1R - 465

REPORTS

DATE:

12/14/2004

Larson & Associates, Inc.
Environmental Consultants

December 14, 2004

VIA FACSIMILE: (505) 393-0720

Mr. Chris Williams
District Supervisor
Oil Conservation Division
New Mexico Energy, Minerals and Natural Resources Department
1625 North French Drive
Hobbs, New Mexico 88240

Re: Unlined Surface Impoundment Investigation Work Plan, John H. Hendrix Corp., Will Cary Lease, Unit Letter F (SE/4, NW/4), Section 22, Township 22 South, Range 37 East, Lea County, New Mexico

Dear Mr. Williams:

John H. Hendrix Corp. ("JHHC") has retained Larson and Associates, Inc. ("LA") to investigate an unlined surface impoundment ("Pit") located on the Will Cary Lease in the southeast quarter (SE/4) of the northwest quarter (NW/4), Section 22, Township 22 South, Range 37 East, in Lea County, New Mexico. The Pit was associated with a tank battery that once served the Will Cary Lease. However, the tank battery has been dismantled, and the pit has remained inactive for an undetermined amount of time. The pit is located about 300 feet east of the Will Cary #5 well (API #30-025-10410-00-00). Figure 1 presents a location and topographic map. Figure 2 presents a site drawing.

Background

On July 6, 2004, Mr. Buddy Hill with the District 1 office of the New Mexico Oil Conservation Division ("NMOCD"), located in Hobbs, New Mexico, conducted a routine inspection of the Will Cary Lease. The NMOCD notified JHHC of the pit, and issued a Notice of Violation ("NOV") on July 8, 2004, requiring JHHC to empty and remediate the pit in accordance with NMOCD rules and guidelines. The NMOCD required the corrective actions to be completed by October 9, 2004. An extension is requested until March 1, 2005, to complete the investigation and submit a remediation plan to the NMOCD. This investigation work plan has been prepared in accordance with NMOCD guideline titled, *" Pit and Below Grade Tank Guidelines, November 1, 2004"*.

Setting

The elevation of the land surface at the Will Cary Lease is about 3,365 feet above mean sea level (MSL), and the topography slopes gently to the southeast. No surface water features (i.e., ponds, lakes, rivers, streams, etc.) are located within 1-mile of the pit. Monument Draw is located about 2 miles southeast. Recent-age wind-blown sand overlies the Tertiary-age Ogallala formation, which overlies the Triassic-age Dockum Group. The Ogallala formation consists of sand, silt, clay and gravel derived from mountainous areas to the west. A layer of calcium carbonate (commonly referred to as caliche) is often present near the upper part of the Ogallala

formation and is resistant to erosion. The Ogallala formation rests unconformably on mudstone, sandstone and siltstone of the Chinle formation, an upper member of the Dockum Group. The unconformity developed when the surface of the Dockum group was exposed to erosion, removing a portion of the geological record, before the Ogallala formation was deposited.

Ground water occurs in the Ogallala formation (commonly referred to as the Ogallala or High Plains aquifer). Ground water in the Ogallala aquifer flows to the southeast (Alexander Nicholson, Jr. and Alfred Clebsch, Jr., 1961 and Ronit Nativ, 1988). The approximate depth to the water table, based on records compiled by Office of the New Mexico State Engineer ("NMSE") in Roswell, New Mexico, in Section 22, Township 22 South, Range 37 East is about 70 feet below ground surface (BGS). The depth-to-ground water ranges from about 59 to 90 feet BGS.

Proposed Investigation

LA proposes to assess concentrations of hydrocarbons and chloride in soil from samples collected from five (5) borings that will be drilled around the perimeter and near the center of the pit. The borings will be drilled using direct-push or air rotary drilling techniques. Soil samples will be collected continuously using a four-foot long stainless steel core barrel equipped with disposable sample liners if direct-push sampling is employed. However, if subsurface conditions prohibit direct-push sampling, soil samples will be collected at ground surface, and about every five (5) feet thereafter, using a split spoon or jam tube sampler in conjunction with air rotary drilling. The borings will be advanced until field observations suggest that the impact has diminished or approximately 70 feet BGS, whichever occurs first. The sampler will be washed between events using a solution of water and laboratory grade detergent, and rinsed with distilled water. The rig and down-hole equipment (i.e., bits, rods, etc.) will be washed between locations using a high-pressure washer. Figure 2 presents the approximate locations for the proposed borings.

Soil samples will be collected for field headspace and laboratory analysis. The field headspace samples will be collected according to industry and NMOCD procedures by partially filling a clean glass sample jar to approximately ¾ full with soil, sealing the opening with a layer of aluminum foil, and replacing the cap. The concentration of organic vapors in the container headspace will be checked with a photoionization detector (PID) equipped with a 10.3 electron-volt (eV) lamp after the samples have reached ambient temperature (approximately 30 minutes), or the samples may be heated, depending on the ambient temperature. The PID probe will be passed through the aluminum foil into the headspace, and the peak concentration, in parts per million (ppm), will be recorded on the field boring record. The PID will be calibrated to isobutylene prior to recording the measurements. The laboratory samples will be collected in clean glass sample jars, sealed, labeled, chilled in an ice chest and delivered under chain-of-custody control to an environmental laboratory.

The headspace method is a qualitative procedure accepted by the NMOCD for screening samples for petroleum hydrocarbons. The field headspace readings, in conjunction with observations (i.e., staining, odor, etc.), will be used to determine what samples will be analyzed by the laboratory. The NMOCD accepts field headspace analysis in lieu of laboratory analysis

for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) if headspace readings are below 100 ppm. Samples exhibiting field headspace readings greater than 100 ppm will be analyzed for BTEX using method SW-846-8021B, total petroleum hydrocarbons (TPH) using method SW-846-8015 for gasoline range organics (GRO) and diesel range organics (DRO), and chloride using method SW-846-9253. Additional samples will be analyzed for TPH and chloride to assess the vertical and horizontal extent of impact. Field boring logs will be prepared in accordance with the Unified Soil Classification System (USCS). Drill cuttings will be placed on the ground adjacent to the borings, and the borings will be plugged with bentonite.

The laboratory data will be evaluated and discussed with the NMOCD to determine the need for monitoring wells. Monitoring wells will be constructed in accordance with American Society of Testing Materials (ASTM) practices ASTM-D5092 and D5521, if required. The wells will be surveyed by a professional land surveyor licensed in New Mexico, and a ground water flow map prepared from depth-to-ground water measurements. Ground water samples will be analyzed for volatile organics, semi-volatile organics, dissolved metals, anions, cations and total dissolved solids (TDS).

LA will prepare a report and remediation plan for submittal to the NMOCD on or before March 1, 2005. Please call Mr. Ron Westbrook at (432) 684-6631 or myself at (432) 687-0901 if you have questions.

Sincerely,
Larson and Associates, Inc.

Mark J. Larson, P.G., C.P.G., C.G.W.P.
Senior Hydrogeologist/President

Enclosures

cc: Ron Westbrook
Michael Klein

FIGURES

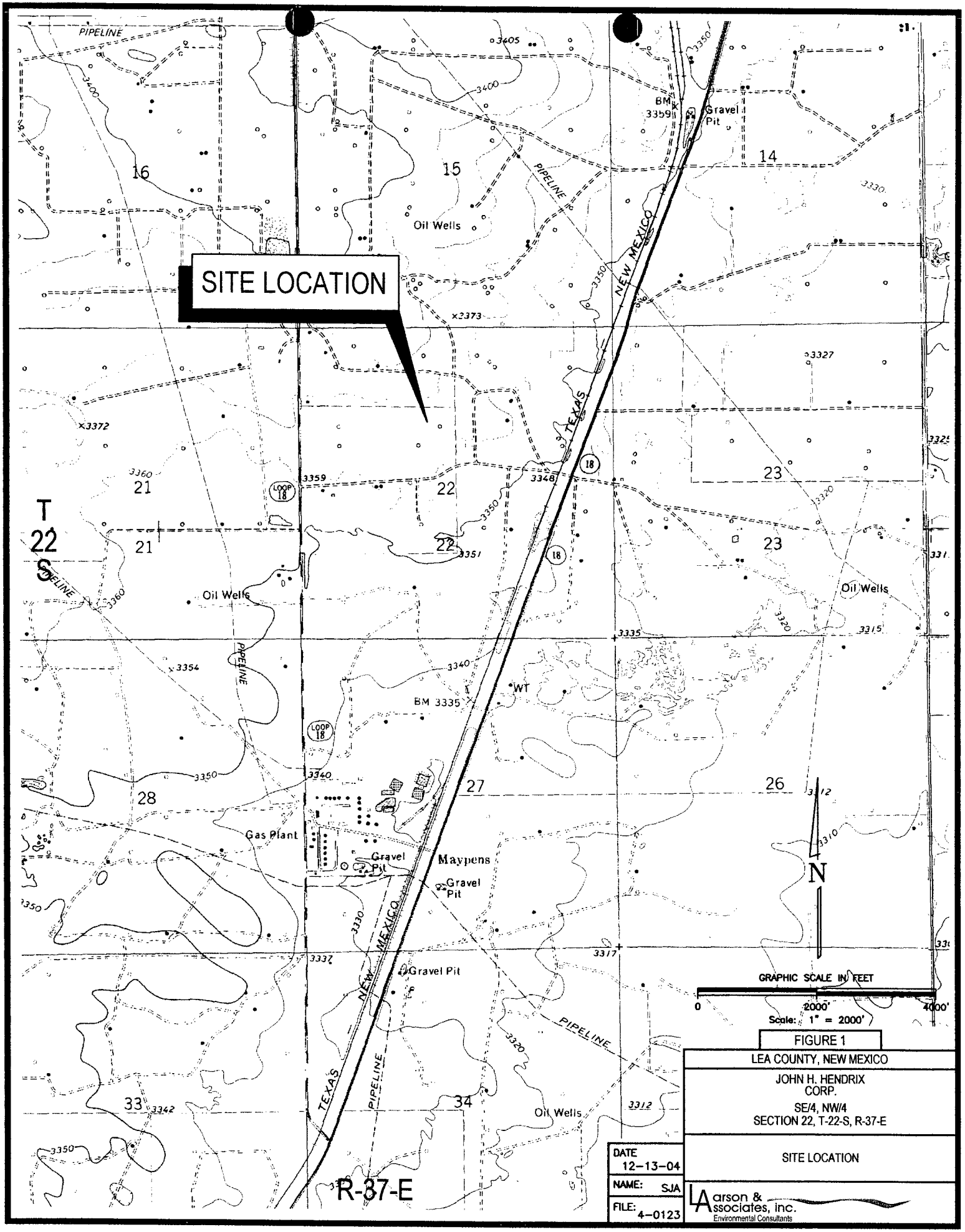

FIGURE 1

LEA COUNTY, NEW MEXICO

JOHN H. HENDRIX CORP.

SE/4, NW/4
SECTION 22, T-22-S, R-37-E

SITE LOCATION

DATE	12-13-04
NAME:	SJA
FILE:	4-0123

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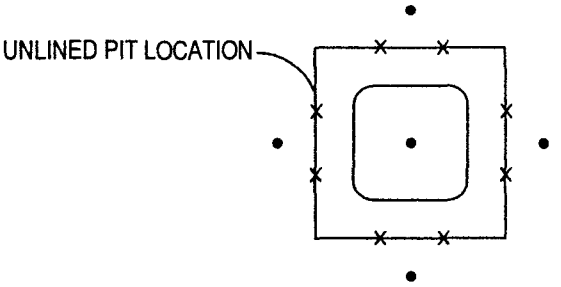

▲ JOHN H. HENDRIX CORP.
WILL CARY #5 WELL

GRAPHIC SCALE IN FEET

0 50' 100'

Scale: 1" = 50'

FIGURE # 2

LEA COUNTY, NEW MEXICO

JOHN H. HENDRIX
CORP.
SE/4, NW/4
SECTION 22, T-22-S, R-37-E

SITE DRAWING

DATE	12-13-04
NAME:	SJA
FILE:	4-0123

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LEGEND

- PROPOSED BORING LOCATION

▲ - OIL WELL LOCATION