AP - 39

STAGE 1 & 2 WORKPLANS

DATE: 6/1/2005

STAGE I & II ABATEMENT PLAN

CONOCOPHILLIPS EAST VACUUM GLORIETTA EAST TANK BATTERY PLAYA

LEA COUNTY, NEW MEXICO

Prepared for:

ConocoPhillips

ConocoPhillips Remediation Technology

Prepared by:

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1.0 INTRODUCTION

ConocoPhillips proposes a path forward plan for mitigating the petroleum hydrocarbon affected soil found in a playa (Site) and monitoring groundwater quality in the vicinity of the playa located east of ConocoPhillips' East Vacuum Glorietta, East Tank Battery. The Site is located on State owned land in the SW¼, SE ¼, Section 27, Township 17S, Range 35E, within Lea County, New Mexico (32° 47.932' N, 103° 26.726' W). Impairment of the soil and groundwater in and below the playa was caused by historic placement of production ponds in the playa beginning in the late 1940's and intermittent releases of crude oil and production water from the 1940's to the most recent release reported to the New Mexico Oil Conservation Division (NMOCD) in October 28, 2002.

ConocoPhillips' proposes to remove historical production pit material from the playa to a depth of approximately eight (8) feet below ground surface (fbgs) or to the top of a caliche lens, located 7 to 9 fbgs, to minimize disturbance to the playa's natural soil structure and limit impact to groundwater below the playa. A membrane barrier will be installed in the playa excavation to channel precipitation away from the affected area and prevent further downward migration of petroleum hydrocarbons and chlorides in the vadose zone below the caliche lens in this area of the playa.

A quarterly groundwater sampling program will be established to monitor water levels, petroleum hydrocarbon constituents and chloride concentration levels in three monitoring wells. If the aquifer does not show evidence of self attenuation within one year, then ConocoPhillips would propose alternatives for NMOCD approval.

1.1 DESCRIPTION OF THE SITE

The playa is located immediately east of ConocoPhillips' East Vacuum Glorietta East Tank Battery. The playa is bisected east to west by Lea County Road 50 and the location of the Site is in the northwestern area of the northern portion of the playa. Figure 1 is a map showing the location of the Site. The Site is located in the SW¼, SE ¼, Section 27, Township 17S, Range 35E, within Lea County, New Mexico (32° 47.932' N, 103° 26.726' W).

1.2 SITE HISTORY AND NATURE OF THE RELEASE

Table 1 provides the chronology of the Site. Aerial photographic evidence indicates the presence of a production pit in the playa in 1949, and a later photography (1966) provided evidence of two additional pits developed in the playa (Appendix A). The latest petroleum hydrocarbon and produced water release was discovered October 28, 2002, and was reported to NMOCD. Approximately 80 barrels of oil was released into the playa, which is located approximately 120 feet southeast of well number VAC ABO 6-80, and affected an area of approximately 80 feet by 150 feet in the adjacent playa. Immediately after the release, ConocoPhillips recovered 80 barrels of oil and 20 barrels of water from the playa.

1.3 SUMMARY OF PREVIOUS INVESTIGATIONS

The initial Site investigation was performed after the petroleum hydrocarbon and produced water release was discovered October 28, 2002, and reported to NMOCD. B&H Environmental Services was called to the Site to delineate the contamination and ConocoPhillips submitted their data in a letter to the NMOCD, dated November 20, 2002. A compilation of their findings is presented in Table 2 and on Figure 2.

B&H Environmental Services bored six 2-fbgs borings to delineate the spill horizontally and one 11-fbgs boring to delineate the spill vertically. Detectable concentrations of petroleum hydrocarbons were reported in all borings and concentrations were highest in the northwest portion of the playa. Hydrocarbon and chloride concentrations were noted down to 11 fbgs in the boring located in the northwestern area of the release Site, at 1,240 milligrams per kilogram (mg/kg) and 3,470 mg/kg, respectively (Table 2). In the NMOCD letter, ConocoPhillips indicated groundwater in a nearby water well was at 51 fbgs.

On April 7, 2003, BBC International deepened B&H Environmental's "vertical" boring to further delineate the vertical extent of hydrocarbon and chloride affected soil (Table 3). These data indicated that hydrocarbon and chloride concentrations were present down to a depth of 35 fbgs in the northeast portion of the release Site.

On February 4-6, 2004, Maxim Technologies (Maxim) used a truck-mounted air rotary drill unit to install three soil borings at the Site to assess subsurface and groundwater conditions below the playa east of the Vacuum Glorietta East Unit, East Tank Battery. Soil boring VG-1 was located inside the playa; VG -2 and VG-3 were located outside the playa (Figure 3). Boring VG-1 established the presence and extent of hydrocarbon and chloride impact vertically in the vadose zone of the playa (Table 4). VG-2 and VG-3, located north and southwest of the playa, respectively, established the lateral extent of groundwater impact (Table 5). Once hydrocarbons were detected immediately above the soil-water interface, borings VG-1, -2 and -3 were completed as monitoring wells. Boring logs and well completion diagrams are included in Appendix B.

On May 19, 2004, Maxim initiated a GeoProbe soil survey to assess subsurface conditions below the playa east of the Vacuum Glorietta East Unit, East Tank Battery. Maxim used a truck-mounted hydraulic push probe unit to examine 17 locations inside the northern portion of the playa adjacent to the tank battery (Figure 4). The probe was pushed until refusal at all locations. Soil probes GP-3, -7, -8, -9, -11, -13, -14, -15, and -16 were located outside the affected area, GP-1, -2, -4, -5, -6, and -10 were located inside the affected area, and GP-17 represented background. The soils from these 17 penetrations were logged for sediment type or lithology, and the split-spoon cuttings were tested with a photo-ionization detector (PID) to determine the presence of volatile organic compounds (VOCs). The hydraulic probe, split-spoon penetrations were continuously sampled and logged by the field geologist (Appendix B). The probes established the presence and extent of hydrocarbon and chloride impact horizontally and vertically in the shallow vadose zone of the playa (Table 6).

In accordance with ConocoPhillips' remediation plan, presented to NMOCD on August 9, 2004, Maxim initiated the excavation of affected soils in the East Vacuum Glorietta, East Tank Battery playa on August 11, 2004. Figure 5 illustrates the footprint in which the excavation of the petroleum hydrocarbon/produced water affected soil has occurred. Maxim began excavation of the affected soil to a depth of approximately 8 fbgs and hauled this material to a State-approved disposal facility. As the excavation advanced, a historic petroleum hydrocarbon zone was encountered, forcing the excavation to deepen to approximately 20 fbgs. In reviewing aerial photographs, this historic petroleum hydrocarbon zone was shown to be from historic production pits existing on or before year 1949 (Appendix A).

Because the unexpected historic petroleum hydrocarbon zone was encountered, Maxim halted excavation and advanced six exploratory borings to better define the area inside the spill footprint not yet excavated (Figure 6). A mobile air rotary boring unit was used to delineate the vertical and horizontal extent of the vadose zone petroleum hydrocarbons and chloride in this area (Table 7). Soil samples were collected at 10 foot intervals and logged by the field geologist (Appendix B). Groundwater from monitoring well VG-1 was also analyzed (Table 8)

2.0 SITE HYDROLOGY

2.1 REGIONAL GEOLOGY

According to the Geologic Map of New Mexico (NMBGMR, 2003[1]), Vacuum Glorietta is underlain by the Pliocene-age Ogallala Formation, which consists of fluvial sand, silt, clay, and gravel capped by caliche. The Ogallala sand is very fine to medium grained quartz, silty in part, and calcareous, clay balls are common, clayey in upper part, indistinctly bedded to massive, crossbedded, unconsolidated to weakly cohesive, with local quartzite lenses, and colored various shades of gray and red. The sand may have silt and clay with caliche nodules, colored reddish brown, dusky red, and pink. Gravel, not everywhere present, is mostly quartz, some quartzite, sandstone, limestone, chert, igneous rock, metamorphic rock, and worn *Gryphaea* in intraformational channel deposits and as basal conglomerate. Caliche, hard, sandy and pisolitic at top, produces a "caprock" along Mescalero Ridge. Maximum thickness of the Ogallala is up to 100 feet.

2.2 SITE LITHOLOGY

Soils in the Vacuum Glorietta area are white caliche and black clays, red sandy loams, and sands. Based on drill cuttings collected during the subsurface investigations, the shallow subsurface geology consists of white to light gray caliche to approximately 6-9 fbgs, and light reddish brown sand with thin caliche and clay stringers to approximately 70 bgs. The dry playa contains dark gray clay to a depth of 7-9 fbgs overlying the caliche and sand sequence.

2.3 SURFACE WATER HYDROLOGY

The land surface is a nearly level to very gently undulating constructional plain that has little dissection. Local topography is characterized by a dry playa located on a southeast-sloping plateau consisting of a level to gently rolling prairie broken by draws and playas. Large areas within the region have poorly developed drainage systems. The elevation ranges from 4,400 feet to 3,350 feet above sea level. There is a general slope of about 10 to 15 feet per mile (Turner, et al, 1974[2]).

Two local relic drainage ways, both un-named, cross just east of the area from northwest to southeast. These drainage ways end on a flat area to the southeast. These draws are shallow, usually dry, and seldom carry runoff water.

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[1] New Mexico Bureau of Geology and Mineral Resources, 2003. Geologic Map of New Mexico, 1:500,000.
[2] Turner, M.T., D.N. Cox, B.C Mickelson, A.J. Roath, and C.D Wilson, 1973. Soil Survey Lea County, New Mexico. U.S. Department of Agriculture Soil Conservation Service, 89p.

Playas, or shallow ephemeral lakes, are common in the area. The playas provide the only surface drainage in many areas. Aquifer recharge occurs through these playa basins during and after significant rainfall events. Recharge is limited once the clays in the basins swell and effectively stop percolation of groundwater.

The only fresh surface water nearby is a pond created by discharge of cooling water from a power plant located approximately 6 miles to the southeast. There are many dry playas that briefly hold water following a rainfall event.

2.4 GROUNDWATER HYDROGEOLOGY

The Site is underlain by the Ogallala Aquifer. The aquifer extends from the ground surface downward, ranging in thickness from 80 feet to more than 200 feet. The formation consists of heterogeneous sequences of clay, silt, sand and gravel. A resistant layer of calcium carbonate-cemented caliche, known locally as the caprock, occurs near the surface of much of the area (Ashworth and Hopkins, 1995[3]).

The Ogallala Formation can be divided up into the unsaturated zone and the saturated zone. The upper section of the Ogallala is unsaturated and is known as the "Vadose Zone". The lower section of the Ogallala Formation is the primary water-bearing unit and is the Ogallala Aquifer. Groundwater in the Ogallala Aquifer generally flows from northwest to southeast, normally at right angles to water level contours. Velocities of less than one foot per day are typical, but higher velocities may occur along filled erosional valleys where coarser grained deposits have greater permeabilities.

The nearest water well to the Site is located approximately 675 feet northwest of the Site. No information is available on depth to water for this well. A water well (L010593) is located approximately 1,525 feet north with no depth to water information (New Mexico Office of the State Engineer's database). There is a water well located approximately 2,190 feet to the south with depth to water reported as 33 feet. A water well (L10297), located to approximately 2,450 feet to the southwest, has a depth to water of 42 feet. A water well located approximately 2,460 feet east of the Site has depth to water of 85 feet. A water well (L04793 [3]) located approximately 2,285 feet to the southeast has no depth to water information. A water well (L05362) located approximately 3,500 feet west, has a depth to water of 80 feet.

Shallow groundwater at the Site occurs under unconfined conditions. In the three monitoring wells drilled at the Site, groundwater was encountered at a depth of approximately 60 feet. Based on groundwater elevations measured in the three monitoring wells, groundwater flow direction was determined to be southeast at a gradient of 0.004 feet per foot.

[3] Asworth, J.B. and J. Hopkins, 1995. Aquifers of Texas. Texas Water Development Board Report 345, 69p.

Recharge of the aquifer system in the area mainly occurs in two ways: (1) infiltration of precipitation runoff in and around playa lakes and (2) direct infiltration of precipitation into the coarse eolian surfical deposits.

2.5 MAGNITUDE, EXTENT AND ORIGIN PETROLEUM HYDROCARBONS AND CHLORIDE IN THE PLAYA

Present Condition

From the previously described investigations, it was determined that groundwater in the vicinity of the Site is less than 50 ft below the depth of impairment. Distance from the nearest fresh water supply well at the Site is less than 1,000 feet. Benzene concentration in soil was reported below 10 mg/kg and total benzene, toluene, ethylbenzene and total xylenes (BTEX) concentration was reported below 50 mg/kg. Total petroleum hydrocarbons (TPH) concentration in soil was detected above 100 mg/kg in earlier investigations.

Based on deep drill cuttings and shallow GeoProbe samples collected in the dry playa during previous subsurface investigations, the shallow subsurface geology can be described as dark gray clay to a depth of 7-9 fbgs, white to light gray caliche to approximately 20 fbgs, and light reddish brown sand with thin caliche and clay stringers to approximately 70 fbgs (Appendix B).

For the clayey soil above the caliche lens, evidence suggests the petroleum hydrocarbons concentrated in an area defined by GeoProbe and six deep borings in the northwestern portion of the playa. Data from these investigations suggests the hydrocarbons infiltrated the caliche zone and migrated into the sands above the aquifer (water level at 60 fbgs). Groundwater chemistry from previous sampling suggests that detectable amounts of hydrocarbons reached groundwater in the vicinity of monitoring well VG-1 below the playa bed (Tables 5, 8 and 9).

Chloride present in the release area described above, also affected soils below the playa. Data from the previous investigations (Tables 2, 3, 4, 6 and 7) suggest chloride infiltrated the caliche zone and is present in the sands above the aquifer. Groundwater chemistry from previous sampling suggests that chloride made contact with groundwater below the playa bed (Table 5, 8, 9).

Excavation of affected soils in the East Vacuum Glorietta, East Tank Battery playa began on August 11, 2004. Figure 6 illustrates the footprint in which the excavation of the petroleum hydrocarbon/produced water-affected soil has occurred. The excavation began at a depth of approximately 8 fbgs. As the excavation advanced, a historic petroleum hydrocarbon zone was encountered in the southern portion of the excavation, forcing the excavation to deepen to approximately 20 fbgs. In reviewing aerial photographs, this historic petroleum hydrocarbon zone was shown to be from historic production pits existing on or before year 1949

(Appendix A – Photographs collected in February 2005). Approximately 3,240 cubic yards of material has been removed and hauled to a State approved disposal location.

Because the unexpected historic petroleum hydrocarbon zone was encountered, excavation was halted and six exploratory borings were advanced in September 2004 to better define the area inside the spill footprint not yet excavated (Figure 6). These borings described vadose zone conditions above and below the 7-9 fbgs caliche zone in the unexcavated portion of the playa (Table 7).

The gasoline (GRO) and diesel (DRO) range concentrations for TPH are presented in Table 7. TPH concentrations were above the NMOCD remediation standard (100 parts per million [ppm]) in the northwestern (VG-21, VG-22, VG-23) unexcavated portion of the spill footprint (Figure 6). In boring VG-21, residual TPH >100 ppm was found from 0-50 fbgs [10,000 – 2,000 mg/kg, respectively]. Residual TPH in VG-23 was also found above the remediation standard from 0-50 fbgs (670 to 730 mg/kg, respectively), with the highest concentration found in the 20-30 fbgs sampling interval (6,500 mg/kg). Boring VG-22 was positioned approximately 40 feet south of VG-21, and this boring exhibited residual TPH above the remediation standard in the 0-10 fbgs (720 mg/kg) and the 40-50 fbgs (280 mg/kg) sampling intervals. Near the southern edge of the excavation (Figure 5), boring VG-20 had residual TPH >100 ppm from 10-50 fbgs (2,000 to 1,800 mg/kg, respectively), with the highest TPH concentration in the 20-30 fbgs sampling interval (11,000 mg/kg). All sampling intervals for borings VG-18 and VG-19 exhibited <100 ppm TPH, with the exception of the 0-10 fbgs sampling interval at VG-19 (110 mg/kg).

Laboratory analysis [Synthetic Precipitation Leach Procedure (SPLP)] reported either non-detection or low migration concentrations for BTEX in all September 2004 sample borings at all sampling depths (Table 7). All samples containing BTEX concentrations were below NMOCD remediation standards (10 ppm benzene, 50 ppm BTEX).

Chloride laboratory analyses (both ion chromatography and SPLP methods) of soils collected from the playa are also presented in Table 7. SPLP chloride concentrations in all borings and at all depths were found to be below NMOCD's stated chloride cleanup level (250 ppm) in NMOCD's guidance e-mail dated July 7, 2004 (Appendix C), with the exception of VG-23, 40-50 fbgs sample range (261 mg/kg).

In September 2004 and January 2005, monitoring well VG-1 was tested for BTEX, polynuclear aromatic hydrocarbons (PAH) and chlorides in groundwater (Tables 8 and 9). Benzene increased from 0.005 milligrams per liter (mg/l) in September 2004 to 0.752 mg/l in January 2005 in VG-1. Other constituents not detected in September 2004 were present at VG-1 in the January 2005 sampling (ethylbenzene, fluorene, 2-methylnaphthalene, naphthalene, phenanthrene, and 1-methynaphthalene). During this period, benzene and naphthalene concentrations were above regulatory action levels. Groundwater conditions in VG-2 and -3 remained essentially the same from September 2004 to January 2005. Chloride concentrations increased from 1,040 mg/l in January 2004 to 1,140 mg/l in September 2004 and to 2,880 mg/l in January 2005.

Additional information was collected in December 2004, and January, February and March 2005. The December 2004 excursion provided data on the condition of the excavation floor and side walls (Table 10) Composite soil samples, collected using a trachoe, indicated the south and west walls and the floor were above NMOCD's July 12, 2004 e-mail guidance for TPH (<100 mg/kg; Appendix C). The north wall TPH concentrations were also above the guidance level concentrations but were very close to compliance (470 mg/kg). BTEX and chloride concentrations were below regulatory action levels. In February and March 2005, a backhoe was used to further delineate the lateral extent of hydrocarbons south and west of the existing excavation. The south boundary was found but the presence of crude oil flowlines to the west prevented the finding of the western boundary. Based on the information collected to date, a new excavation design was created (Figure 7).

Fate and Transport of BTEX, Chlorides to Groundwater

The SPLP test evaluates the potential for leaching materials into groundwater. It provides an assessment of material mobility under field conditions (i.e. rainfall) and is a method of choice when evaluating fate and transport (Alforque, 1996[4]). The SPLP analysis of soil collected in investigations supporting this document indicate leachable concentrations of BTEX were present in playa soil at low levels, below the New Mexico Water Quality Control Commission (NMWQCC) cleanup standards. However between September 2004 and January 2005, benzene and naphthalene concentrations were above water quality regulatory action levels. Also, there was a 153 percent increase in groundwater chloride concentration between September 2004 and January 2005.

During the fall of 2004, the area experienced greater than normal rainfall. According to the National Weather Service, rainfall in the Hobbs area was 4.78 inches in September 2004 (153% above normal), and 3.44 inches in November 2004 (395% above normal). During these storm events, the playa filled with water and the water migrated to groundwater through the open excavation. Because aquifer sands were exposed during excavation, hydrologic head pressure created by the weight of the impounded water may have flushed the hydrocarbons from the sand, causing an increase in petroleum hydrocarbons in the groundwater.

Provided that no further releases of crude oil and produced water enter the playa, a simple geo-membrane barrier will confine existing petroleum hydrocarbon and chloride below the caliche (caprock) zone, minimizing further migration to groundwater. Approval of the Stage II Abatement Plan, which requires:

- Removing additional impaired vadose zone material above the caprock
- Backfilling the existing excavation to grade with the top of the caprock with clean material
- Constructing a geo-membrane barrier above the caprock, and
- Backfilling the remaining excavation with clean material,

[4] Alforque, Maricia, 1996. Synthetic Precipitation Leaching Procedure. USEPA Manchester Laboratory Tech Notes 9/06/1996.

would re-direct water flow away from the lower aquifer sands located immediately below the barrier. The water would flow over the geo-membrane, into adjacent sub-soils, then percolate downward through the unaffected sands to the aquifer. Details concerning the construction of the proposed barrier are in the Section 6 entitled *Design and Support of the Preferred Abatement Option.*

3.0 PROPOSED MONITORING PROGRAM

For the first year of implementation of the Abatement Plan, ConocoPhillips will:

- Obtain quarterly water levels and water samples from all monitoring wells,
- Submit all water samples to a laboratory for analysis of BTEX, PAH, chloride and total dissolved solids, and
- Provide the results of the monitoring program to NMOCD.

If the aquifer does not show evidence of self attenuation within one year, then ConocoPhillips would propose alternatives for NMOCD approval.

4.0 QUALITY ASSURANCE PLAN

With the report of results, ConocoPhillips will present evidence that the sampling and analysis is consistent with the techniques listed in Subsection B of 20.6.2.3107 NMAC and with 20.6.4.13 NMAC of the Water Quality Standards of Interstate and Intrastate Surface Water in New Mexico 20.6.4 MAC.

5.0 ASSESSMENT OF ABATEMENT OPTIONS

The following options are available:

Option 1: Continue excavation of impaired soil down to the aquifer sands.
Option 2: Remove remaining impaired soil above the caprock, backfill and construct geo-member barrier.

Continued excavation of all impaired materials from the playa removes the effective caprock barrier and alters the lithologic structure of the playa (Option 1). The change in subsoil structure exposes the aquifer to unimpeded in-flow of potential contaminants. Option 1 is also the most expensive option and will not provide greater protection of human health or the environment than Option 2.

The preferred abatement Option 2 removes the remnants of the historic production pits in the northwestern portion of the playa. By removing these pits and deploying a geo-membrane

barrier to divert downward water flow around the impaired area, natural attenuation will allow groundwater to meet regulatory water quality mandates. Implementation of this option requires NMOCDs approval.

6.0 DESIGN AND SUPPORT OF THE PREFERRED ABATEMENT OPTION

The design of the preferred abatement option is described below.

Based on the most recent investigation (Table 7), the excavation configuration was altered to include the area immediately west of the present excavation and an expansion of southern boundary (Figure 7). It is the objective of this abatement option (Plan) to remove historical production pit material from the playa, minimize disturbance to the playa's natural soil structure and limit impact to groundwater below the playa. The Plan includes:

- Removing petroleum hydrocarbon affected material west and south of the excavation down to the top of the caliche zone (7-9 fbgs),
- Backfilling the present excavation to the top of the caliche zone with clean material,
- Backfilling the excavation (top of clean backfilled material) with clean sand, free of rocks to a depth of one foot on the sides and 1.5 feet in the center to slightly dome the surface,
- Place a 40-mil medium density polyethylene geo-membrane (liner) directly above the sand base (the slight doming of the sand beneath the liner will promote lateral drainage off of the liner after placement),
- Backfilling an additional one foot of sand, with no rocks or debris, over the liner for surface protection,
- Backfilling clean caliche/soil up to 3 fbgs in the excavation,
- B
- Backfilling with "good, clean" soil of a similar nature to that which was excavated, and;
- Preparing soil for re-seeding (a seed drill will be used to plant the appropriate seed mix).

The plan is to install a membrane barrier in the playa excavation to channel precipitation away from the affected area and prevent further downward migration of hydrocarbons and chlorides in this area of the playa.

Also, monitoring well VG-1 would be re-established (removed during excavation). A quarterly groundwater sampling program would be established to monitor water levels, BTEX, PAH, chloride concentration levels and intrinsic bio-remediation indicator (total dissolved solids, dissolved oxygen, carbonate, bicarbonate, total alkalinity, methane, carbon dioxide, sulfate, sulfide, nitrates, calcium, magnesium, manganese, potassium, sodium, ferrous iron and oxidation reduction potential, temperature, pH, and specific conductance) in the 3 monitoring wells. If the aquifer does not show evidence of self attenuation within one year, then alternatives would be proposed for NMOCDs approval.

If this program is acceptable to NMOCD, ConocoPhillips is prepared to immediately execute the above proposed Plan.

7.0 POST CLOSURE PLAN

When eight (8) consecutive sampling events or other evidence demonstrates to the satisfaction of NMOCD that the water quality standards of Rule 19 are met, ConocoPhillips will petition for closure of the Abatement Plan. ConocoPhillips will plug and abandon monitoring wells that are associated the Abatement Plan and restore the ground surface well sites as required by the landowners.

TABLES

Table 1
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
Chronology of Events

Date	Comment
10/28/02	Spill occurred at heritage Phillips location at Sec 33-T17S-R35E indicating 80 bbls into the playa. 100 bbls recovered consisting of spill and rainwater.
10/29/02	A fax sheet indicated from Conoco field office that spill was called in to New Mexico Oil Conservation Division District 1 (NMOCD, Larry Johnson and Bill Pritchard). Form C 141 was sent to Kent Oberle.
11/05/02	Letter written from ConocoPhillips (CoP) Buckeye field personnel to NMOCD (L. Johnson) describing delineation planned.
11/20/02	Partial delineation performed by B&H and CoP field personnel.
01/03	Quotes to complete additional delineation was requested by CoP Buckeye Unit personnel.
05/23/03	Project communicated to CoP Remediation and Risk Management group (CoPRM&R; Neal Goates) from ConocoPhillips field operations.
05/30/03	CoPRM&R (N. Goates) forwarded all information via email to NMOCD District 1 (L. Johnson) in order to get a path forward.
06/24/03	CoPRM&R (N. Goates) sent follow up email to NMOCD (L. Johnson) on establishing path forward.
07/14/03	Maxim submits work plan to CoPRM&R for exploratory borings.
08/01/03	Steve Wilson transferred to CoP Buckeye Unit as Safety, Health and Environment Asset Resource (SHEAR) Specialist.
8/11/03	CoPRM&R (N. Goates) sent follow up email to NMOCD (L. Johnson) on establishing path forward.
08/23/03	Work plan approved by CoPRM&R.
09/15/03	Plan submitted to NMOCD District 1 (L. Johnson).
10/03	CoPRM&R (N. Goates) sent paper copy via request by NMOCD (L. Johnson) for orientation.
11/03	CoPRM&R (N. Goates) sent follow up email to NMOCD (L. Johnson) on establishing path forward.
01/26/04	NMOCD approved revised work plan.
01/29/04	New Mexico State Land Office permit granted.
01/30/04	Proposed monitoring wells staked and work notification given to NMOCD (L. Johnson & P. Sheeley).
02/5-6/04	Three (3) temporary monitor wells were developed to 70 feet below ground surface (fbgs).
03/12/04	Maxim's draft report forwarded to CoPRM&R (N. Goates).

Table I (Continued)

Date	Comment
03/23/04	CoPRM&R reviewed findings with CoP Buckeye Unit personnel.
03/24/04	CoPRM&R (N. Goates) left message for NMOCD (P. Sheeley) to call me back.
03/25/04	CoPRM&R (N. Goates) left message with NMOCD Santa Fe (Bill Olson) on preliminary findings of elevated chlorides below spill site in playa.
04/06/04	Maxim submitted GeoProbe work plan to CoPRM&R.
05/19/04	GeoProbe investigation initiated.
05/22/04	Draft GeoProbe report submitted to CoPRM&R.
07/01/04	Maxim (Clyde Yancey) received confirmation that Wayne Price (Santa Fe office) would be the NMOCD contact for project.
07/07/04	Investigative report and path forward plan submitted to NMOCD Santa Fe (W. Price). Plan detailed excavation to caliche, placement of a bio-membrane, backfill.
07/21/04	NMOCD denies work plan and sets requirements.
07/20/04	Revised work plan submitted to NMOCD for approval.
08/11/04	Work was initiated to excavate northwestern area of playa.
08/13/04	Historic impact was discovered during excavation operation causing the excavation to deepen to 20+ feet and removing the caliche (caprock) lens.
08/16/04	Excavation halted so that a new work plan could be developed to examine sub-soils in front of excavation.
08/17/04	NMOCD (P. Sheeley) visits site.
08/18/04	NMOCD (W. Price) visits site.
09/08/04	CoPRM&R approved work plan to examine sub-soil in front of excavation.
09/13-15/04	Soil borings to examine sub-soil in front of excavation completed.
10/08/04	Results of boring investigation prepared for CoPRM&R.
12/06/04	Floor and sidewalls of excavation sampled using backhoe.
02/03/05	Backhoe used to delineate surface impairment, flowlines west of the playa limited the examination.
02/23/05	Excavation findings indicated that the excavation would extend into the area west of the playa (location of numerous flowlines). Air photos indicate large historic production pits in northwestern portion of playa.
03/15/05	After flowlines were moved, a backhoe was used to further delineate surface impairment.

Table 1 (Continued)

Date	Comment
03/23/05	Maxim (C. Durrett) met with NMOCD (W. Price) to discuss path forward.
04/07/05	Update report submitted to NMOCD (W. Price).
050/9/05	NMOCD (W. Price) requested an abatement plan be prepared.

Table 2
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
November 2, 2002 Investigation

B&H Environmental Services Sample Locations								
Parameter	Depth (ft)	Vertical	South	East	North 1	North 2	West 1	West 2
TPH (ppm)	Surface	72700	261	159	200		980	995
	2		125	915	1290	985	5680	500
	4	1730						
	6	541						
	8							
	11	1240						
Chloride (ppm)	6	5440						
	8	3230						
	11	3470						

TPH = Total petroleum hydrocarbon
ppm = Parts per million
ft = Feet

Table 3
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
April 7, 2003 Investigation

		11/20/2002 B&H Environmental Services Data*		BBC International								
Sample I.D.	Depth	TPH	Chloride	PID	Chloride	TPH** (mg/kg)		Chloride**	Benzene**	Toluene**	Ethyl-benzene**	Total Xylenes**
	(ft)	(ppm)	(ppm)	(ppm)	(ppm)	GRO	DRO	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
	Surface	72700										
SB1	4	1730										
SB1	6	514	5440									
SB1	8		3230									
SB1	11	1240	3470									
SB1	14	106	700									
SB1	14-15			700	106							
SB1	15	109	880	820	109							
SB1	17	232	1600									
SB1	16-17			1600	232							
SB1	18	355	2120	2120	355	261	5170	1680	1.17	3.41	11.00	14.50
SB1	18-20			3900	247							
SB1	20	247	3900									
SB1	26-28			4400	269	154	2350	4160	0.42	1.05	3.86	6.95
SB1	28	269	4400									
SB1	28-30			3800	167							
SB1	30	167	3800									
SB1	34.5-35			4350	162	81.9	1520	3200	0.04	0.36	2.44	4.74
SB1	35	162	4350									

* BBC reported the same data in their 4/07/2003 Report

** Cardinal Laboratories, Methods 8015M, 4500-Cl⁻ B and 8260.

ft = Feet
ppm = Parts per million
mg/kg = Milligrams per kilogram

Table 4
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
Soil Analysis
February 5, 2004

Parameters	Bore Hole Location				Quality Control
	VG - 1		VG - 2	VG - 3	
Sample Depth (fbgs)	20 - 22	50 - 55	55-60	55 - 60	Blank
Total Petroleum Hydrocarbon (mg/kg)					
Diesel Range	6,700.0	280.00	3.70	3.20	ND
Gasoline Range	440.0	0.18	ND	ND	ND
Total	7,140.0				
Volatile Organics (mg/kg)					
Benzene	0.89	ND	ND	ND	ND
Ethylbenzene	5.40	ND	ND	ND	ND
Toluene	1.30	ND	ND	ND	ND
Xylenes (Total)	10.00	0.0057	ND	ND	ND
Synthetic Precipitation Leaching Procedure (mg/kg)					
Benzene	ND	-	-	-	-
Ethylbenzene	0.046	-	-	-	-
Toluene	0.006	-	-	-	-
Xylenes (Total)	0.094	-	-	-	-
Inorganic Analysis (mg/kg)					
Chloride	1380	2040	ND	ND	ND

fbgs = Feet below ground surface
mg/kg = Milligrams per kilogram
ND = Not detected at or above laboratory detection limits
- = Analysis not performed

Table 5
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
Groundwater Analysis
February 6, 2004

Analytical Parameters	Monitoring Well			Water Quality
Water Matrix	VG-1	VG-2	VG-3	Standards
Volatile Organics (mg/l)				
Benzene	0.0031	ND	ND	0.01
Ethylbenzene	0.0024	ND	ND	0.75
Toluene	ND	ND	ND	0.75
Xylenes (Total)	0.0029	ND	ND	0.62
Semivolatile Organic Compounds (mg/l)				
Acenaphthene	ND	ND	ND	
Acenaphthylene	ND	ND	ND	
Anthracene	ND	ND	ND	
Benzo (a) pyrene	ND	ND	ND	0.0007
Benzo (b) fluoranthene	ND	ND	ND	
Benzo (ghi) perylene	ND	ND	ND	
Benzo (k) fluoranthene	ND	ND	ND	
Chrysene	ND	ND	ND	
Dibenz (a,h) anthracene	ND	ND	ND	
Fluoranthene	ND	ND	ND	
Fluorene	ND	ND	ND	
Indeno (1,2,3 - cd) pyrene	ND	ND	ND	
Naphthalene	ND	ND	ND	0.03*
Phenanthrene	ND	ND	ND	
Pyrene	ND	ND	ND	
Inorganic Analysis (mg/l)				
Chloride	1040	109	33.7	250

mg/l = Milligrams per liter
ND = Not detected at or above laboratory detection limits
* PAH's total naphthalene plus monomethylnaphthalenes

Table 6
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
GeoProbe Soil Investigation and Earlier Investigations
May 19-20, 2004

Probe Sample No.	Depth (fbgs)	Soil Type	VOC (ppm)	Parameter (mg/kg)						
				DRO	GRO	Benzene	Ethylbenzene	Toluene	Total Xylenes	Chloride
GP-1	0-3	C	1416	**4100**	13	ND	ND	ND	0.44	**1410**
	3-6	C, Ca	620							**2780**
	6-8	Ca	371	**140**	ND	ND	ND	ND	ND	**5000**
GP-2	0-3	C	0	20	ND	ND	ND	ND	ND	619
	3-7	C	0.5	10	ND	ND	ND	ND	ND	**1090**
GP-3	0-3	C	0.4							637
	3-6	C	1.1	3.1	ND	ND	ND	ND	ND	**1780**
	6-9	Ca	0.1	ND	ND	ND	ND	ND	ND	**1490**
GP-4	0-3	C	14.9	**770**	0.20	ND	ND	ND	ND	972
	3-6	C, Ca		**800**	0.39	ND	0.01	ND	0.01	**2310**
GP-5	0-3	C	73.4							**3420**
	3-6	C	61.3	**810**	15	0.54	0.59	0.13	2.00	**2600**
	6-8	Ca	140	**3300**	11	0.08	0.96	0.03	0.55	**2550**
GP-6	0-3	C	12.2							**2640**
	3-6	C	0.6							**2070**
	6-9	Ca	251							**2820**
	9-12	Ca	185							**1990**
	12-15	Ca	294	**7500**	150	0.32	4.50	ND	4.50	**2790**
	15-18	Ca, S	235	**3600**	35	ND	2.70	0.25	3.70	**1960**
GP-7	0-3	C	5.9							14.4
	3-6	C	8.3	4.2	ND	ND	ND	ND	ND	72.6
	6-9	C	1.3							326
	9-11	Ca	2.9	3.4	ND	ND	ND	ND	ND	855
GP-8	0-3	C	7	21.0	ND	ND	ND	ND	ND	ND
	3-6	Ca	9	4.0	ND	ND	ND	ND	ND	ND
GP-9	0-3	C	0							ND
	3-6	C	0	2.1	ND	ND	ND	ND	ND	64.3
	6-8	Ca	0.6	1.8	ND	ND	ND	ND	ND	73
GP-10	0-3	C, Ca	10.1	**970**	ND	ND	ND	ND	ND	129
GP-11	0-3	C	21.9	13.0	ND	ND	ND	ND	ND	ND
	3-6	C	3.4							ND
	6-9	Ca	16.2	2.2	ND	ND	ND	ND	ND	164
GP-12	0-3	C	31.5	**470**	ND	ND	ND	ND	ND	ND
	3-6	C	17.9							12.4
	6-9	Ca	10.6	**370**	ND	ND	ND	ND	ND	17
GP-13	0-3	C	17.7	5.5	ND	ND	ND	ND	ND	ND
	3-6	C	8.5							38.1
	6-9	C, Ca	8.8	2.2	ND	ND	ND	ND	ND	863
GP-14	0-3	C	8.8	14.0	ND	ND	ND	ND	ND	ND
	3-6	Ca	5.7	1.9	ND	ND	ND	ND	ND	ND
GP-15	0-3	C	6.3	3.3	ND	ND	ND	ND	ND	44.6
	3-6	C	2.3							119
	6-9	Ca	0	4.1	ND	ND	ND	ND	ND	144
GP-16	0-3	C	0	24.0	ND	ND	ND	ND	ND	13.3
	3-6	C	0	3.9	ND	ND	ND	ND	ND	152
	6-9	C, Ca	0							
GP-17	0-3	C	0.1	6.2	ND	ND	ND	ND	ND	54.3
	3-6	C	0.1							15.5
	6-9	C	0							104
	9-11	Ca		2.2	ND	ND	ND	ND	ND	135

Table 6 Continued

Probe Sample No.	Depth (fbgs)	Soil Type	VOC (ppm)	Parameter (mg/kg)						
				DRO	GRO	Benzene	Ethylbenzene	Toluene	Total Xylenes	Chloride
BS-1*	0-3			ND	ND	ND	ND	ND	ND	
	3-6			ND	ND	ND	ND	ND	ND	**5440**
	6-9			ND	ND	ND	ND	ND	ND	**3230**
	9-12			ND	ND	ND	ND	ND	ND	**3470**
	12-15			ND	ND	ND	ND	ND	ND	700
	15-18			**5170**	261	**1.17**	**11.00**	**3.41**	**14.50**	**2120**
	20			ND	ND	ND	ND	ND	ND	**3900**
	28			**2350**	154	**0.42**	**3.86**	**1.05**	**6.95**	**4400**
	30			ND	ND	ND	ND	ND	ND	**3800**
	35			**1520**	82	0.04	2.44	0.36	4.74	**4350**
VG-1**	0-4		1289							
	4-6		1116							
	6-9		591							
	9-15		243							
	15-20		>9999							
	20-22	S	907	**6700**	440	**0.89**	**5.40**	**1.30**	**10.00**	**1380**
	22-25		322							
	25-27		274							
	27-30		290							
	30-32		245							
	32-35		133							
	35-40		138							
	40-45		95.8							
	45-50		71.9							
	50-55	S	35.4	280	0.18	ND	ND	ND	0.01	**2040**

* Data from 11/20/2002 Environmental Services and 4/7/2003 BBC International investigations

** Data from Maxim 3/15/2004 report

Notes:

Soil Types:
- C - Clay
- Ca - Caliche
- S - Sand

DRO - Diesel Range Organic
GRO - Gasoline Range Organic
ND - Not detected at or above laboratory reporting limit
fbgs - Feet below ground surface
ppm - parts per million
mg/kg - milligrams per kilogram

Table 7
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
Soil Analysis
September 15 – 16, 2004

Boring	Sample Interval	Synthetic Precipitation Leaching Procedure				TPH		Chloride by IC (solid)	SPLP Chloride	Moisture
		Benzene	Toluene	Ethylbenzene	Xylene (total)	GRO	DRO			
VG-18	0-10	ND	ND	ND	ND	<1.1	68	970	47.5	8.1
VG-18	10-20	ND	ND	ND	ND	<1.0	<12	384	18.5	2.8
VG-18	20-30	ND	ND	ND	ND	<1.1	<13	734	45.4	6.7
VG-18	40-50	ND	ND	ND	ND	<1.0	77	179	8	2.8
VG-19	0-10	ND	ND	ND	ND	<1.1	110	63.1	3.7	6.6
VG-19	10-20	ND	ND	ND	ND	<1.0	<12	165	8.9	2.2
VG-19	20-30	ND	0.001 J	0.017	0.13	<1.0	<13	237	12.8	4.3
VG-19	40-50	ND	ND	ND	ND	<1.0	44	27.7	1.9 J	4.4
VG-20	0-10	ND	ND	ND	ND	<1.1	18	92	4.5	9.1
VG-20	10-20	ND	ND	0.006	0.011	44	2000	634	30.5	4.6
VG-20	20-30	ND	0.002 J	0.032	0.052	**340**	**11000**	136	7.3	6.6
VG-20	40-50	ND	ND	ND	ND	17	1800	37.4	2.2	5.2
VG-21	0-10	0.043	0.074	0.05	0.065	**180**	**10000**	302	19.2	6.7
VG-21	10-20	0.0008 J	0.002 J	0.045	0.026	170	5300	80.8	4.8	4.5
VG-21	20-30	ND	0.002 J	0.02	0.035	84	3600	211	10	7.6
VG-21	30-40	NA	NA	NA	NA	NA	NA	391	19.7	6.2
VG-21	40-50	ND	ND	0.004 J	0.009	48	2000	542	27.7	6
VG-22	0-10	ND	ND	ND	ND	<1.1	720	1260	72.1	9.5
VG-22	10-20	ND	ND	ND	ND	<1.0	70	665	30.7	2.9
VG-22	30-40	ND	ND	ND	ND	<1.1	16	1300	78	4.8
VG-22	40-50	ND	ND	ND	ND	<1.0	280	1530	83	4.4
VG-23	0-10	ND	ND	ND	ND	<4.3	670	2690	163	7.3
VG-23	10-20	ND	0.004 J	0.03	0.047	88	4000	3990	209	6.4
VG-23	20-30	ND	ND	0.009	0.018	110	6500	5170	**261**	6.8
VG-23	40-50	ND	ND	ND	ND	<1.0	730	3970	222	4.3

All units are in milligrams per kilogram (mg/kg) except for moisture which is in percent (%)

IC Analysis by Inductively Coupled Plasma Ion Chromatography

SPLP Synthetic Precipitation Leaching Procedure

ND Not detected at or above the Laboratory detection limit

NA Not analyzed

J Estimated Value - the result is ≥# the Method of Determination Limit and < the Limit of Quantification

Table 8
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
Groundwater Analysis
September 16, 2004

Constituent	Units	Well VG-1	WQ Standard
Chloride (titrimetric)	mg/l	1,140	250
Volatile Organics			
Benzene	mg/l	0.005	0.01
Toluene	mg/l	ND	0.75
Ethylbenzene	mg/l	ND	0.75
Xylene (Total)	mg/l	ND	0.62
Semivolatile Organics			
Acenaphthene	mg/l	ND	
Acenaphthylene	mg/l	ND	
Anthracene	mg/l	ND	
Benzo(a)anthracene	mg/l	ND	
Benzo(a)pyrene	mg/l	ND	0.0007
Benzo(b)fluoranthene	mg/l	ND	
Benzo(g,h,i)perylene	mg/l	ND	
Benzo(k)fluoranthene	mg/l	ND	
Chrysene	mg/l	ND	
Dibenz(a,h)anthracene	mg/l	ND	
Fluoranthene	mg/l	ND	
Fluorene	mg/l	ND	
Indeno(1,2,3-cd)pyrene	mg/l	ND	
Naphthalene	mg/l	ND	
Phenanthrene	mg/l	ND	
Pyrene	mg/l	ND	

ND = Not detected at or above the laboratory detection limit
mg/l = Milligrams per liter

Table 9
ConocoPhillips
Vacuum Glorietta Unit, East Tank Battery Playa
Groundwater Analysis
January 14, 2005

Parameter	Method	Unit	VG-1	VG-2	VG-3	Regulatory Limit
Chloride	300	mg/l	2880	88.3	35.6	250
Volatile Organics	8260B	mg/l				
Benzene			**0.752**	ND	ND	0.01
Ethylbenzene			0.147	ND	ND	0.75
Toluene			ND	ND	ND	0.75
Xylenes (total)			ND	ND	ND	0.62
Semivolatile Organics	8270C	mg/l				
Acenaphthene			ND	ND	ND	
Acenaphthylene			ND	ND	ND	
Anthracene			ND	ND	ND	
Benzo(a)anthracene			ND	ND	ND	
Benzo(b)fluoranthene			ND	ND	ND	
Benzo(k)fluoranthene			ND	ND	ND	
Benzo(ghi)perylene			ND	ND	ND	
Benzo(a)pyrene			ND	ND	ND	0.0007
Chrysene			ND	ND	ND	
Dibenzo(a,h)anthracene			ND	ND	ND	
Fluoranthene			ND	ND	ND	
Fluorene			0.002816	ND	ND	
Indeno(1,2,3-cd)pyrene			ND	ND	ND	
2-Methylnaphthalene			0.05457	ND	ND	
Naphthalene			**0.07128**	ND	ND	0.03*
Phenanthrene			0.006317	ND	ND	
Pyrene			ND	ND	ND	
1-Methylnaphthalene			0.07064	ND	ND	

mg/l = Milligrams per liter

ND = Not detected at or above laboratory detection limits

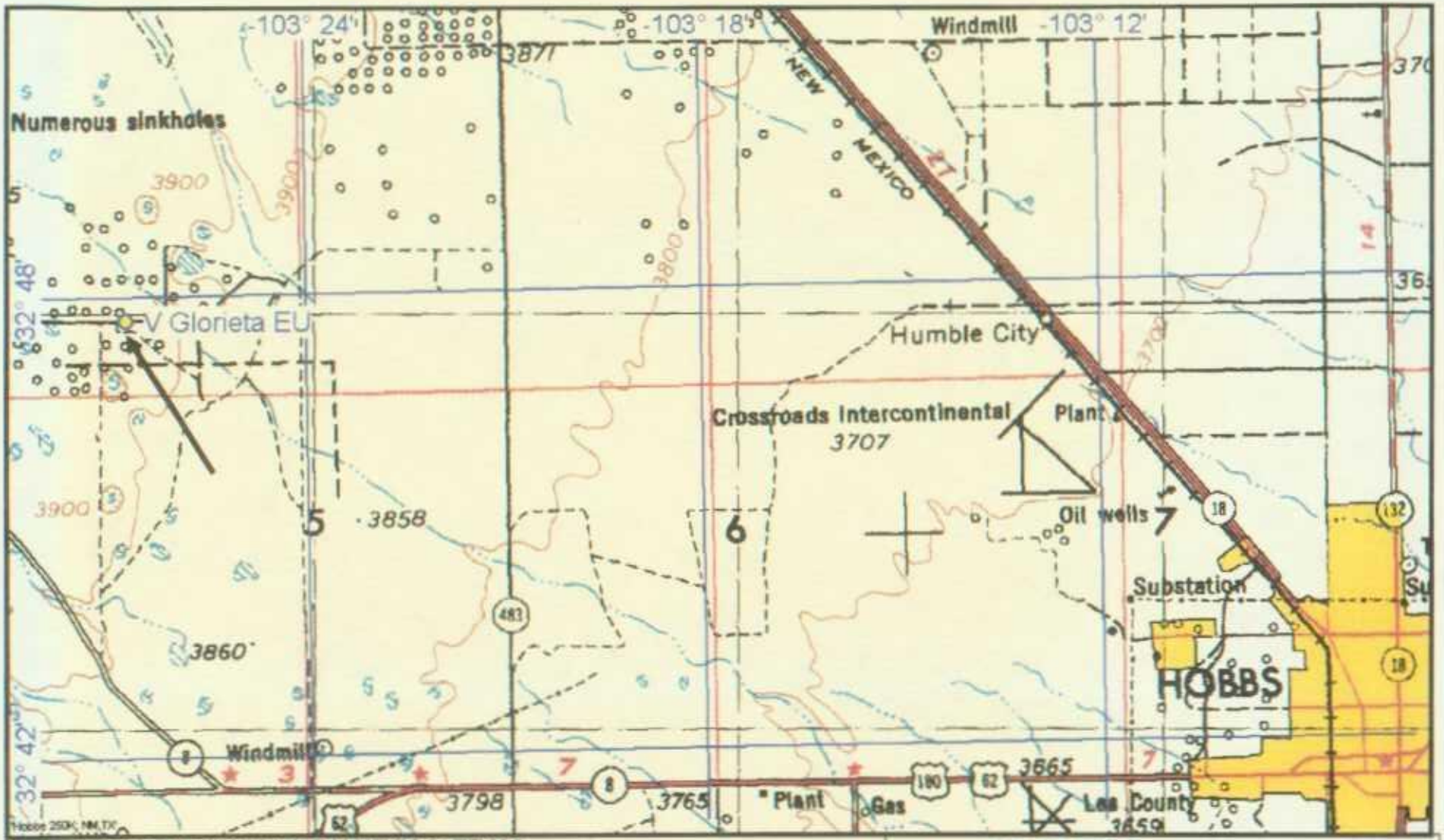
* PAH's total naphthalene plus monomethylnaphthalenes

Table 10
ConocoPhillips
East Vacuum Glorietta Unit, East Tank Battery Playa
Soil Analysis
December 8, 2004

Parameter	Method	Unit	Excavation Walls*				Excavation Floor
			West	South	East	North	
TPH-DRO	8015B	mg/kg	**6,500**	**10,000**	<14	**470**	**13,000**
TPH-GRO	8015B	mg/kg	23	190	10	34	260
Moisture	160.3	%	13.9	16.6	16.8	19.5	20.3
Chloride	1312/300	mg/l	3.9	45.6	37.5	37.5	4.2
Benzene	1312/8260	µg/kg	< 5	< 5	< 5	< 5	< 5
Toluene	1312/8260	µg/kg	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	1312/8260	µg/kg	< 5	< 5	< 5	< 5	< 5
Xylene (Total)	1312/8260	µg/kg	< 5	< 5	< 5	< 5	13

mg/kg = Milligrams per kilogram
% = Percent
mg/l = Milligram per liter
µg/kg = Micrograms per kilogram
* Locations based on field observations

FIGURES

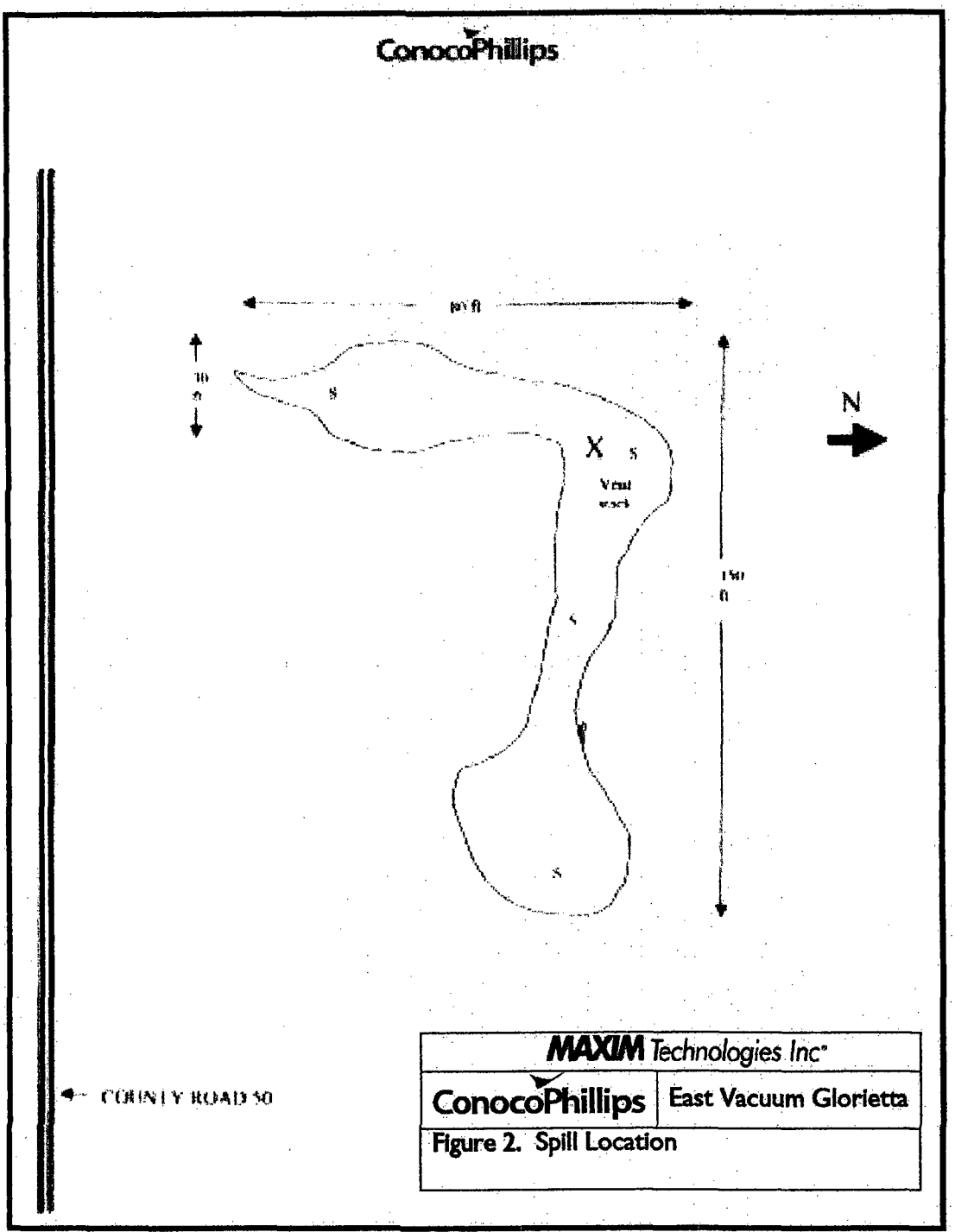


Source: USGS, 1954. HOBBS, NEW MEXICO; TEXAS
1:250,000 scale (Reduced 60%)

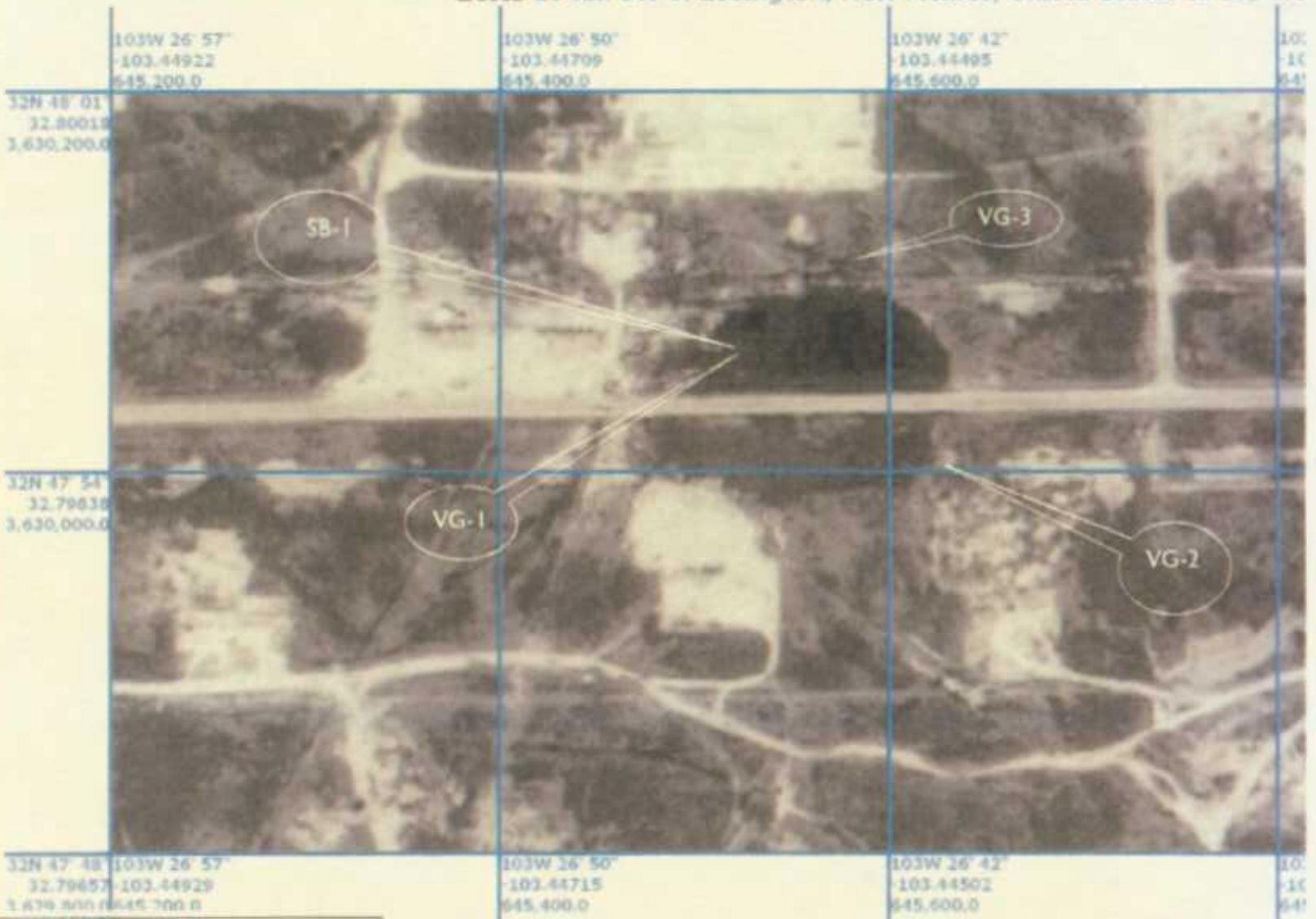
MAXIM Technologies

ConocoPhillips	East Vacuum Glorietta

Figure 1. East Tank Battery Location



Source: 10/28/2002 NMOCD Form C141 Attachment


USGS 19 km SW of Lovington, New Mexico, United States 19 Sep 19
103W 26' 57"
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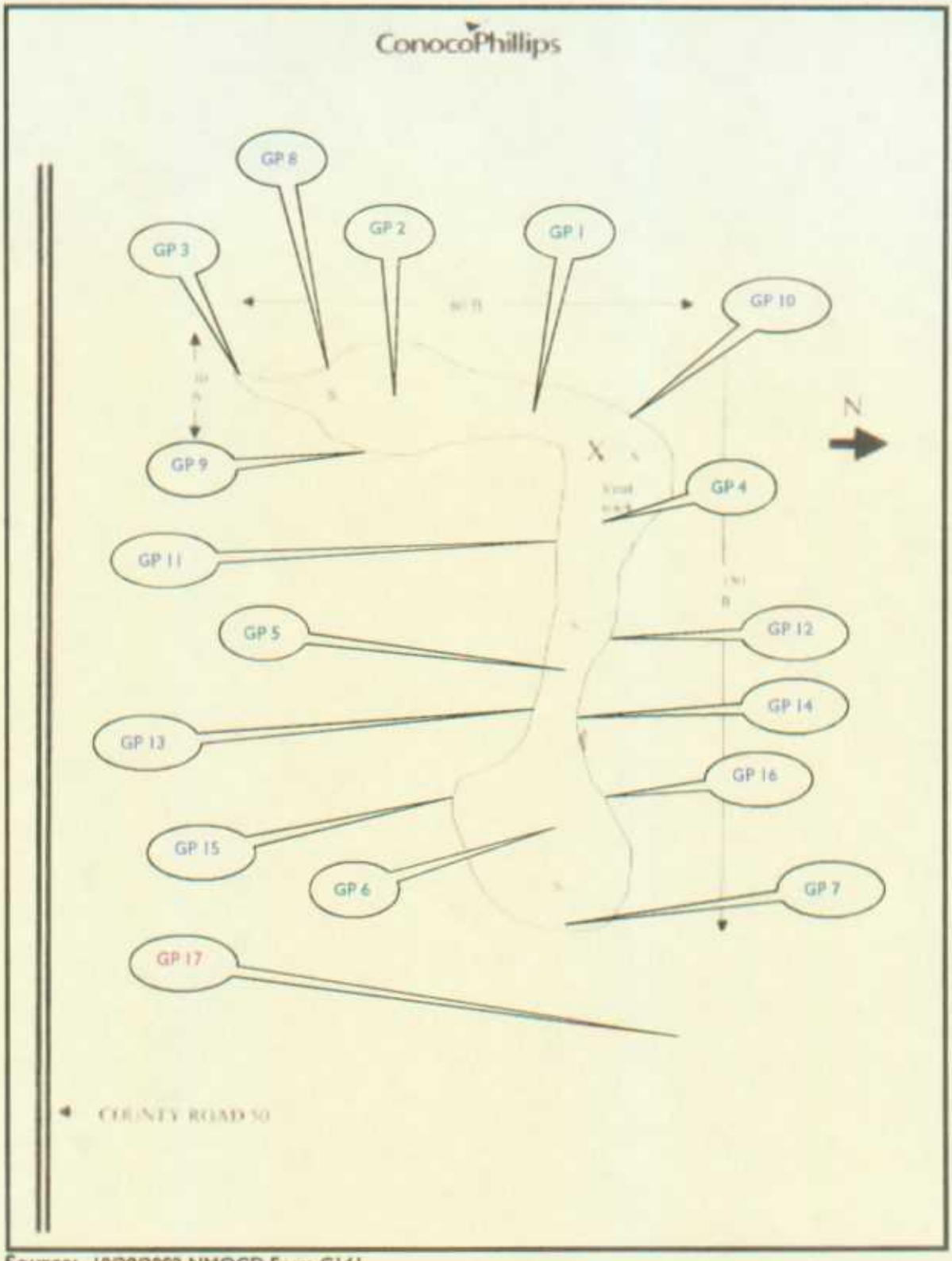
645,200.0
103W 26' 50"
-103.44709
645,400.0
103W 26' 42"
-103.44495
645,600.0
32N 48' 01"
32.80019
3,630,200.0
32N 47' 54"
32.79838
3,630,000.0
32N 47' 48"
32.79657
-103.44929
103W 26' 57"
103W 26' 50"
-103.44715
645,400.0
103W 26' 42"
-103.44502
645,600.0
SB-1
VG-3
VG-1
VG-2
MAXIM Technologies Inc
ConocoPhillips
East Vacuum Glorietta
Figure 3. Monitoring Well Locations (VG)
SB-1 B&H Boring
2000'
1,000yd

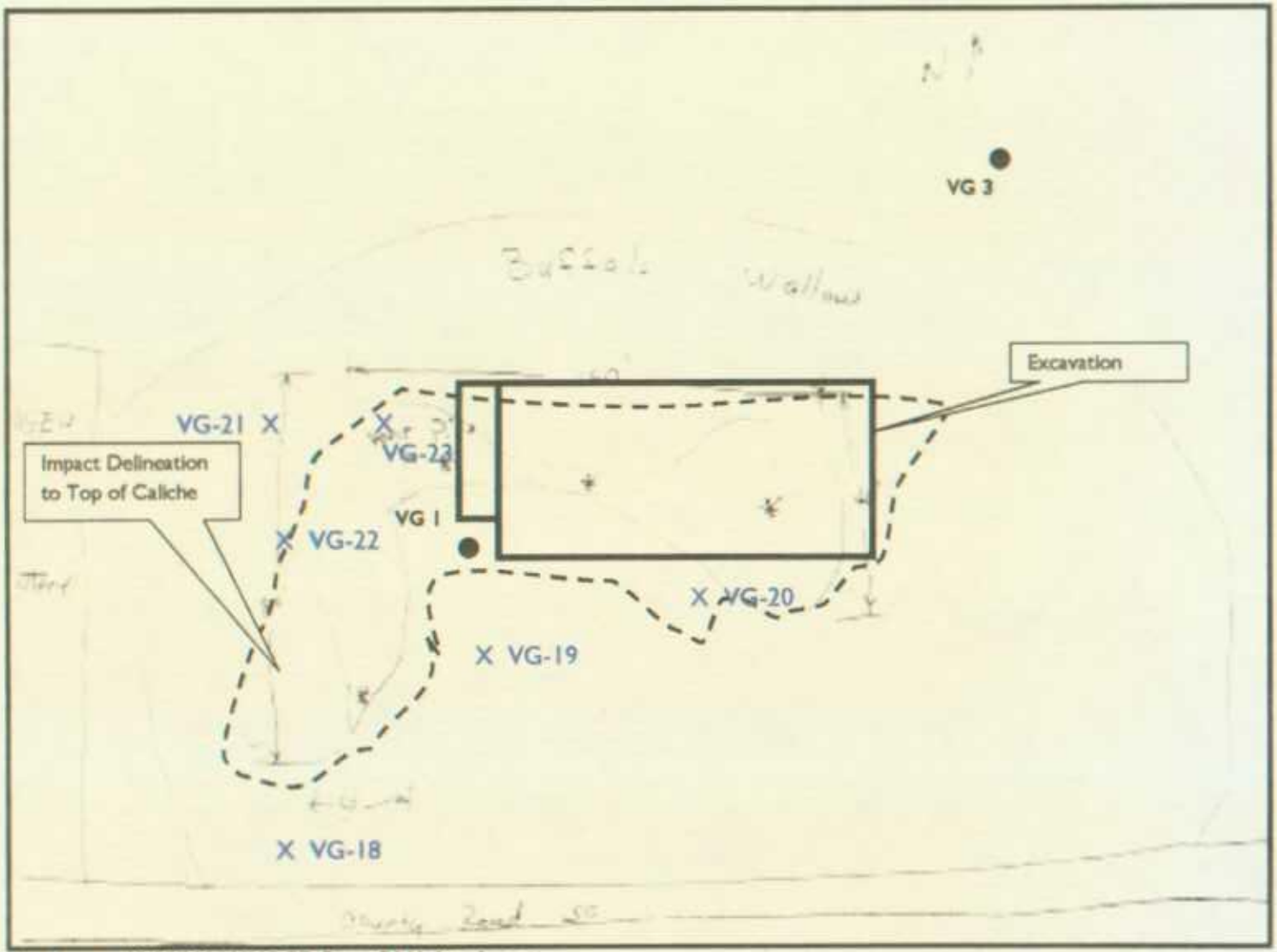


Source: 10/28/2002 NMOCD Form C141 Attachment

MAXIM Technologies	
ConocoPhillips	East Vacuum Glorietta

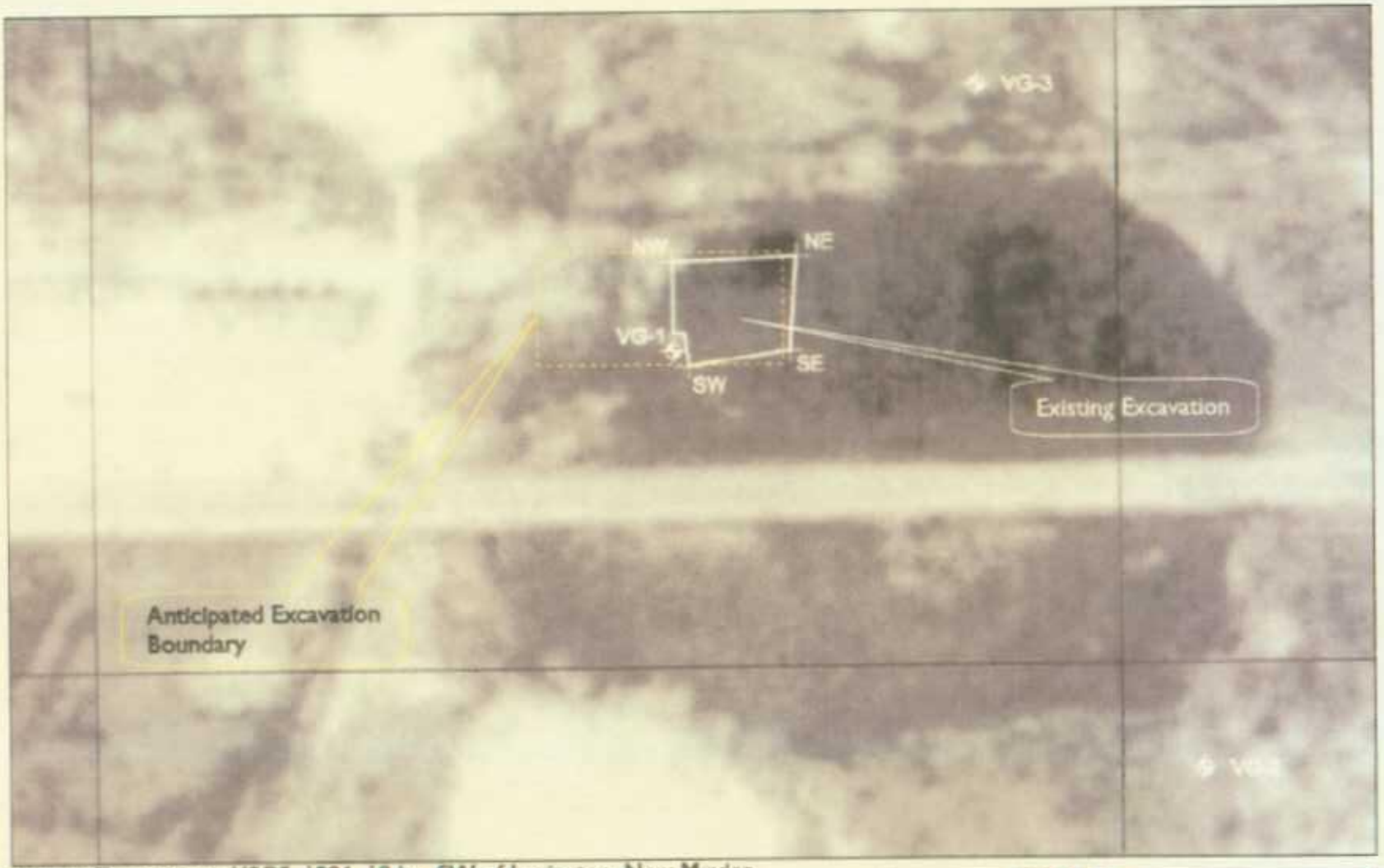
Figure 4. GeoProbe Locations

Figure 5. Condensate/Produced Water Release Area



Base Source: 10/28/2004 NMOCD Form C141 Attachment

MAXIM Technologies	
ConocoPhillips	East Vacuum Glorietta
Figure 6. Spill Footprint & September 2004 Boring Locations	



Source: Terraserver: USGS, 1996. 19 km SW of Lovington, New Mexico.

MAXIM Technologies	
ConocoPhillips	East Vacuum Glorietta

Figure 7. East Tank Battery Playa Excavation

APPENDICES

A – AERIAL PHOTOGRAPHS

B – LOGS & CONSTRUCTION DIAGRAMS

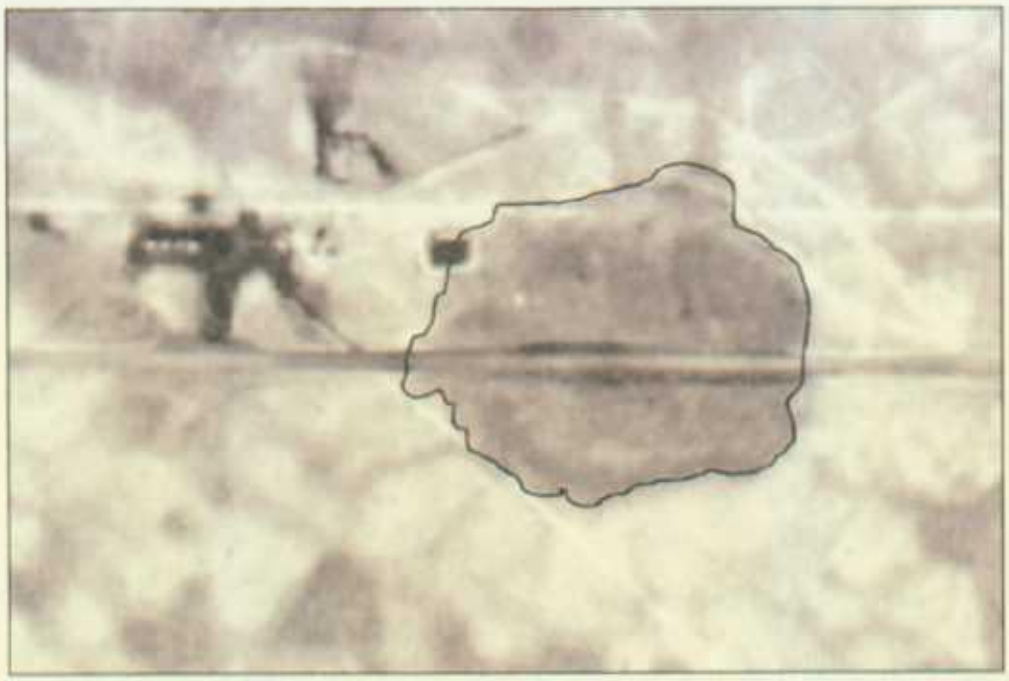
C – 07/12/2004 NMOCD E-MAIL

APPENDIX A

AERIAL PHOTOGRAPHS

ConocoPhillips

VACUUM GLORIETTA EAST TANK BATTERY PLAYA
PHOTO LOG



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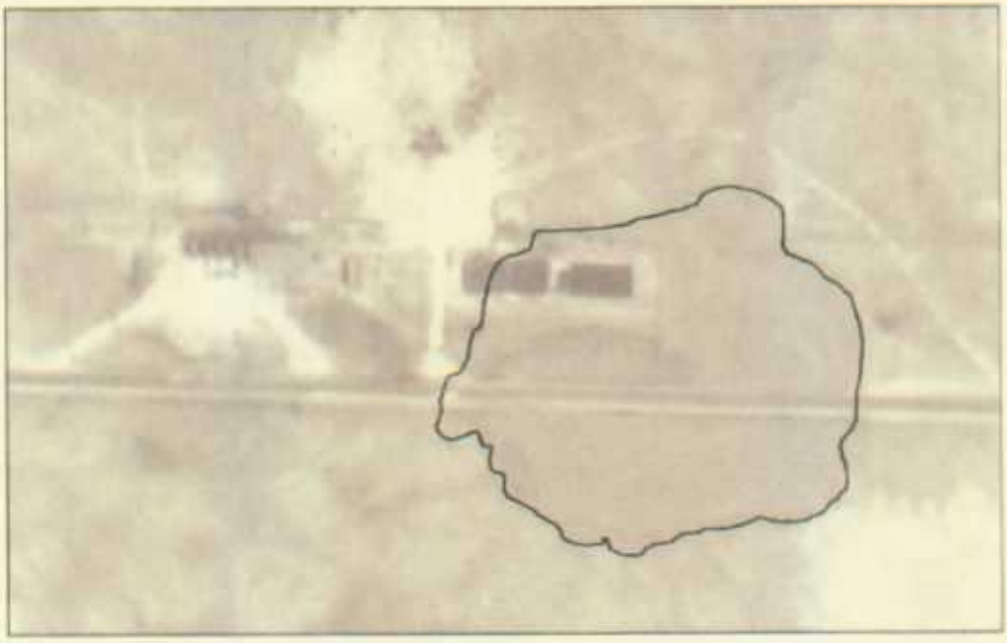

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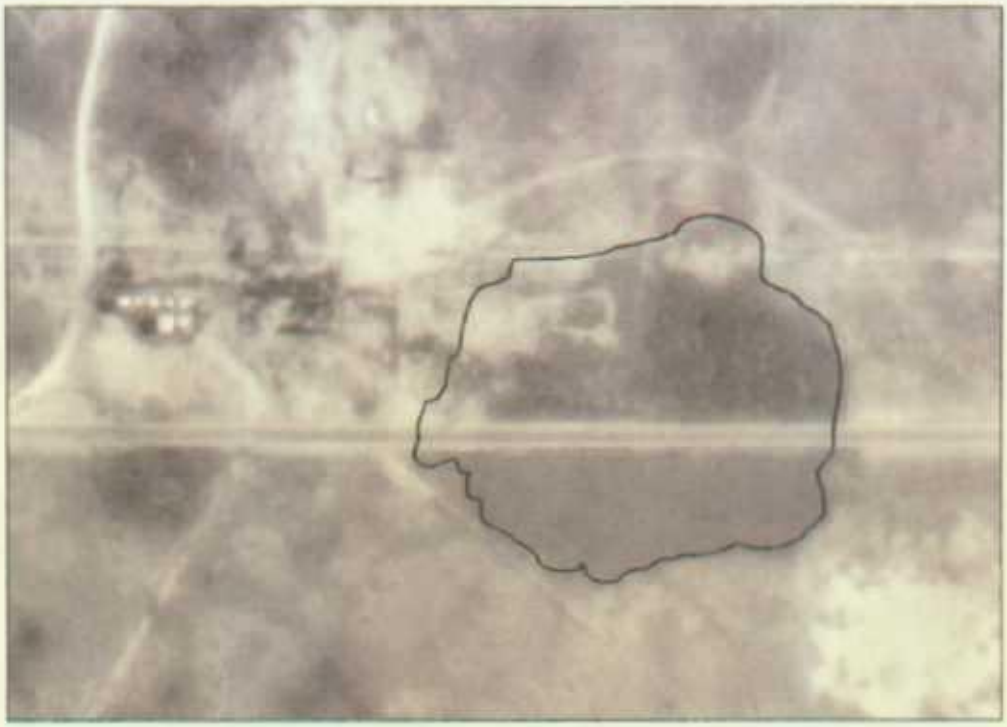

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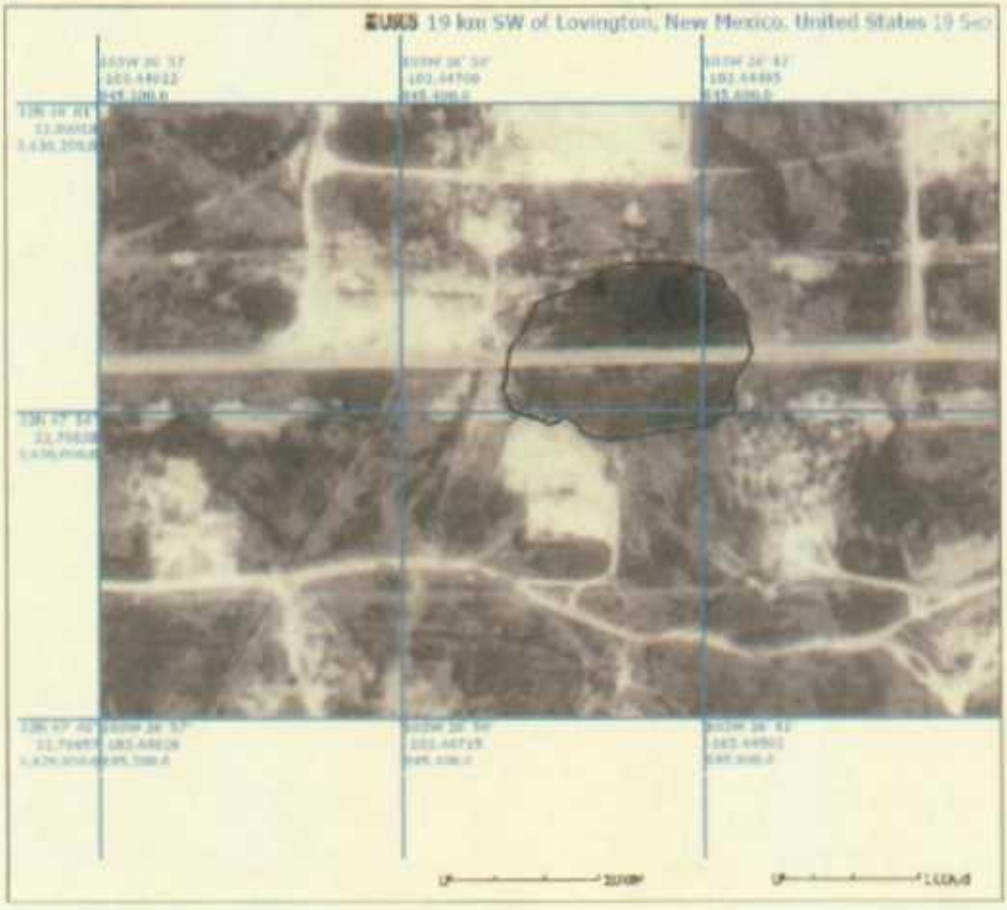


1996

APPENDIX B

LOGS & WELL CONSTRUCTION DIAGRAMS

MAXIM Boring/ Well Log

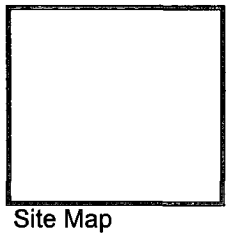
Client__Conoco_____ Project No.__4640008_____
Location__Vacuum Glorieta_____ Driller _Lane_____
Boring/Well No.__VG - 1_____ Drilling Co._Scarborough Drillin
Surface Elevation_3,928.84'_____ Boring Dia._5 in._____
Dates Drilled___02-04-04_____ Fluids used___Air_____
Logged By__Lichnovsky_____ Depth to Water___60'_____
Weather_Sunny and Cool_____

Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark gray, plastic, strong hydrocarbon smell Split spoon 0-2 no rec.	0 - 4	1289		
5	Clay, light brown, sandy, Caliche, white, hard strong hydrocarbon smell Split spoon 4-6 PID 1116 1 foot rec.	4 - 9	591		
10	Caliche, white to light gray, hard with sandy clay stringers, hydrocarbon smell	9 - 15	243		
15					
	Caliche, white to light gray, hard Strong hydrocarbon smell	15 - 20	>9999		
20					
	Sand, light brown, very fine to fine, with thin caliche layers. Split spoon 20-22 PID 907 1 foot rec.	20 - 25	322		
25					
	Sand, light brown, very fine to fine, with thin caliche layers. Split spoon 25-27 PID 274 1 foot rec.	25 - 30	290		
30					
	Sand, light brown, very fine to fine, with thin caliche layers. Split spoon 30-32 PID 245 1 foot rec.	30 - 35	133		
35					

MAXIM Boring/ Well Log

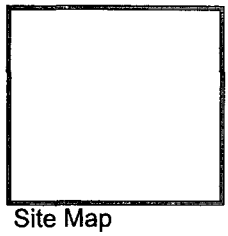
Client__Conoco_____ Project No.__4640008_____
Location__Vacuum Glorieta_____ Driller __Lane_____
Boring/Well No._VG-1_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._5 in._____
Dates Drilled__02-04-04_____ Fluids used___Air_____
Logged By__Lichnovsky_____ Depth to Water____60'_____
Weather__Sunny and cool_____


Site Map

	Description	Interval	PID	TPH	Well Design
35	Sand, light brown, very fine to fine, with thin caliche layers.	35 - 40	138		
40	Sand, light brown, very fine to fine, with thin caliche layers.	40 - 45	95.8	>9999	
45	Sand, light brown, very fine to fine, with thin caliche layers.	45 - 50	71.9	>9999	
50	Sand, light brown, very fine to fine, with thin caliche and gray clay stringers, moist	50 - 55	35.4	4140	
55	Wet, no samples to surface.	55 - 70			
60					
65					
70	TD 70 feet				

MAXIM Boring/ Well Log

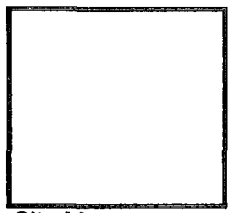
Client__Conoco_____ Project No.__4640008_____
Location__Vacuum Glorieta_____ Driller _Lane_____
Boring/Well No.__VG - 2_____ Drilling Co._Scarborough Drilling_
Surface Elevation____3,930.39'____ Boring Dia._5 in._____
Dates Drilled___02-05-04_____ Fluids used___Air_____
Logged By__Lichnovsky_____ Depth to Water___63'_____
Weather_Sunny and Cool_____


Site Map

	Description	Interval	PID	Graphic	Well Design
0	Caliche, white to light gray, hard with sandy clay stringers, no smell	0 - 5	1.7		
5	Caliche, white to light gray, hard	5 - 10	0.8		
10	Caliche, white to light gray, hard	10 - 15	4.2		
15	Caliche, white to light gray, hard	15 - 20	0.6		
20	Clay, light grayish brown, sandy	20 - 25	1.4		
25	Sand, light brown, very fine to fine, with thin caliche layers.	25 - 30	0.9		
30	Sand, light brown, very fine to fine, with thin caliche layers.	30 - 35	0.6		
35					

MAXIM Boring/ Well Log

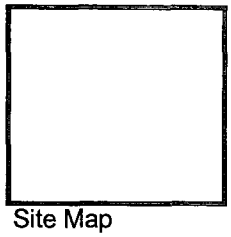
Client__Conoco_____ Project No.__4640008_____
Location__Vacuum Glorieta_____ Driller __Lane_____
Boring/Well No._VG-2_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._5 in._____
Dates Drilled__02-05-04_____ Fluids used___Air_____
Logged By__Lichnovsky_____ Depth to Water____63'_____
Weather__Sunny and cool_____


Site Map

	Description	Interval	PID	Graphic	Well Design
35	Sand, light brown, very fine to fine, with thin caliche layers.	35 - 40	0.8		
40	Sand, light brown, very fine to fine, with thin caliche layers.	40 - 45	0.9		
45	Sand, light brown, very fine to fine, with thin caliche layers.	45 - 50	0.4		
50	Sand, light brown, very fine to fine, with thin caliche layers.	50 - 55	0.3		
55	Sand, light brown, very fine to fine, with thin caliche and gray clay stringers, moist	55 - 60	2.9		
60	Wet, no samples to surface.	60 - 70			
65					
70	TD 70 feet				

MAXIM Boring/ Well Log

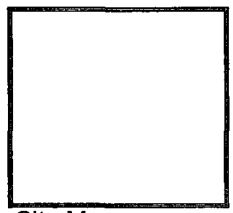
Client__Conoco_____ Project No.__4640008_____
Location__Vacuum Glorieta_____ Driller _Lane_____
Boring/Well No.__VG - 3_____ Drilling Co._Scarborough Drilling
Surface Elevation____3,930.84'_____ Boring Dia._5 in._____
Dates Drilled___02-05-04_____ Fluids used___Air_____
Logged By__Lichnovsky_____ Depth to Water___62'_____
Weather_Sunny and Cool_____


Site Map

	Description	Interval	PID	Graphic	Well Design
0	Caliche, white to light gray, with sandy clay	0 - 5	1.4		
5	Sand, light yellowish brown to light tan, very fine to fine grained, with caliche layers	5 - 10	0.2		
10	Sand, light yellowish brown to light tan, very fine to fine grained, with caliche layers	10 - 15	0.1		
15	Caliche, white to light gray, hard	15 - 20	1.2		
20	Sand, light brown, very fine to fine, with thin caliche and light brown clay stringers	20 - 25	3.2		
25	Sand, light brown, very fine to fine, with thin caliche layers.	25 - 30	0.7		
30	Sand, light brown, very fine to fine, with thin caliche layers.	30 - 35	1.6		
35					

MAXIM Boring/ Well Log

Client__Conoco_____ Project No.__4640008_____
Location__Vacuum Glorieta_____ Driller __Lane_____
Boring/Well No._VG-3_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._5 in._____
Dates Drilled__02-05-04_____ Fluids used___Air_____
Logged By__Lichnovsky_____ Depth to Water____62'_____
Weather__Sunny and cool_____


Site Map

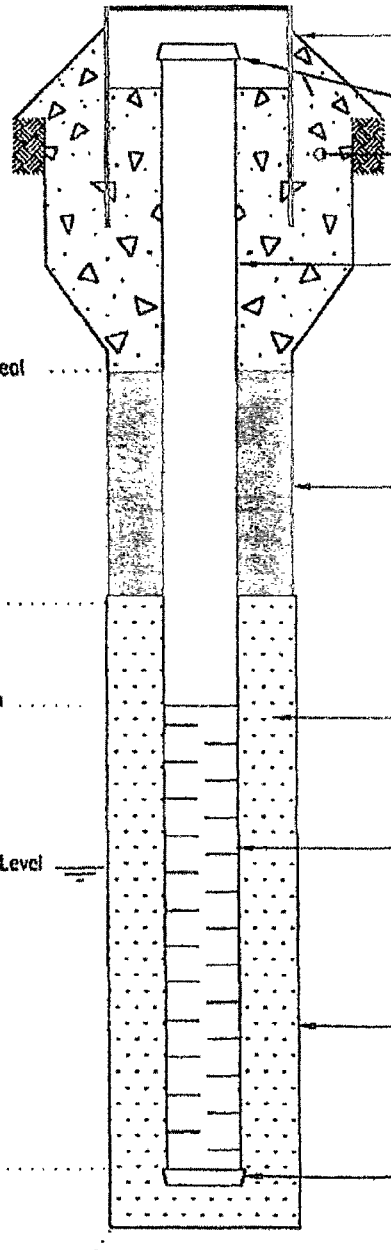
	Description	Interval	PID	Graphic	Well Design
35	Sand, light brown, very fine to fine, with thin caliche layers.	35 - 40	1.0		
40	Sand, light brown, very fine to fine, with thin caliche layers.	40 - 45	1.6		
45	Sand, light brown, very fine to fine, with thin caliche layers.	45 - 50	0.4		
50	Sand, light brown, very fine to fine, with thin caliche layers.	50 - 55	0.3		
55	Sand, light brown, very fine to fine, with thin caliche and gray clay stringers, moist	55 - 60	0.3		
60	Wet, no samples to surface.	60 - 70			
65					
70	TD 70 feet				

PROJECT NAME: Vacuum Glorieta
LOCATION: Buckeye
PROJECT NUMBER: 464 0008

MONITORING WELL NO. VG-1
SHEET 1 OF 1
LOCATION: Refer to Site Map

DRILL TYPE: Air
DRILLED BY: Scarborough Drilling
LOGGED BY: Frank Lichnovsky
REMARKS:

DATE HOLE STARTED: 2-4-04
COMPLETED: 2-4-04



Ground Surface

Depth to Top of Bentonite Seal: 36

Depth to Top of Filter Pack: 46

Depth to Top of Well Screen: 49

Depth to Initial Static Water Level: 59.62

Depth to Bottom Screen: 69

Depth to Bottom of Boring: 70

NOT TO SCALE

Protective Casing	8-inch Diam. Steel Bolt-down Manhole
Water Tight Cap	Locking Expandable
Surface Completion	2 ft. x 2 ft. Concrete Pad
Well Casing	2-inch Schedule 40 PVC
Bentonite Seal	Bentonite chips
Filter Pack	8-16 Sand
Well Screen	2" slotted PVC
Boring Diameter	5 inch
End Cap	69 feet 2 inch PVC

MAXIM TECHNOLOGIES INC

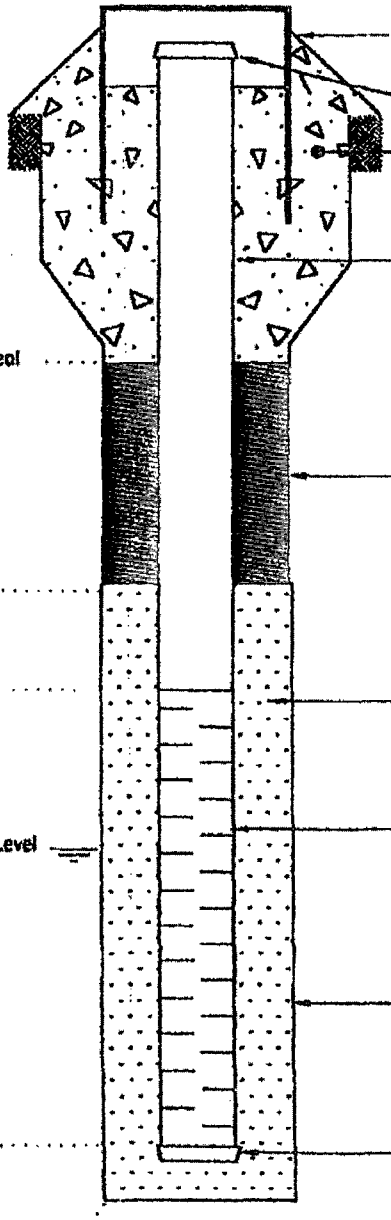
MONITORING WELL CONSTRUCTION DIAGRAM

PROJECT NAME: Vacuum Glorieta
LOCATION: Buckeye
PROJECT NUMBER: 464.0008

MONITORING WELL NO. VG-2
SHEET 1 OF 1
LOCATION: Refer to Site Map

DRILL TYPE: Air
DRILLED BY: Scarborough Drilling
LOGGED BY: Frank Lichyovsky
REMARKS:

DATE HOLE STARTED: 2-5-04
COMPLETED: 2-5-04



Ground Surface

Protective Casing — 8-inch Diam. Steel Bolt-down Manhole
Water Tight Cap — Locking Expandable
Surface Completion — 2 ft. x 2 ft. Concrete Pad
Well Casing — 2-inch Schedule 40 PVC

Depth to Top of Bentonite Seal
41

Bentonite Seal — Bentonite chips

Depth to Top of Filter Pack
52

Depth to Top of Well Screen
54

Filter Pack — 8-16 Sand

Well Screen — 2" slotted PVC

Depth to Initial Static Water Level
62.77

Boring Diameter — 5 inch

Depth to Bottom Screen
69

End Cap — 2 in PVC

Depth to Bottom of Boring
70

NOT TO SCALE

MAXIM TECHNOLOGIES INC

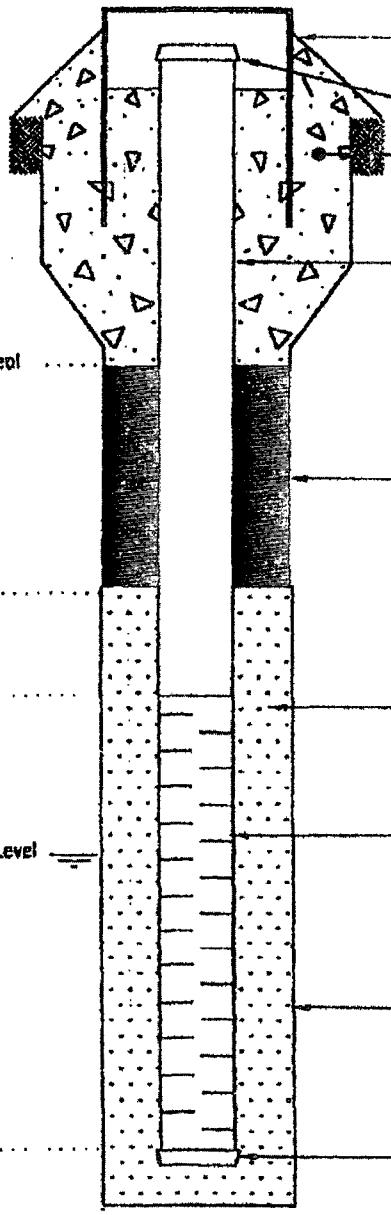
MONITORING WELL CONSTRUCTION DIAGRAM

PROJECT NAME: Vacuum Glorieta
LOCATION: Buck eye
PROJECT NUMBER: 464008 8

MONITORING WELL NO. VG-3
SHEET 1 OF 1
LOCATION: Refer to Site Map

DRILL TYPE: Air
DRILLED BY: Scarborough Drilling
LOGGED BY: Frank Lichaorsky
REMARKS:

DATE HOLE STARTED: 2-5-04
COMPLETED: 2-5-04



Ground Surface

Protective Casing — 8-inch Diam. Steel Bolt-down Manhole
Water Tight Cap — Locking Expandable
Surface Completion — 2 ft. x 2 ft. Concrete Pad
Well Casing — 2-inch Schedule 40 PVC

Depth to Top of Bentonite Seal: 36
Bentonite Seal — Bentonite chips

Depth to Top of Filter Pack: 52
Filter Pack — 8-16 Sand

Depth to Top of Well Screen: 55
Well Screen — 2" slotted PVC

Depth to Initial Static Water Level: 62.15

Boring Diameter — 5 inch

Depth to Bottom Screen: 70
End Cap — 2 inch PVC

Depth to Bottom of Boring: 70

NOT TO SCALE

MAXIM TECHNOLOGIES INC

MONITORING WELL CONSTRUCTION DIAGRAM

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-1_____ Drilling Co.__ESN, South____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-19-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

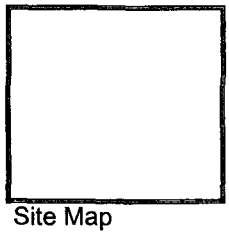
Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, black to reddish brown, strong smell	0 - 3	1416		
	Clay, reddish brown, slightly sandy, moderate smell	3 - 6	620		
5	Caliche, white, chalky				
	Caliche, white, chalky to indurated	6 - 8	371		
8	TD 8 feet				

Page____of_____

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-2_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-19-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown, no smell	0 - 3	0		
	Clay, dark reddish brown, slightly sandy	3 - 6	0.5		
5	Caliche, white, chalky	6 - 7			
7	Caliche, white, chalky to indurated. with gravel				
	TD 7 feet				

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-3_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-19-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown, no smell	0 - 3	0.4		
	Clay, reddish brown, slightly sandy	3 - 6	1.1		
5	Caliche, white, chalky				
	Caliche, white, chalky to indurated, with gravel	6 - 9	0.1		
9	TD 9 feet				

MAXIM GeoProbe/ Well Log

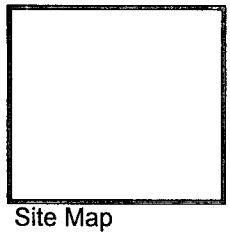
Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-4_____ Drilling Co.__ESN, South____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-19-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

Description	Interval	PID	Graphic	Well Design
0 Clay, black to dark brown	0 - 3	14.9		
Clay, reddish brown, slightly sandy	3 - 6			
5 Caliche, white, chalky to indurated				
TD 6 feet				

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-5_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-19-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, black, strong smell	0 - 3	73.4		
	Clay, reddish brown, slightly sandy	3 - 6	61.3		
5	Caliche, white to dark gray, chalky to indurated	6 - 8	140		
8	TD 8 feet				

MAXIM GeoProbe/ Well Log

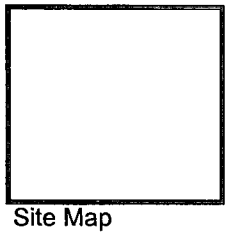
Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-6_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-19-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, black	0 - 3	12.2		
	Clay, dark brown, slightly sandy	3 - 6	0.6		
5	Caliche, white to dark gray, chalky to indurated, with gravel lenses	6 - 9	251		
10	Caliche, white to dark gray, chalky to indurated,	9 - 12	185		
	Caliche, white to dark gray to orange chalky to indurated	12 - 15	294		
15	Caliche, white to dark gray to orange chalky to indurated Sand, black,	15 - 18	235		
	TD 18 feet				

MAXIM GeoProbe/ Well Log

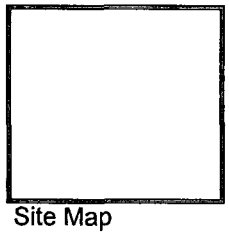
Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-7_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-19-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown	0 - 3	5.9		
	Clay, dark brown, slightly sandy	3 - 6	8.3		
5					
	Clay, dark brown, slightly sandy, with light brown sand lenses	6 - 9	1.3		
10	Caliche, white, chalky to indurated,	9 - 11	2.9		
	TD 11 feet				

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-8_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-19-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

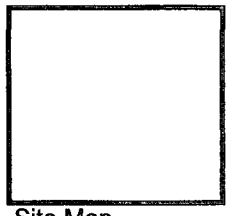

Site Map

Description	Interval	PID	Graphic	Well Design
0 Clay, dark brown	0 - 3	7		
Clay, reddish brown, slightly sandy	3 - 6	9		
5 Caliche, white, chalky to indurated				
TD 6 feet				

Page____of _____

MAXIM GeoProbe/ Well Log

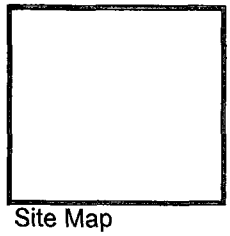
Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-9_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

Description	Interval	PID	Graphic	Well Design
0 Clay, brown	0 - 3	0		
Clay, brown, slightly sandy	3 - 6	0		
5 Caliche, white, chalky				
Caliche, white, chalky to indurated	6 - 8	0.6		
8 TD 8 feet				

MAXIM GeoProbe/ Well Log

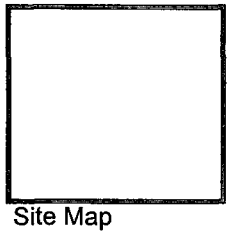
Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-10_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

Description	Interval	PID	Graphic	Well Design
0 Clay, dark brown	0 - 3	10.1		
Caliche, white, chalky to indurated				
TD 3 feet				

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-11_____ Drilling Co.__ESN, South____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

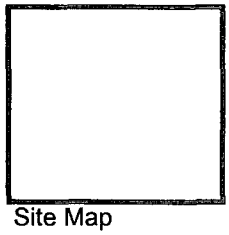

Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown	0 - 3	21.9		
	Clay, dark brown, slightly sandy	3 - 6	3.4		
5					
	Caliche, white, chalky to indurated	6 - 9	16.2		
9					
	TD 9 feet				

Page____of _____

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-12_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

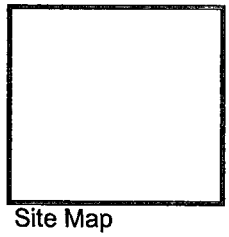

Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown	0 - 3	31.5		
	Clay, dark brown, slightly sandy	3 - 6	17.9		
5					
	Caliche, white, chalky to indurated	6 - 9	10.6		
9					
	TD 9 feet				

Page____of _____

MAXIM GeoProbe/ Well Log

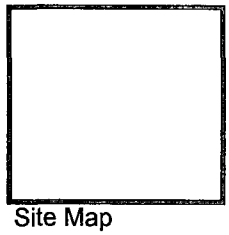
Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller__Don_____
Boring/Well No.____GP-13_____ Drilling Co.__ESN, South____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

Description	Interval	PID	Graphic	Well Design
0 Clay, dark brown	0 - 3	17.7		
Clay, brown, sticky	3 - 6	8.5		
5				
Clay, brown, slightly sandy	6 - 9	8.8		
Caliche, white, chalky to indurated				
9				
TD 9 feet				

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-14_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

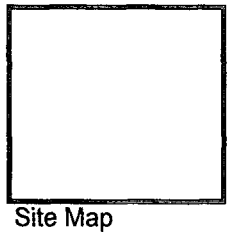

Site Map

Description	Interval	PID	Graphic	Well Design
0 Clay, dark brown	0 - 3	8.8		
Caliche, white, chalky to indurated	3 - 6	5.7		
5 TD 6 feet				

Page____of _____

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-15_____ Drilling Co.__ESN, South____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

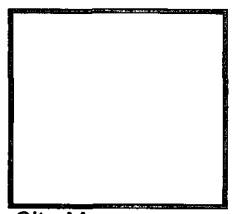

Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown	0 - 3	6.3		
	Clay, brown, sticky in part	3 - 6	2.3		
5					
	Caliche, white, chalky to indurated	6 - 9	0		
9					
	TD 9 feet				

Page____of _____

MAXIM GeoProbe/ Well Log

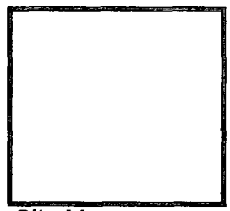
Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-16_____ Drilling Co.__ESN, South____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown	0 - 3	0		
	Clay, dark brown, slightly sandy	3 - 6	0		
5					
	Clay, dark brown, slightly sandy Caliche, white, chalky to indurated	6 - 9	0		
9	TD 9 feet				

MAXIM GeoProbe/ Well Log

Client__Conoco_____ Project No.__4640031_____
Location_Vacuum Glorieta_____ Driller __Don_____
Boring/Well No.____GP-17_____ Drilling Co.__ESN, South_____
Surface Elevation_____ Boring Dia._2 in._____
Dates Drilled__5-20-04_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____


Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown	0 - 3	0.1		
	Clay, dark brown, slightly sandy	3 - 6	0.1		
5	Clay, brown	6 - 9	0		
10	Caliche, white, chalky to indurated,	9 - 11			
	TD 11 feet				

MAXIM safety excellence

Boring/ Well Log

Client__Conoco_____ Project No.__4640037_____
Location_Vacuum Glorieta_____ Driller __Scott_____
Boring/Well No.____VG-18_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._4.75 in._____
Dates Drilled__9-14-2004_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

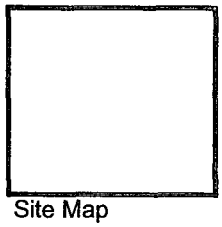
Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark brown, plastic, slightly moist,with red sand, VF, clayey, 3-	0 - 10	0		
5	Caliche, white, chalky to moderate hard	10-20	0		
	Sand, lt brown, yellowish, vf-f, friable to slightly compact, subangular to sub rounded	20-30	0		
#	Sand, lt yellowish, lt reddish brown.vf-f, slightly compact, subangulor to subrounded, thin clay stringers	30-40	0		
	Sand, lt yellowish, lt brown, vf-f, subangulor to subround, slighty compact, thin clay and caliche stringers	40-50	0		
	TD 50 feet				

MAXIM safety excellence

Boring/ Well Log

Client__Conoco_____ Project No.__4640037_____
Location_Vacuum Glorieta_____ Driller __Scott_____
Boring/Well No.____VG-19_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._4.75 in._____
Dates Drilled__9-15-2004_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____



Site Map

Description	Interval	PID	Graphic	Well Design
Clay, dark gray to lt brown, slightly plastic, trace to slightly sandy, caliche, white, chalky to hard 8-	0 - 10	0		
Caliche, white, chalky, f, hard	10-20	0		
Sand, lt yellowish brown, vf-f, subangular-subround, slightly compact, scattered thin clay stringers	20-30	0		
Sand, as above	30-40	0		
Sand, as above	40-50	10.2		
TD 50 feet				

MAXIM safety excellence

Boring/ Well Log

Client__Conoco_____ Project No.__4640037_____
Location_Vacuum Glorieta_____ Driller __Scott_____
Boring/Well No.____VG-20_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._4.75 in._____
Dates Drilled__9-15-2004_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay dark gray, lt brown, slightly plastic, slightly sandy	0 - 10	0		
	Caliche, white, chalky-hard	10-20	208		
5	Sand, lt yellow orange, vf-f, subangular-subround	20-30	249		
10	As above	30-40	128		
	Sand, lt tan, lt brown, vf-f, subangular - subround, slighty compact	40-50	52.1		
	TD 50 feet				

MAXIM safety excellence

Boring/ Well Log

Client__Conoco_____ Project No.__4640037_____
Location_Vacuum Glorieta_____ Driller __Scott_____
Boring/Well No.____VG-21_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._4.75 in._____
Dates Drilled__9-15-2004_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

Site Map

	Description	Interval	PID	Graphic	Well Design
0	1' black clay, caliche, white, chalky-hard, dark black clay smell	0 - 10	636		
	Caliche, white, chalky - hard, sand, greeenish gray, smell	10-20	274		
5	Sand, gray, vf-f, subangular-subround, smell, oil on water	20-30	237		
10	As above	30-40	192		
	As above	40-50	133		
	TD 50 feet				

MAXIM safety excellence

Boring/ Well Log

Client__Conoco_____ Project No.__4640037_____
Location_Vacuum Glorieta_____ Driller __Scott_____
Boring/Well No.____VG-22_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._4.75 in._____
Dates Drilled__9-16-2004_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____

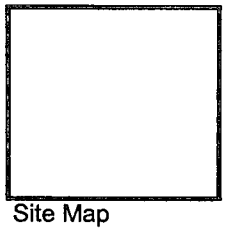
Site Map

Description	Interval	PID	Graphic	Well Design
Clay, dark brown, slightly plastic, slightly sandy, 8-19	0-10	72.6		
Caliche, white, chalky to hard	10-20	31.6		
Sand, lt yellow-lt brown, vf-f, subangular-subround, slightly compact, scattered thin clay stringers	20-30	26.9		
Sand, as above	30-40	12.6		
Sand, as above	40-50	133		
TD 50 feet				

MAXIM safety excellence

Boring/ Well Log

Client__Conoco_____ Project No.__4640037_____
Location_Vacuum Glorieta_____ Driller __Scott_____
Boring/Well No.____VG-23_____ Drilling Co.__Scarborough____
Surface Elevation_____ Boring Dia._4.75 in._____
Dates Drilled__9-16-2004_____ Fluids used_____
Logged By__Lichnovsky_____ Depth to Water_____
Weather_____



Site Map

	Description	Interval	PID	Graphic	Well Design
0	Clay, dark gray, slightly plastic, slightly sandy	0 -10	24.5		
	Caliche, white, chalky-hard	10-20	683		
5					
	Sand, black, vf-f, subangular- subround, slightly compact, strang smell	20-30	285		
10	Sand, lt yellowish brown, as above	30-40	95.7		
	Sand, as above	40-50	267		
	TD 50 feet				

APPENDIX C

NMOCD E-MAIL

Subj: **RE: ConocoPhillips Vacuum Glorieta Findings Report and Recommendations**
Date: 7/12/2004 6:40:01 PM Eastern Daylight Time
From: "Price, Wayne" <WPrice@state.nm.us>
To: "'Cwdurrett1@aol.com'" <Cwdurrett1@aol.com>, "Price, Wayne"<WPrice@state.nm.us>
Cc: "Williams, Chris" <CWilliams@state.nm.us>, "Sheeley, Paul"<PSheeley@state.nm.us>, neal.goates@conocophillips.com, Stephen.R.Wilson@ConocoPhillips.com, "Johnson, Larry"<LWJohnson@state.nm.us>

Sent from the Internet (Details)

OCD has reviewed the document and hereby denies your request to install a liner to cover contaminated soils in the playa lake. OCD will require ConocoPhillips to excavate soils to some practical extent to remove the major source of contamination and dispose of contaminated soils at an OCD approved site. Bottom hole and sidewall samples shall be collected and analyzed for BTEX and Chlorides using the SPLP method. Excavation may cease before the practical extent is reached if TPH and chloride levels are 100 ppm and 250 ppm or less respectfully. If analysis shows constituents to be below the WQCC groundwater limits or the actual groundwater conditions at the time then Conoco may backfill and compact with similar clean soil. ConocoPhillips shall notify the OCD District office to witness the sampling. A report shall be submitted by August 20, 2004 describing all activities, analytical results, photos, a groundwater monitoring and remediation plan for OCD approval. OCD will forgo the formal Rule 19 abatement process if the above actions are taken and groundwater remediated in a timely manner pursuant to the Rule 19 exemptions.

In addition, ConocoPhillips shall perform an internal investigation to determine why the spill report did not reflect that a watercourse was impacted and why ConocoPhillips did not report the spill or perform clean-up actions in a timely manner. The delay in clean-up actions may have caused groundwater contamination. The spill was found by OCD approximately 30 hours after the initial occurrence. Please provide to OCD by August 20, 2004 your findings in this manner and what actions, if necessary will be taken to remedy this problem in the future.

-----Original Message-----
From: Cwdurrett1@aol.com [mailto:Cwdurrett1@aol.com]
Sent: Wednesday, July 07, 2004 10:15 AM
To: WPrice@state.nm.us
Cc: Cwilliams@state.nm.us; psheeley@state.nm.us; neal.goates@conocophillips.com; Stephen.R.Wilson@ConocoPhillips.com
Subject: ConocoPhillips Vacuum Glorieta Findings Report and Recommendations

Attach is Mr. Neal Goates, ConocoPhillips, transmittal letter and Maxim Technologies' findings report for a playa adjacent to East Glorieta, East Tank Battery located in Lea County, New Mexico (Sec 27, T35S, R35E).

If you concur with the approach as presented in Mr. Goates letter, ConocoPhillips will authorize Maxim to proceed with the proposed program. Please contact Mr. Goates (832-379-6427) or me if you have any questions or require additional information.

If requested, Maxim will send a hard copy of the subject report. Please acknowledge receipt of this e-mail.
