ConocoPhillips

RISK ASSESSMENT

AND

SITE CLOSURE PROPOSAL

WARREN UNIT SAN ANDRES

TRUNK LINE RELEASE SITE

UL-B NW¼ OF THE NE¼ OF SECTION 28 T20S R38E

~7.7 MILES NORTH (BEARING 3.6°)

OF EUNICE, LEA COUNTY, NEW MEXICO

LATITUDE: N32° 32' 57.62" LONGITUDE: W103° 09' 02.77"

SEPTEMBER 25, 2003

PREPARED BY:

Conoco - 21817
Release - fPAC0603426621
Impact - ePAC0603426746
Incident - nPAC0603426800
Appl. - pPAC0603426977

John Good
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September 25, 2003

Mr. Larry Johnson
New Mexico Oil Conservation Division
1625 North French
Hobbs, New Mexico 88240

Subject: ConocoPhillips Company Warren Unit San Andres Release Site

Dear Mr. Johnson:

Environmental Plus, Inc. (EPI), on behalf of ConocoPhillips Company, submits the attached "**Risk Assessment and Closure Proposal**" for the above referenced leak site located on land owned by the Federal Bureau of Land Management and leased to Robert McCasland. The site is located in the NW¼ of the NE¼ (Unit Letter B), Section 28, Township 20 South, and Range 38 East. The geographic location is 32°32'57.62"N and 103°09'02.77"W. The site is approximately 7.7 miles north (bearing 3.6°) of Eunice, Lea County, New Mexico. According to information obtained from the New Mexico Office of the State Engineer (NMOSE) database, ground water level beneath this site is conservatively estimated to be ~50-ft below ground surface (bgs). The site matrix ranking for this site is 20 based on depth to ground water from lowest contaminant level of <50-ft.

The remedial action proposal for this site is to install a 2-ft compacted clay barrier over the areal extents of the contamination at the depth interval of 5-ft to 7-ft. Two 1000-year VADSAT Risk Assessments (benzene and chlorides) were performed for this site incorporating conservative data parameters. The results of these VADSAT models indicate that the proposed placement of an impermeable layer above the zone of contamination will eliminate the risk of contaminant migration to the water table at 50-ft bgs.

If there are any questions please call Mr. Ben Miller, or myself, at our office or at 505-390-0288 and 505-390-9804, respectively, or Mr. C. John Coy, ConocoPhillips Hobbs/Eunice Area Operations Supervisor at 505-391-3127. All official written communications should be addressed to:

Mr. C. John Coy
ConocoPhillips Company
1410 NW County Road
Hobbs, New Mexico 88240

Sincerely,

John Good
EPI – Environmental Consultant

cc: C. John Coy, ConocoPhillips Company, Hobbs, NM
Dennis Ross, ConocoPhillips Company, Hobbs, NM
Ben Miller, EPI Vice President and General Manager
Sherry Miller, EPI President
File

ENVIRONMENTAL PLUS, INC.

Table of Contents

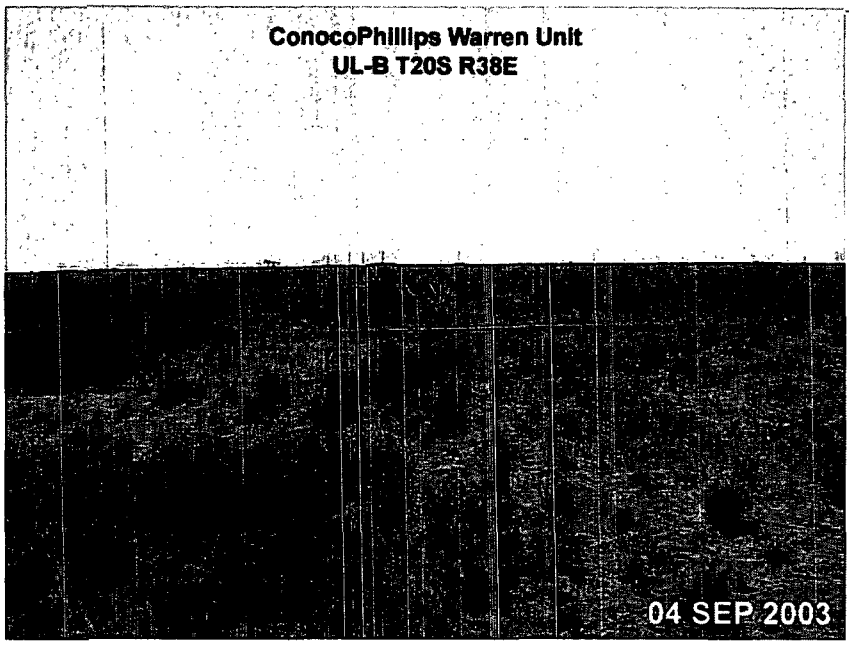
1.0 Introduction

This document addresses the initial site characterization, vertical contaminant delineation, partial excavation and the proposal to close this site with the installation of an impermeable clay barrier. Environmental Plus, Inc. (EPI), Eunice, New Mexico commenced the initial site characterization and delineation process at this site on September 4, 2003. To date (9-24-03), the following remediation activities have taken place:

- GPS demarcation and photography of the release site and relevant surface features. *(See Plate 3, Attachments).*
- Drilling and sampling of one borehole (BH3-E) to 25-ft bgs immediately adjacent to the Indian Fire & Safety Borehole #3. *(See Plates 3, 4, 5 and 6 - Attachments).*
- Partial excavation (to 7-ft bgs) and disposal of ~500-yd^3 of contaminated soil (as of 9-24-03, excavation still in progress). The excavation will ultimately have an approximate areal extent of 4,300-ft^2, which includes the 5-ft overlap area for the installation of a clay barrier *(See Plate 4, Attachments).*
- A conservative VADSAT 3.0 Risk Assessment was run for the site based on the analytical results for the borehole drilled by EPI on September 17, 2003. The analytical results *(Plates 5-6, Attachments)* indicate that the maximum TPH contamination below the proposed 7-ft clay barrier level is 577-ppm at 12-ft bgs; and the maximum chloride contamination is 608-ppm at 15-ft bgs *(See Plates 7 and 8, Attachments).*
- Water depth at this site is estimated to be ~50-ft bgs. The State Engineer's records indicate one water well in the northeast quarter of Section 18 T20S R38E with a depth-to-water of 50-ft, and one well in the southwest quarter of Section 26 T20S R38E with a depth-to-water of 65-ft. All calculations for this project, including the VADSAT Risk Assessments utilize 50-ft as the depth-to-water.

2.0 Background

Environmental Plus, Inc. (EPI) was contacted by ConocoPhillips Company early in September-2003 regarding the remediation of a pipeline release site located on a "Warren Unit San Andres" trunk line. The release is located on Bureau of Land Management land and is leased to Robert McCasland for grazing purposes (LC 031670B). ConocoPhillips' internal spill report (3-26-02) indicates a release at this location on March 25, 2002. 4-bbl of crude and 21-bbl of produced water were released at that time, with ~22-bbl combined recovery. A NMOCD C-141 Form *(page 22, Attachments)* has been completed based upon information contained within the ConocoPhillips internal spill report. A preliminary contaminant characterization of the site was performed by Indian Fire and Safety (IFS) in April-2003 with the drilling of three boreholes within the visible release extents to a depth of 15-ft bgs. The IFS analytical data indicates TPH contamination of 287-ppm and chloride contamination of 512-ppm at the 15-ft level in Borehole #3, ~20-ft south of the Point of Release (POR). EPI drilled a borehole in this same area on September 17, 2003. Confirmation samples were taken at the 7-ft and 15-ft levels, then the borehole was extended to 25-ft bgs with sampling at the 20-ft and 25-ft levels. As opposed to the IFS data, the EPI analytical data indicates a TPH concentration of 494-ppm at 7-ft (vs. the IFS data of 1940-ppm), and 29-ppm at 15-ft (vs. the IFS data of 287-ppm). EPI's chloride level is slightly higher at 15-ft bgs (608-ppm vs. 512-ppm).



Evaluation of the combined analytical data for this site results in the conclusion that chlorides are the deepest Contaminant of Concern (CoC) and that total removal of chlorides above the 250-ppm threshold level would require an excavation of nearly 25-ft depth.

Due to the prohibitive financial, engineering and safety factors involved with excavating to ~25-ft bgs in very sandy soil, EPI, on behalf of ConocoPhillips Company, is proposing to remediate and close this site with the installation of an impermeable 2-ft clay barrier. This proposal contains the VADSAT 3.0 Risk Assessment models for this site. The 1000-year assessments *(Plates 7 and 8, Attachments)*, compiled for both benzene and chlorides, project "no impact" on the water table with the installation of an impermeable layer at this site. EPI proposes to excavate and dispose of contaminated soil down to the 7-ft bgs level. The lateral contaminated extents of the release will be determined by field testing (PID) and then verified with composite sidewall samples analyzed for TPH, BTEX and Chlorides. A 5-ft "overlap" area will be excavated from the perimeter of the excavation. This clean material will be retained as backfill. The two-lift clay barrier system will be installed at the 7-ft depth of the excavation, each 1-ft layer being certified for >95% compaction by a Professional Engineer. The remaining 5-ft of the excavation will be backfilled with clean topsoil. All contaminated soil removed from the site will be disposed of in the J&L surface waste disposal facility.

3.0 Site Description

3.1 Site Location

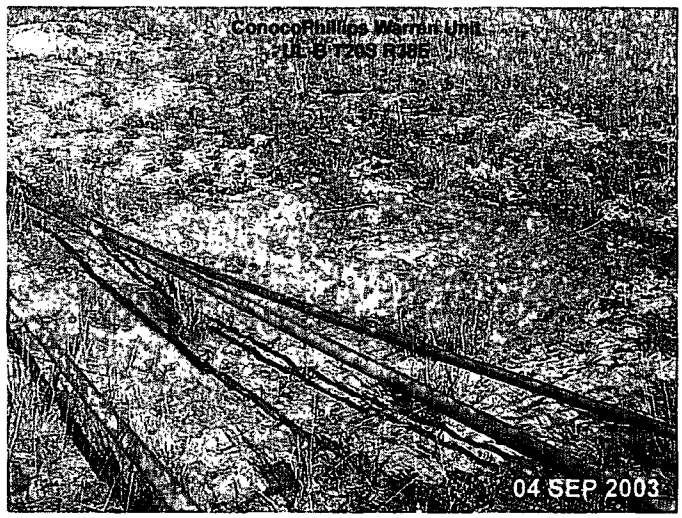
The ConocoPhillips "Warren Unit San Andres" site is located in UL-B of Section 28 T20S R38E. The site is approximately 3,479-ft from the west section line and 4,616-ft from the south section line. The Latitude and Longitude coordinates are: 32°32'57.62"N; 103°09'02.77"W. The land is owned by the federal government (BLM) and leased to Robert McCasland *(see Attachments, Plates 1, 2 and 3)*

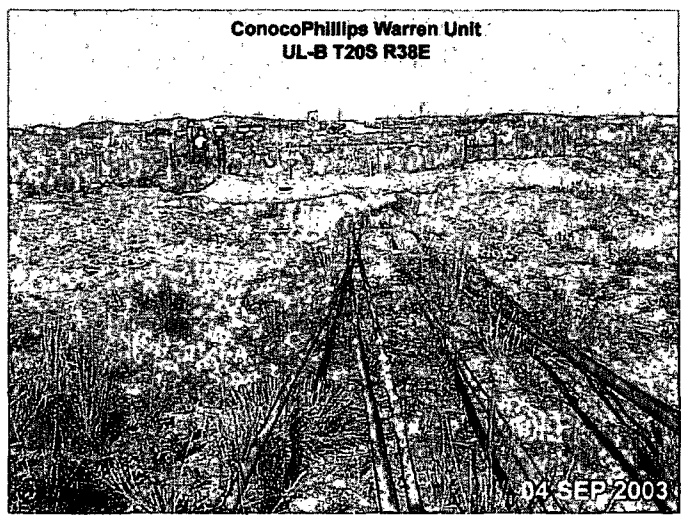
3.2 Geohydrology

The United States Geological Survey (USGS) Ground-Water Report 6, "Geology and Ground-Water Conditions in Southern Lea County, New Mexico," A. Nicholson and A. Clebsch, 1961, describes the near surface geology of southern Lea County as an intergrade of the Quaternary Alluvium (QA) sediments, i.e., fine to medium sand, with the mostly eroded Cenozoic Ogallala (CO) formation. Typically, the QA and CO formations in the area are capped by a thick interbed of caliche and generally overlain by sandy soil. The release site is located in the Eunice Plain physiographic subdivision, described by Nicholson & Clebsch as an area "underlain by a hard caliche surface and is almost entirely covered by reddish-brown dune

sand. The thickness of the sand cover ranges from 2-5 feet in most areas to as much as 20-30 feet in drift areas."

The subsurface at the site is composed of a hard caliche base at the 25-ft bgs level that is covered with 25-feet of reddish sand. Based on data obtained from the Office of the State Engineer for water wells in this vicinity, a conservative estimate of ground water depth at this site is ~50-ft bgs.





3.3 Ecology

The area is typical of the Upper Chihuahuan Desert Biome consisting primarily of hummocky sand hills covered with Harvard Shin Oak (Querqus harvardi) interspersed with Honey Mesquite (Prosopis glandulosa) along with typical desert grasses, flowering annuals and flowering perennials. Mammals represented, include Orrd's and Merriam's Kangaroo Rat, Deer Mouse, White Throated Wood Rat, Cottontail Rabbit, Black Tailed Jackrabbit, Mule Deer, Bobcat, Red Fox and Coyote. Reptiles, Amphibians, and Birds are numerous and typical of area. A survey of Listed, Threatened, or Endangered species was not conducted.

3.4 Area Water Wells and/or Surface Water Features

There are no water wells and/or surface water features within 1000-ft of the release site.

There are no surface water bodies within 1000-ft of the site.

4.0 NMOCD Site Ranking

Contaminant delineation and site characterization accomplished at this site indicate that the chemical parameters of the soil and ground water were characterized consistent with the NMOCD guidelines published in the following documents:

- ***Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993)***
- ***Unlined Surface Impoundment Closure Guidelines (February 1993)***

Acceptable thresholds for **contaminants/constituents of concern** (CoCs), i.e., TPH^{8015m}, Benzene, and the mass sum of Benzene, Toluene, Ethyl Benzene, and total Xylene (BTEX), was determined based on the NMOCD Ranking Criteria as follows:

- Depth to Ground water, i.e., distance from the lower most acceptable concentration to the ground water.
- Wellhead Protection Area, i.e., distance from fresh water supply wells.
- Distance to Surface Water Body, i.e., horizontal distance to all down gradient surface water bodies.

Based on the proximity of the site to protectable area water wells, surface water bodies, and depth to ground water from the lower most contamination, the NMOCD ranking score for the site is 10 points with the soil remedial goals highlighted in the Site Ranking Matrix presented as Table 1.

Table 1 - Site Ranking Matrix

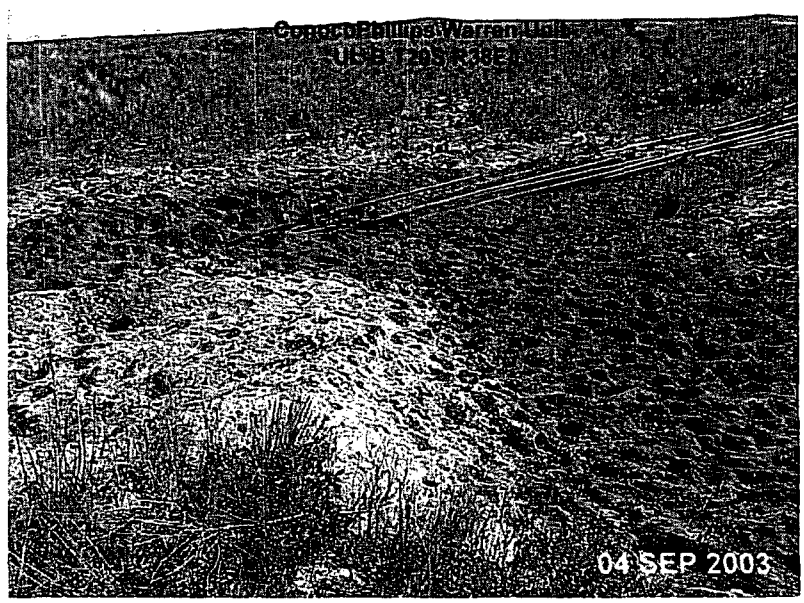
1. Ground Water	2. Wellhead Protection Area	3. Distance to Surface Water
Depth to GW <50 feet: *20 points*	**If <1000' from water source, or; <200' from private domestic water source: *20 points***	**<200 horizontal feet: *20 points***
Depth to GW 50 to 99 feet: *10 points*		**200-1000 horizontal feet: *10 points***
Depth to GW >100 feet: 0 points	**If >1000' from water source, or; >200' from private domestic water source: *0 points***	**>1000 horizontal feet: *0 points***
Ground Water Score = 10	**Wellhead Protection Score = 0**	**Surface Water Score= 0**
Site Rank (1+2+3) = 10 + 0 + 0 = 10 points (for soil 0-56'bgs)		

Total Site Ranking Score and Acceptable Remedial Goal Concentrations

Parameter	20+	10	0
Benzene[1]	**10 ppm**	10 ppm	10 ppm
BTEX[1]	**50 ppm**	50 ppm	50 ppm
TPH	**100 ppm**	1000 ppm	5000 ppm

5.0 Subsurface Soil Investigation

The subsurface soil analyses were accomplished on April 17 and September 17, 2003 with the drilling and sampling of four boreholes within the release extents. The April 17 sampling event encompassed three boreholes extended to a depth of 15-ft *(Plates 3-4, Attachments)*. The September 17, 2003 borehole drilled by EPI was bored to 25-ft bgs in the immediate vicinity of the IFS BH3, which indicated the deepest contamination. The analytical results of the EPI borehole demonstrate a TPH contamination concentration of 29-ppm at 15-ft bgs, and a chloride concentration of 112-ppm at 25-ft bgs. *(See Plates 5-6, Attachments).*



6.0 Ground Water Investigation

Ground water depth is conservatively projected to be 50-ft bgs at the site, based on the water depths of the nearest water wells of record in the NM Office

of the State Engineer's database. The site will be excavated to a level depth of 7-ft. All contaminated soil left within the excavation *(see Section 8.0 below)* will be covered with a 2-ft impermeable layer of compacted clay. The remaining upper 5-ft depth of the excavation will be backfilled with clean and topsoil obtained onsite. Based on the containment of the Constituents of Concern, VADSAT Risk Assessment Models for benzene and chlorides and a remaining depth to ground water of ~30-ft, there will be no need for further ground water investigation at this site.

7.0 VADSAT Risk Assessment

Conservative 1000-year Risk Assessment Models of vertical hydrocarbon (benzene) and inorganic chloride migration for this site were generated utilizing the American Petroleum Institute's VADSAT 3.0 software. Although the sampling protocol for this site does not show an inordinate presence of Benzene, it was the chemical species utilized to run the assessment because it is the lightest and fastest migrating of the chemical choices VADSAT offers. VADSAT calculates the Mean Infiltration Rate based on annual precipitation minus a runoff coefficient and the evaporation rate. This number must be positive, so VADSAT does not accommodate arid and semi-arid areas such as southeast NM where the evaporation rate exceeds the precipitation rate.

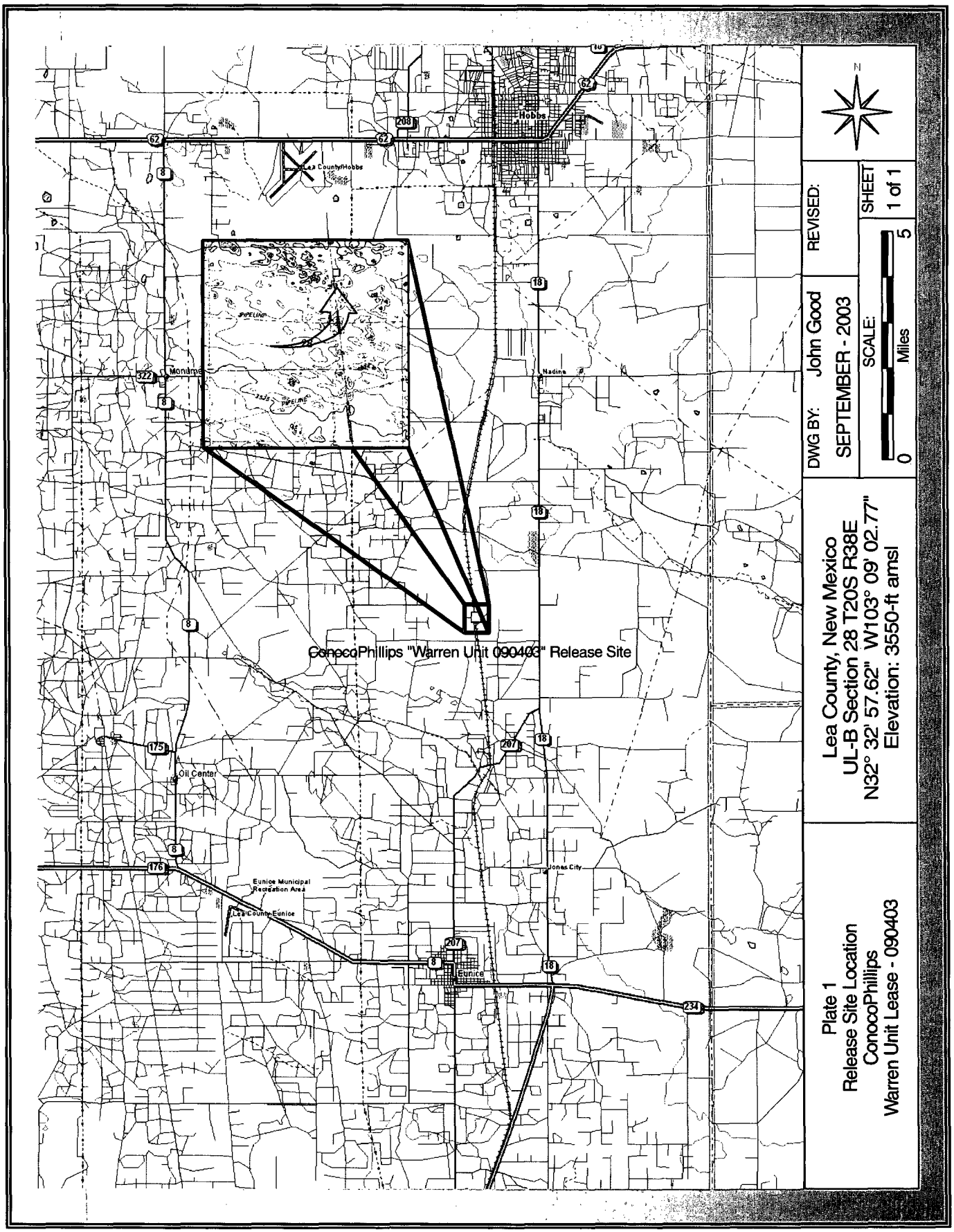
Two contrasting assessment sets were run for this site: one clay barrier/no barrier set for Chlorides present in the soil at 577-ppm and one clay barrier/no barrier set for Benzene with a correlated TPH concentration of 6,400-ppm. Other than the two variable constituents and the presence, or lack of, the clay barrier, the input parameters for each assessment are identical. The downstream receptors were set at 10-meters, 20-meters, 30-meters, 40-meters and 50-meters (X=10, X=20, X=30, X=40, X=50). The transverse offset (Y value) was set at 0-meters, and the depth into the aquifer (Z value) was set at 0.

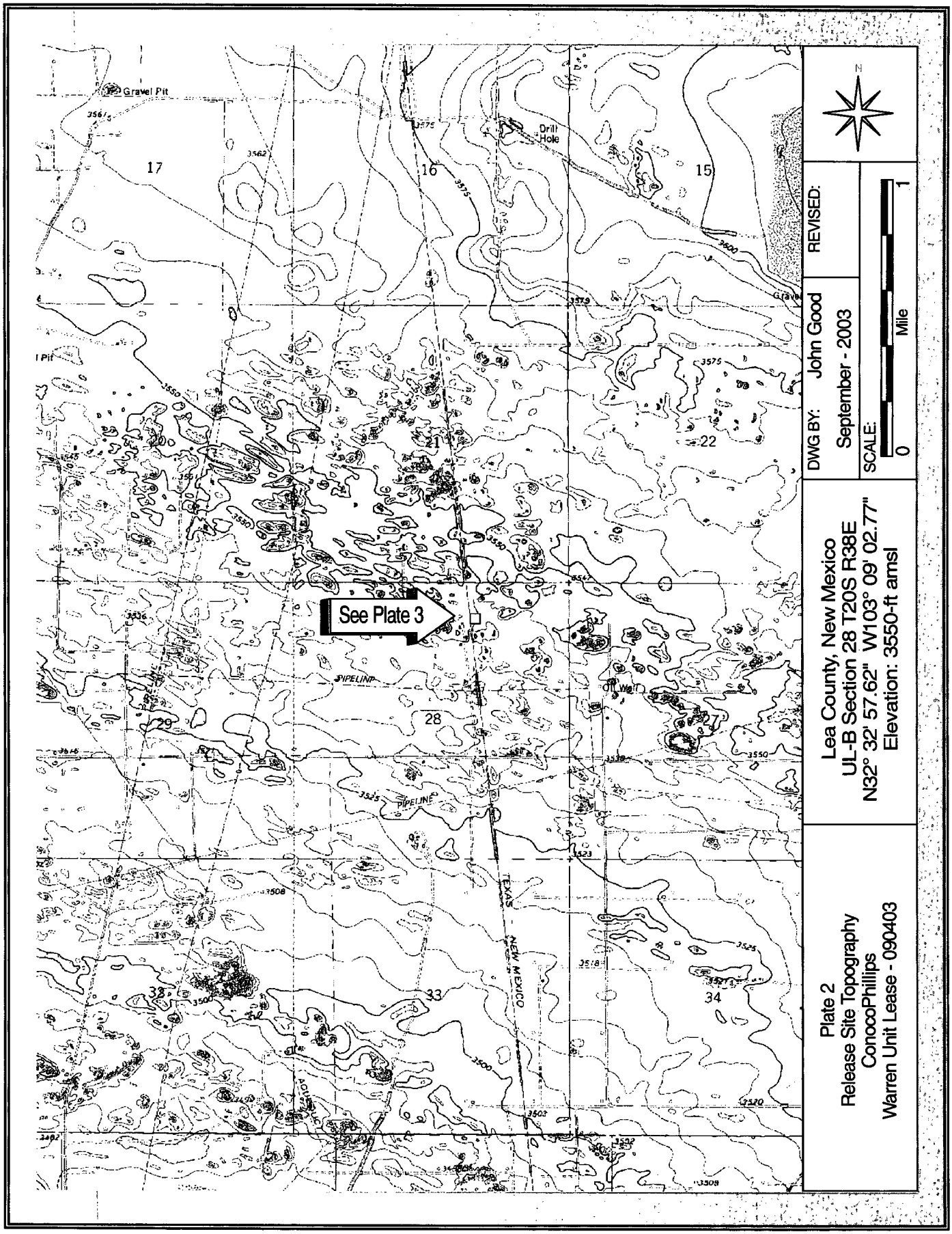
The results of the computer risk assessment modeling for benzene without a clay barrier in place indicate that benzene present would reach the top of the 50-ft aquifer directly under the site in approximately 10-years (2013) and reach its peak concentration of .0137-ppm 80-years later (2093). The results of the computer risk assessment modeling for chlorides without a clay barrier in place indicate that chlorides present would reach the top of a 50-ft aquifer directly under the site in approximately 10-years (2013) and reach its peak concentration of 1890-ppm 70-years later (2083). The risk assessment models of the site for both benzene and chlorides, with a clay barrier in place, show a flat-line of 0 values for the 1000-year period modeled, thus the contaminant migration for either constituent theoretically would never reach the aquifer. *(See Attachments, pages 14 –21).*

8.0 Closure Proposal

Based upon the VADSAT Risk Assessment model for this site which predicts no ground water impact with the placement of an impermeable layer, ConocoPhillips Company proposes to contract with EPI for the placement of a 2-ft compacted clay barrier, with 5-ft overlap, over the chloride and hydrocarbon contaminated soil in the excavation below the 7-ft bgs level. The clay barrier will be placed in two stages, 1-ft thickness in each stage. After each 1-ft layer of clay is placed, it will be compacted and tested for compaction percentage by Pettigrew and Associates, Hobbs, NM. After the clay barrier is in place and certified, the remainder of the excavation will be backfilled with the clean topsoil, smoothed and contoured.

Attachments: (*pages 8-23*)


Hobbs
Lea County/Hobbs
Monument
Nadine
Oil Center
Eunice Municipal Recreation Area
Lea County-Eunice
Eunice
Jones City
ConocoPhillips "Warren Unit 090403" Release Site
Plate 1
Release Site Location
ConocoPhillips
Warren Unit Lease - 090403
Lea County, New Mexico
UL-B Section 28 T20S R38E
N32° 32' 57.62" W103° 09' 02.77"
Elevation: 3550-ft amsl
DWG BY: John Good
SEPTEMBER - 2003
REVISED:
SCALE:
0
5
Miles
SHEET
1 of 1
N


Gravel Pit
Drill Hole
See Plate 3
PIPELINE
TEXAS - NEW MEXICO
17
16
15
21
22
28
29
33
34
Plate 2
Release Site Topography
ConocoPhillips
Warren Unit Lease - 090403
Lea County, New Mexico
UL-B Section 28 T20S R38E
N32° 32' 57.62" W103° 09' 02.77"
Elevation: 3550-ft amsl
DWG BY: John Good
September - 2003
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0
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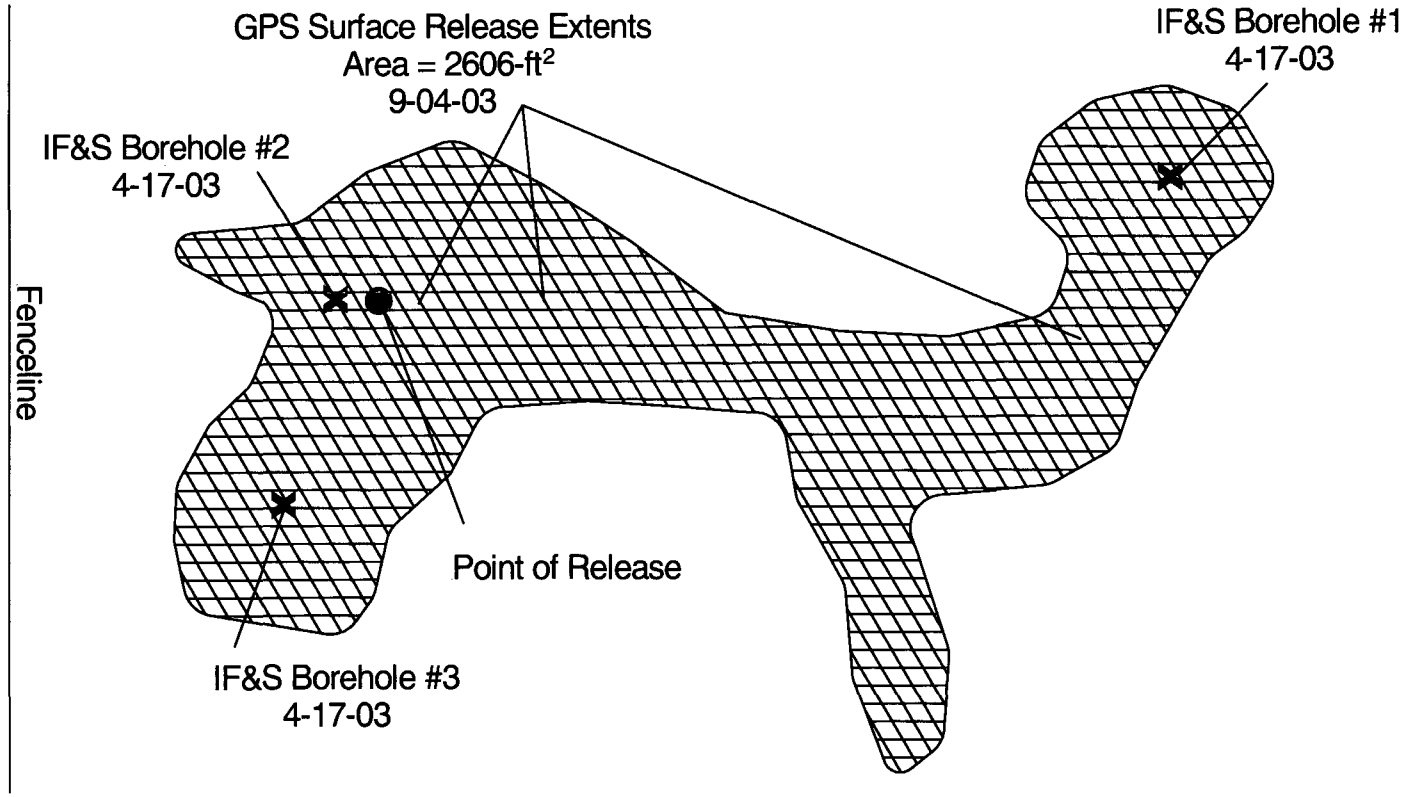


Plate 3 Release Site GPS Demarcation ConocoPhillips Warren Unit 090403	Lea County, New Mexico UL-B Section 28 T20S R38E N32° 32' 57.62" W103° 09' 02.77" Elevation: 3550-ft amsl	DWG BY: John Good SEPT - 2003 SCALE: 0 Feet 50	REVISED:

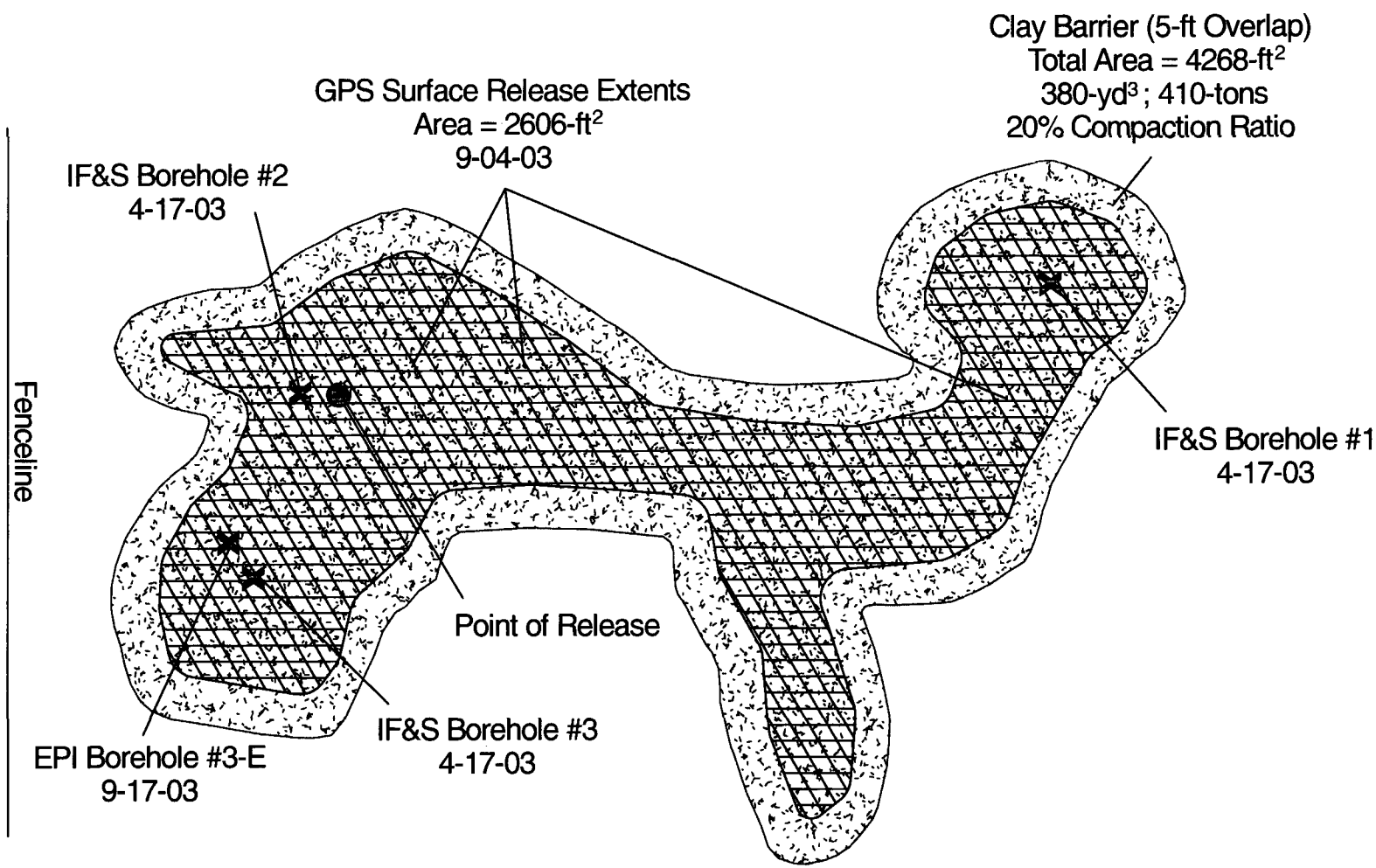


Plate 4 Release Extents + 5-ft Overlap ConocoPhillips Warren Unit 090403	Lea County, New Mexico UL-B Section 28 T20S R38E N32° 32' 57.62" W103° 09' 02.77" Elevation: 3550-ft amsl	DWG BY: John Good SEPT - 2003 SCALE: 0 Feet 50	REVISED:

Plate 5 - Soil Analysis Results (TPH, BTEX & Chlorides)

ConocoPhillips Warren Unit San Andres (Indian Fire & Safety Samples - 4/17/03; EPI Samples - 9/17/03)

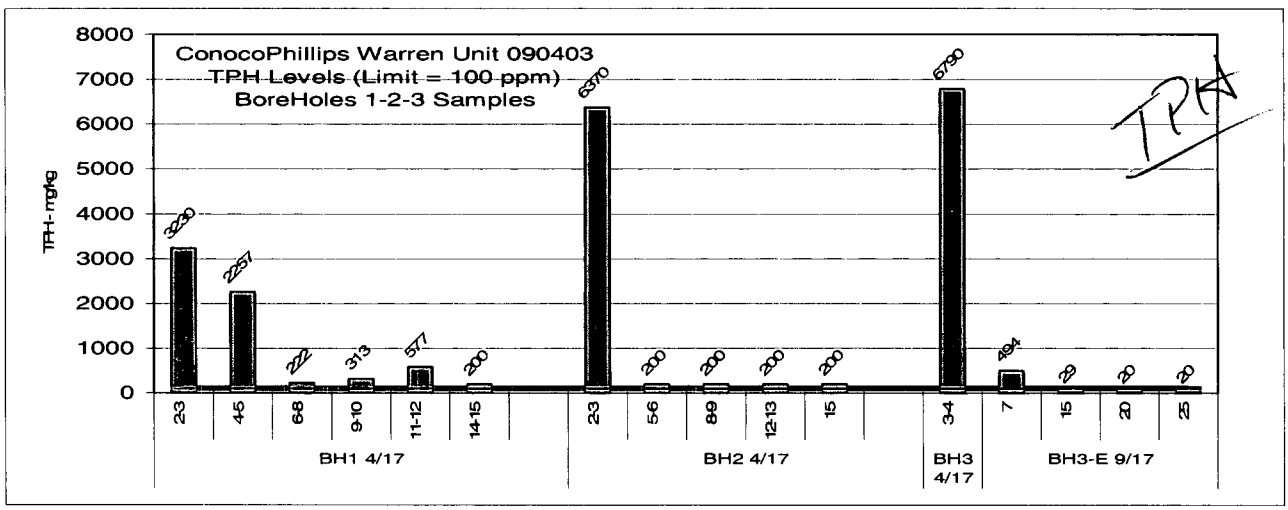
Bold highlighted cells indicate values in excess of the NMOCD remedial action guideline thresholds: TPH = 100 mg/Kg; Benzene = 10 mg/Kg; BTEX = 50 mg/Kg; Cl = 250 mg/Kg; SO4 = 600 mg/Kg

Sample Date	Excavation Sampling Area	Depth (ft - bgs[1])	SAMPLE ID#	VOC[2] ppm	GRO[3] mg/Kg	DRO[4] mg/Kg	TPH[5] mg/Kg	BTEX[6] mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl Benzene mg/Kg	Total Xylenes mg/Kg	Cl⁻ mg/Kg	$SO_4^=$ mg/Kg
17-Apr	BH1	2-3	BORING 1 @ 2-3'		1220	2010	**3230**	NT	NT	NT	NT	NT	160.0	NT
17-Apr	BH1	4-5	BORING 1 @ 4-5'		847	1410	**2257**	NT	NT	NT	NT	NT	128.0	NT
17-Apr	BH1	6-8	BORING 1 @ 6-8'		100	122	**222**	NT	NT	NT	NT	NT	**384.0**	NT
17-Apr	BH1	9-10	BORING 1 @ 9-10'		100	213	**313**	NT	NT	NT	NT	NT	**352.0**	NT
17-Apr	BH1	11-12	BORING 1 @ 11-12'		131	446	**577**	NT	NT	NT	NT	NT	**256.0**	NT
17-Apr	BH1	14-15	BORING 1 @ 14-15'		100	100	**200**	NT	NT	NT	NT	NT	80.0	NT
17-Apr	BH2	2-3	BORING 1 @ 2-3'		1440	4930	**6370**	NT	NT	NT	NT	NT	80.0	NT
17-Apr	BH2	5-6	BORING 1 @ 5-6'		100	100	**200**	NT	NT	NT	NT	NT	**400.0**	NT
17-Apr	BH2	8-9	BORING 1 @ 8-9'		100	100	**200**	NT	NT	NT	NT	NT	**416.0**	NT
17-Apr	BH2	12-13	BORING 1 @ 12-13'		100	100	**200**	NT	NT	NT	NT	NT	**516.0**	NT
17-Apr	BH2	15	BORING 1 @ 15'		100	100	**200**	NT	NT	NT	NT	NT	**368.0**	NT
17-Apr	BH3	3-4	BORING 1 @ 3-4'		3180	3610	**6790**	NT	NT	NT	NT	NT	128.0	NT
17-Apr	BH3	7-8	BORING 1 @7-8'		740	1200	**1940**	NT	NT	NT	NT	NT	**544.0**	NT
17-Apr	BH3	11-12	BORING 1 @ 11-12'		409	739	**1148**	NT	NT	NT	NT	NT	**496.0**	NT
17-Apr	BH3	15	BORING 1 @ 15'		100	187	**287**	NT	NT	NT	NT	NT	**512.0**	NT
							0							
17-Sep	BH3-E	7	SCPWU091703-7	**1260.0**	12	482	**494**	1.052	0.005	0.005	0.579	0.463		
17-Sep	BH3-E	15	SCPWU091703-15	**143.0**	10	19	29	0.030	0.005	0.005	0.005	0.015	**608.0**	121.0
17-Sep	BH3-E	20	SCPWU091703-20	**120.0**	10	10	20	0.030	0.005	0.005	0.005	0.015	**352.0**	51.0
17-Sep	BH3-E	25	SCPWU091703-25	84.3	10	10	20	0.030	0.005	0.005	0.005	0.015	112.0	75.0

[1] bgs = below ground surface [2] VOC = Volatile Organic Constituents; (note: 100 ppm Isobutylene calibration gas = 101 ppm)

[3] GRO - Gasoline Range Organics (Detection Limit = 100 or 10 mg/Kg) [4] DRO - Diesel Range Organics (Detection Limit = 100 or 10 mg/Kg) [5] TPH - Total Petroleum Hydrocarbon (GRO+DRO)

[6] BTEX = Sum of CoC's (Detection Limits = 0.005 mg/Kg; 0.015 mg/Kg) Note: Reported detection limits are considered "de minimus" values and are included in the TPH and BTEX summations.



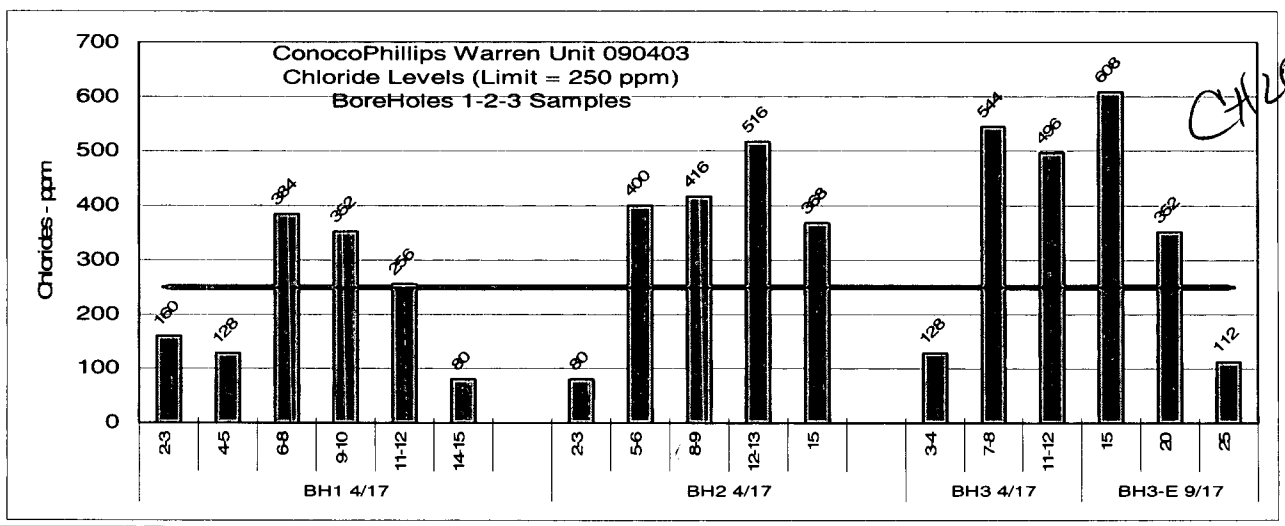
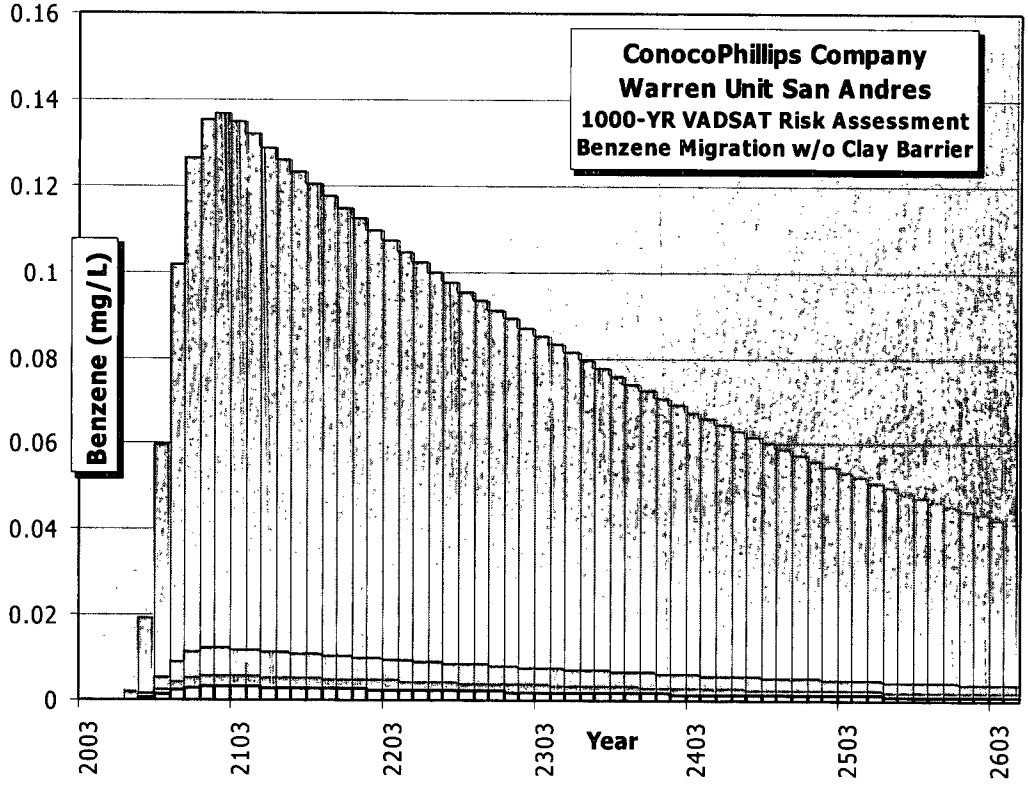


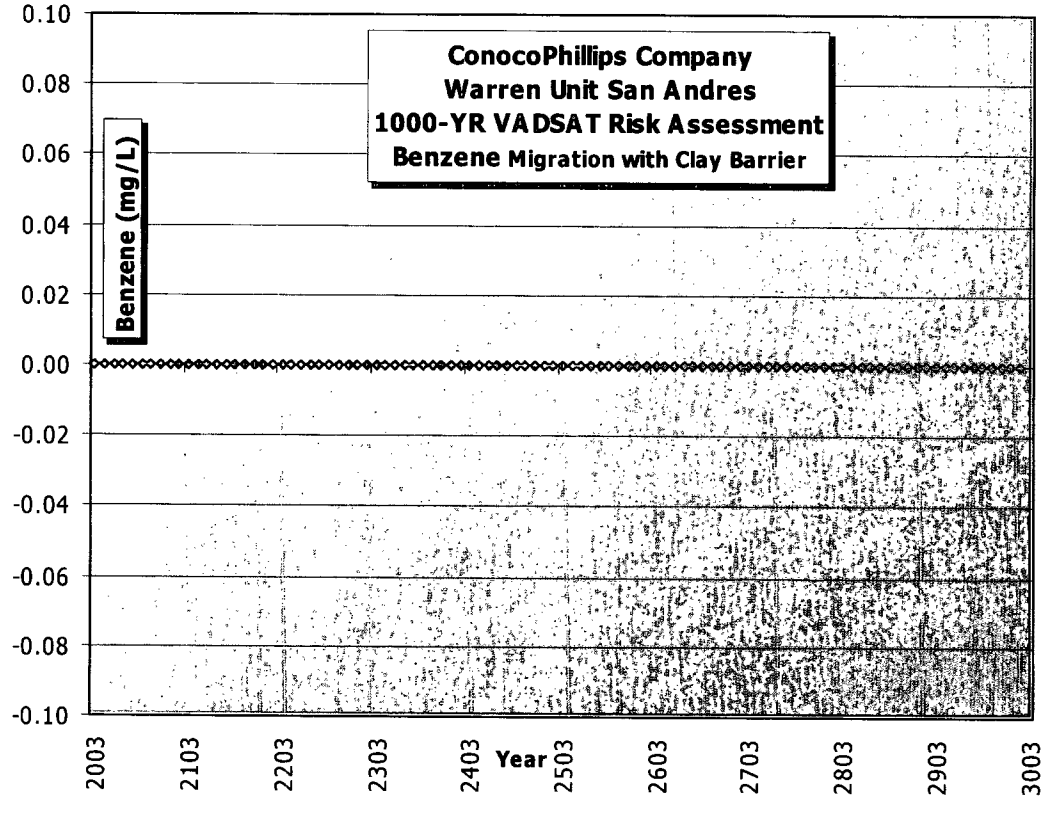
Plate 6 – Boreholes 1, 2, 3 Profiles and Lithology

TPH PROFILE (mg/kg)				
FEET	BH1	BH2	BH3	Lithology
1	3230	6370	6790	Reddish Brown Sand
2	3230	6370	6790	
3	3230	6370	6790	
4	2257	200	6790	
5	2257	200	4240	
6	222	200	4240	
7	222	200	494	
8	222	200	436	
9	313	200	369	
10	313	200	303	
11	577	200	236	
12	577	200	170	
13	400	200	104	
14	200	200	37	
15	200	200	29	
16			20	
17			20	
18			20	
19			20	
20			20	
21			20	
22			20	
23			20	
24			20	
25			20	White Caliche
Some values are extrapolated from actual data				

CHLORIDES PROFILE (mg/kg)				
FEET	BH1	BH2	BH3	Lithology
1	160	80	80	Reddish Brown Sand
2	160	80	80	
3	160	80	128	
4	128	240	128	
5	128	400	208	
6	384	400	208	
7	384	408	544	
8	384	416	544	
9	352	416	520	
10	352	470	520	
11	256	470	496	
12	256	516	496	
13	176	516	552	
14	80	444	552	
15	80	368	608	
16			544	
17			480	
18			480	
19			416	
20			352	
21			292	
22			232	
23			232	
24			172	
25			112	White Caliche
Some values are extrapolated from actual data				

Plate 7 – VADSAT Risk Assessment - Benzene





VADSAT Data Table (Benzene without a clay barrier)

Year	Water Table	10 Meter Down Gradient	20 Meter Down Gradient	30 Meter Down Gradient	40 Meter Down Gradient	50 Meter Down Gradient
2003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2013	2.04E-10	9.98E-12	3.45E-12	1.44E-12	6.91E-13	3.62E-13
2023	1.46E-05	1.01E-06	4.18E-07	2.06E-07	1.15E-07	6.96E-08
2033	1.84E-03	1.44E-04	6.36E-05	3.35E-05	1.99E-05	1.29E-05
2043	1.90E-02	1.58E-03	7.20E-04	3.91E-04	2.40E-04	1.60E-04
2053	5.96E-02	5.12E-03	2.37E-03	1.31E-03	8.16E-04	5.52E-04
2063	1.02E-01	8.85E-03	4.13E-03	2.30E-03	1.45E-03	9.88E-04
2073	1.26E-01	1.11E-02	5.20E-03	2.91E-03	1.84E-03	1.26E-03
2083	1.35E-01	1.19E-02	5.61E-03	3.15E-03	1.99E-03	1.37E-03
2093	1.37E-01	1.21E-02	5.67E-03	3.18E-03	2.01E-03	1.39E-03
2103	1.35E-01	1.19E-02	5.59E-03	3.14E-03	1.99E-03	1.37E-03
2113	1.32E-01	1.17E-02	5.48E-03	3.08E-03	1.95E-03	1.34E-03
2123	1.29E-01	1.14E-02	5.36E-03	3.01E-03	1.91E-03	1.31E-03
2133	1.26E-01	1.11E-02	5.24E-03	2.94E-03	1.86E-03	1.28E-03
2143	1.23E-01	1.09E-02	5.12E-03	2.87E-03	1.82E-03	1.25E-03
2153	1.20E-01	1.06E-02	5.00E-03	2.81E-03	1.78E-03	1.22E-03
2163	1.18E-01	1.04E-02	4.89E-03	2.74E-03	1.74E-03	1.20E-03
2173	1.15E-01	1.01E-02	4.77E-03	2.68E-03	1.70E-03	1.17E-03
2183	1.12E-01	9.91E-03	4.66E-03	2.62E-03	1.66E-03	1.14E-03
2193	1.10E-01	9.69E-03	4.56E-03	2.56E-03	1.62E-03	1.11E-03
2203	1.07E-01	9.46E-03	4.45E-03	2.50E-03	1.58E-03	1.09E-03
2213	1.05E-01	9.25E-03	4.35E-03	2.44E-03	1.55E-03	1.06E-03
2223	1.02E-01	9.03E-03	4.25E-03	2.39E-03	1.51E-03	1.04E-03
2233	9.99E-02	8.83E-03	4.15E-03	2.33E-03	1.48E-03	1.02E-03
2243	9.76E-02	8.62E-03	4.06E-03	2.28E-03	1.44E-03	9.92E-04
2253	9.54E-02	8.43E-03	3.96E-03	2.23E-03	1.41E-03	9.70E-04
2263	9.32E-02	8.23E-03	3.87E-03	2.17E-03	1.38E-03	9.47E-04
2273	9.10E-02	8.04E-03	3.78E-03	2.13E-03	1.35E-03	9.26E-04
2283	8.90E-02	7.86E-03	3.70E-03	2.08E-03	1.32E-03	9.04E-04
2293	8.69E-02	7.68E-03	3.61E-03	2.03E-03	1.28E-03	8.84E-04
2303	8.49E-02	7.50E-03	3.53E-03	1.98E-03	1.26E-03	8.63E-04
2313	8.30E-02	7.33E-03	3.45E-03	1.94E-03	1.23E-03	8.44E-04
2323	8.11E-02	7.16E-03	3.37E-03	1.89E-03	1.20E-03	8.24E-04
2333	7.92E-02	7.00E-03	3.29E-03	1.85E-03	1.17E-03	8.05E-04
2343	7.74E-02	6.84E-03	3.22E-03	1.81E-03	1.14E-03	7.87E-04
2353	7.56E-02	6.68E-03	3.14E-03	1.77E-03	1.12E-03	7.69E-04
2363	7.39E-02	6.53E-03	3.07E-03	1.72E-03	1.09E-03	7.51E-04
2373	7.22E-02	6.38E-03	3.00E-03	1.69E-03	1.07E-03	7.34E-04
2383	7.05E-02	6.23E-03	2.93E-03	1.65E-03	1.04E-03	7.17E-04
2393	6.89E-02	6.09E-03	2.87E-03	1.61E-03	1.02E-03	7.01E-04
2403	6.73E-02	5.95E-03	2.80E-03	1.57E-03	9.95E-04	6.85E-04
2413	6.58E-02	5.81E-03	2.74E-03	1.54E-03	9.72E-04	6.69E-04
2423	6.43E-02	5.68E-03	2.67E-03	1.50E-03	9.50E-04	6.54E-04
2433	6.28E-02	5.55E-03	2.61E-03	1.47E-03	9.28E-04	6.39E-04
2443	6.14E-02	5.42E-03	2.55E-03	1.43E-03	9.07E-04	6.24E-04
2453	6.00E-02	5.30E-03	2.49E-03	1.40E-03	8.86E-04	6.10E-04
2463	5.86E-02	5.18E-03	2.44E-03	1.37E-03	8.66E-04	5.96E-04
2473	5.72E-02	5.06E-03	2.38E-03	1.34E-03	8.46E-04	5.82E-04
2483	5.59E-02	4.94E-03	2.33E-03	1.31E-03	8.27E-04	5.69E-04
2493	5.46E-02	4.83E-03	2.27E-03	1.28E-03	8.08E-04	5.56E-04
2503	5.34E-02	4.72E-03	2.22E-03	1.25E-03	7.89E-04	5.43E-04
2513	5.22E-02	4.61E-03	2.17E-03	1.22E-03	7.71E-04	5.30E-04
2523	5.10E-02	4.50E-03	2.12E-03	1.19E-03	7.53E-04	5.18E-04
2533	4.98E-02	4.40E-03	2.07E-03	1.16E-03	7.36E-04	5.06E-04
2543	4.87E-02	4.30E-03	2.02E-03	1.14E-03	7.19E-04	4.95E-04
2553	4.75E-02	4.20E-03	1.98E-03	1.11E-03	7.03E-04	4.83E-04
2563	4.65E-02	4.10E-03	1.93E-03	1.08E-03	6.87E-04	4.72E-04
2573	4.54E-02	4.01E-03	1.89E-03	1.06E-03	6.71E-04	4.61E-04
2583	4.43E-02	3.92E-03	1.84E-03	1.04E-03	6.55E-04	4.51E-04
2593	4.33E-02	3.83E-03	1.80E-03	1.01E-03	6.40E-04	4.41E-04
2603	4.23E-02	3.74E-03	1.76E-03	9.88E-04	6.26E-04	4.30E-04
2613	4.14E-02	3.66E-03	1.72E-03	9.65E-04	6.11E-04	4.21E-04
2623	4.04E-02	3.57E-03	1.68E-03	9.43E-04	5.97E-04	4.11E-04
2633	3.95E-02	3.49E-03	1.64E-03	9.22E-04	5.84E-04	4.02E-04
2643	3.86E-02	3.41E-03	1.60E-03	9.00E-04	5.70E-04	3.92E-04
2653	3.77E-02	3.33E-03	1.57E-03	8.80E-04	5.57E-04	3.83E-04
2663	3.68E-02	3.25E-03	1.53E-03	8.60E-04	5.44E-04	3.75E-04
2673	3.60E-02	3.18E-03	1.50E-03	8.40E-04	5.32E-04	3.66E-04
2683	3.52E-02	3.11E-03	1.46E-03	8.21E-04	5.20E-04	3.58E-04
2693	3.44E-02	3.04E-03	1.43E-03	8.02E-04	5.08E-04	3.49E-04
2703	3.36E-02	2.97E-03	1.40E-03	7.83E-04	4.96E-04	3.41E-04
2713	3.28E-02	2.90E-03	1.36E-03	7.65E-04	4.85E-04	3.34E-04
2723	3.20E-02	2.83E-03	1.33E-03	7.48E-04	4.74E-04	3.26E-04
2733	3.13E-02	2.77E-03	1.30E-03	7.31E-04	4.63E-04	3.18E-04
2743	3.06E-02	2.70E-03	1.27E-03	7.14E-04	4.52E-04	3.11E-04
2753	2.99E-02	2.64E-03	1.24E-03	6.98E-04	4.42E-04	3.04E-04
2763	2.92E-02	2.58E-03	1.21E-03	6.82E-04	4.32E-04	2.97E-04
2773	2.85E-02	2.52E-03	1.19E-03	6.66E-04	4.22E-04	2.90E-04
2783	2.79E-02	2.46E-03	1.16E-03	6.51E-04	4.12E-04	2.84E-04
2793	2.72E-02	2.41E-03	1.13E-03	6.36E-04	4.03E-04	2.77E-04
2803	2.66E-02	2.35E-03	1.11E-03	6.21E-04	3.93E-04	2.71E-04
2813	2.60E-02	2.30E-03	1.08E-03	6.07E-04	3.84E-04	2.64E-04
2823	2.54E-02	2.25E-03	1.06E-03	5.93E-04	3.76E-04	2.58E-04
2833	2.48E-02	2.19E-03	1.03E-03	5.79E-04	3.67E-04	2.52E-04
2843	2.43E-02	2.14E-03	1.01E-03	5.66E-04	3.59E-04	2.47E-04
2853	2.37E-02	2.09E-03	9.85E-04	5.53E-04	3.50E-04	2.41E-04
2863	2.32E-02	2.05E-03	9.63E-04	5.40E-04	3.42E-04	2.35E-04
2873	2.26E-02	2.00E-03	9.41E-04	5.28E-04	3.34E-04	2.30E-04
2883	2.21E-02	1.95E-03	9.19E-04	5.16E-04	3.27E-04	2.25E-04
2893	2.16E-02	1.91E-03	8.98E-04	5.04E-04	3.19E-04	2.20E-04
2903	2.11E-02	1.87E-03	8.77E-04	4.93E-04	3.12E-04	2.15E-04
2913	2.06E-02	1.82E-03	8.57E-04	4.81E-04	3.05E-04	2.10E-04
2923	2.02E-02	1.78E-03	8.37E-04	4.70E-04	2.98E-04	2.05E-04
2933	1.97E-02	1.74E-03	8.18E-04	4.59E-04	2.91E-04	2.00E-04
2943	1.92E-02	1.70E-03	8.00E-04	4.49E-04	2.84E-04	1.96E-04
2953	1.88E-02	1.66E-03	7.81E-04	4.39E-04	2.78E-04	1.91E-04
2963	1.84E-02	1.62E-03	7.63E-04	4.29E-04	2.71E-04	1.87E-04
2973	1.79E-02	1.59E-03	7.46E-04	4.19E-04	2.65E-04	1.82E-04
2983	1.75E-02	1.55E-03	7.29E-04	4.09E-04	2.59E-04	1.78E-04
2993	1.71E-02	1.51E-03	7.12E-04	4.00E-04	2.53E-04	1.74E-04

VADSAT Risk Assessment Criteria and Data (Benzene)

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+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +
+                                                                         +
+                      VADSAT Version 3.0                                 +
+                                                                         +
+   A Monte Carlo Model for Assessing the Effects of Soil                 +
+           Contamination on Groundwater Quality                          +
+                                                                         +
+                                                                         +
+                        Developed by:                                    +
+          Environmental Systems and Technologies Inc.                    +
+                Blacksburg, Virginia                                     +
+            Tel: 703-552-0685, Fax: 703-951-5307                         +
+                                                                         +
+                                                                         +
+                           For                                           +
+              The American Petroleum Institute                           +
+                           1995                                          +
+                                                                         +
+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +
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PROJECT TITLE:CP Warren San Andres

SOURCE AND CHEMICAL DATA ****

DEPTHM, MEAN THICKNESS OF WASTE ZONE (m)	=	3.65760
DEPSTD, STD.DEV. OF THICKNESS OF WASTE ZONE	=	0.00000
AREAM, MEAN WASTE ZONE AREA (m^2)	=	241.55000
STDA, STD.DEV. OF WASTE ZONE AREA	=	0.00000
RLWM, MEAN L/W RATIO (-)	=	1.00000
STDRLW, STD.DEV. OF L/W RATIO	=	0.00000
CVRTHM, MEAN VALUE OF COVER THICKNESS (m)	=	0.00000
CVRTHS, STD.DEV. OF COVER THICKNESS	=	0.00000
KOCM, MEAN ORG. CARBON PARTITION COEF (cm^3/g)	=	83.20000
STDKOC, STD.DEV. OF ORG.CARBON PARTITION COEF	=	0.00000
FMOLM, MEAN INIT.VOL.FRAC. OF CONTAMINANT(-)	=	0.00078
FMOLSTD, STD.DEV. OF VOL.FRAC. OF CONTAMINANT	=	0.00000
CMFM, MASS OF CONTAMINANT PER MASS OF WASTE(mg/kg)	=	5.00000
CMFSD STD.DEV. OF MASS CONTAMINANT PER MASS WASTE	=	0.00000
HCCONM, HYDCARBON MASS FRAC. IN WASTE (mg/kg)	=	6400.00000
HCCONS, STD OF HYDCARBON MASS FRAC. IN WASTE	=	0.00000
CHEMICAL SPECIES		benzene
MOLW, MOLECULAR WT. OF CONTAMINANT (g/mole)	=	78.10000
AVERMW, AVG. MOL. WT. OF OILY WASTE (g/mole)	=	100.00000
RHO, DENSITY OF CONTAMINANT (g/cm^3)	=	0.87600
RHOG, AVERAGE DENSITY OF HYDROCARBON (g/cm^3)	=	0.90000
SOL, AQUEOUS SOLUB. OF CONTAMINANT (g/m^3)	=	1790.00000
HENRYC, HENRY'S CONSTANT (-)	=	0.23000
DIFFA, DIFFUSION COEF. IN FREE AIR (m^2/day)	=	0.77000

HYDROGEOLOGICAL PROPERTIES

** UNSATURATED ZONE INPUT PARAMETERS **

GAMMAM, MEAN UNSAT ZONE DECAY COEF (1/day) = 0.00010

STDGAM, STD.DEV. OF UNSAT ZONE DECAY COEF = 0.00000

UNFOCM, MEAN UNSAT ZONE ORGANIC CARBON FRACTION (-) = 0.00000

UNFOCS, STD.DEV. OF UNSAT ZONE ORGANIC CARBON FRAC. = 0.00000

FKSW, MEAN SAT. CONDUCTIVITY (m/day) = 0.02900

STDFKS, STD.DEV. OF SAT. CONDUCTIVITY = 0.000

DISTM, MEAN DEPTH TO GROUNDWATER (m) = 11.58200

STDDST, STD.DEV. OF DEPTH TO GROUNDWATER = 0.00000

UNPORM, MEAN VADOSE ZONE POROSITY (-) = 0.38000

SUNPOR, STD.DEV. OF VADOSE ZONE POROSITY = 0.00000

PARNM, MEAN VALUE OF VG PARAMETER N (-) = 1.23000

SDPARN, STD.DEV. OF VG PARAMETER N = 0.00000

RESWCM, MEAN RESIDUAL WATER CONTENT (-) = 0.01110

RESWCS, STD.DEV. OF RESIDUAL WATER CONTENT = 0.00000

ALFINM = 0, UNSAT DISPERSIVITY CALCULATED INTERNALLY

** SATURATED ZONE INPUT PARAMETERS **

LAMBW, MEAN SAT. ZONE DECAY COEFF. (1/day) = 0.00010

SLAMB, STD.DEV. OF SAT. ZONE DECAY COEFF. = 0.00000

PORM, MEAN SAT. ZONE POROSITY (-) = 0.20000

STDPOR, STD.DEV. OF SAT. ZONE POROSITY = 0.00000

FOCM, MEAN SAT. ZONE ORG. CARBON FRAC. (-) = 0.00000

STDFOC, STD.DEV. SAT. ZONE ORG. CARBON FRAC.= 0.00000

ALRLTM, MEAN DISPERS, RATIO LONG/TRANSV. (-) = 3.00000

SALRLT, STD.DEV. OF DISP. RATIO LONG/TRANSV. = 0.00000

ALRTVM, MEAN DISPERS. RATIO TRANSV/VERT. (-) = 87.00000

SALRTV, STD.DEV. OF DISP. RATIO TRANSV/VERT. = 0.00000

CONDS, SAT. HYDRAULIC COND. (m/day) = 1.03000

SCONDS, STD.DEV. OF SAT HYDRAULIC COND. = 0.00000

GRADS, HYDRAULIC GRADIENT (m/m) = 0.02700

SGRADS, STD.DEV. OF HYDRAULIC GRADIENT = 0.00000

HMEAN, MEAN AQUIFER THICKNESS (m) = 15.24000

STDH, STD.DEV. OF AQUIFER THICKNESS = 0.00000

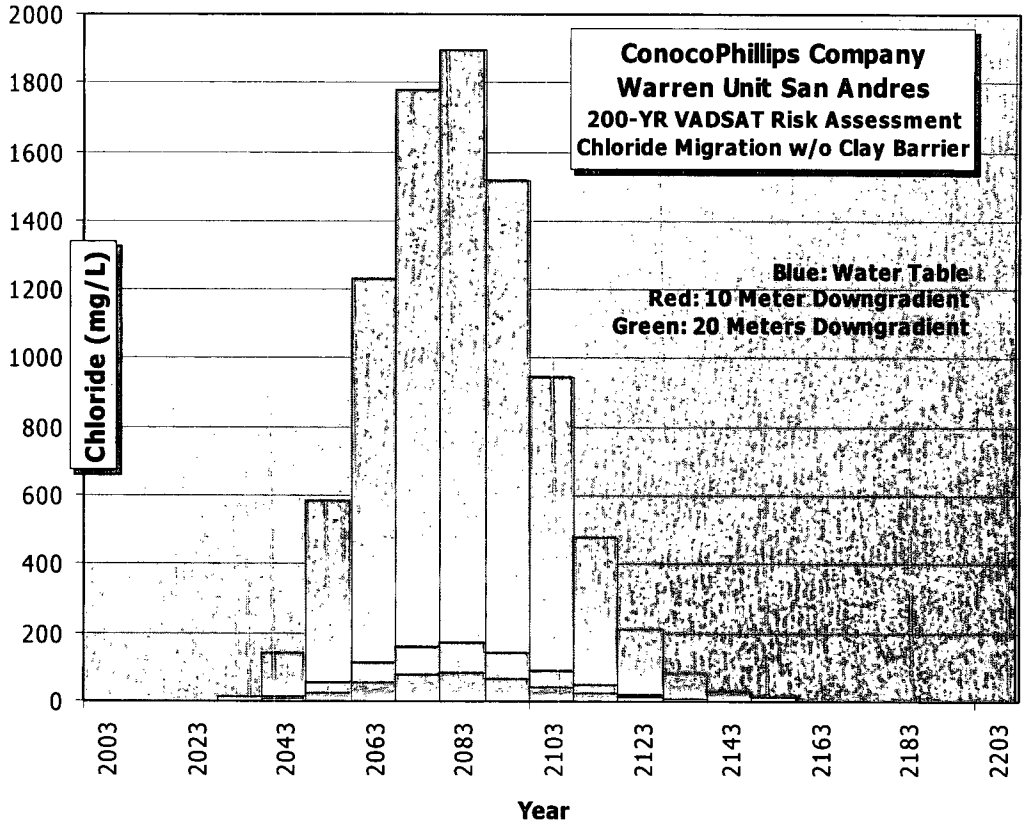
QINM, MEAN INFILTRATION RATE (m/day) = 0.00011

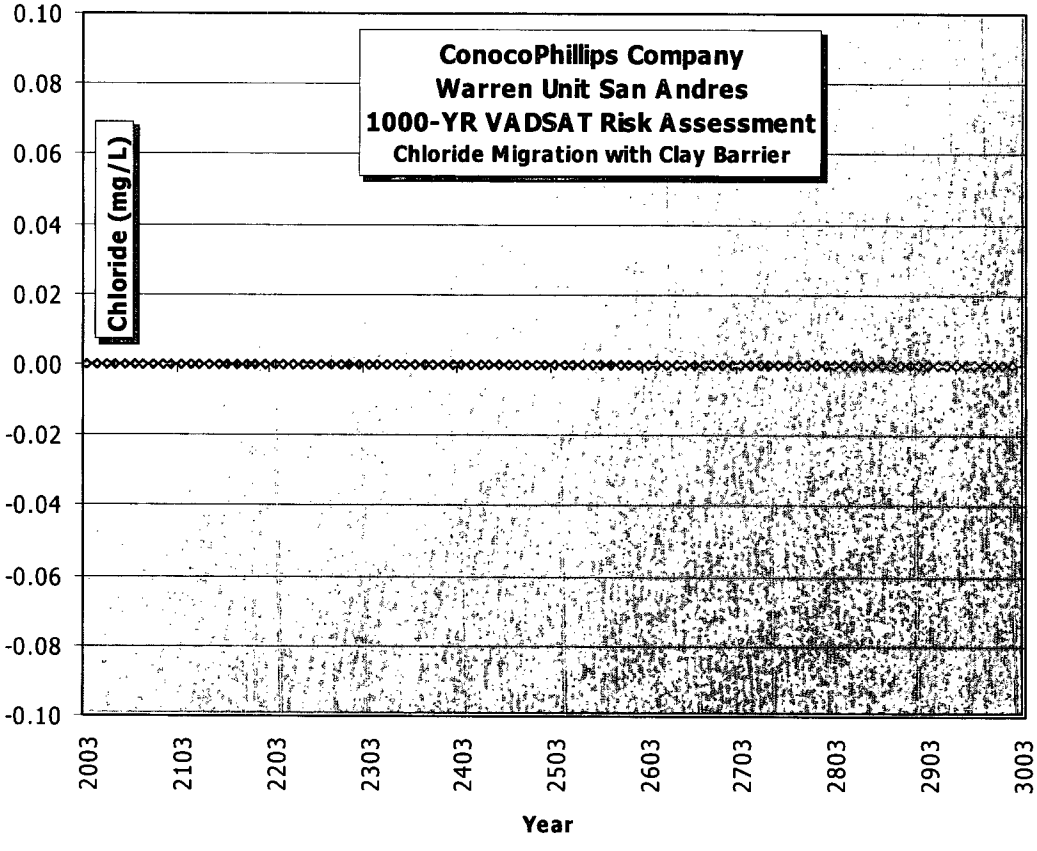
QINSTD, STD.DEV. OF INFILTRATION RATE = 0.00000

LOCATION OF RECEPTORS:

	X (M)	Y (M)	Z (M)
RECEPTOR(1)	10.0	0.0	0.0
RECEPTOR(2)	20.0	0.0	0.0
RECEPTOR(3)	30.0	0.0	0.0
RECEPTOR(4)	40.0	0.0	0.0
RECEPTOR(5)	50.0	0.0	0.0

Plate 8 - VADSAT Risk Assessment - Chlorides





VADSAT Data (Chlorides without a clay barrier)

Year	Water Table	10 Meter Down Gradient	20 Meter Down Gradient	30 Meter Down Gradient	40 Meter Down Gradient	50 Meter Down Gradient
2003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2013	5.91E-07	2.90E-08	1.00E-08	4.20E-09	2.01E-09	1.05E-09
2023	5.91E-02	4.10E-03	1.69E-03	8.34E-04	4.65E-04	2.82E-04
2033	1.02E+01	8.03E-01	3.55E-01	1.87E-01	1.11E-01	7.18E-02
2043	1.42E+02	1.19E+01	5.41E+00	2.95E+00	1.81E+00	1.21E+00
2053	5.82E+02	5.02E+01	2.33E+01	1.29E+01	8.05E+00	5.46E+00
2063	1.23E+03	1.08E+02	5.07E+01	2.83E+01	1.79E+01	1.22E+01
2073	1.78E+03	1.58E+02	7.43E+01	4.18E+01	2.65E+01	1.83E+01
2083	1.89E+03	1.70E+02	8.05E+01	4.56E+01	2.91E+01	2.02E+01
2093	1.52E+03	1.37E+02	6.55E+01	3.73E+01	2.39E+01	1.67E+01
2103	9.43E+02	8.61E+01	4.13E+01	2.36E+01	1.52E+01	1.07E+01
2113	4.79E+02	4.40E+01	2.12E+01	1.21E+01	7.86E+00	5.52E+00
2123	2.08E+02	1.92E+01	9.26E+00	5.33E+00	3.46E+00	2.44E+00
2133	8.01E+01	7.42E+00	3.59E+00	2.07E+00	1.35E+00	9.50E-01
2143	2.81E+01	2.61E+00	1.26E+00	7.30E-01	4.76E-01	3.37E-01
2153	9.17E+00	8.55E-01	4.14E-01	2.40E-01	1.56E-01	1.11E-01
2163	2.83E+00	2.64E-01	1.28E-01	7.42E-02	4.84E-02	3.44E-02
2173	8.33E-01	7.80E-02	3.78E-02	2.19E-02	1.43E-02	1.02E-02
2183	2.37E-01	2.22E-02	1.08E-02	6.24E-03	4.08E-03	2.90E-03
2193	6.52E-02	6.12E-03	2.98E-03	1.73E-03	1.13E-03	8.03E-04
2203	1.73E-02	1.63E-03	7.92E-04	4.59E-04	3.01E-04	2.14E-04
2213	4.64E-03	4.26E-04	2.05E-04	1.18E-04	7.73E-05	5.50E-05
2223	1.22E-03	1.09E-04	5.23E-05	3.02E-05	1.99E-05	1.43E-05
2233	2.44E-04	2.19E-05	1.08E-05	6.65E-06	4.71E-06	3.60E-06
2243	0.00E+00	1.74E-13	1.71E-10	2.90E-09	1.29E-08	3.13E-08
2253	0.00E+00	0.00E+00	0.00E+00	8.37E-23	3.03E-19	4.90E-17
2263	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2273	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2283	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2293	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2303	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2313	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2323	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2333	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2343	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2353	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2363	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2373	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2383	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2393	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2403	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2413	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2423	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2433	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2443	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2453	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2463	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2473	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2483	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Year	Water Table	10 Meter Down Gradient	20 Meter Down Gradient	30 Meter Down Gradient	40 Meter Down Gradient	50 Meter Down Gradient
2503	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2513	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2523	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2533	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2563	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2573	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2583	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2593	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2603	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2613	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2623	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2633	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2643	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2653	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2663	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2673	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2683	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2693	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2713	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2723	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2733	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2743	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2753	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2763	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2773	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2783	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2793	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2803	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2813	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2823	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2833	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2843	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2853	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2863	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2873	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2883	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2893	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2903	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2913	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2923	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2933	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2943	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2953	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2963	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2973	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2983	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2993	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

VADSAT Risk Assessment Criteria and Data (Chlorides)

```
+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +
+                                                                         +
+                      VADSAT Version 3.0                                 +
+                                                                         +
+   A Monte Carlo Model for Assessing the Effects of Soil                 +
+           Contamination on Groundwater Quality                          +
+                                                                         +
+                                                                         +
+                       Developed by:                                     +
+          Environmental Systems and Technologies Inc.                    +
+                Blacksburg, Virginia                                     +
+             Tel: 703-552-0685, Fax: 703-951-5307                        +
+                                                                         +
+                                                                         +
+                            For                                          +
+              The American Petroleum Institute                           +
+                            1995                                         +
+                                                                         +
+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +
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PROJECT TITLE:CP Warren San Andres

SOURCE AND CHEMICAL DATA ****

DEPTHM, MEAN THICKNESS OF WASTE ZONE (m)	=	3.65760
DEPSTD, STD.DEV. OF THICKNESS OF WASTE ZONE	=	0.00000
AREAM, MEAN WASTE ZONE AREA (m^2)	=	241.55000
STDA, STD.DEV. OF WASTE ZONE AREA	=	0.00000
RLWM, MEAN L/W RATIO (-)	=	1.00000
STDRLW, STD.DEV. OF L/W RATIO	=	0.00000
CVRTHM, MEAN VALUE OF COVER THICKNESS (m)	=	0.00000
CVRTHS, STD.DEV. OF COVER THICKNESS	=	0.00000
MEAN MASS FRACTION OF SALT IN WASTE (mg/kg)	=	577.00787
STD OF MASS FRACTION OF SALT IN WASTE	=	0.00000
CZEROM, MEAN AQU. PHASE CONC OF SALT (g/m^3)	=	2494.80005
CZEROS, STD.DEV. OF AQU. PHASE CONC. OF SALT	=	0.00000

CHEMICAL SPECIES Sodium Chloride

HYDROGEOLOGICAL PROPERTIES

** UNSATURATED ZONE INPUT PARAMETERS **

GAMMAM, MEAN UNSAT ZONE DECAY COEF (1/day)	=	0.00010
STDGAM, STD.DEV. OF UNSAT ZONE DECAY COEF	=	0.00000
UNFOCM, MEAN UNSAT ZONE ORGANIC CARBON FRACTION (-)	=	0.00000
UNFOCS, STD.DEV. OF UNSAT ZONE ORGANIC CARBON FRAC.	=	0.00000
FKSW, MEAN SAT. CONDUCTIVITY (m/day)	=	0.02900

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     STDFKS, STD.DEV. OF SAT. CONDUCTIVITY        =       0.000

     DISTM, MEAN DEPTH TO GROUNDWATER (m)         =    11.58200
     STDDST, STD.DEV. OF DEPTH TO GROUNDWATER     =     0.00000

     UNPORM, MEAN VADOSE ZONE POROSITY (-)        =     0.38000
     SUNPOR, STD.DEV. OF VADOSE ZONE POROSITY     =     0.00000

     PARNM, MEAN VALUE OF VG PARAMETER N (-)      =     1.23000
     SDPARN, STD.DEV. OF VG PARAMETER N           =     0.00000

     RESWCM, MEAN RESIDUAL WATER CONTENT (-)      =     0.01110
     RESWCS, STD.DEV. OF RESIDUAL WATER CONTENT   =     0.00000

ALFINM = 0, UNSAT DISPERSIVITY CALCULATED INTERNALLY
     ** SATURATED ZONE INPUT PARAMETERS **

     LAMBW, MEAN SAT. ZONE DECAY COEFF. (1/day)    =     0.00010
     SLAMB, STD.DEV. OF SAT. ZONE DECAY COEFF.     =     0.00000

     PORM, MEAN SAT. ZONE POROSITY (-)             =     0.20000
     STDPOR, STD.DEV. OF SAT. ZONE POROSITY        =     0.00000

     FOCM, MEAN SAT. ZONE ORG. CARBON FRAC. (-)    =     0.00000
     STDFOC, STD.DEV. SAT. ZONE ORG. CARBON FRAC.=     0.00000

     ALRLTM, MEAN DISPERS, RATIO LONG/TRANSV. (-) =     3.00000
     SALRLT, STD.DEV. OF DISP. RATIO LONG/TRANSV. =     0.00000

     ALRTVM, MEAN DISPERS. RATIO TRANSV/VERT. (-) =    87.00000
     SALRTV, STD.DEV. OF DISP. RATIO TRANSV/VERT. =     0.00000

     CONDS, SAT. HYDRAULIC COND. (m/day)           =     1.03000
     SCONDS, STD.DEV. OF SAT HYDRAULIC COND.       =     0.00000

     GRADS, HYDRAULIC GRADIENT (m/m)              =     0.02700
     SGRADS, STD.DEV. OF HYDRAULIC GRADIENT       =     0.00000

     HMEAN, MEAN AQUIFER THICKNESS (m)             =    15.24000
     STDH, STD.DEV. OF AQUIFER THICKNESS           =     0.00000

     QINM, MEAN INFILTRATION RATE (m/day)          =     0.00011
     QINSTD, STD.DEV. OF INFILTRATION RATE         =     0.00000


     LOCATION OF RECEPTORS:

                  X (M)          Y (M)          Z (M)
   RECEPTOR( 1)    10.0           0.0            0.0
   RECEPTOR( 2)    20.0           0.0            0.0
   RECEPTOR( 3)    30.0           0.0            0.0
   RECEPTOR( 4)    40.0           0.0            0.0
   RECEPTOR( 5)    50.0           0.0            0.0
```

ConocoPhillips	**Incident Date and NMOCD Notified?** 3/25/02

SITE:	Warren Unit San Andres		Assigned Site Reference
Company:	CONOCOPHILLIPS CO.		
Street Address:	5805 East Highway 80		
Mailing Address:	1410 NW COUNTY RD.		
City, State, Zip:	Hobbs, NM 88240		
Representative:	C. JOHN COY		
Representative Telephone:	505-391-3127		
Telephone:			
Fluid volume released (bbls):	25	Recovered (bbls):	22
>25 bbls: Notify NMOCD verbally within 24 hrs and submit form C-141 within 15 days.			
5-25 bbls: Submit form C-141 within 15 days (Also applies to unauthorized releases of 50-500 mcf Natural Gas)			
Leak, Spill, or Pit (LSP) Name:	0		
Source of contamination:	3" Steel Pipeline		
Land Owner, i.e., BLM, ST, Fee, Other:	Bureau of Land Management 620 E. Green St., Carlsbad, NM 88220		
LSP Dimensions:	Irregular Shape (GPS Site Diagram attached)		
LSP Area:	2,206 -ft^2		
Location of Reference Point (RP):			
Location distance and direction from RP:			
Latitude:	N32° 32' 57.62"		
Longitude:	W103° 09' 02.77"		
Elevation above mean sea level:	3550 -ft amsl		
Feet from South Section Line:	4616		
Feet from West Section Line:	3479		
Location - Unit and 1/4 1/4:	UL- B	NW 1/4 of NE 1/4	
Location - Section:	28		
Location - Township:	20S		
Location - Range:	38E		
Surface water body within 1000' radius of Site:	0		
Surface water body within 1000' radius of Site:	0		
Domestic water wells within 1000' radius of Site:	0		
Domestic water wells within 1000' radius of Site:	0		
Agricultural water wells within 1000' radius of Site:	0		
Agricultural water wells within 1000' radius of Site:	0		
Public water supply wells within 1000' radius of Site:	0		
Public water supply wells within 1000' radius of Site:	0		
Depth (ft) from land surface to ground water (DG):	50		
Depth (ft) of contamination (DC):	20		
Depth (ft) to ground water (DG - DC = DtGW):	30		

1. Ground Water	2. Wellhead Protection Area	3. Distance to Surface Water Body
If Depth to GW <50 feet: *20 points*	If <1000' from water source, or, <200' from private domestic water source: *20 points*	<200 horizontal feet: 20 points
If Depth to GW 50 to 99 feet: *10 points*		200-100 horizontal feet: 10 points
If Depth to GW >100 feet: *0 points*	If >1000' from water source, or, >200' from private domestic water source: *0 points*	>1000 horizontal feet: 0 points
Ground water Score: 20	*Wellhead Protection Area Scor* 0	*Surface Water Score:* 0
Site Rank (1+2+3) = 20		

Total Site Ranking Score and Acceptable Concentrations

Parameter	**20 or >**	10	0
Benzene[1]	**10 ppm**	10 ppm	10 ppm
BTEX[1]	**50 ppm**	50 ppm	50 ppm
TPH	**100 ppm**	1000 ppm	5000 ppm

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised June 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company	CONOCOPHILLIPS CO.	Contact	C. JOHN COY
Address	1410 NW COUNTY RD. Hobbs, NM 88240	Telephone No.	505-391-3127
Facility Name	Warren Unit San Andres	Facility Type	Crude Petroleum Trunk Line

Surface Owner	Bureau of Land Management	Mineral Owner	NA	Lease No.	LC 031670B

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from South Line	Feet from West Line	Longitude	Latitude	County:
B	28	20S	38E	4616	3479	W103° 09' 02.77"	N32° 32' 57.62"	Lea

NATURE OF RELEASE

Type of Release **Crude Oil and Produced Water**	Volume of Release **25 bbl**	Volume Recovered **22 bbl**
Source of Release **3" Steel Pipeline**	Date and Hour of Occurrence **3/25/02 6:00 AM**	Date and Hour of Discovery **3/25/02 7:00 AM**
Was Immediate Notice Given? ☐ Yes ☑ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☑ No	If YES, Volume Impacting the Watercourse. **NA**	

If a Watercourse was Impacted, Describe Fully.*

NA

Describe Cause of Problem and Remedial Action Taken.*

Gasket between flanges failed; repaired by replacing gasket with metallic gasket

Describe Area Affected and Cleanup Action Taken.*

~2206-ft^2 surface spill area affected. 22-bbl of crude and PW recovered from 25-bbl release. RCRA Exempt Non-hazardous contaminated soil will be or excavated down to 7-ft depth and disposed of by EPI. A 2-ft clay barrier will be installed over remaining contamination. Backfill will be clean topsoil obtained onsite.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:		**OIL CONSERVATION DIVISION**	
Printed Name:	C. JOHN COY	Approved by District Supervisor:	
Title:	OPERATIONS SUPERVISOR	Approval Date:	Expiration Date:
E-mail Address:	c-john.coy@conocophillips.com	Conditions of Approval:	☐ Attached .
Date: 9/24/03	Phone: 505-391-3127		

30'