8 8-10'	<10	<10	<20						
	SB8 13-15'	<10	<10	<20						
	SB8 18-20'	<10	<10	<20						
	SB8 23-25'	<10	<10	<20						
	SB8 28-30'	<10	<10	<20						
	SB8 33-35'	<10	<10	<20						
	SB8 38-40'	<10	<10	<20						
	SB8 43-45'	<10	<10	<20						
	SB8 48-50'	<10	<10	<20						
	SB8 53-55'	<10	<10	<20						
	SB8 58-60'	<10	70	70						
	SB8 63-65'	<10	<10	<20						
07/14/2000	SB9 0-2'	<10	<10	<20						
	SB9 3-5'	<10	<10	<20						
	SB9 8-10'	<10	<10	<20						
	SB9 13-15'	<10	<10	<20						

SUMMARY OF SOIL CHEMISTRY

EOTT Energy Corp.
DARR ANGELL #3
LEA COUNTY, NM
ETGI Project # EOT2059C

All concentrations are in mg/kg

SAMPLE DATE	SAMPLE LOCATION	Methods: EPA SW 846-8021B, 5030			SW 846-8021B, 5030					
		GRO C_6-C_{10}	DRO >C_{10}-C_{28}	TPH C_6-C_{28}	BENZENE	TOLUENE	ETHYL-BENZENE	M,P-XYLENES	O-XYLENES	BTEX
	SB9 18-20'	<10	<10	<20						
	SB9 23-25'	<10	<10	<20						
	SB9 28-30'	<10	<10	<20						
	SB9 33-35'	<10	<10	<20						
	SB9 38-40'	<10	<10	<20						
	SB9 43-45'	<10	<10	<20						
	SB9 48-50'	<10	328	328						
	SB9 53-55'	<10	92	92						
	SB9 58-60'	<10	396	396						
07/12/2000	RW3 0-2'	465	1228	1693						
	RW3 3-5'	503	2803	3306	<0.100	<0.100	3.45	14.1	7.55	25.1
	RW3 8-10'	2221	5575	7796	<0.100	5.06	3.89	14	6.22	29.17
	RW3 13-15'	2267	5757	8024	1.16	22.8	13.6	46.6	15.6	99.76
	RW3 18-20'	1665	4875	6540	<0.100	3.59	2.36	8.28	3.33	17.56
	RW3 23-25'	3072	5147	8219	5.37	38.6	17.3	69.3	22.9	153.47
	RW3 28-30'	3818	12533	16351	2.52	25.8	14.6	56.7	20.7	120.32
	RW3 33-35'	<10	714	714						
	RW3 38-40'	<10	78	78						
	RW3 43-45'	<10	27	27						
	RW3 48-50'	<10	11	11						
	RW3 53-55'	<10	<10	<20						
	RW3 58-60'	1730	5501	7231	1.29	20.2	13.8	50	16.4	101.69
	RW3 63-65'	47	1050	1097	<0.100	0.635	0.585	2.29	0.911	4.421
07/13/2000	RW4 0-2'	<10	<10	<20						
	RW4 3-5'	<10	<10	<20						
	RW4 8-10'	<10	<10	<20						
	RW4 13-15'	<10	<10	<20						
	RW4 18-20'	<10	<10	<20						
	RW4 23-25'	<10	<10	<20						
	RW4 28-30'	<10	<10	<20						
	RW4 33-35'	<10	<10	<20						
	RW4 38-40'	<10	<10	<20						
	RW4 43-45'	<10	233	233	<0.100	0.156	<0.100	0.141	<0.100	0.297
	RW4 48-50'	34	699	733	<0.100	0.106	<0.100	0.167	<0.100	0.273
	RW4 53-55'	37	492	529	<0.100	0.305	0.165	0.641	0.249	1.36
	RW4 58-60'	253	1796	2049	<0.100	1.2	1.18	4.25	1.73	8.36
	RW4 63-65'	<10	342	342						

TABLE 2

CHEMICAL CONCENTRATION IN GROUNDWATER

EOTT Energy Corp.
DARR ANGELL #3
LEA COUNTY, NM
ETGI Project # EOT2059C

All concentrations are in mg/l.

SAMPLE DATE	SAMPLE LOCATION	SW 846-8021B, 5030						Methods: EPA 375.4, 325.3, 310. 160.1				
		BENZENE	TOLUENE	ETHYL-BENZENE	M,P-XYLENES	O-XYLENES	BTEX	Sulfate	Chloride	Carbonate	Bicarbonate	TDS
07/18/2000	MW1	0.001	0.001	<0.001	0.002	<0.001	0.004	147	85	0	218	561
07/18/2000	MW2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	194	277	0	300	912
07/18/2000	MW3	0.359	0.002	<0.001	0.071	0.002	0.434	124	85	0	210	417
07/18/2000	RW1	0.016	0.011	0.002	0.003	0.001	0.033	121	89	0	169	423

Table 3

CONCENTRATIONS OF SEMI-VOLATILES IN GROUNDWATER

EOTT Energy Corp.
DARR ANGELL #3
LEA COUNTY, NM
ETGI Project # EOT2059C

All soil concentrations are in mg/kg
All water concentrations are in mg/L

SAMPLE DATE	SAMPLE LOCATION	SAMPLE TYPE	EPA SW846-8270C, 3510																
			Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo[a]anthracene	Chrysene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[a]pyrene	Indeno[1,2,3-cd]pyrene	Dibenz[a,h]anthracene	Benzo[g,h,i]perylene	Report Limit
07/18/2000	MW-1	Water	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005
07/18/2000	MW-2	Water	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005
07/18/2000	MW-3	Water	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005
07/18/2000	RW-1	Water	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005

Table 4

CONCENTRATIONS OF METALS IN GROUNDWATER

EOTT Energy Corp.
DARR ANGELL #3
LEA COUNTY, NM
ETGI Project # EOT2059C

All soil concentrations are in mg/kg
All water concentrations are in mg/L

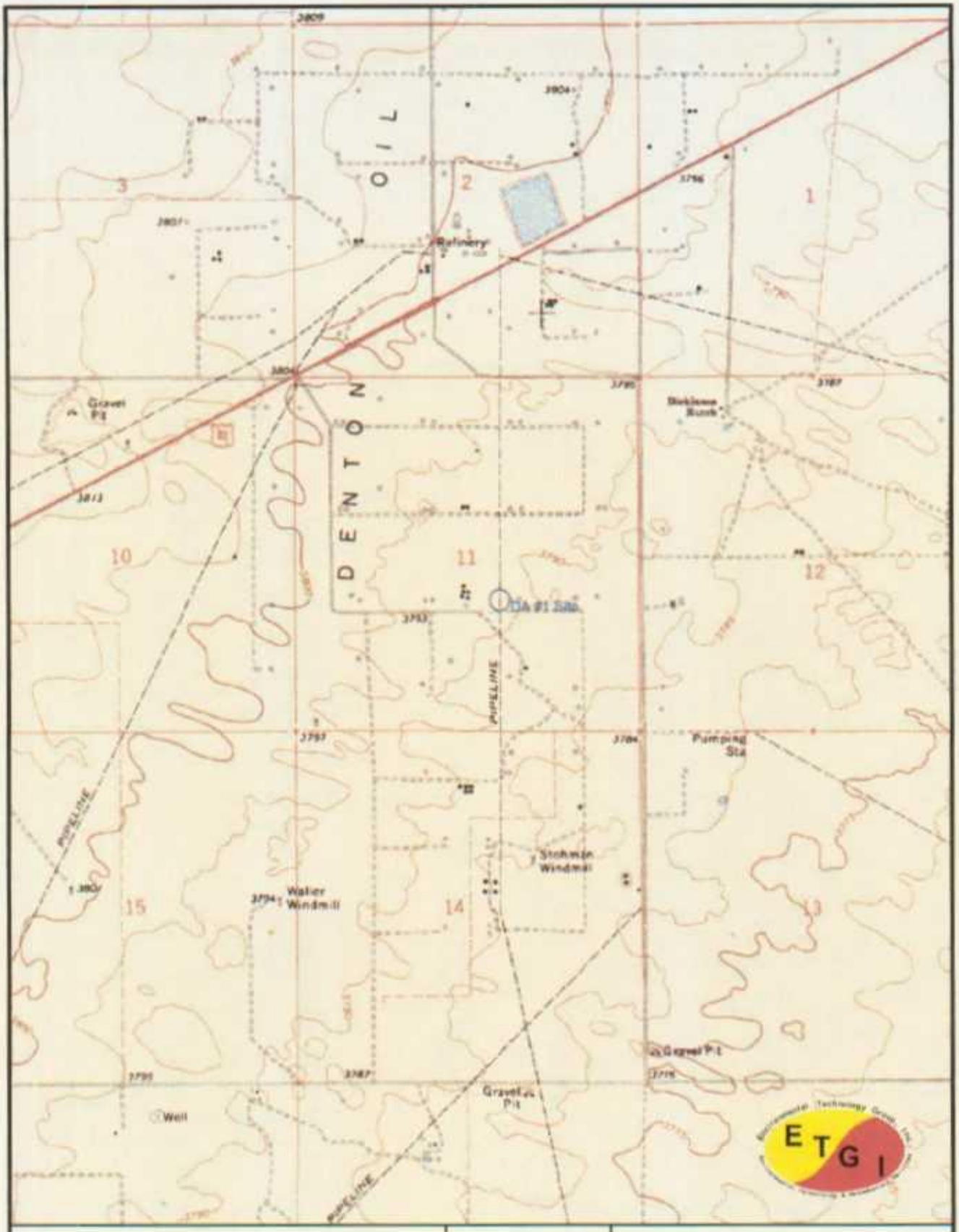
			EPA SW846-6010B, 7470																								
	SAMPLE LOCATION	SAMPLE TYPE	Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Tin	Vanadium	Zinc	Boron	Strontium
07/18/2000	MW-1	Water	1.92	<0.005	0.134	<0.004	<0.001	135	0.009	<0.02	<0.01	1.34	<0.003	21.8	0.035	<0.002	<0.05	0.011	5.42	0.008	<0.005	81.4	<0.05	0.025	<0.02	0.129	0.669
07/18/2000	MW-2	Water	19	0.01	0.443	<0.004	<0.001	446	0.052	0.032	0.013	11.9	0.003	46.7	0.218	<0.002	<0.05	0.047	14	0.008	<0.005	333	<0.05	0.085	0.042	0.173	1.12
07/18/2000	MW-3	Water	16.7	0.008	0.367	<0.004	<0.001	373	0.073	0.08	<0.01	10.7	<0.003	41.3	0.197	<0.002	<0.05	0.064	8.97	<0.005	<0.005	71.45	<0.05	0.083	0.036	0.121	0.843
07/18/2000	MW-4	Water	0.388	<0.005	0.082	<0.004	<0.001	91.1	<0.005	<0.02	<0.01	0.407	<0.003	16.2	0.016	<0.002	<0.05	<0.01	4.36	0.005	<0.005	63.5	<0.05	0.03	<0.02	0.098	0.524

DARR ANGELL #3
GROUNDWATER ELEVATION TABLE
PROJECT # EOT2059C
07/31/00

Well Number	Casing Well Elevation	Depth to Product	Depth to Water	PSH Thickness	Corrected Groundwater Elevation
MW - 1	3,800.66	-	64.55	0.00	3,736.11
MW - 2	3,796.33	-	60.55	0.00	3,735.78
MW - 3	3,798.10	-	62.53	0.00	3,735.57
RW - 1	3,797.66	-	61.76	0.00	3,735.90
RW - 2	3,797.60	61.53	62.45	0.92	3,735.93
RW - 3*	3,798.81	61.35	67.81	6.46	3,736.49
RW - 4	3,798.34	61.95	64.92	2.97	3,735.94

*This anomalous data point was not used in the gradient calculation.

FIGURES



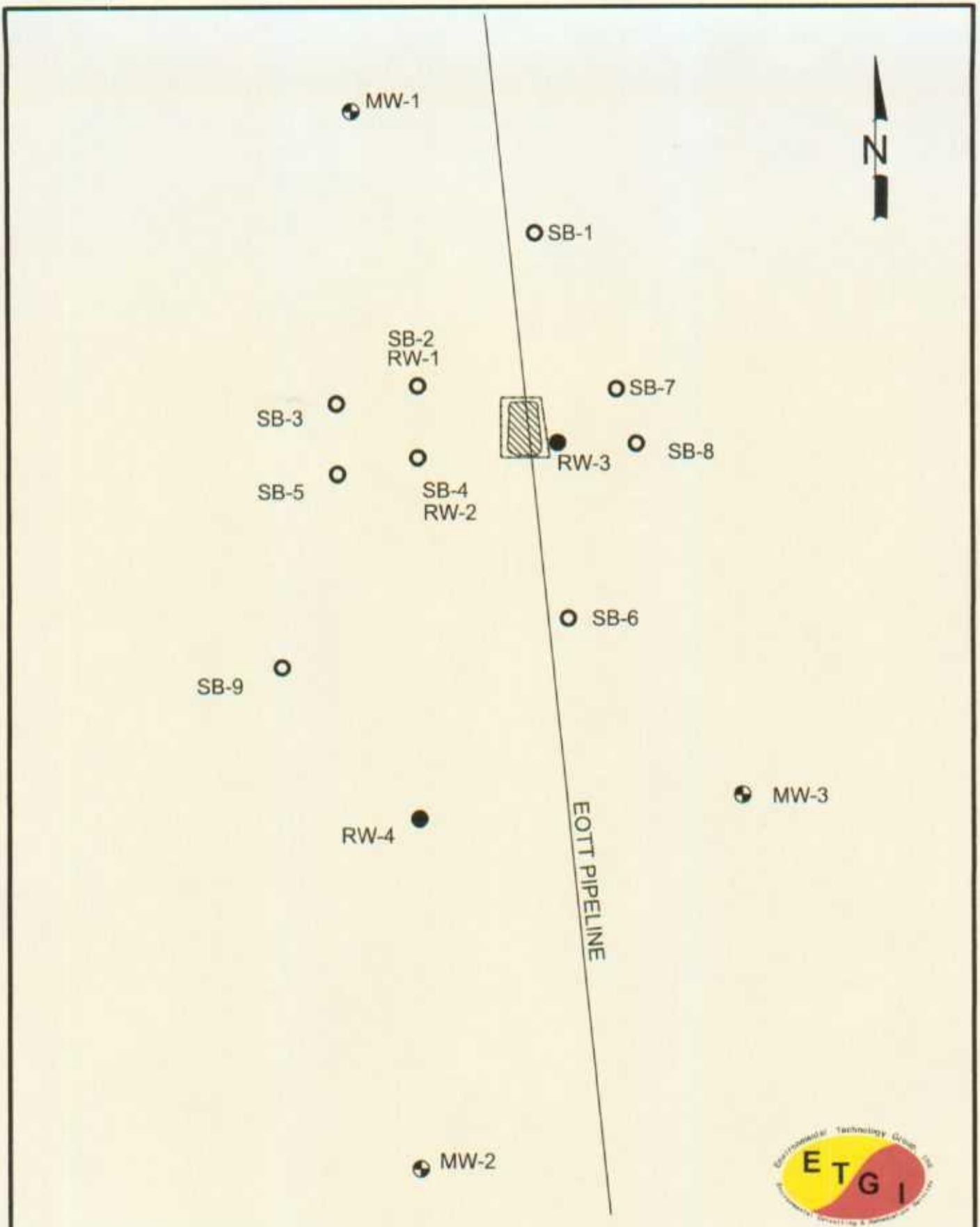
Site Location
033° 01' 59.5" N 103° 10' 03.1" W

Figure 1
Site Location Map

EOTT Energy Corp.
Darr Angell #3 / #4
Lea County, NM

Environmental Technology Group, INC.

Scale: 1"=2000'	Prep By: JDJ	Checked By: MVS
August 20, 2000	ETIG Project # EOT 2059C	



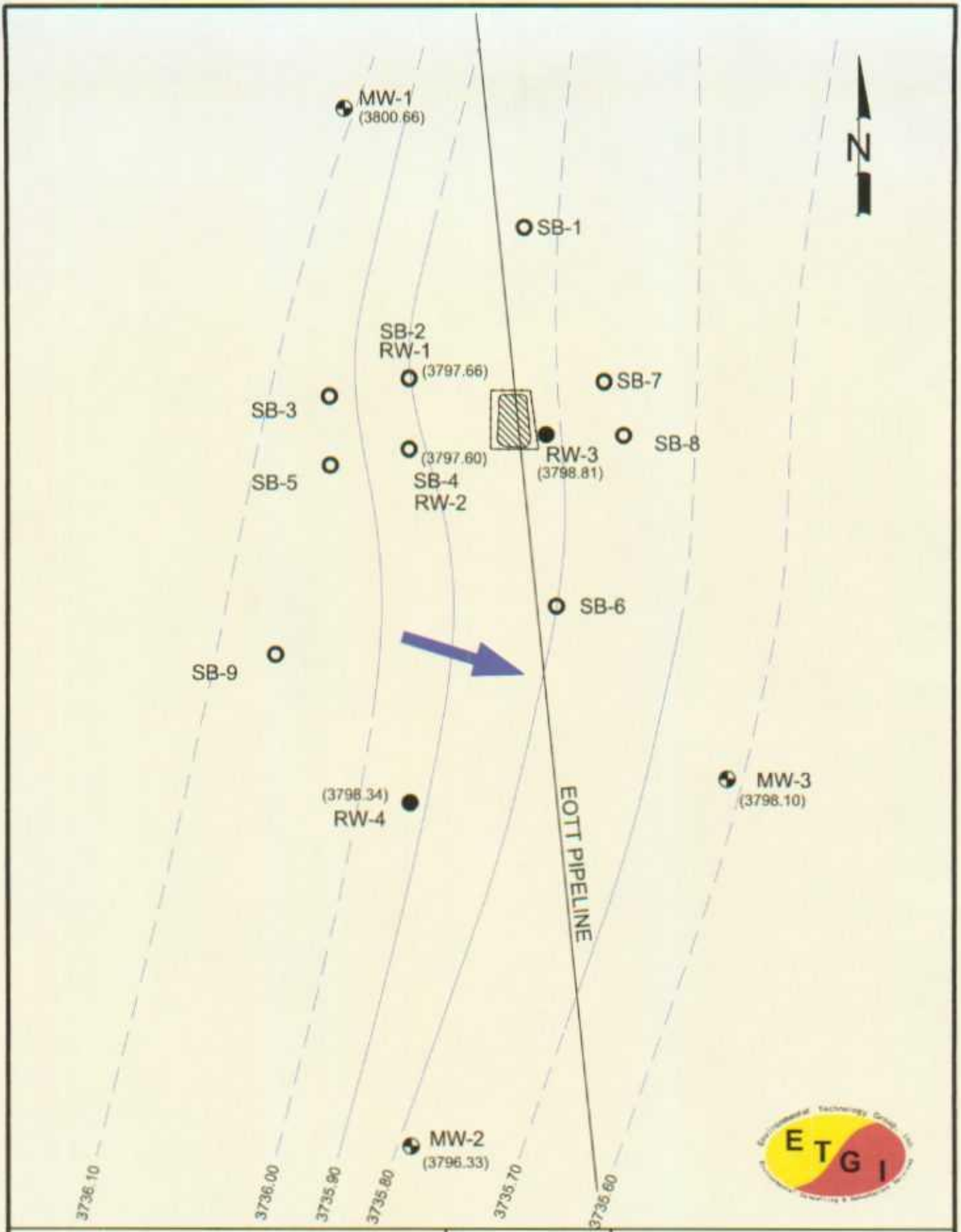
LEGEND:
- Monitoring Well Locations
- Recovery Well Locations
- Soil Boring Locations
- Fence
- Excavation Area

Figure 2
Site Map

EOTT Energy Corp.
Darr Angell #3 / #4
Lea County, NM

Environmental Technology Group, Inc.

Scale: 1"=80'	Prep By: RS	Checked By: JT
July 24, 2000	ETIG Project # EOT 2059C	



LEGEND:

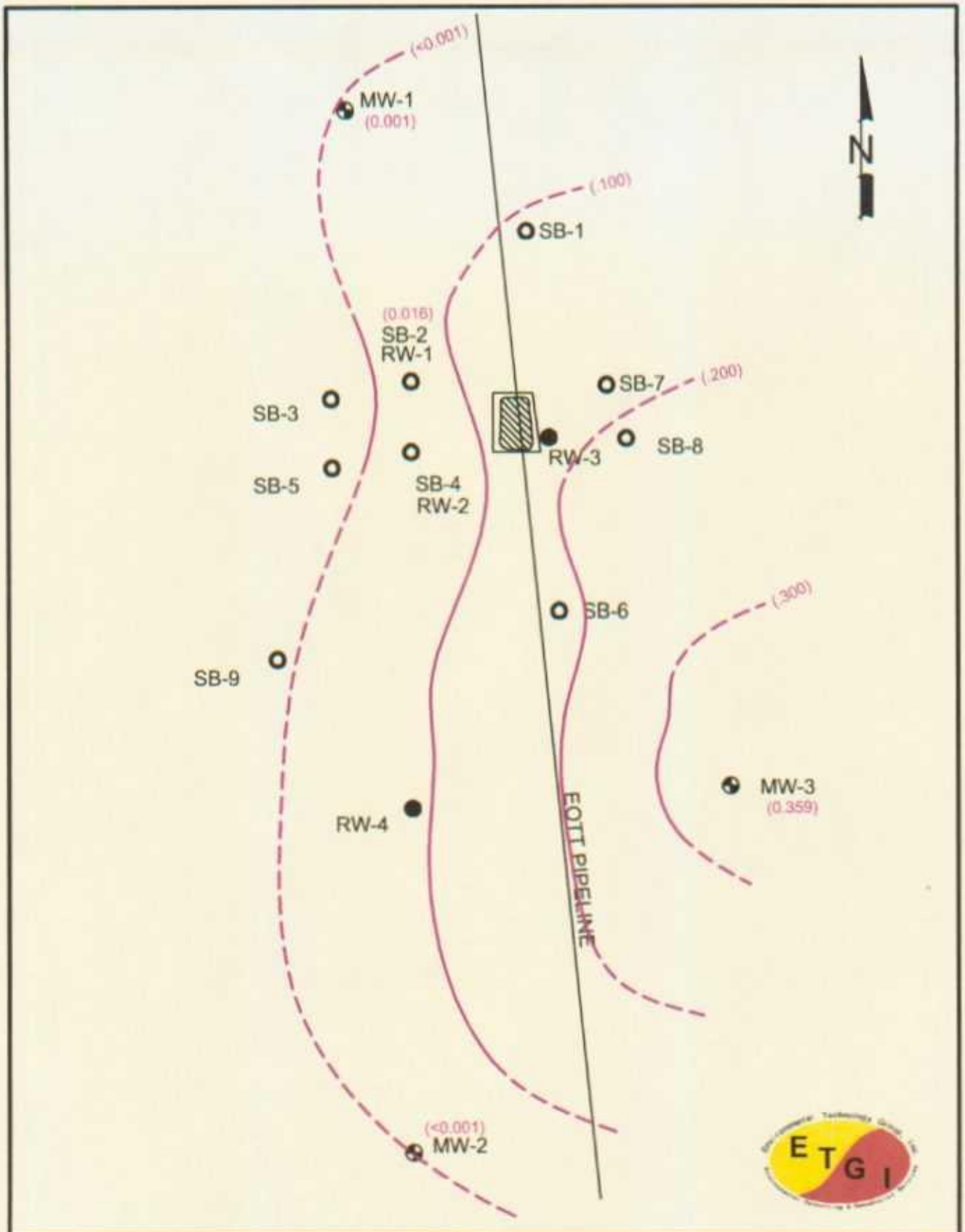
- Monitoring Well Locations
- Recovery Well Locations
- Soil Boring Locations
- Fence
- Excavation Area
- GW Contour Lines
- 3736.10 GW Elevations in ft.

Figure 3
Inferred GW Gradient Map

EOTT Energy Corp.
Darr Angell #3 / #4
Lea County, NM

Environmental Technology Group, Inc.

Scale: 1"=80'	Prep By: RS	Checked By: JT
July 24, 2000	ETG Project # EOT 2059C	



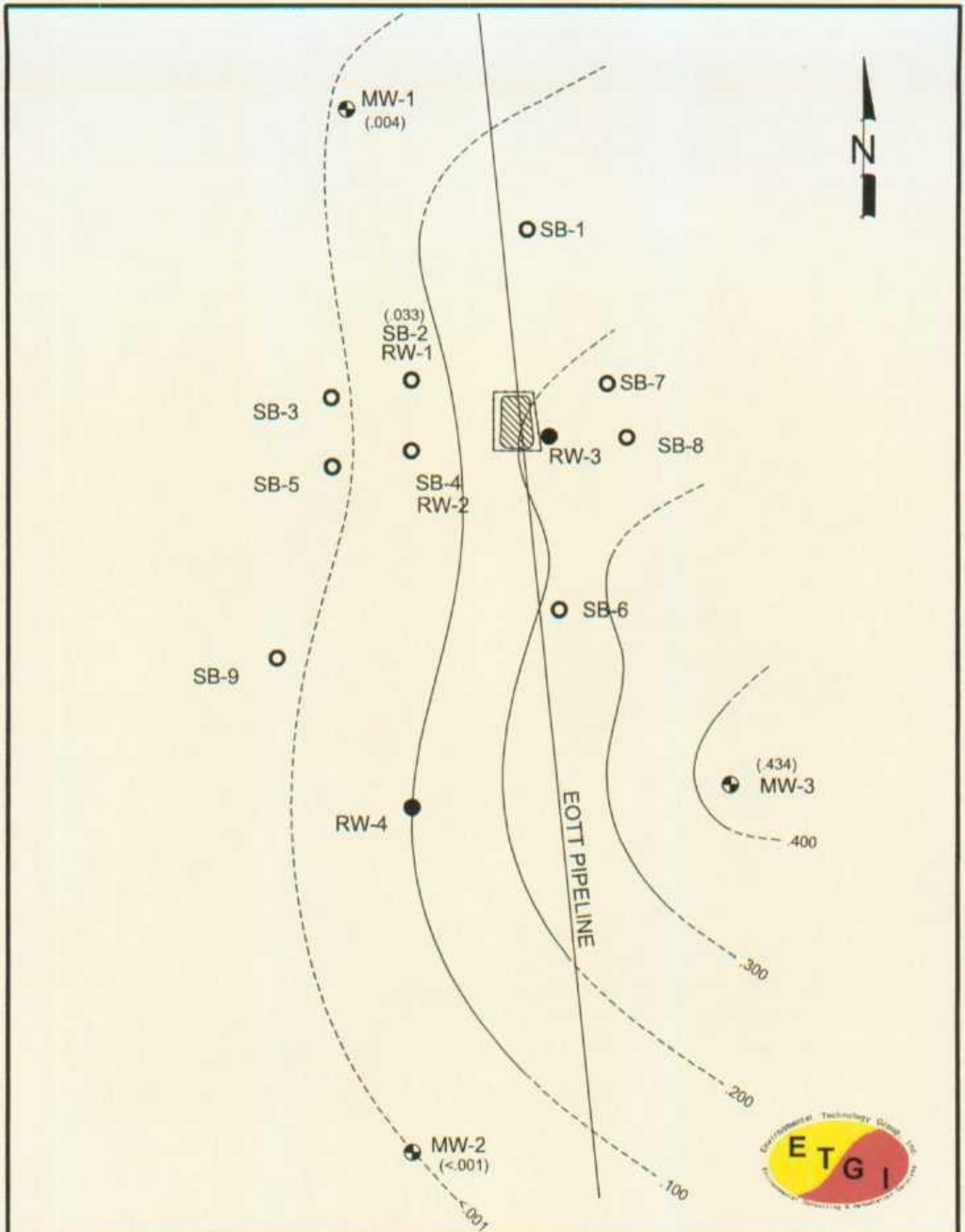
LEGEND:

- Monitoring Well Locations
- Recovery Well Locations
- Soil Boring Locations
- Fence
- Excavation Area
- Benzene Contour Line
- (0.016) Benzene Concentration in mg/kg

Figure 4
Benzene Iso-Concentration Map
EOTT Energy Corp.
Darr Angell #3 / #4
Lea County, NM

Environmental Technology Group, Inc.

Scale: 1"=80'	Prep By: RS	Checked By: JT
July 24, 2000	ETIG Project # EOT 2059C	



LEGEND:

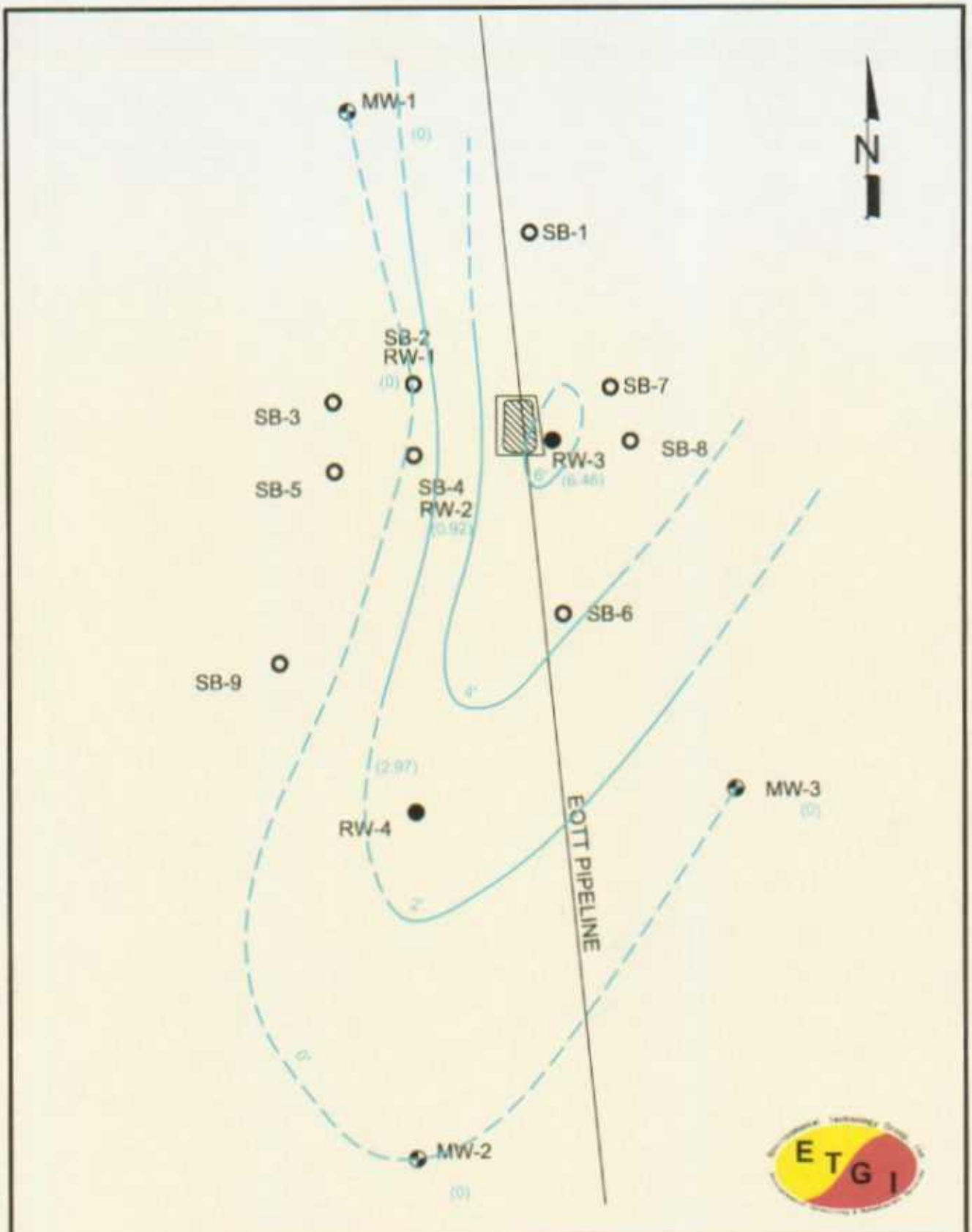
- Monitoring Well Locations
- Recovery Well Locations
- Soil Boring Locations
- Fence
- Excavation Area
- (0.434) BTEX Concentration in mg/kg.
- BTEX Contour Lines

Figure 5
BTEX Iso-Concentration Map

EOTT Energy Corp.
Darr Angell #3 / #4
Lea County, NM

Environmental Technology Group, Inc.

Scale: 1"=80'	Prep By: RS	Checked By: JT
July 24, 2000	ETG Project # EOT 2059C	



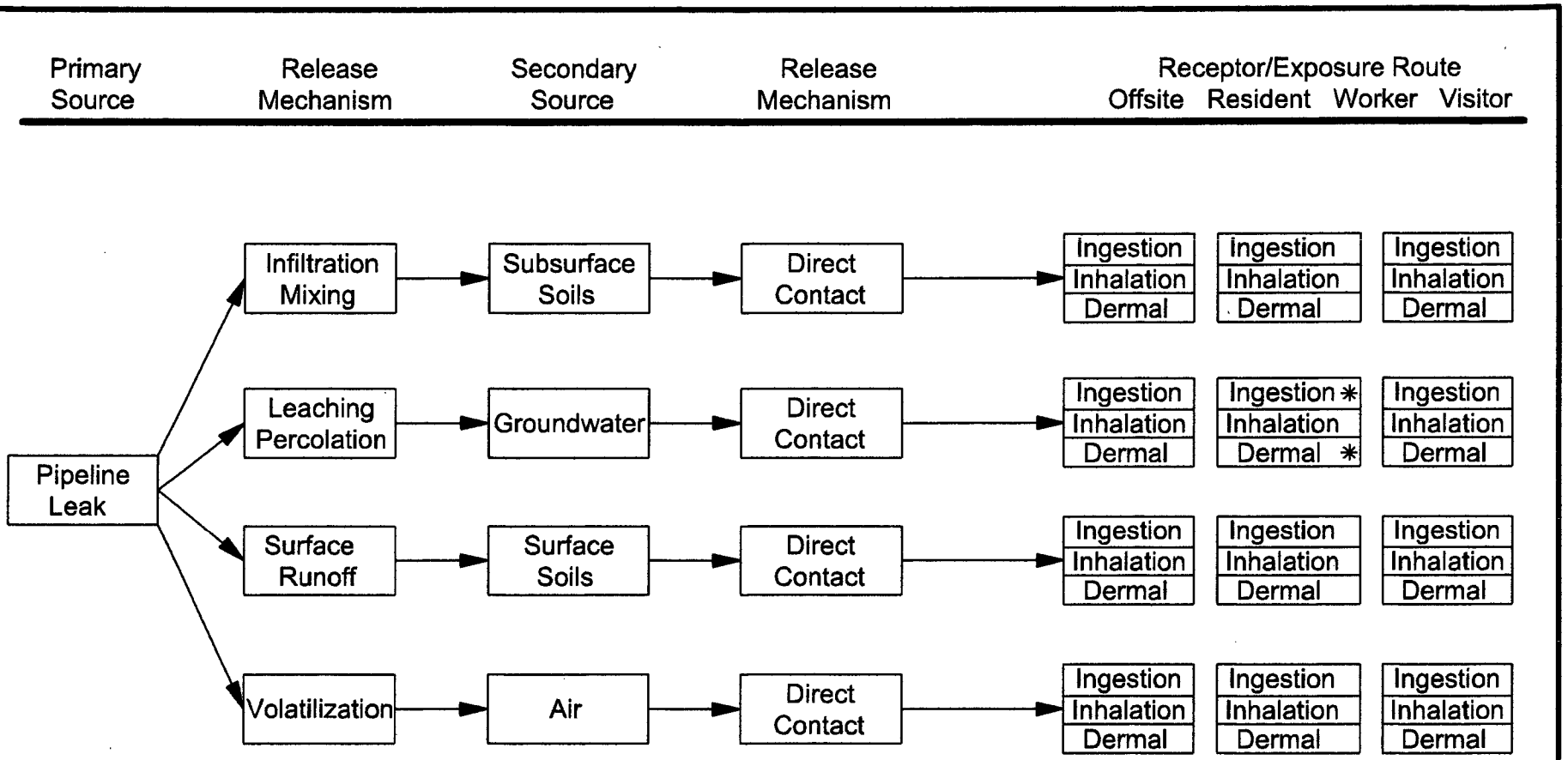
LEGEND:
- Monitoring Well Locations
- Recovery Well Locations
- Soil Boring Locations
- Fence
- Excavation Area
- PSH Thickness Contour (in feet)

Figure 6
PSH Thickness Map

EOTT Energy Corp.
Darr Angell #3 / #4
Lea County, NM

Environmental Technology Group, Inc.

Scale: 1"=80'	Prep By: RS	Checked By: JT
July 24, 2000	ETIG Project # EOT 2009C	



Note: "*" denotes potentially complete pathways

Figure 7

Site Conceptual Exposure Model for Present Conditions

E.O.T.T. Energy Corp. Darr Angell # 3 / #4 Lovington, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: BA
August 24, 2000	ETGI Project # EOT 2059C	

APPENDICES

APPENDIX A

WATER WELL INVENTORY

New Mexico Office of the State Engineer

Well Reports and Downloads

Township: 15S Range: 37E Sections: 11,14

NAD27 X: Y: Zone: Search Radius:

County: LE Basin: Number: Suffix:

Owner Name: (First) (Last) O Non-Domestic O Domestic

◉ All

[redacted]

WATER COLUMN REPORT 08/13/2000

(quarters are biggest to smallest)

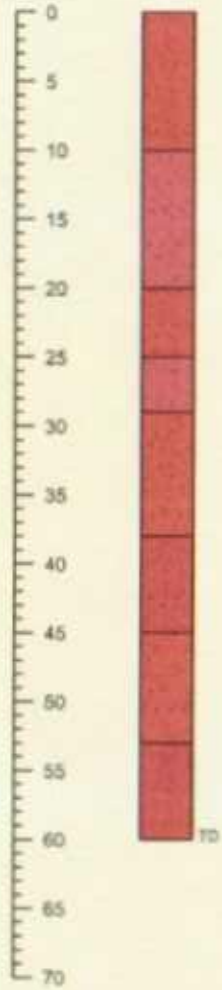
Well Number	Tws	Rng	Sec	q	q	q	Zone	X	Y	Depth Well	Depth Water	Wat Colu
L 02317 APPRO	15S	37E	11	1	1					110	65	
L 01182 APPRO	15S	37E	11	1	1	1				110	35	
L 01322 APPRO	15S	37E	11	1	1	2				120		
L 01430 APPRO	15S	37E	11	1	2					120	33	
L 01324 APPRO	15S	37E	11	2	1					120	32	
L 07610	15S	37E	11	2	3					100		
L 01283 APPRO	15S	37E	11	2	3					120	40	
L 01321 APPRO	15S	37E	11	2	4					120	32	
L 01323 APPRO	15S	37E	11	2	4					120	32	
L 01117 APPRO	15S	37E	11	2	4	3				120	50	
L 02391 APPRO	15S	37E	11	3	3	3				80	37	
L 07665	15S	37E	11	4	4	4				136	40	
L 01199 APPRO	15S	37E	14	1	4	2				121	37	
L 01080 APPRO	15S	37E	14	2	2	1				120	32	
L 01045 APPRO	15S	37E	14	2	3	1				120	70	

Record Count: 15

APPENDIX B

BORING LOGS

Soil Boring SB-1



Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0 - 5	0.0	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
5 - 10	0.0	None	None	
10 - 15	0.0	None	None	Sand - (SP) - Tan, very fine grained, well sorted, caliche nodules.
15 - 20	0.0	None	None	
20 - 25	0.0	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
25 - 30	0.0	None	None	Sand - (SP) - Tan, very fine grained, well sorted, sandstone nodules.
30 - 35	0.0	None	None	
35 - 40	0.0	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
40 - 45	0.0	None	None	Sand - (SP) - Red, very fine grained, well sorted.
45 - 50	0.0	None	None	
50 - 55	0.6	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
55 - 60	1.3	None	None	Sand - (SP) - Red, very fine grained, well sorted, sandstone nodules.
60 - TD	0.0	None	None	

Legend

PID Head-space reading in ppm obtained with a photo-ionization detector. All PID readings were analyzed.

Soil Boring Details

Date Drilled 07 / 03 / 00

Plugged - Surface to TD with Bentonite and hydrated with deionized water.

Soil Boring Log Details

Soil Boring SB-1

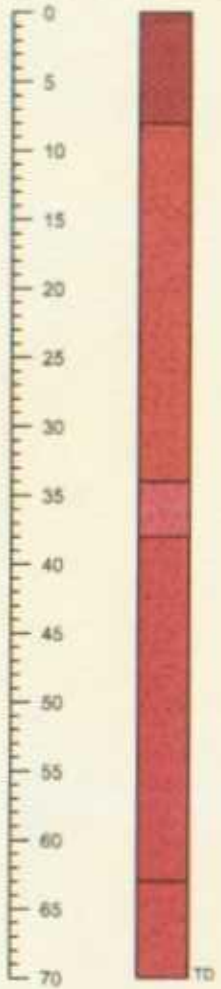
EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JN
July 3, 2000	ETGI Project # EOT 2059C	

Soil Boring SB-2

Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0	33.2	None	None	
5	17.4	None	None	Sand - (SM) - Dark brown, very fine grained, well sorted, dry, caliche nodules.
10	25.3	None	None	
15	19.1	None	None	
20	21.0	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
25	24.5	None	None	
30	19.8	None	None	
35	19.1	None	None	Sand - (SP) - Tan, very fine grained, well sorted, caliche nodules.
40	23.2	None	None	
45	39.0	None	None	
50	20.3	None	None	Sand - (SP) - Red, very fine grained, well sorted, wet, sandstone nodules.
55	19.5	moderate	None	
60	342	Heavy	None	
65	6.2	Slight	Yellow	Sand - (SP) - Red, very fine grained, well sorted, caliche nodules.
70 TD	6.5	Slight	None	



Legend

PID Head-space reading in ppm obtained with a photo-ionization detector.

Indicates samples selected for laboratory analysis.

Soil Boring Details

Date Drilled 07 / 05 / 00

Plugged - Surface to TD with Bentonite and hydrated with deionized water.

Soil Boring Log Details

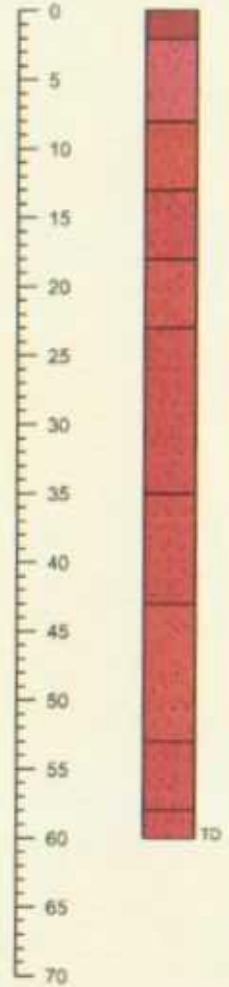
Soil Boring SB-2

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: N/S	Prep By: RB	Checked By: JK
July 5, 2000	ETGI Project # EOT 2000C	

Soil Boring SB-3



Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0	0.0	None	None	Sand - (SP) - Dark brown, very fine grained, well sorted, caliche nodules.
5	0.0	None	None	Sand - (SP) - Tan, very fine grained, well sorted, caliche nodules.
10	0.0	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
15	3.0	None	None	Sand - (SP) - Red, very fine grained, well sorted, caliche nodules.
20	13.6	None	None	Sand - (SP) - Red tan, very fine grained, well sorted.
25	13.2	None	None	
30	13.7	None	None	Sand - (SP) - Red, very fine grained, well sorted, caliche nodules.
35	11.8	None	None	
40	14.4	None	None	Sand - (SP) - Red tan, very fine grained, well sorted.
45	13.3	None	None	
50	11.0	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
55	11.7	None	None	Sand - (SP) - Red, very fine grained, well sorted.
60 TD	11.6	None	None	Sand - (SP) - Red, very fine grained, well sorted, caliche nodules.

Legend

PID Head-space reading in ppm obtained with a photo-ionization detector. All PID readings were analyzed.

Soil Boring Details

Date Drilled 07 / 06 / 00

Plugged - Surface to TD with Bentonite and hydrated with deionized water.

Soil Boring Log Details

Soil Boring SB-3

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JN
July 6, 2000	ETGI Project # EOT 2086C	

Soil Boring SB-4

Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0	9.5	None	None	Sand - (SM) - Brown tan, very fine grained, well sorted, dry, caliche nodules.
5	11.9	None	None	Sand - (SP) - Tan, very fine grained, well sorted, caliche nodules.
10	12.4	None	None	
15	11.8	None	None	
20	11.4	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
25	11.1	None	None	
30	4.3	None	None	
35	5.1	None	None	
40	8.0	Slight	None	Sand - (SP) - Red tan, very fine grained, well sorted, sandstone nodules.
45	11.3	Slight	None	
50	12.2	Slight	None	Sand - (SP) - Red tan, very fine grained, well sorted, sand stone nodules.
55	6.2	Slight	None	Sand - (SP) - Red, very fine grained, well sorted.
60	3.7	Heavy	None	
65				Sand - (SP) - Red, very fine grained, well sorted, caliche nodules.
70				

Soil Columns

TD

Legend

PID Head-space reading in ppm obtained with a photo ionization detector.

Indicates samples selected for laboratory analysis.

Soil Boring Details

Date Drilled 07 / 05 / 00

Plugged - Surface to TD with Bentonite and hydrated with deionized water.

Soil Boring Log Details

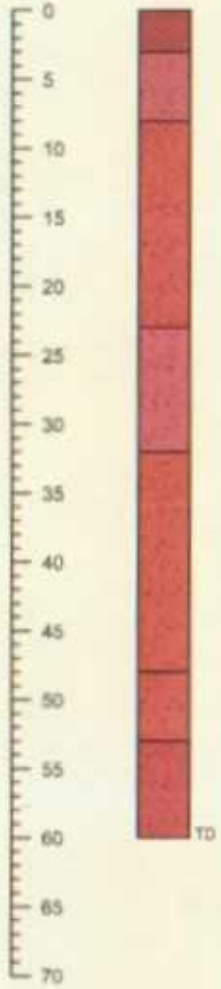
Soil Boring SB-4

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JN
July 5, 2000	ETGI Project # EOT 2000C	

Soil Boring SB-5



Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0	0.8	None	None	Sand - (SP) - Dark brown, very fine grained, well sorted, caliche nodules.
5	7.0	None	None	Sand - (SP) - Tan, very fine grained, well sorted, caliche nodules.
10	9.5	None	None	
15	10.0	None	None	Sand - (SP) - Red, very fine grained, well sorted, caliche nodules.
20	10.8	None	None	
25	11.6	None	None	
30	11.2	None	None	Sand - (SP) - Tan, very fine grained, well sorted, caliche nodules.
35	10.3	None	None	
40	9.8	None	None	Sand - (SP) - Red tan, very fine grained, well sorted.
45	10.2	None	None	
50	2.9	None	None	Sand - (SP) - Red tan, very fine grained, well sorted.
55	3.2	None	None	Sand - (SP) - Red, very fine grained, well sorted.
60 (TD)	6.2	None	None	

Legend

PID Head-space reading in ppm obtained with a photo-ionization detector. All PID readings were analyzed.

Soil Boring Details

Date Drilled 07 / 07 / 00

Plugged - Surface to TD with Bentonite and hydrated with deionized water.

Soil Boring Log Details

Soil Boring SB-5

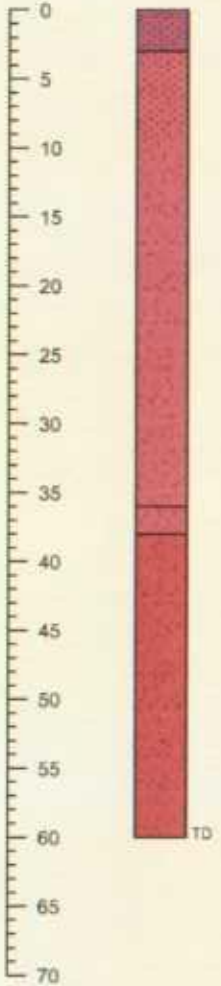
EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JN
July 7, 2000	ETGI Project # EOT 2059C	

Soil Boring SB-6

Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0	7.6	None	None	Sand - (SM) - Dark tan, very fine grained, well sorted, caliche nodules.
5	8.6	None	None	
10	6.6	None	None	
15	8.5	None	None	
20	10.2	None	None	Sand - (SP) - Tan, very fine grained, well sorted, caliche nodules.
25	7.2	None	None	
30	5.8	None	None	
35	3.7	None	None	
40	6.8	None	None	Sand - (SP) - Tan, very fine grained, well sorted, sandstone nodules.
45	4.8	None	None	
50	8.0	None	None	
55	7.1	None	None	Sand - (SP) - Red, very fine grained, well sorted.
60 TD	7.2	Slight	None	
65				
70				



Legend

PID Head-space reading in ppm obtained with a photo-ionization detector. All PID readings were analyzed.

Soil Boring Details

Date Drilled 07 / 07 / 00

Plugged - Surface to TD with Bentonite and hydrated with deionized water.

Soil Boring Log Details

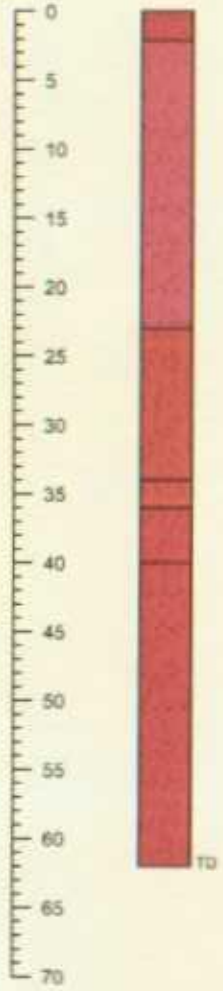
Soil Boring SB-6

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JN
July 7, 2000	ETGI Project # EOT 2059C	

Soil Boring SB-7



Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0	3.5	None	None	Sand - (SM) - Brown tan, very fine grained, well sorted, caliche nodules.
5	2.9	None	None	
10	4.2	None	None	
15	3.4	None	None	Sand - (SM) - Tan, very fine grained, well sorted, caliche nodules.
20	11.5	None	None	
25	9.6	None	None	
30	8.4	None	None	Sand - (SC) - Red tan, very fine grained, well sorted, caliche nodules.
35	6.9	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, sandstone nodules.
40	6.3	None	None	Sand - (SP) - Red, very fine grained, well sorted, sandstone nodules.
45	5.2	None	None	
50	1.2	None	None	
55	2.0	Moderate	None	Sand - (SP) - Red, very fine grained, well sorted, caliche nodules.
60	(156)	Slight	None	
65				
70				

Legend

PID Head-space reading in ppm obtained with a photo-ionization detector.

(oval) Indicates samples selected for laboratory analysis.

Soil Boring Details

Date Drilled 07 / 07 / 00

Plugged - Surface to TD with Bentonite and hydrated with deionized water.

Soil Boring Log Details

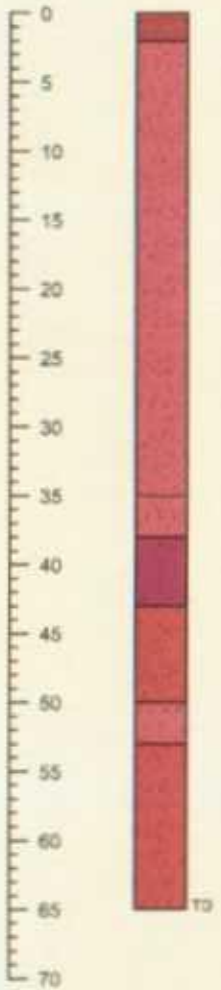
Soil Boring SB-7

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JN
July 7, 2000	ETGI Project # EOT 2059C	

Soil Boring SB-8



Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0	0.0	None	None	Sand - (SM) - Dark brown, very fine grained, well sorted, caliche nodules.
5	0.0	None	None	
10	0.0	None	None	
15	0.0	None	None	
20	0.0	None	None	Sand - (SM) - Tan, very fine grained, well sorted, caliche nodules.
25	0.0	None	None	
30	0.0	None	None	
35	0.0	Slight	Slight	Sand - (SM) - Tan, very fine grained, well sorted, caliche nodules.
40	0.0	None	None	Sand - (SC) - Red brown, very fine grained, well sorted, sandstone nodules.
45	0.0	None	None	Sand - (SM) - Brown tan, very fine grained, well sorted, ccaliche nodules.
50	0.0	None	None	Sand - (SP) - Red, very fine grained, well sorted, sandstone nodules.
55	0.0	None	None	
60	15.3	None	None	Sand - (SP) - Red, very fine grained, well sorted, caliche nodules.
65 (TD)	5.9	None	None	

Legend

PID Head-space reading in ppm obtained with a photo-ionization detector.

Indicates samples selected for laboratory analysis.

Soil Boring Details

Date Drilled 07 / 11 / 00

Plugged - Surface to TD with Benzonite and hydrated with deionized water.

Soil Boring Log Details

Soil Boring SB-8

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JH
July 11, 2000	ETGI Project # EOT 2000C	

Soil Boring SB-9

Depth (feet)	PID Reading	Petroleum Odor	Petroleum Stain	Soil Description
0	10.7	None	None	Sand - (SM) - Brown tan, very fine grained, well sorted, caliche nodules.
5	10.3	None	None	
10	10.9	None	None	Sand - (SP) - Tan, very fine grained, well sorted, caliche nodules.
15	10.3	None	None	
20	9.3	None	None	Sand - (SM) - Brown tan, very fine grained, well sorted, caliche nodules.
25	9.8	None	None	
30	10.1	None	None	Sand - (SP) - Red tan, very fine grained, well sorted, caliche nodules.
35	11.1	None	None	Sand - (SP) - Red tan, very fine grained, well sorted.
40	10.8	None	None	Sand - (SP) - Red brown, very fine grained, well sorted.
45	11.1	None	None	Sand - (SM) - Red brown, very fine grained, well sorted, sandstone nodules.
50	22.9	Slight	None	
55	26.1	None	None	Sand - (SP) - Red brown, very fine grained, well sorted.
60	29.7	None	None	
65				
70				

TD

Legend

PID Head-space reading in ppm obtained with a photo-ionization detector.

⬭ Indicates samples selected for laboratory analysis.

Soil Boring Details

Date Drilled 07 / 14 / 00

Plugged - Surface to TD with Bentonite and hydrated with deionized water.

Soil Boring Log Details

Soil Boring SB-9

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

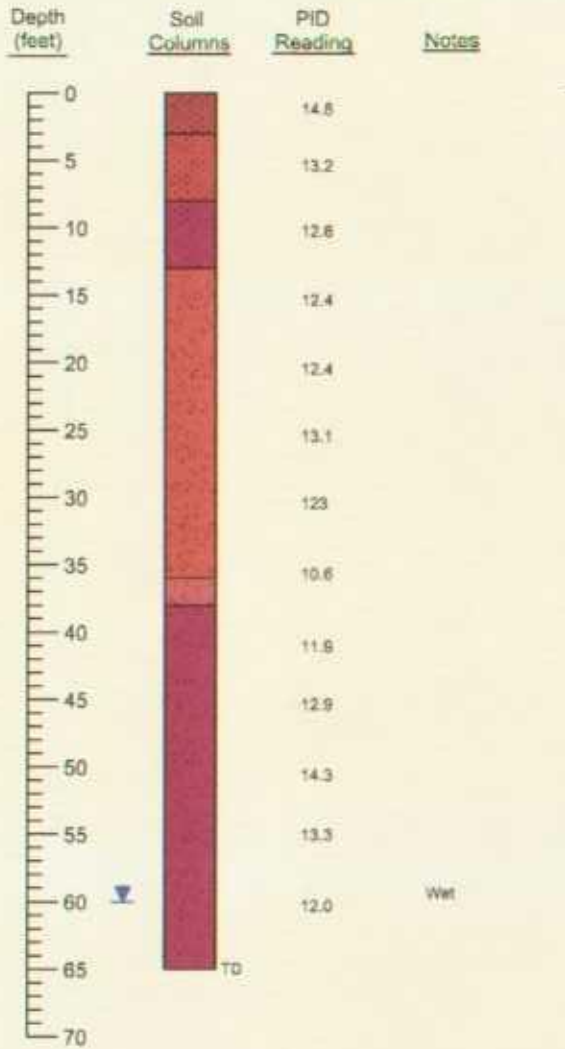
Environmental Technology Group, Inc.

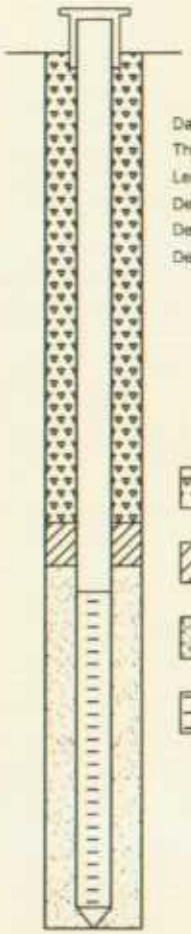
Scale: NTS	Prep By: RS	Checked By: JN
July 14, 2000	ETGI Project # EOT 2059C	

APPENDIX C

BORING LOGS AND MONITORING WELL DETAILS

Monitoring Well MW - 1





Monitoring Well Details

Date Drilled	07 - 13 - 00
Thickness of Bentonite Seal	2 ft
Lenght of PVC Well Screen	25 ft
Depth of PVC Well	65 ft
Depth of Exploratory Well	65 ft
Depth to Ground Water	60 ft

Grout Surface Seal

Bentonite Pellet Seal

Sand Pack

Screen

Legend

Sand - (SP) - Dark brown, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Brown tan, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Red brown, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Red tan, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Tan, very fine grained, well sorted, no stain, no odor, caliche nodules.

Indicates samples selected for laboratory analysis.

Indicates the PSH level measured on date.

Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

Completion Notes

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 2" ID, 0.020 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked stick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

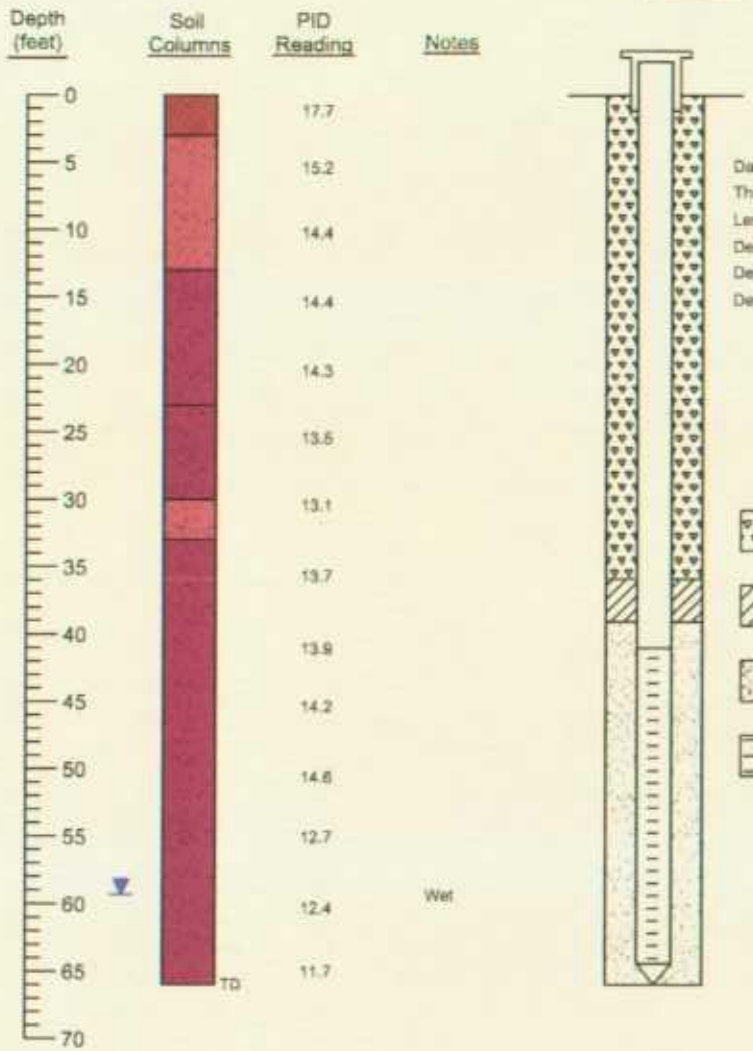
Monitoring Well - 1

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: use scale	Prep By: RB	Checked By: JT
July 13, 2000	ETGI Project # EOT 2058C	

Monitoring Well MW - 2



Monitoring Well Details

Date Drilled	07 - 14 - 00
Thickness of Bentonite Seal	2 ft
Lenght of PVC Well Screen	25 ft
Depth of PVC Well	66 ft
Depth of Exploratory Well	66 ft
Depth to Ground Water	59.5 ft

Grout Surface Seal

Bentonite Pellet Seal

Sand Pack

Screen

Legend

Sand - (SP) - Dark brown, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Tan, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Red brown, very fine grained, well sorted, no stain, no odor, caliche nodules.

Indicates samples selected for laboratory analysis.

Indicates the PSH level measured on date.

Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

Completion Notes

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 2" ID, 0.020 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked stick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

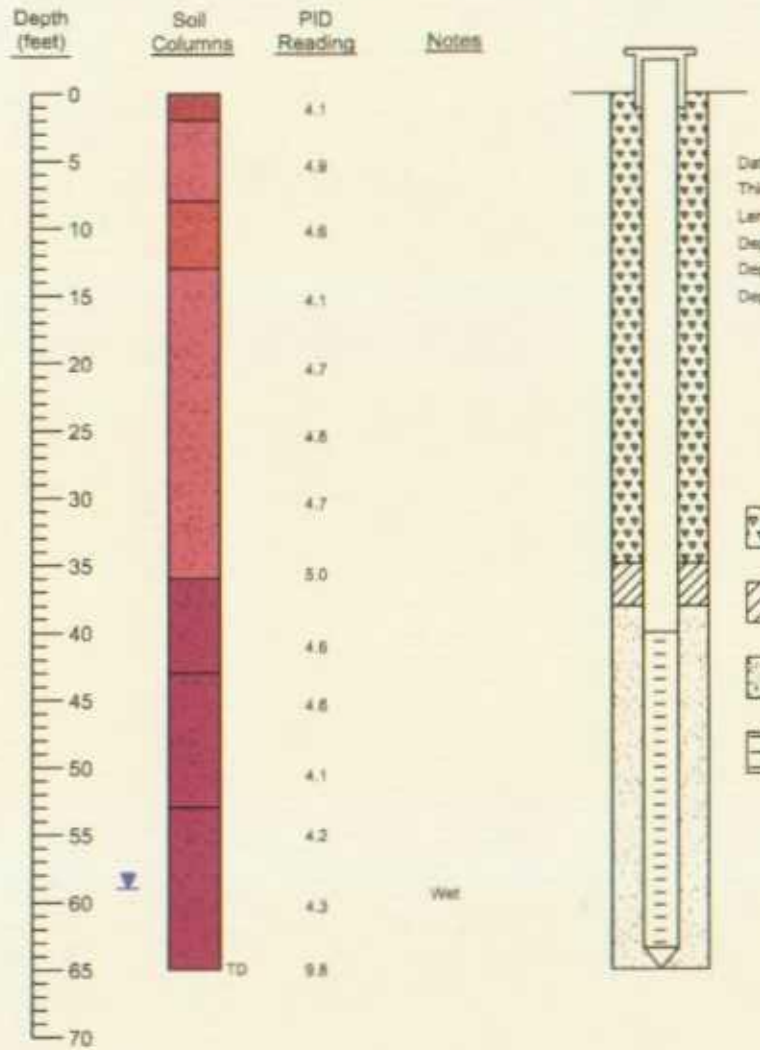
Monitoring Well - 2

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: use scale	Prep By: RS	Checked By: JT
July 14, 2000	ETGI Project # EOT 2058C	

Monitoring Well MW - 3



Monitoring Well Details

Date Drilled	07 - 17 - 00
Thickness of Bentonite Seal	2 ft
Lenght of PVC Well Screen	25 ft
Depth of PVC Well	65 ft
Depth of Exploratory Well	65 ft
Depth to Ground Water	59 ft

Grout Surface Seal

Bentonite Pellet Seal

Sand Pack

Screen

Legend

Sand - (SP) - Dark brown, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Tan, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Red brown, very fine grained, well sorted, no stain, no odor, caliche nodules.

Sand - (SP) - Red tan, very fine grained, well sorted, no stain, no odor, caliche nodules.

Indicates samples selected for laboratory analysis

Indicates the PSH level measured on date

Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

Completion Notes

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 2" ID, 0.020 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked stick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

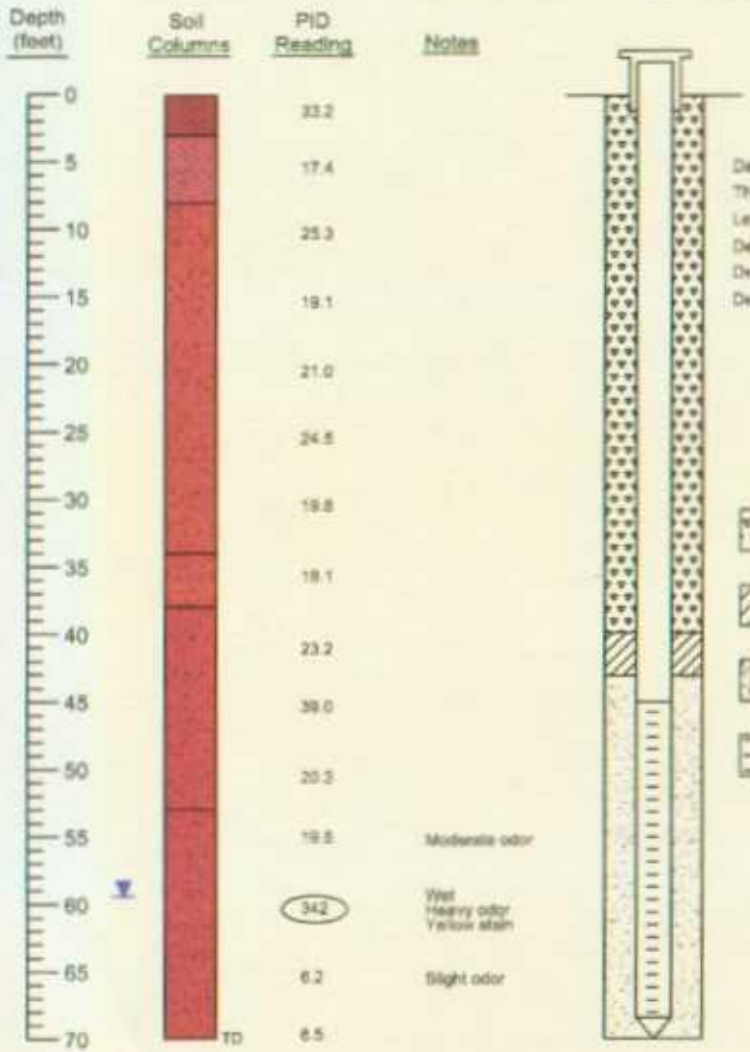
Monitoring Well - 3

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: use scale	Prep By: RS	Checked By: JT
July 17, 2000	ETGI Project # EOT 2056C	

Recovery Well RW - 1



Monitoring Well Details

Date Drilled	07 - 05 - 00
Thickness of Bentonite Seal	2 ft
Lenght of PVC Well Screen	25 ft
Depth of PVC Well	70 ft
Depth of Exploratory Well	70 ft
Depth to Ground Water	59.5 ft

Grout Surface Seal

Bentonite Pellet Seal

Sand Pack

Screen

Legend

Sand - (SP) - Dark brown, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red tan, very fine grained, well sorted, dry, no stain, no odor, sandstone nodules.

Sand - (SP) - Red, very fine grained, well sorted, dry, no stain, no odor.

Indicates samples selected for laboratory analysis.

Indicates the PSH level measured on date.

Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

Completion Notes

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 4" ID, 0.020 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked stick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

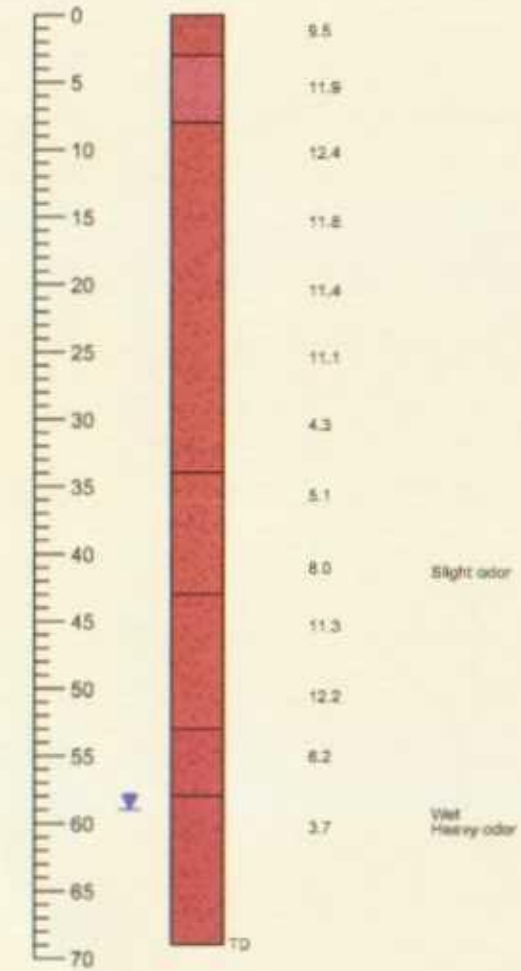
Recovery Well - 1

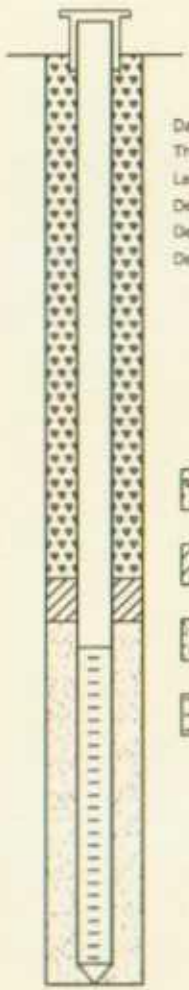
EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: see scale	Prep By: RS	Checked By: JT
July 5, 2000	ETGI Project # EOT 2089C	

Recovery Well RW - 2





Monitoring Well Details

Date Drilled	07 - 06 - 00
Thickness of Bentonite Seal	3 ft
Lenght of PVC Well Screen	25 ft
Depth of PVC Well	69 ft
Depth of Exploratory Well	80 ft
Depth to Ground Water	56 ft

Grout Surface Seal

Bentonite Pellet Seal

Sand Pack

Screen

Legend

Sand - (SP) - Brown tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red brown, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red, very fine grained, well sorted, dry, no stain, no odor.

Indicates samples selected for laboratory analysis.

Indicates the PSH level measured on date.

Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

Completion Notes

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 4" ID, 0.020 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked stick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

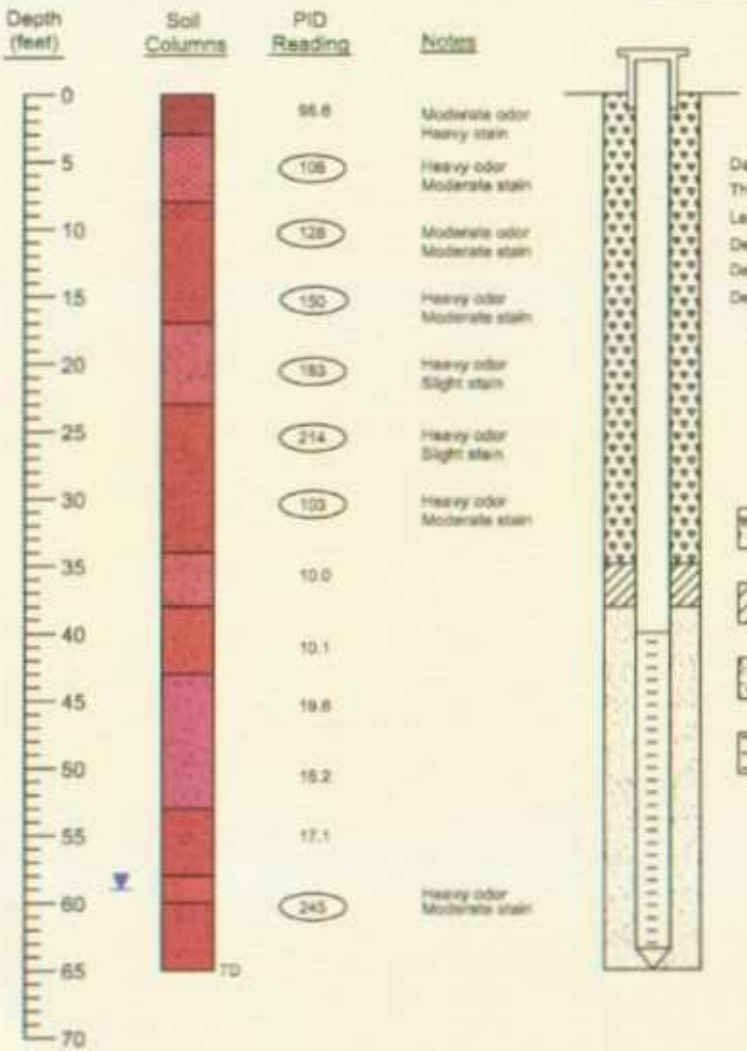
Recovery Well - 2

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: use scale	Prep By: RS	Checked By: JT
July 5, 2000	ETGI Project # EOT 2039C	

Recovery Well RW - 3



Monitoring Well Details

Date Drilled	07 - 12 - 00
Thickness of Bentonite Seal	3 ft
Lenght of PVC Well Screen	25 ft
Depth of PVC Well	65 ft
Depth of Exploratory Well	69 ft
Depth to Ground Water	59 ft

Grout Surface Seal

Bentonite Pellet Seal

Sand Pack

Screen

Legend

Sand - (SP) - Brown tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red brown, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red, very fine grained, well sorted, dry, no stain, no odor.

Sand - (SP) - Dark brown, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Indicates samples selected for laboratory analysis.

Indicates the PSH level measured on date.

Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

Completion Notes

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 4" ID, 0.020 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked stick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

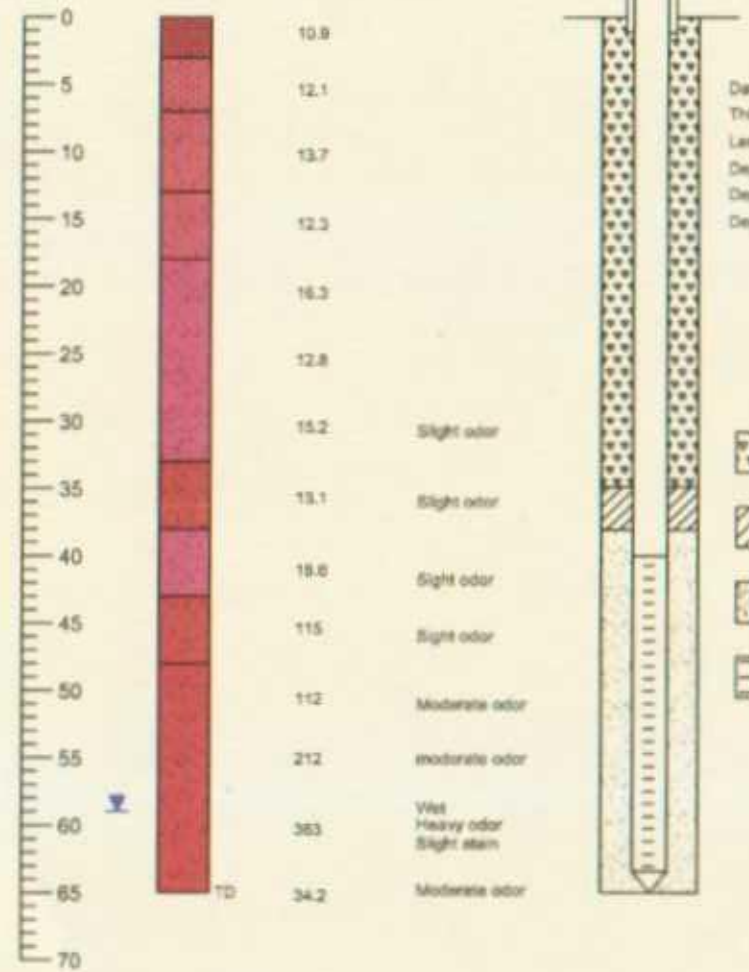
Recovery Well - 3

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: use scale	Prep By: RS	Checked By: JT
July 12, 2000	ETGI Project # EOT 2056C	

Recovery Well RW - 4



Monitoring Well Details

Date Drilled	07 - 12 - 00
Thickness of Bentonite Seal	3 ft
Lenght of PVC Well Screen	25 ft
Depth of PVC Well	69 ft
Depth of Exploratory Well	69 ft
Depth to Ground Water	59 ft

Grout Surface Seal

Bentonite Pellet Seal

Sand Pack

Screen

Legend

Sand - (SP) - Brown tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red brown, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Red, very fine grained, well sorted, dry, no stain, no odor.

Sand - (SP) - Dark brown, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Sand - (SP) - Tan, very fine grained, well sorted, dry, no stain, no odor, caliche nodules.

Indicates samples selected for laboratory analysis.

Indicates the PSH level measured on date.

Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

Completion Notes

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 4" ID, 0.020 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked stick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

Recovery Well - 4

EOTT Energy Corp. Darr Angell #3 / #4 Lea County, NM

Environmental Technology Group, Inc.

Scale: use scale	Prep By: RB	Checked By: JT
July 12, 2000	ETGI Project # EOT 2086C	

APPENDIX D

ANALYTICAL RESULTS

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: BETH ALDRICH
2540 W. MARLAND
HOBBS,N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 27 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: See Below
Receiving Date: 07/10/00
Analysis Date: 07/12/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg	Sample Date
27878	SB-1 3-5'C	<10	<10	07/03/00
27879	SB-1 8-10'C	<10	<10	07/03/00
27880	SB-1 13-15'C	<10	<10	07/03/00
27881	SB-1 18-20'C	<10	<10	07/03/00
27882	SB-1 23-25'C	<10	<10	07/03/00
27883	SB-1 28-30'SS	<10	<10	07/03/00
27884	SB-1 33-35'C	<10	<10	07/03/00
27885	SB-1 38-40'SS	<10	<10	07/03/00
27886	SB-1 43-45'SS	<10	<10	07/03/00
27887	SB-1 48-50'SS	<10	<10	07/03/00
27888	SB-1 53-55'SS	<10	<10	07/03/00
27889	SB-1 58-60'SS	<10	<10	07/03/00
27890	SB-2 0-2'C	<10	<10	07/05/00
27891	SB-2 3-5'C	<10	<10	07/05/00
27892	SB-2 8-10'C	<10	<10	07/05/00
27893	SB-2 13-15'C	<10	<10	07/05/00
27894	SB-2 18-20'C	<10	<10	07/05/00
27895	SB-2 23-25'C	<10	<10	07/05/00
27896	SB-2 28-30'SS	<10	<10	07/05/00
	% IA	95	104	
	% EA	105	113	
	BLANK	<10	<10	

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-21-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: BETH ALDRICH
2540 W. MARLAND
HOBBS,N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 27 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: See Below
Receiving Date: 07/10/00
Analysis Date: 07/13/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg	Sample Date
27897	SB-2 33-35'C	<10	<10	07/05/00
27898	SB-2 38-40'SS	<10	<10	07/05/00
27899	SB-2 43-45'SS	<10	<10	07/05/00
27900	SB-2 48-50'SS	<10	<10	07/05/00
27901	SB-2 53-55'SS	<10	<10	07/05/00
27902	SB-2 58-60'SS	562	1007	07/05/00
27903	SB-2 63-65'C	<10	<10	07/05/00
27904	SB-2 68-70'C	<10	<10	07/05/00
27905	SB-3 0-2'C	<10	<10	07/06/00
27906	SB-3 3-5'C	<10	<10	07/06/00
27907	SB-3 8-10'C	<10	<10	07/06/00
27908	SB-3 13-15'C	<10	<10	07/06/00
27909	SB-3 18-20'C	<10	<10	07/06/00
27910	SB-3 23-25'C	<10	<10	07/06/00
27911	SB-3 28-30'C	<10	<10	07/06/00
27912	SB-3 33-35'C	<10	<10	07/06/00
27913	SB-3 38-40'C	<10	<10	07/06/00
27914	SB-3 43-45'C	<10	<10	07/06/00
27915	SB-3 48-50'C	<10	<10	07/06/00
27916	SB-3 53-55'C	<10	<10	07/06/00
	% IA	92	98	
	% EA	104	114	
	BLANK	<10	<10	

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-21-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: BETH ALDRICH
2540 W. MARLAND
HOBBS,N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 27 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: 07/06/00
Receiving Date: 07/10/00
Analysis Date: 07/14/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
27917	SB-3 58-60' (S/S)	<10	<10
27918	SB-4 0-2' (C)	<10	<10
27919	SB-4 3-5' (C)	<10	<10
27920	SB-4 8-10' (C)	<10	<10
27921	SB-4 13-15' (C)	<10	<10
27922	SB-4 18-20' (C)	<10	<10
27923	SB-4 23-25' (C)	<10	<10
27924	SB-4 28-30' (C)	<10	<10
27925	SB-4 33-35' (C)	<10	<10
27926	SB-4 38-40' (C)	<10	<10
27927	SB-4 43-45' (C)	<10	<10
27928	SB-4 48-50' (C)	<10	<10
27929	SB-4 53-55' C)	<10	<10
	% IA	92	98
	% EA	124	126
	BLANK	<10	<10

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-21-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: BETH ALDRICH
2540 W. MARLAND
HOBBS,N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 27 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: See Below
Receiving Date: 07/10/00
Analysis Date: 07/14/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg	SAMPLE DATE
27930	SB-4 58-60' (S/S)	<10	137	07/06/00
27931	SB-5 0-2' (C)	<10	<10	07/07/00
27932	SB-5 3-5' (C)	<10	<10	07/07/00
27933	SB-5 8-10' (C)	<10	<10	07/07/00
27934	SB-5 13-15' (C)	<10	<10	07/07/00
27935	SB-5 18-20' (C)	<10	<10	07/07/00
27936	SB-5 23-25' (C)	<10	<10	07/07/00
27937	SB-5 28-30' (C)	<10	<10	07/07/00
27938	SB-5 33-35' (C)	<10	<10	07/07/00
27939	SB-5 38-40' (C)	<10	<10	07/07/00
27940	SB-5 43-45' (C)	<10	<10	07/07/00
27941	SB-5 48-50' (C)	<10	<10	07/07/00
27942	SB-5 53-55' (C)	<10	<10	07/07/00
27943	SB-5 58-60' (S/S)	<10	<10	07/07/00
27944	SB-6 0-2' (C)	<10	<10	07/07/00
27945	SB-6 3-5' (C)	<10	<10	07/07/00
27946	SB-6 8-10' (C)	<10	<10	07/07/00
27947	SB-6 13-15' (C)	<10	<10	07/07/00
27948	SB-6 18-20' (C)	<10	<10	07/07/00
27949	SB-6 23-25 (C)	<10	<10	07/07/00
27950	SB-6 28-30' (C)	<10	<10	07/07/00
27951	SB-6 33-35' (C)	<10	<10	07/07/00
27952	SB-6 38-40' (C)	<10	<10	07/07/00
27953	SB-6 43-45' (C)	<10	<10	07/07/00
27954	SB-6 48-50' (C)	<10	<10	07/07/00
	% IA	90	103	
	% EA	123	124	
	BLANK	<10	<10	

METHODS: SW 846-8015M GRO/DRO

Raland K Tuttle
Raland K. Tuttle

7-21-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: BETH ALDRICH
2540 W. MARLAND
HOBBS,N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 27 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: 07/07/00
Receiving Date: 07/10/00
Analysis Date: 07/14/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
27955	SB-6 53-55' (C)	<10	<10
27956	SB-6 58-60' (S/S)	<10	<10
27957	SB-7 0-2' (C)	<10	<10
27958	SB-7 3-5' (C)	<10	<10
27959	SB-7 8-10' (C)	<10	<10
27960	SB-7 13-15' (C)	<10	<10
27961	SB-7 18-20' (C)	<10	<10
27962	SB-7 23-25' (C)	<10	<10
27963	SB-7 28-30' (C)	<10	<10
27964	SB-7 33-35' (C)	<10	<10
27965	SB-7 38-40' (C)	<10	<10
27966	SB-7 43-45' (C)	<10	<10
27967	SB-7 48-50' (C)	<10	<10
27968	SB-7 53-55' (C)	<10	<10
27969	SB-7 58-60' (S/S)	87	730
27970	SB-7 60-62' (S/S)	<10	<10
	% IA	100	109
	% EA	123	155
	BLANK	<10	<10

METHODS: SW 846-8015M GRO/DRO

Raland K Tuttle

Raland K. Tuttle

7-21-00

Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: BETH ALDRICH
2540 W. MARLAND
HOBBS, N.M. 88240
FAX: 915-520-4310
FAX: 505-397-4701

SampleType: Soil
Sample Condition: Intact/ Iced/ 24 deg. F
Project #: EOT 2059C
Project Name: Darr Angell 3
Project Location: Lea Co., N.M.

Sampling Date: See Below
Receiving Date: 07/10/00
Analysis Date: 07/11/00

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg	SAMPLE DATE
27902	SB-2 58-60' (S/S)	<0.100	7.55	3.64	13.4	4.71	07/05/00
27930	SB-4 58-60' (S/S)	<0.100	0.739	0.530	2.51	0.939	07/06/00
27969	SB-7 60-62' (S/S)	<0.100	<0.100	<0.100	0.158	<0.100	07/07/00
	% IA	96	92	95	103	96	
	% EA	87	87	88	98	86	
	BLANK	<0.100	<0.100	<0.100	<0.100	<0.100	

METHODS: SW 846-8021B,5030

Raland K. Tuttle

7-21-00
Date

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 182

Project Manager: Beth Aldrich

Phone #: (505) 397-4882

FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: EOT2059C

Project Name: DARK ANGEL 3

Project Location: Lea Cty, NM

Sampler Signature: Beth Aldrich

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 8021B/5030	TPH 418.1 8015 GRO DRO	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
27878	SB-1 3'5'(c)	1	4oz	X							X			7/3/00	1114		X						
27879	SB-1 8-10'(c)														1147								
27880	SB-1 13'15'(c)														1120								
27881	SB-1 18'20'(c)														1122								
27882	SB-1 23'25'(s/s)														1133								
27883	SB-1 28'30'(s/s)														1152								
27884	SB-1 33'35'(c)														1255								
27885	SB-1 38'40'(s/s)														1306								
27886	SB-1 43'45'(s/s)														1322								
27887	SB-1 48'50'(s/s)														1348								
27888	SB-1 53'55'(s/s)														1410								

Relinquished by:	Date:	Time:	Received by:
Beth Aldrich	7/10/00	0745	Tracy Peterson
Relinquished by: Tracy Peterson	Date: 7/10/00	Time: 1210	Received by: Roland Lynch
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS: fax results to ETGI (505) 397-4701

27°F

Bill to EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC #182

Project Manager: Beth Aldrich
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: EOT2059C
Project Name: DARK ANGEL 3

Project Location: Lea Cty, NM
Sampler Signature: Beth Aldrich

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 8021B/5030	TPH 8015 GRO/DRO	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	TOS	RCI
27889	SB-1	58-60' (S/S)	1	4oz	X						X			7/3/00	1447		X						
27890	SB-2	0-2' (C)												7/5/00	0850								
27891	SB-2	3-5' (C)													0903								
27892	SB-2	8-10' (C)													0906								
27893	SB-2	13-15' (C)													0908								
27894	SB-2	18-20' (C)													0910								
27895	SB-2	23-25' (C)													0920								
27896	SB-2	28-30' (S/S)													0932								
27897	SB-2	33-35' (C)													1022								
27898	SB-2	38-40' (S/S)													1034								
27899	SB-2	43-45' (S/S)													1049								

Relinquished by:	Date:	Time:	Received by:
Beth Aldrich	7/10/00	0745	
Relinquished by:	Date:	Time:	Received by:
	7/10/00	1210	
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS
Fax results to (505) 397-4701
27°F

Bill to EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 182

Project Manager: Beth Aldrich
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: EOT 2059C
Project Name: DARR ANGELL 3

Project Location: Lea Cty, NM
Sampler Signature: Beth Aldrich

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 8021B/5030	TPH 418.1 / 8015 GRO / DRO	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
27900	SB-2 48-50' (S/S)	1	4oz		X						X			7/8/00	1117		X						
27901	SB-2 53-55' (S/S)														1140								
27902	SB-2 58-60' (S/S)														1208	X							
27903	SB-2 63-65' (C)														1436								
27904	SB-2 68-70' (C)														1440								
27905	SB-3 0-2' (C)													7/11/00	0846								
27906	SB-3 3-5' (C)														0859								
27907	SB-3 8-10' (C)														0906								
27908	SB-3 13-15' (C)														0919								
27909	SB-3 18-20' (C)														0912								
27910	SB-3 23-25' (C)														0919								

Relinquished by:	Date:	Time:	Received by:
Beth Aldrich	7/11/00	1745	Tracy Peterson
Tracy Peterson	7/10/00	1210	Rebecca Jurd
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS
Fax Results to (505) 397-4701
27 °F

Bill To EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 182

Project Manager: Beth Aldrich
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: EOT2059C

Project Name: DARK ANGEL 3

Project Location: Lea Cty, NM

Sampler Signature: Beth Aldrich

ANALYSIS REQUEST

4 of 9

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 8021B/5030	TPH 8015 GRO/DRO	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
27911	SB-3 28.30(c)	1	4oz	X							X			7/6/00	0828		X						
27912	SB-3 33.35(c)														1028								
27913	SB-3 38.40(c)														1031								
27914	SB-3 43.45(c)														1036								
27915	SB-3 48.50(c)														1038								
27916	SB-3 53.55(c)														1041								
27917	SB-3 58-60(c)														1058								
27918	SB-4 0'2'(c)														1158								
27919	SB-4 3'5'(c)														1200								
27920	SB-4 8'10'(c)														1205								
27921	SB-4 13'15'(c)														1208								

Relinquished by:	Date:	Time:	Received by:
Beth Aldrich	7/10/00	1745	
Relinquished by:	Date:	Time:	Received by:
Tracy Peters	7/10/00	1210	
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS
Fax results to (505) 397-4701
27°E
BILL TO EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 18-2

Project Manager: Beth Aldrich

Phone #: (505) 397-4882

FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: EOT 20590

Project Name: DAFF ANGELL 3

Project Location: Lea Cty NM

Sampler Signature: Beth Aldrich

ANALYSIS REQUEST

5 of 9

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 8112/5030	TPH 8015 GRO/DRO	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
27922	SB-4 18'20'(c)	1	4oz		X						X			7/6/00	1140		X						
27923	SB-4 23'25'(c)														1213								
27924	SB-4 28'30(c)														1219								
27925	SB-4 33'35'(c)														1246								
27926	SB-4 38'40'(c)														1249								
27927	SB-4 43'45'(c)														1258								
27928	SB-4 48'50'(c)														1256								
27929	SB-4 53'55'(c)														1258								
27930	SB-4 58'60'(c)														1315	X							
27931	SB 5 0'2'(c)													7/7/00	0928								
27932	SB-5 3-5(c)														0932								

Relinquished by:	Date:	Time:	Received by:
Beth Aldrich	7/10/00	0745	Jerry Petterson
Relinquished by:	Date:	Time:	Received by:
Jerry Petterson	7/10/00	1210	Dale Strunk
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

Fax results to (505) 397-4701

27°F

Bill TO EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

CoC # 182

6 of 9

Project Manager: Beth Aldrich
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: EOT 2059C
Project Name: DARR ANGELL 3

Project Location: Lea Cty NM
Sampler Signature: Beth Aldrich

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 8021B/5030	TPH 418.1 / 8015 GRO / DRO	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	ANALYSIS REQUEST
27933	SB-5	1	4oz		X						X			7/6/00	0937		X							
27934	SB-5														0940									
27935	SB-5														0943									
27936	SB-5														0947									
27937	SB-5														1000									
27938	SB-5														1030									
27939	SB-5														1032									
27940	SB-5														1034									
27941	SB-5														1038									
27942	SB-5														1040									
27943	SB-5														11:00									

Relinquished by:	Date:	Time:	Received by:
Beth Aldrich	7/10/00	3745	Lucy Tolbert
Relinquished by: Lucy Tolbert	Date: 7/10/00	Time: 1210	Received by: Rebecca Hunt
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS
Fax results to (505) 397-4701
27°F

Bill To EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 182

Project Manager: Beth Aldred

Phone #: (505) 397-4882

FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: EOT20590

Project Name: DARE ANGEL 3

Project Location: Lea Cty, NM

Sampler Signature: Beth Aldred

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 8021B/5030	TPH 418.1/8015 GRO DRO	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
27944	SB-6	0-2'(c)	1	4oz	X						V			7/7/00	1117		X						
27945	SB-6	3-5'(c)													1119								
27946	SB-6	8-10'(c)													1123								
27947	SB-6	13-15'(c)													1125								
27948	SB-6	18-20'(c)													1127								
27949	SB-6	23-25'(c)													1131								
27950	SB-6	28-30'(c)													1133								
27951	SB-6	33-35'(c)													1217								
27952	SB-6	38-40'(c)													1219								
27953	SB-6	43-45'(c)													1220								
27954	SB-6	48-50'(c)													1222								

Relinquished by:	Date:	Time:	Received by:
Beth Aldred	7/10/00	1745	Jerry Peterson
Relinquished by:	Date:	Time:	Received by:
Jerry Peterson	7/10/00	1210	Rebecca Hunt
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

Fax results to (505) 397-4701

27° F

BILL TO EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC #182

Project Manager: Beth Aldrich
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: E0T2059C
Project Name: DARL ANGELL 3

Project Location: Lea Cty, NM
Sampler Signature: Beth Aldrich

ANALYSIS REQUEST

8 of 9

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 8021B/5030	TPH ~~418.1~~ 8015 DRO/GRO	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
27955	SB-6	1	4oz	X							X			7/1/00	1224		X						
27956	SB-6														1240								
27957	SB-7														1334								
27958	SB-7														1338								
27959	SB-7														1340								
27960	SB-7														1341								
27961	SB-7														1343								
27962	SB-7														1347								
27963	SB-7														1350								
27964	SB-7														1416								
27965	SB-7														1417								

Relinquished by:	Date:	Time:	Received by:
Beth Aldrich	7/10/00	0745	
Relinquished by:	Date:	Time:	Received by:
	7/10/00	1210	
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS
Fax results to (505) 397-4701
27°F
Bill To EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 182

Project Manager: Beth Aldrich
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: ETGI, 2540 W. Marland, Hobbs, NM 88240

Project #: EOT 2059C
Project Name: Dar Angell #3

Project Location: Lea Cty, NM
Sampler Signature: Beth Aldrich

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 8021B/5030	TPH 8015 GRO/DRO	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
27966	SB-7	1	4oz	X							X			7/6/00	1420		X						
27967	SB-7				X										1422								
27968	SB-7														1424								
27969	SB-7														1518	X							
27970	SB-7														1529								

43.45 (c)
48.50' (c)
53.55' (c)
58' 60' (Sb)
60' 62' (Sb)

Relinquished by:	Date:	Time:	Received by:
Beth Aldrich	7/14/00	0745	Tracy Peterson
Tracy Peterson	7/10/00	1210	Rudy Yates
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS
Fax Results to (505) 397-4701
27°F

Bill To EOT

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS,N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 30 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: 07/11/00
Receiving Date: 07/12/00
Analysis Date: 07/14/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
28076	SB-8 0-2'	<10	<10
28077	SB-8 3-5'	<10	<10
28078	SB-8 8-10'	<10	<10
28079	SB-8 13-15'	<10	<10
28080	SB-8 18-20'	<10	<10
28081	SB-8 23-25'	<10	<10
28082	SB-8 28-30'	<10	<10
28083	SB-8 33-35'	<10	<10
28084	SB-8 38-40'	<10	<10
28085	SB-8 43-45'	<10	<10
28086	SB-8 48-50'	<10	<10
28087	SB-8 53-55'	<10	<10
28088	SB-8 58-60'	<10	70
28089	SB-8 63-65'	<10	<10
	% IA	91	123
	% EA	130	136
	BLANK	<10	<10

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-19-00
Date

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

1 of 2

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC 186

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: E.T.G.I.
2540 W. MARLAND, HOBBS, NM 88242

Project #: EOT 20590
Project Name: DARR ANGELL #3

Project Location: LEA COUNTY, NM
Sampler Signature: Lemon Casas

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 8021	TPH 8015 DRO/GRO	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
28076	SB 8 0'-2'	1	40z		X						X			7-11	1242		X						
28077	SB 8 3'-5'														1246								
28078	SB 8 8'-10'														1253								
28079	SB 8 13'-15'														1258								
28080	SB 8 18'-20'														1302								
28081	SB 8 23'-25'														1309								
28082	SB 8 28'-30'														1334								
28083	SB 8 33'-35'														1545								
28084	SB 8 38-40														1550								
28085	SB8 43-45														1600								
28086	SB 8 48-50	↓	↓		↓						↓			✓	1615		↓						

Relinquished by:	Date:	Times:	Received by:
Lemon Casas	7-12-00	0800	Tracy Peterson
Relinquished by:	Date:	Times:	Received by:
Relinquished by:	Date:	Times:	Received by Laboratory:
Tracy Peterson	7/12/00	16:30	Cindy Ward

REMARKS: 300F
FAX RESULTS: HOBBS OFFICE

INVOICE: EOTT

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

2 of 2

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC 186

Project Manager: Jesse Taylor
Phone #: (505) 397-4882
FAX #: (505) 392-4734

Company Name & Address: E.T.G.E.
2540 W Marland

Project #: 607 20594C
Project Name: Dora Roberts #3

Project Location: Lea County NM
Sampler Signature: Jesse Casas

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 8021/5030	TPH 8015 Dro/Gro	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
28087	SB8 @ 53-55	1	4oz		X						X			7-11	1638		X						
28088	SB8 58-60	↓	↓		↓						↓			↓	1780		↓						
28089	SB8 63-65	↓	↓		↓						↓			↓	1730		↓						

Relinquished by:	Date:	Times:	Received by:	REMARKS
Jesse Casas	7-12-00	0800	Jacqui Peterson	30 °F
Relinquished by:	Date:	Times:	Received by:	
Relinquished by: Jacqui Peterson	Date: 7/12/00	Times: 16:30	Received by Laboratory: Celey Keene	

p.3

Jul 19 00 01:31p

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS,N.M. 88242
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 34 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: See Below
Receiving Date: 07/14/00
Analysis Date: 07/18/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg	SAMPLE DATE
28202	RW 4 28-30'	<10	<10	07/13/00
28203	RW 4 33-35'	<10	<10	07/13/00
28204	RW 4 38-40'	<10	<10	07/13/00
28205	RW 4 43-45'	<10	233	07/13/00
28206	RW 4 48-50'	34	699	07/13/00
28207	RW 4 53-55'	37	492	07/13/00
28208	RW 4 58-60'	253	1796	07/13/00
28209	RW 4 63-65'	<10	342	07/13/00
28210	MW 1 38-40'	<10	<10	07/13/00
28211	MW 1 43-45'	<10	<10	07/13/00
28212	MW 1 48-50'	<10	<10	07/13/00
28213	MW 1 53-55'	<10	<10	07/13/00
28214	MW 1 58-60'	<10	<10	07/13/00
28215	RW 4 0-2'	<10	<10	07/13/00
28216	RW 4 3-5'	<10	<10	07/13/00
28217	RW 4 8-10'	<10	<10	07/13/00
28218	RW 4 13-15'	<10	<10	07/13/00
28219	RW 4 18-20'	<10	<10	07/13/00
28220	RW 4 23-25'	<10	<10	07/13/00
28221	RW 3 53-55'	<10	<10	07/12/00
28222	RW 3 58-60'	1720	5501	07/12/00
28223	RW 3 63-65'	47	1050	07/12/00
28224	MW 1 0-2'	<10	75	07/13/00
28225	MW 1 3-5'	<10	<10	07/13/00
28226	MW 1 8-10'	<10	<10	07/13/00
	% IA	91	113	
	% EA	72	80	
	BLANK	<10	<10	

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-24-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS,N.M. 88242
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 34 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: See Below
Receiving Date: 07/14/00
Analysis Date: 07/19/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg	SAMPLE DATE
28227	MW 1 13-15'	<10	<10	07/13/00
28228	MW 1 18-20'	<10	<10	07/13/00
28229	MW 1 23-25'	<10	<10	07/13/00
28230	MW 1 28-30'	<10	<10	07/13/00
28231	MW 1 33-35'	<10	<10	07/13/00
28232	RW 3 0-2'	465	1228	07/12/00
28233	RW 3 3-5'	503	1803	07/12/00
28234	RW 3 8-10'	2221	5575	07/12/00
28235	RW 3 13-15'	2267	5757	07/12/00
28236	RW 3 18-20'	1665	4875	07/12/00
28237	RW 3 23-25'	3071	5147	07/12/00
28238	RW 3 28-30'	3818	12533	07/12/00
28239	RW 3 33-35'	<10	714	07/12/00
28240	RW 3 38-40'	<10	78	07/12/00
28241	RW 3 43-45'	<10	27	07/12/00
28242	RW 3 48-50'	<10	11	07/12/00
	% IA	77	89	
	% EA	70	80	
	BLANK	<10	<10	

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-24-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS, N.M. 88242
FAX: 505-397-4701
FAX: 915-520-4310

Sample Type: Soil
Sample Condition: Intact/Iced/ 34 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: See Below
Receiving Date: 07/14/00
Analysis Date: 07/18/00

ELT#	FIELD CODE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	m,p-XYLENE (mg/kg)	o-XYLENE (mg/kg)	SAMPLE DATE
28205	RW 4 43-45'	<0.100	0.156	<0.100	0.141	<0.100	07/13/00
28206	RW 4 48-50'	<0.100	0.106	<0.100	0.167	<0.100	07/13/00
28207	RW 4 53-55'	<0.100	0.305	0.165	0.641	0.249	07/13/00
28208	RW 4 58-60'	<0.100	1.20	1.18	4.25	1.73	07/13/00
28222	RW 3 58-60'	1.29	20.2	13.8	50.0	16.4	07/12/00
28223	RW 3 63-65'	<0.100	0.635	0.585	2.29	0.911	07/12/00
28233	RW 3 3-5'	<0.100	<0.100	3.45	14.1	7.55	07/12/00
28234	RW 3 8-10'	<0.100	5.06	3.89	14.0	6.22	07/12/00
28235	RW 3 13-15'	1.16	22.8	13.6	46.6	15.6	07/12/00
28236	RW 3 18-20'	<0.100	3.59	2.36	8.28	3.33	07/12/00
28237	RW 3 23-25'	5.37	38.6	17.3	69.3	22.9	07/12/00
28238	RW 3 28-30'	2.52	25.8	14.6	56.7	20.7	07/12/00
	%IA	93	91	92	104	94	
	%EA	94	94	91	107	91	
	BLANK	<0.100	<0.100	<0.100	<0.100	<0.100	

METHODS: EPA SW 846-8021B,5030

Raland K. Tuttle

7-24-00
Date

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 188

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: E.T.G.I.
2540 W MARLAND, HOBBS NM 88242

Project #: EOT 2059 C
Project Name: DARR ANGELL #3

Project Location: LEA COUNTY, NM
Sampler Signature: Jesse Casas

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 8021B/5030	TPH 418.1 / 8015 DRO/GRO	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
28202	RW 4 28-30	1	40E		X						X			7/13	1400		X						
28203	RW 4 33-35														1423								
28204	RW 4 38-40														1448								
28205	RW 4 43-45														1515	X							
28206	RW4 48-50														1540	X							
28207	RW4 53-55														1610	X							
28208	RW4 58-60														1630	X							
28209	RW4 63-65	↓	↓		↓						↓			↓	1700		↓						

Relinquished by:	Date:	Time:	Received by:
Jesse Casas	7/14/00	0715	Tracy Pettus
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:
Tracy Pettus	7/14/00	1700	Rebecca Negron

REMARKS: 34°

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 188

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4201

Company Name & Address: E.T.G.I
2540 W. MARLAND HOBBS, NM 88242

Project #: EOT 2059C
Project Name: DARR ANGELL #3

Project Location: LEA COUNTY, NM
Sampler Signature: Simon Casas

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 8021B/5030	TPH 8015 DRO/GRO	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
28210	MW1 38'-40'	1	4oz		X						X			7/13	1200		X						
28211	MW1 43-45														1210								
28212	MW1 48-50														1220								
28213	MW1 53-55														1230								
28214	MW1 58-60														1240								
28215	RW4 0-2'														1325								
28216	RW 4 3-5														1330								
28217	RW 4 8-10'														1338								
28218	RW 4 13-15														1345								
28219	RW 4 18-20														1350								
28220	RW4 23-25	↓	↓		↓						↓			↓	1355		↓						

Relinquished by:	Date:	Times:	Received by:
Simon Casas	7/14/00	0715	Lucas Peter
Relinquished by:	Date:	Times:	Received by:
Relinquished by:	Date:	Times:	Received by Laboratory:
Lucas Peter	7/14/00	1700	Relinquished

REMARKS: 34°

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 184

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: E.T.G.I.
1540 W. MARLAND, HOBBS NM 88242

Project #: EOT 2059C
Project Name: DARR ANGELL #3

Project Location: LEA COUNTY, NM
Sampler Signature: Jesse Casas

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	ANALYSIS REQUEST: BTEX 8021B/5030	TPH 8015 Modified	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
28221	RW 3 53-55'	1	4oz.		X						X			7-12	1430		X						
28222	RW3 58-60'														1445	X							
28223	RW3 63-65'														1640	X							
28224	MW1 0'-2'													7-13	0830								
28225	MW1 3-5'														0835								
28226	MW1 8-10'														0838								
28227	MW1 13-15'														0847								
28228	MW1 18-20'														0900								
28229	MW1 23-25'														0918								
28230	MW1 28-30'														0930								
28231	MW1 33-35														1115								

Relinquished by:	Date:	Time:	Received by:
Jesse Casas	7/14/00	0715	
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:
	7/14/00	1700	

REMARKS
34°

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC# 188

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: E.T.G.I.
2540 W MARLAND, HOBBS, NM 88242

Project #: EOT 2059 C
Project Name: DARR ANGELL #3

Project Location: LEA COUNTY, NM
Sampler Signature: Jesse Casas

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
28232	RW3 0'-2'	1	402		X						X			7-12	0930
28233	RW3 3'-5'														0935
28234	RW3 8'-10'														0940
28235	RW3 13'-15'														0945
28236	RW3 18'-20'														0952
28237	RW3 23'-25'														1005
28238	RW3 28'-30'														1011
28239	RW3 33'-35'														1305
28240	RW3 38'-40'														1310
28241	RW3 43'-45'														1330
28242	RW3 48'-50'														1400

ANALYSIS REQUEST

BTEX 8021B/602	TPH 8015 DRO/GRO	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
	X						
X							
X							
X							
X							
X							
X							
	X						

Relinquished by:	Date:	Time:	Received by:
Jesse Casas	7/14/00	0715	Tracy Patterson
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:
Tracy Patterson	7/14/00	1700	Rob McLeod

REMARKS
FAX RESULTS: HOBBS OFFICE
340

INVOICE: EOTT

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS,N.M. 88242
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 28 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: 07/14/00
Receiving Date: 07/18/00
Analysis Date: 07/19/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
28256	MW 2 0-2'	<10	<10
28257	MW 2 3-5'	<10	<10
28258	MW 2 8-10'	<10	<10
28259	MW 2 13-15'	<10	<10
28260	MW 2 18-20'	<10	<10
28261	MW 2 23-25'	<10	<10
28262	MW 2 28-30'	<10	<10
28263	MW 2 33-35'	<10	<10
28264	MW 2 38-40'	<10	<10
	% IA	77	89
	% EA	70	85
	BLANK	<10	<10

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-24-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS,N.M. 88242
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 28 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: See Below
Receiving Date: 07/18/00
Analysis Date: 07/20/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg	SAMPLE DATE
28265	MW 2 43-45'	<10	<10	07/14/00
28266	MW 2 48-50'	<10	<10	07/14/00
28267	MW 2 53-55'	<10	<10	07/14/00
28268	MW 2 58-60'	<10	<10	07/14/00
28269	MW 2 63-65'	<10	<10	07/14/00
28270	SB-9 0-2'	<10	<10	07/14/00
28271	SB-9 3-5'	<10	<10	07/14/00
28272	SB-9 8-10'	<10	<10	07/14/00
28273	SB-9 13-15'	<10	<10	07/14/00
28274	SB-9 18-20'	<10	<10	07/14/00
28275	SB9 23-25'	<10	<10	07/14/00
28276	SB9 28-30'	<10	<10	07/14/00
28277	SB-9 33-35'	<10	<10	07/14/00
28278	SB-9 38-40'	<10	<10	07/14/00
28279	SB-9 43-45'	<10	<10	07/14/00
28280	SB-9 48-50'	<10	328	07/14/00
28281	SB-9 53-55'	<10	92	07/14/00
28282	SB-9 58-60'	<10	396	07/14/00
28283	MW 3 0-2'	<10	<10	07/17/00
28284	MW 3 3-5'	<10	<10	07/17/00
28285	MW 3 8-10'	<10	<10	07/17/00
28286	MW 3 13-15'	<10	<10	07/17/00
	% IA	70	89	
	% EA	70	80	
	BLANK	<10	<10	

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-24-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS,N.M. 88242
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 28 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: 07/17/00
Receiving Date: 07/18/00
Analysis Date: 07/21/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
28287	MW 3 18-20'	<10	<10
28288	MW 3 23-25'	<10	<10
28289	MW 3 28-30'	<10	<10
28290	MW 3 33-35'	<10	<10
28291	MW 3 38-40'	<10	<10
28292	MW 3 43-45'	<10	<10
	% IA	74	84
	% EA	70	80
	BLANK	<10	<10

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-24-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS,N.M. 88242
FAX: 505-397-4701
FAX: 915-520-4310

SampleType: Soil
Sample Condition: Intact/ Iced/ 28 deg. F
Project #: EOT 2059C
Project Name: DARR ANGELL #3
Project Location: Lea County, N.M.

Sampling Date: 07/17/00
Receiving Date: 07/18/00
Analysis Date: 07/23/00

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
28293	MW 3 48-50'	<10	<10
28294	MW 3 53-55'	<10	<10
28295	MW 3 58-60'	<10	<10
28296	MW 3 63-65'	<10	<10
	% IA	79	104
	% EA	79	84
	BLANK	<10	<10

METHODS: SW 846-8015M GRO/DRO

Raland K. Tuttle

7-24-00
Date

1064

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

LOC # 191

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: E.T.G.E.
2540 W MARLAND HOBBS NM 88242

Project #: EOT 2059c
Project Name: DARK ANGEL 3

Project Location: LEA COUNTY, NM
Sampler Signature: Jesse Casas

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 8021B/5030	TPH 418.1 8015 DRO/GRO	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
28256	MW 2 0-2'	1	40z		X						X			7-14	0845		X						
28257	MW 2 3-5'														0850								
28258	MW 2 8-10'														0900								
28259	MW 2 13-15'														0910								
28260	MW 2 18-20'														0915								
28261	MW 2 23-25'														0930								
28262	MW 2 28-30'														0950								
28263	MW 2 33-35'														1010								
28264	MW 2 38-40'														1020								
28265	MW 2 43-45'														1030								
28266	MW 2 48-50'														1045								

Relinquished by:	Date:	Times:	Received by:
Jesse Casas	7/18/00	0800	
Relinquished by:	Date:	Times:	Received by:
Relinquished by:	Date:	Times:	Received by Laboratory:
	7/18/00	1645	

REMARKS
FAX RESULTS: HOBBS OFFICE
28° F
INVOICE: EOTT

Jul 24 00 05:20p

2 of 4

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

LOC # 191

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: E.T.G.E.
2540 W MARLAND HOBBS NM 88242

Project #: EOT 2059C
Project Name: DARR ANGELL 3

Project Location: LEA COUNTY NM
Sampler Signature: Simon Casas

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 8021B/5030	TPH 418.1/1005	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
28267	MW 2 53'-55'	1	4oz		X						X			7-14	1102		X						
28268	MW 2 58'-60'														1124								
28269	MW 2 63'-65'														1200								
28270	SB-9 0'-2'														1306								
28271	SB-9 3'-5'														1308								
28272	SB 9 8'-10'														1315								
28273	SB 9 13'-15'														1345								
28274	SB 9 18'-20'														1400								
28275	SB 9 23'-25'														1420								
28276	SB 9 28'-30'														1430								
28277	SB 9 33'-35'	✓			✓						✓			✓	1540								

Relinquished by:	Date:	Time:	Received by:
Simon Casas	7/18/00	0800	Jerry Patterson
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:
Jerry Patterson	7/18/00	16:45	Celey Keene

REMARKS
FAX RESULTS: HOBBS OFFICE
28°F
INVOICE: EOTT

Jul 24 00 05:20p

3 of 4

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC # 191

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: E.T.G.E.
2540 W MARLAND HOBBS NM 88242

Project #: EOT 2059C
Project Name: DARR ANGELL #3

Project Location: LEA COUNTY NM
Sampler Signature: Simon Casas

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 8021B/5030	TPH 8015 DRO/GRO	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
28278	SB9 38-40'	1	40z	X							X			7-14	1524		X						
28279	SB9 43-45'														1542								
28280	SB9 48-50'														1605								
28281	SB-9 53-55'														1630								
28282	SB-9 58-60'														1700								
28283	MW 3 0-2'													7-17	0850								
28284	MW 3 3-5'														0853								
28285	MW 3 8-10'														0858								
28286	MW 3 13-15'														0903								
28287	MW 3 18-20'														0910								
28288	MW 3 23-25'														0920								

Relinquished by:	Date:	Time:	Received by:
Simon Casas	7-18-00	0800	
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:
	7/18/00	1645	

REMARKS
FAX RESULTS: HOBBS OFFICE
28°F
INVOICE: EOTT

Jul 24 00 05:21p

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

LOC # 191

Project Manager: JESSE TAYLOR
Phone #: (505) 397-4882
FAX #: (505) 397-4701

Company Name & Address: E.T.G.E.
2540 W MARLAND HOBBS NM 88242

Project #: EOT 2059C
Project Name: DARR ANGELL #3

Project Location: LEA COUNTY NM
Sampler Signature:

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
28284	MW 3 28-30'	1	40z		✓						✓			7-17	0930
28290	MW 3 33-35'														1000
28291	MW 3 38-40'														1020
28292	MW 3 43-45'														1042
28293	MW 3 48-50'														1108
28294	MW 3 53-55'														1125
28295	MW 3 58-60'														1146
28296	MW 3 63-65'	↓	↓		↓						↓			↓	1213

ANALYSIS REQUEST

BTEX 8021D/5030	TPH 8015 DRO/GRO	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
	✓						

Relinquished by:	Date:	Time:	Received by:
Aaron Casas	7-18-00	0800	
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:
	7/18/00	16:45	

REMARKS
FAX RESULTS: HOBBS OFFICE
28°F
INVOICE: EOTT

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 505-397-4701
FAX: 915-520-4310

Sample Type: Water
Sample Condition: Intact/ Iced/ 28 deg F
Project #: EOT 2059C
Project Name: Darr Angell 3
Project Location: Lea County

Sampling Date: 07/18/00
Receiving Date: 07/18/00
Analysis Date: See Below

ELT#	FIELD CODE	Sulfate mg/L	Chloride mg/L	Carbonate mg/L	Bicarbonate mg/L	TDS mg/L
28302	MW-1	147	85	0	218	561
28303	MW-2	194	277	0	300	912
28304	MW-3	124	85	0	210	417
28305	RW-1	121	89	0	169	423
	QUALITY CONTROL	49.0	5193	"	"	"
	TRUE VALUE	50.0	5000	"	"	"
	% PRECISION	98	104	"	"	"
	ANALYSIS DATE	07/26/00	07/19/00	07/19/00	07/19/00	07/19/00

METHODS: EPA 375.4, 325.3, 310, 160.1

Raland K. Tuttle

8-4-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 MARLAND
HOBBS, N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

Sample Type: Water
Sample Condition: Intact/Iced/HNO3/ 26 deg. F
Project #: EOT 2059C
Project Name: Darr Angell 3
Project Location: Lea County

Sample Date: 07/18/00
Receiving Date: 07/18/00
Analysis Date: 07/28/00

Analyte (mg/L)	MW-1 28302	MW-2 28303	MW-3 28304	RW-1 28305	Report Limit	%IA	%EA	BLANK	RPD
Aluminum	1.92	19.0	16.7	0.388	0.0500	100	112	<0.0500	1.45
Arsenic	ND	0.0100	0.0080	ND	0.0050	110	112	<0.0050	5.22
Barium	0.1340	0.4430	0.3670	0.0620	0.0100	107	111	<0.0100	0.43
Beryllium	ND	ND	ND	ND	0.0040	102	102	<0.0040	1.94
Cadmium	ND	ND	ND	ND	0.0010	102	100	<0.0010	1.98
Calcium	135.0	446.0	373.0	91.10	1.000	101	N/A	<1.000	2.09
Chromium	0.0090	0.0520	0.0730	ND	0.0050	105	109	<0.0050	0.44
Cobalt	ND	0.0320	0.0300	ND	0.0200	99	98	<0.0200	0.81
Copper	ND	0.0130	ND	ND	0.0100	102	110	<0.0100	0.36
Iron	1.340	11.90	10.70	0.4070	0.0500	118	111	<0.0500	1.23
Lead	ND	0.0030	ND	ND	0.0030	104	100	<0.0030	1.98
Magnesium	21.80	46.70	41.30	16.20	1.000	105	N/A	<1.000	2.21
Manganese	0.0350	0.2180	0.1970	0.0160	0.0150	106	106	<0.0150	0.00
Mercury	ND	ND	ND	ND	0.002	104	101	<0.002	2.40
Molybdenum	ND	ND	ND	ND	0.050	102	102	<0.050	0.39
Nickel	0.0110	0.0470	0.0640	ND	0.0100	105	104	<0.0100	0.75
Potassium	5.420	14.00	8.970	4.360	1.000	86	N/A	<1.000	2.55
Selenium	0.0080	0.0080	ND	0.0050	0.0050	108	112	<0.0050	3.17
Silver	ND	ND	ND	ND	0.00500	104	94	<0.0050	6.19
Sodium	81.40	333.0	71.45	63.50	1.000	116	N/A	<1.000	2.46
Tin	ND	ND	ND	ND	0.0500	105	112	<0.0500	0.90
Vanadium	0.0250	0.0850	0.0630	0.0300	0.0200	102	104	<0.0200	0.37
Zinc	ND	0.0420	0.0360	ND	0.0200	105	110	<0.0200	1.46
Boron	0.129	0.173	0.121	0.096	0.050	116	124	<0.050	0.00
Strontium	0.669	1.12	0.843	0.524	0.050	106	110	<0.050	1.71

ND = Below Reporting Limit
METHOD: EPA SW846-S010B, 7470

Raland K. Tuttle

8-4-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS, N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

Sample Type: Water
Sample Condition: Intact/ Iced/ 28 deg. F
Project #: EOT 2059C
Project Name: Darr Angell 3
Project Location: Lea County
Field Code: MW 1

Sampling Date: 07/18/00
Receiving Date: 07/18/00
Analysis Date: 07/24/00

EPA SW846 8270 (mg/L)	REPORT LIMIT	ELT# 28302	RPD	%EA	%DEV
Naphthalene	0.005	ND			7.5
Acenaphthylene	0.005	ND			-6.8
Acenaphthene	0.005	ND	20	84	-2.8
Fluorene	0.005	ND			4.5
Phenanthrene	0.005	ND			7.9
Anthracene	0.005	ND			10.0
Fluoranthene	0.005	ND			1.3
Pyrene	0.005	ND	16	96	-3.1
Benzo[a]anthracene	0.005	ND			-0.3
Chrysene	0.005	ND			3.5
Benzo[b]fluoranthene	0.005	ND			-8.5
Benzo[k]fluoranthene	0.005	ND			9.9
Benzo [a]pyrene	0.005	ND			-0.1
Indeno[1,2,3-cd]pyrene	0.005	ND			0.4
Dibenz[a,h]anthracene	0.005	ND			0.8
Benzo[g,h,i]perylene	0.005	ND			0.9

	% RECOVERY
Nitrobenzene-d5 SURR	44
2-Fluorobiphenyl SURR	53
p-Terphenyl-d14 SURR	57

ND= not detected at report limit.
Method: EPA SW 846 8270C , 3510

Raland K Tuttle
Raland K. Tuttle

8-4-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS, N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

Sample Type: Water
Sample Condition: Intact/ Iced/ 28 deg. F
Project #: EOT 2059C
Project Name: Darr Angell 3
Project Location: Lea County
Field Code: MW 2

Sampling Date: 07/18/00
Receiving Date: 07/18/00
Analysis Date: 07/24/00

EPA SW846 8270 (mg/L)	REPORT LIMIT	ELT# 28303	RPD	%EA	%DEV
Naphthalene	0.005	ND			7.5
Acenaphthylene	0.005	ND			-6.8
Acenaphthene	0.005	ND	20	84	-2.8
Fluorene	0.005	ND			4.5
Phenanthrene	0.005	ND			7.9
Anthracene	0.005	ND			10.0
Fluoranthene	0.005	ND			1.3
Pyrene	0.005	ND	16	96	-3.1
Benzo[a]anthracene	0.005	ND			-0.3
Chrysene	0.005	ND			3.5
Benzo[b]fluoranthene	0.005	ND			-8.5
Benzo[k]fluoranthene	0.005	ND			9.9
Benzo [a]pyrene	0.005	ND			-0.1
Indeno[1,2,3-cd]pyrene	0.005	ND			0.4
Dibenz[a,h]anthracene	0.005	ND			0.8
Benzo[g,h,i]perylene	0.005	ND			0.9

	% RECOVERY
Nitrobenzene-d5 SURR	60
2-Fluorobiphenyl SURR	70
p-Terphenyl-d14 SURR	61

ND= not detected at report limit.
Method: EPA SW 846 8270C , 3510

Raland K Tuttle
Raland K. Tuttle

8-4-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS, N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

Sample Type: Water
Sample Condition: Intact/ Iced/ 28 deg. F
Project #: EOT 2059C
Project Name: Darr Angell 3
Project Location: Lea County
Field Code: MW 3

Sampling Date: 07/18/00
Receiving Date: 07/18/00
Analysis Date: 07/24/00

EPA SW846 8270 (mg/L)	REPORT LIMIT	ELT# 28304	RPD	%EA	%DEV
Naphthalene	0.005	ND			7.5
Acenaphthylene	0.005	ND			-6.8
Acenaphthene	0.005	ND	20	84	-2.8
Fluorene	0.005	ND			4.5
Phenanthrene	0.005	ND			7.9
Anthracene	0.005	ND			10.0
Fluoranthene	0.005	ND			1.3
Pyrene	0.005	ND	16	96	-3.1
Benzo[a]anthracene	0.005	ND			-0.3
Chrysene	0.005	ND			3.5
Benzo[b]fluoranthene	0.005	ND			-8.5
Benzo[k]fluoranthene	0.005	ND			9.9
Benzo [a]pyrene	0.005	ND			-0.1
Indeno[1,2,3-cd]pyrene	0.005	ND			0.4
Dibenz[a,h]anthracene	0.005	ND			0.8
Benzo[g,h,i]perylene	0.005	ND			0.9

	% RECOVERY
Nitrobenzene-d5 SURR	43
2-Fluorobiphenyl SURR	55
p-Terphenyl-d14 SURR	53

ND= not detected at report limit.
Method: EPA SW 846 8270C , 3510

Raland K Tuttle

8-4-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 W. MARLAND
HOBBS, N.M. 88240
FAX: 505-397-4701
FAX. 915-520-4310

Sample Type: Water
Sample Condition: Intact/ Iced/ 28 deg. F
Project #: EOT 2059C
Project Name: Darr Angell 3
Project Location: Lea County
Field Code: RW-1

Sampling Date: 07/18/00
Receiving Date: 07/18/00
Analysis Date: 07/24/00

EPA SW846 8270 (mg/L)	REPORT LIMIT	ELT# 28305	RPD	%EA	%DEV
Naphthalene	0.005	ND			7.5
Acenaphthylene	0.005	ND			-6.8
Acenaphthene	0.005	ND	20	84	-2.8
Fluorene	0.005	ND			4.5
Phenanthrene	0.005	ND			7.9
Anthracene	0.005	ND			10.0
Fluoranthene	0.005	ND			1.3
Pyrene	0.005	ND	16	96	-3.1
Benzo[a]anthracene	0.005	ND			-0.3
Chrysene	0.005	ND			3.5
Benzo[b]fluoranthene	0.005	ND			-8.5
Benzo[k]fluoranthene	0.005	ND			9.9
Benzo [a]pyrene	0.005	ND			-0.1
Indeno[1,2,3-cd]pyrene	0.005	ND			0.4
Dibenz[a,h]anthracene	0.005	ND			0.8
Benzo[g,h,i]perylene	0.005	ND			0.9

	% RECOVERY
Nitrobenzene-d5 SURR	48
2-Fluorobiphenyl SURR	62
p-Terphenyl-d14 SURR	54

ND= not detected at report limit.
Method: EPA SW 846 8270C , 3510

Raland K. Tuttle

8-4-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN. MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310
FAX: 505-397-4701

SampleType: Water
Sample Condition: Intact/ Iced/ HCl/ 28 deg. F
Project #: EOT 2059C
Project Name: Darr Angell 3
Project Location: Lea County

Sampling Date: 07/18/00
Receiving Date: 07/18/00
Analysis Date: 07/20/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
28302	MW-1	0.001	0.001	<0.001	0.002	<0.001
28303	MW-2	<0.001	<0.001	<0.001	<0.001	<0.001
28304	MW-3	0.359	0.002	<0.001	0.071	0.002
28305	RW-1	0.016	0.011	0.002	0.003	0.001
	% IA	95	94	94	105	95
	% EA	93	90	93	102	94
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8021B,5030

Raland K. Tuttle

8-4-00
Date

Environmental Lab of Texas, Inc.

12600 West I-20 East, Odessa, Texas 79763
(915) 563-1800, FAX (915) 563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

COC

Project Manager: Jesse Tovar	Phone #: (505) 397-4882
Company Name & Address: ENT 3540 E Marland Hobbs NM	FAX #: (505) 397-4701
Project #: EOT 2059 C	Project Name: Dair Angel W
Project Location: LEE County	Sampler Signature: Dany Strand

ANALYSIS REQUEST — 1 of 1

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 8021B	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 160.1	RCI	PAH 8100	Cations 6010	Anions 300.0	Metals 6010
26302	MW 1	5	5ml	X					X	X	X			7-18	9:50	X						X		X	X	X	X
26303	MW 2													7-18	10:05												
26304	MW 3													7-18	10:20												
26305	Rw 1													7-18	10:35												

Relinquished by:	Date:	Time:	Received by:
Dany Strand	7-18	12:10	Jessy Pelton
Relinquished by:	Date:	Time:	Received by:
Relinquished by: Jessy Pelton	Date: 7/18/00	Time: 14:45	Received by Laboratory: Alyssa

REMARKS

F. R. Hobbs Office
28°F

INVOICE: EOTT 10157