

AP015

**GENERAL
CORRESPONDENCE**

2005

Chavez, Carl J, EMNRD

From: Wynn, Tom R [Tom.R.Wynn@conocophillips.com]
Sent: Tuesday, June 14, 2011 1:54 PM
To: VonGonten, Glenn, EMNRD
Cc: Chavez, Carl J, EMNRD; 'Pope, Greg'

Mr. Glenn VonGonten:

Per our teleconference today, ConocoPhillips (COP) requested that the sampling frequency at Line NM1-1 (AP – 10) and East Hobbs Junction (AP – 15) move from a quarterly to semi annually. The request comes after COP installed four six inch recovery wells at Line NM1-1 and has demonstrated that the additional recovery wells have improved product recovery rates. The plumes at both project sites appear to be stable and that quarterly sampling is not necessary to move the projects forward. The New Mexico OCD approved the sample frequency change from quarterly to semi annual for both projects. The next sampling event on a semi annual basis will occur in October 2011 and will be followed by an annual report for both projects.

ConocoPhillips and Tetra Tech appreciated the time provided by the NMOCD to discuss these projects and we look forward to discussing additional projects with you in the near future.

Regards,

Tom Wynn

Thomas (Tom) Wynn
ConocoPhillips
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Risk Management and Remediation
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AP0015



**EAST HOBBS JUNCTION
REMEDIATION SITE
Hobbs, New Mexico**

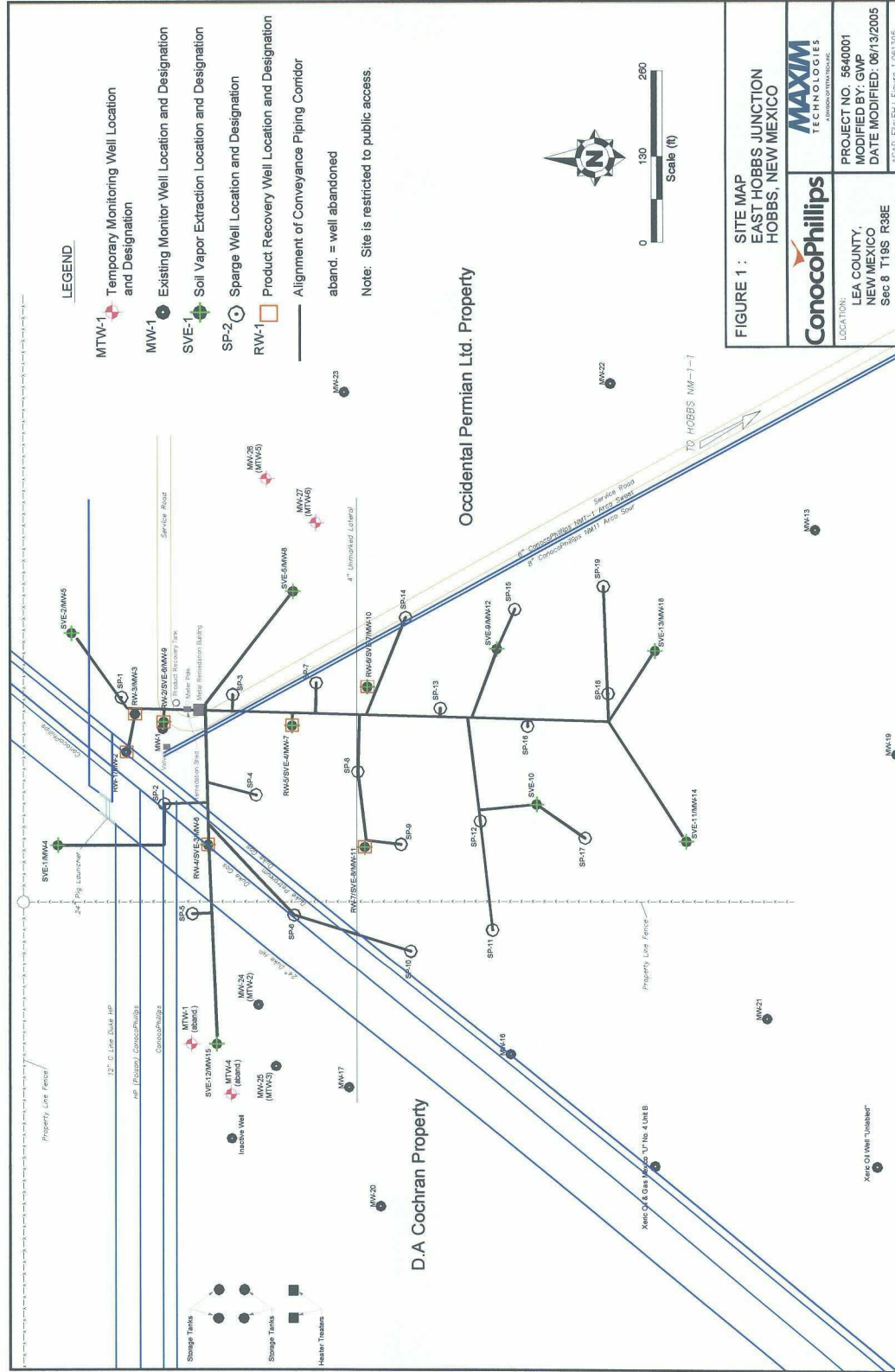
**OPERATION & MAINTENANCE
PERFORMED BY**



Project History

- Project activities commenced at the site in January of 2000 following the discovery of a release of crude oil from a gathering line at East Hobbs Junction.
- Assessment and remediation activities have been conducted at the site to define and address the crude oil impacts.
- An abatement action was enacted consisting of the installation of a comprehensive soil and groundwater remediation system.
- The remediation system consists of a crude oil recovery system using pneumatic skimmer pumps, a soil vapor extraction (SVE) system, and an air sparging system.
- The SVE system at East Hobbs Junction is operated under permit from the New Mexico Air Quality Bureau.
- Recovered crude oil and water is transferred to an on-site storage tank and periodically transported off-site for recycling and disposal.

Site Layout



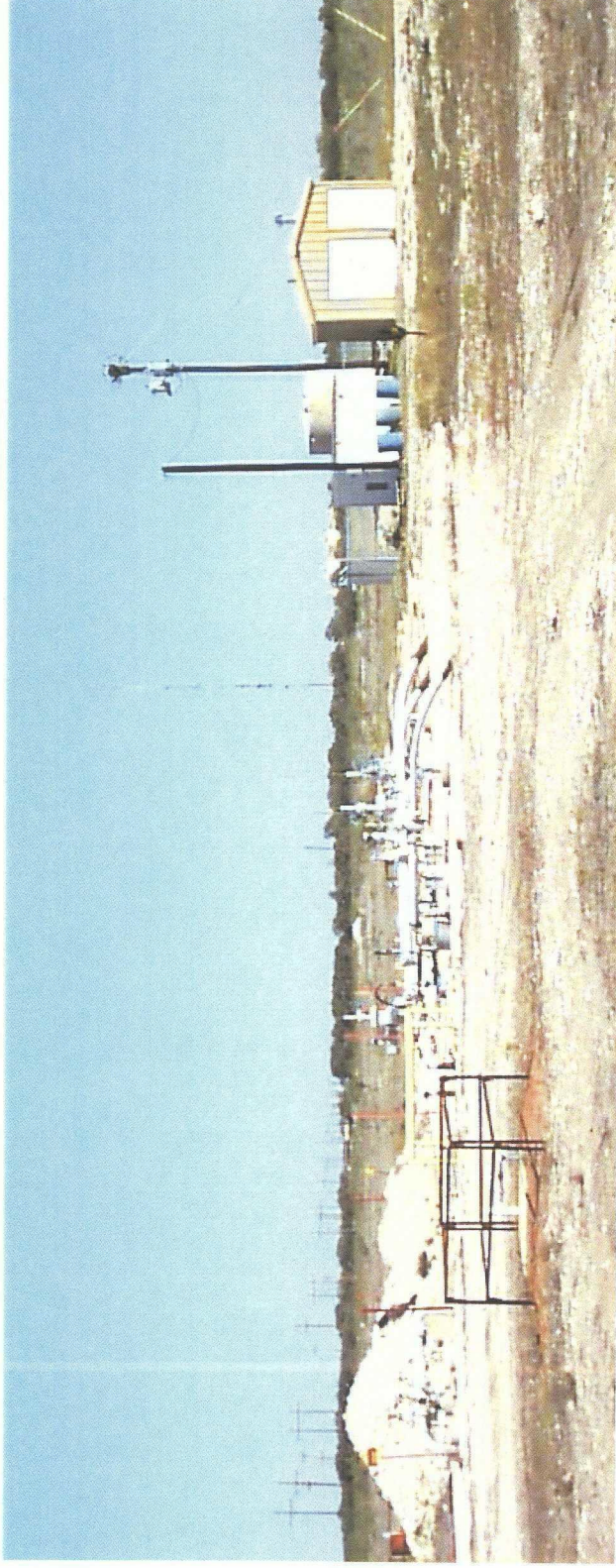
Site Facilities

- Main remediation building with SVE blower system, air compressor, SVE and air sparge well headers, and associated electrical controls .
- Secondary remediation shed with standby air compressor, recovery well headers, electrical controls and supplies storage.
- 140-barrel crude oil storage tank with secondary containment berm and perimeter security fencing.



East Hobbs Junction Remediation Site

Main Remediation Building, Secondary Remediation Shed,
140-bbl Crude Oil Storage Tank, Air Sparge Well, and
Production Pipeline Header Junction





East Hobbs Junction Remediation Site

Main & Secondary
Remediation Sheds, 140-bbl
Crude Oil Storage Tank



Remediation System
Control Panel



**Roots 615 URAI Positive
Displacement Blower Assembly**



Soil Vapor Extraction Flow Control Header



Air Sparging Flow Control Header



Remediation Wells

- Two (2) crude oil recovery wells only with pneumatic skimmer pumps.
- Five (5) dual phase wells with pneumatic skimmer pumps for crude oil recovery and SVE.
- Eight (8) SVE wells only.
- Nineteen (19) air sparge wells.
- Twelve (12) groundwater monitoring wells.

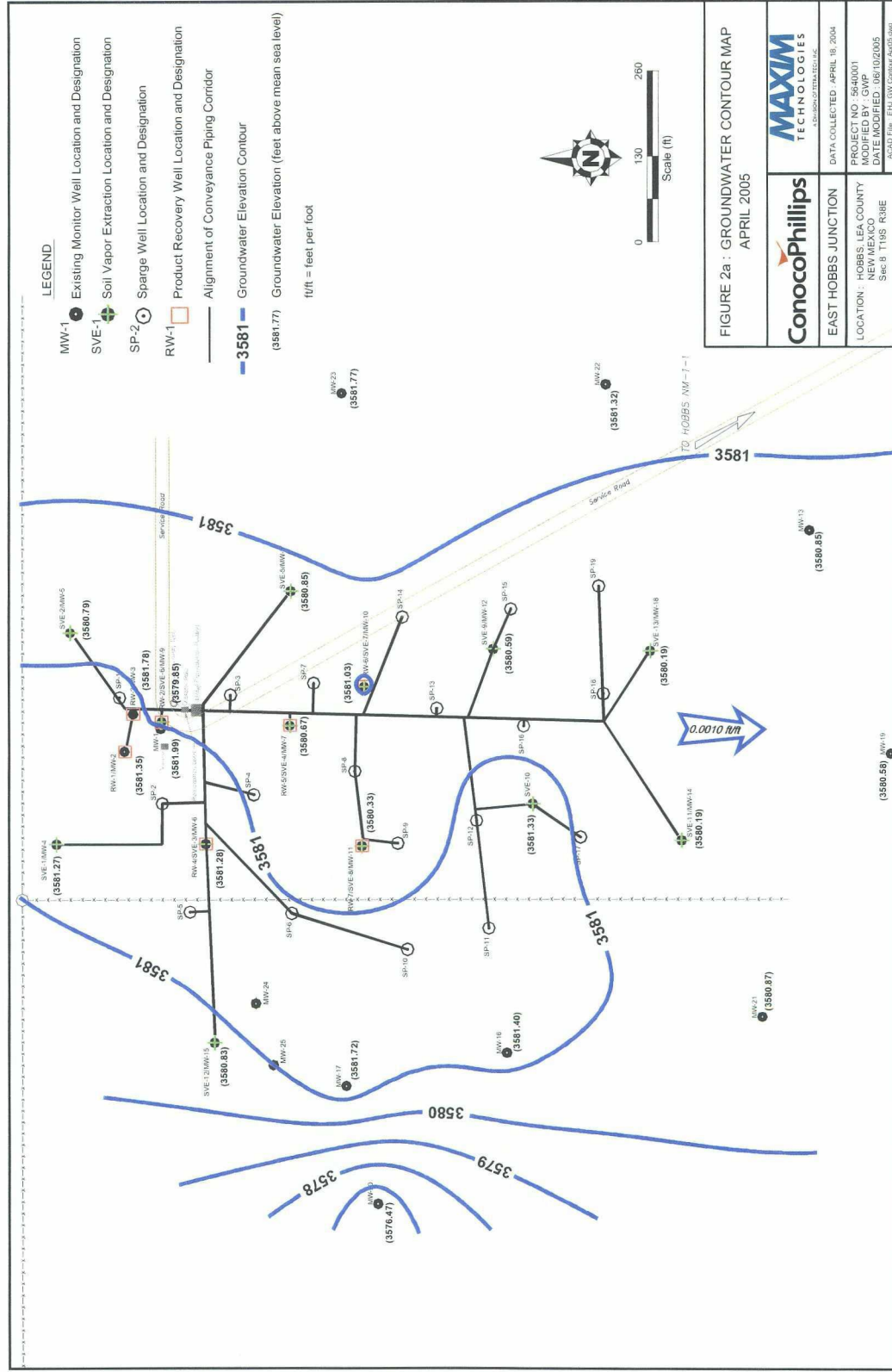


East Hobbs Junction Remediation Site

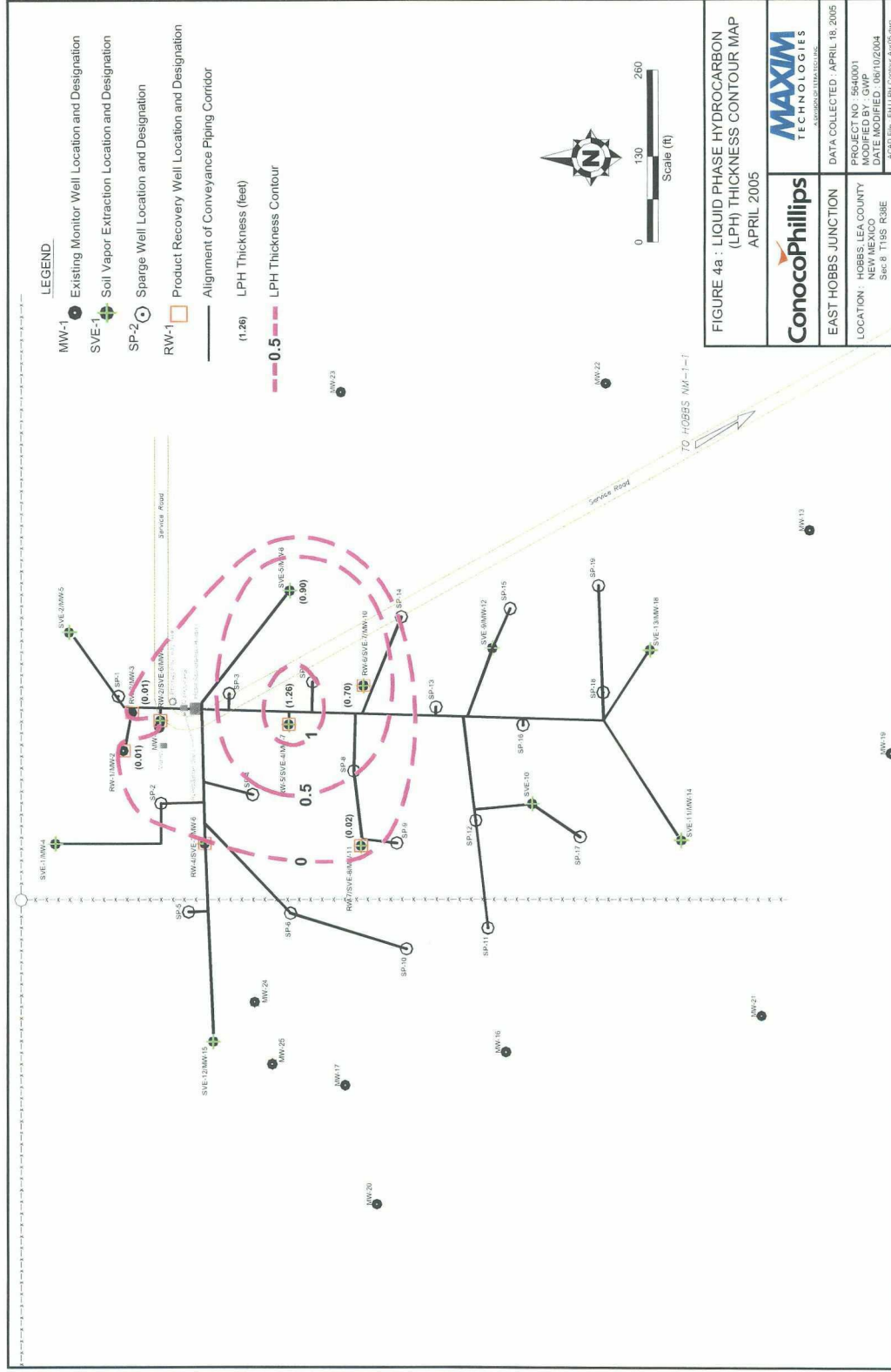
Groundwater Elevations & Liquid-Phase Hydrocarbon (LPH) Thickness Table

Well Number	Sample Date	Casing Elevation	Depth to Water	Depth to L.P.H.	L.P.H. Thickness	L.P.H. Thickness X 0.8	Adjusted Depth to Water	Groundwater Elevation	Jan-Apr05 GW Elev Diff	Jan-Apr05 L.P.H. ThickDiff	Apr04-05 GW Elev Diff	Apr04-05 L.P.H. ThickDiff
MW-1	04/18/05	3606.28	24.29		0.00	0.00	24.29	3581.99				
MW-2	04/18/05	3606.45	25.11	25.10	0.01	0.01	25.10	3581.35	0.32	0.01	2.52	-0.76
MW-3	04/18/05	3606.33	24.56	24.55	0.01	0.01	24.55	3581.78	0.36	-0.01	2.93	-1.44
MW-4	04/18/05	3606.37	25.10		0.00	0.00	25.10	3581.27	0.32		2.54	
MW-5	04/18/05	3604.90	24.11		0.00	0.00	24.11	3580.79	0.41		2.82	
MW-6	04/18/05	3606.14	24.86		0.00	0.00	24.86	3581.28	0.31	0.00	2.84	-0.33
MW-7	04/18/05	3605.50	25.84	24.58	1.26	1.01	24.83	3580.67	0.27	1.24	2.92	-0.99
MW-8	04/18/05	3604.92	24.79	23.89	0.90	0.72	24.07	3580.85	0.34	-0.04	3.13	0.45
MW-9	04/18/05	3605.75	25.90		0.00	0.00	25.90	3579.85	0.33	0.00	3.04	-0.13
MW-10	04/18/05	3604.94	24.47	23.77	0.70	0.56	23.91	3581.03	0.32	0.27	3.01	-1.26
MW-11	04/18/05	3608.06	27.75	27.73	0.02	0.02	27.73	3580.33	0.30	0.01	2.76	-0.03
MW-12	04/18/05	3604.14	23.55		0.00	0.00	23.55	3580.59	0.30		3.02	
MW-13	04/18/05	3604.31	23.46		0.00	0.00	23.46	3580.85	0.18		3.49	
MW-14	04/18/05	3603.77	23.58		0.00	0.00	23.58	3580.19	0.18		3.03	
MW-15	04/18/05	3609.23	28.40		0.00	0.00	28.40	3580.83	0.32	0.00	2.64	-0.06
MW-16	04/18/05	3606.31	24.91		0.00	0.00	24.91	3581.40	0.20		2.87	
MW-17	04/18/05	3609.03	27.31		0.00	0.00	27.31	3581.72	0.26			
MW-18	04/18/05	3605.34	25.15		0.00	0.00	25.15	3580.19	0.22		3.25	
MW-19	04/18/05	3606.69	26.11		0.00	0.00	26.11	3580.58	0.09		3.29	
MW-20	04/18/05	3606.25	29.78		0.00	0.00	29.78	3576.47	0.19		2.68	
MW-21	04/18/05	3603.51	22.64		0.00	0.00	22.64	3580.87	0.06		3.04	
MW-22	04/18/05	3603.27	21.95		0.00	0.00	21.95	3581.32	0.30		3.64	
MW-23	04/18/05	3604.62	22.85		0.00	0.00	22.85	3581.77	0.40		3.49	
SVE-10	04/18/05	3605.12	23.79		0.00	0.00	23.79	3581.33	0.22		2.83	

Groundwater Elevation Contour Map – April 18, 2005



Liquid Phase Hydrocarbon Thickness Contour Map – April 18, 2005



SVE VOC Removal Details Table

Date	Total Time (days)	Effluent Concentration (ppm)	Flow Rate (SCFM)	"SnapShot" Discharge (lbs/day)	Average Discharge for Period (lbs/day)	Incremental		Cumulative Discharge (lbs)	Incremental Time (Days)
						Discharge (lbs)	Discharge (lbs/day)		
01/29/2004	469	147	873	37.39	38.40	1152.13	27300.29	30	
02/16/2004	487	142	849	35.12	35.74	643.33	27943.62	18	
02/25/2004	496	116	861	29.10	32.36	291.22	28234.84	9	
03/25/2004	525	114	875	29.06	29.32	850.14	29084.99	29	
04/14/2004	545	181	875	46.14	37.60	752.00	29836.99	20	
04/27/2004	558	158	875	40.28	43.21	561.71	30398.70	13	
05/26/2004	587	127	875	32.37	36.33	1053.44	31452.13	29	
06/09/2004	601	108	875	27.53	29.95	419.34	31871.47	14	
06/30/2004	622	97.6	875	24.88	26.21	550.31	32421.78	21	
07/27/2004	649	104	875	26.51	25.70	693.78	33115.56	27	
08/03/2004	656	94.2	875	24.01	25.26	176.83	33292.40	7	
08/24/2004	677	112	875	28.55	26.28	551.92	33844.31	21	
09/08/2004	692	114	875	29.06	28.81	432.08	34276.40	15	
09/20/2004	704	100	875	25.49	27.28	327.31	34603.71	12	
10/05/2004	719	109	875	27.79	26.64	399.58	35003.29	15	
11/11/2004	756	91.9	875	23.43	25.61	947.43	35950.72	37	
11/22/2004	767	72	875	18.35	20.89	229.79	36180.51	11	
12/29/2004	804	66	875	16.82	17.59	650.80	36831.31	37	
01/27/2005	833	54	875	13.77	15.29	443.55	37274.87	29	
02/14/2005	851	35.9	875	9.15	11.46	206.25	37481.12	18	
03/02/2005	867	29.1	875	7.42	8.28	132.56	37613.68	16	
03/23/2005	888	28.3	875	7.21	7.32	153.64	37767.31	21	
04/08/2005	904	26.5	875	6.76	6.98	111.76	37879.07	16	
04/12/2005	908	27.9	875	7.11	6.93	27.73	37906.80	4	
05/16/2005	942	18.2	875	4.64	5.88	199.78	38106.58	34	
05/23/2005	949	19.5	875	4.97	4.81	33.64	38140.22	7	
06/01/2005	958	17.1	875	4.36	4.66	41.98	38182.20	9	
06/10/2005	967	17.5	875	4.46	4.41	39.69	38221.89	9	

Estimated average pounds per day removed:	39.53	Total tons VOCs removed (Oct 2002-Oct 2003):	11.45
Estimated total pounds VOCs removed:	38,221.89	Total tons VOCs removed (Nov 2003-Apr 2005):	7.66
		Cumulative tons VOCs removed since startup:	19.11

Notes and Calculations:

$$\text{VOC Discharge (lbs/day)} = ((\text{Co (ppm)} \times 78 \text{ g/mole}) / 24.05) \times (1 \text{ g/1000 mg}) \times (1 \text{ m}^3 / 35.31 \text{ cf}) \times (1 \text{ lb/454 g}) \times (\text{Q (scfm)} \times 1440 \text{ min/day})$$

Where: Co = Average Effluent VOC concentration (ppm) from previous time period

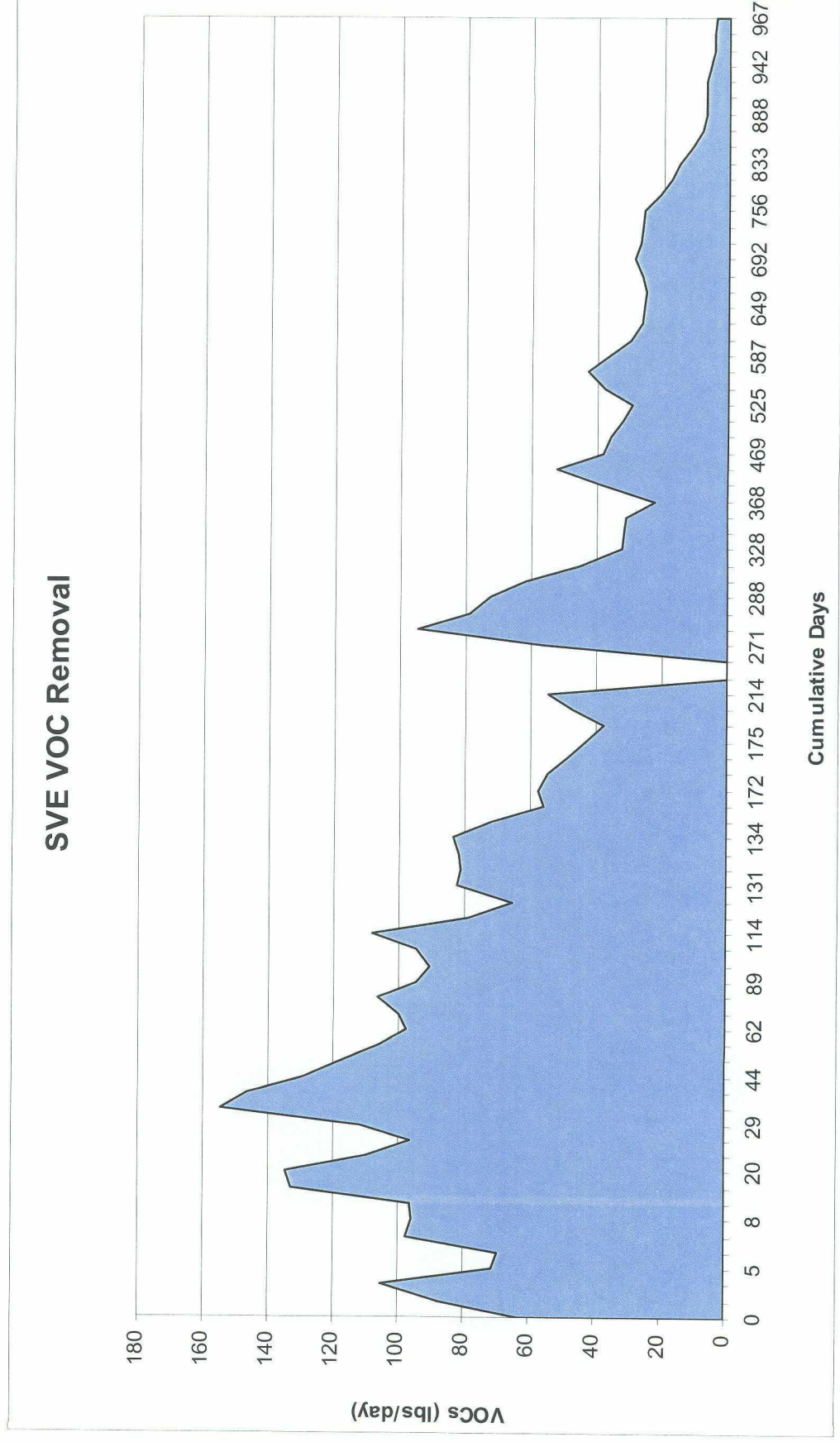
Q = flow rate of effluent air (scfm)

24.05 = gas law constant

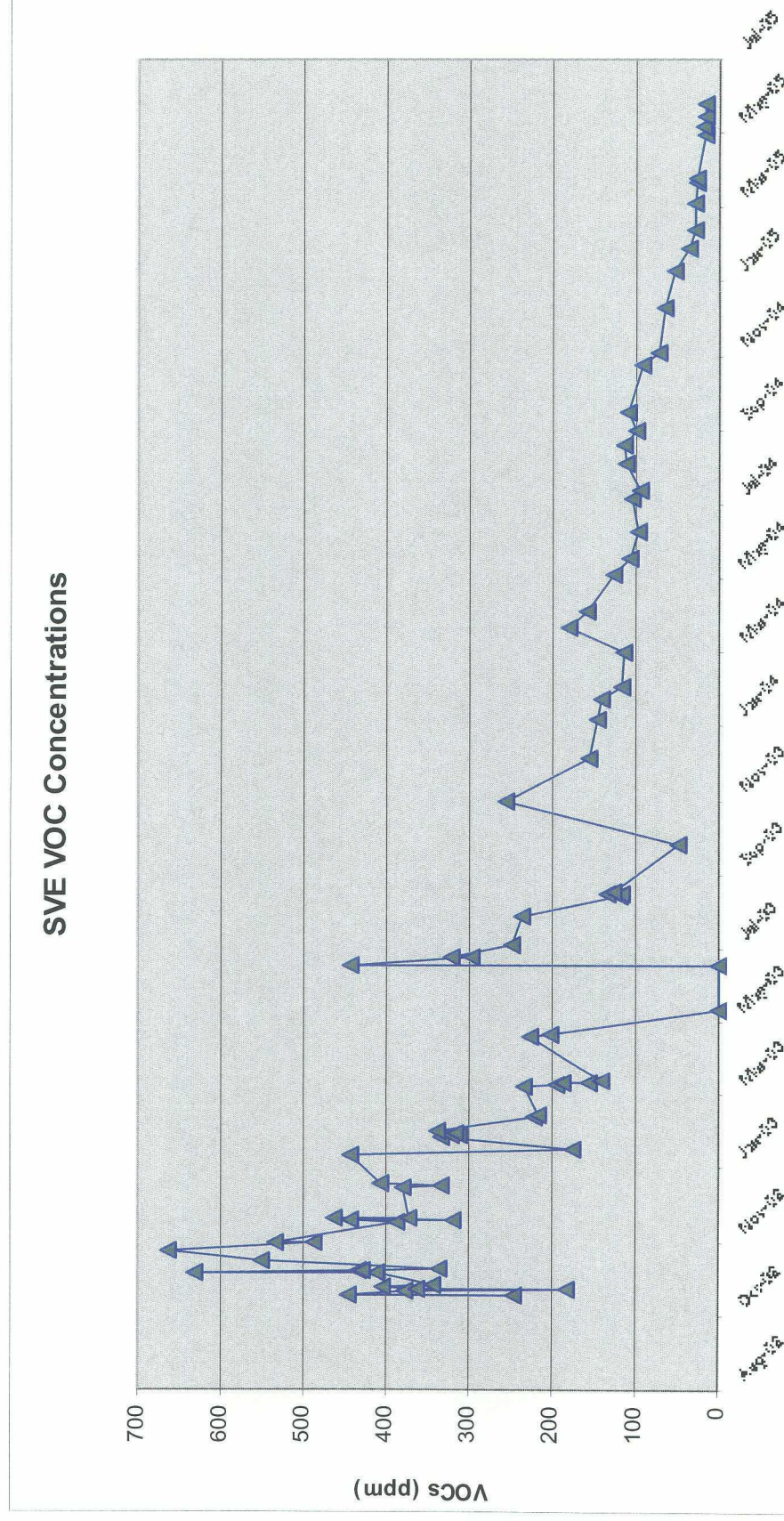


East Hobbs Junction Remediation Site

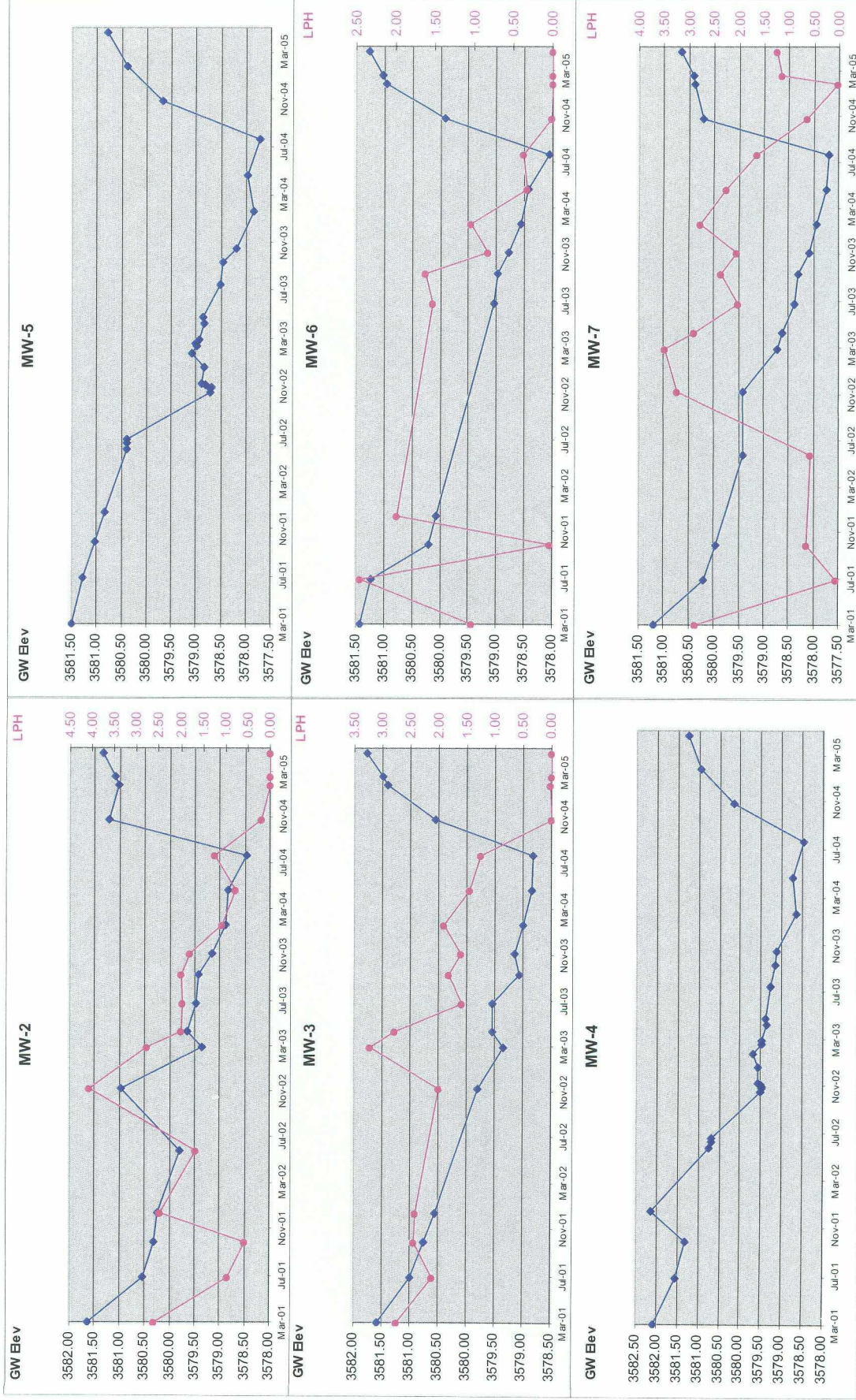
SVE VOC Removal Rate Graph



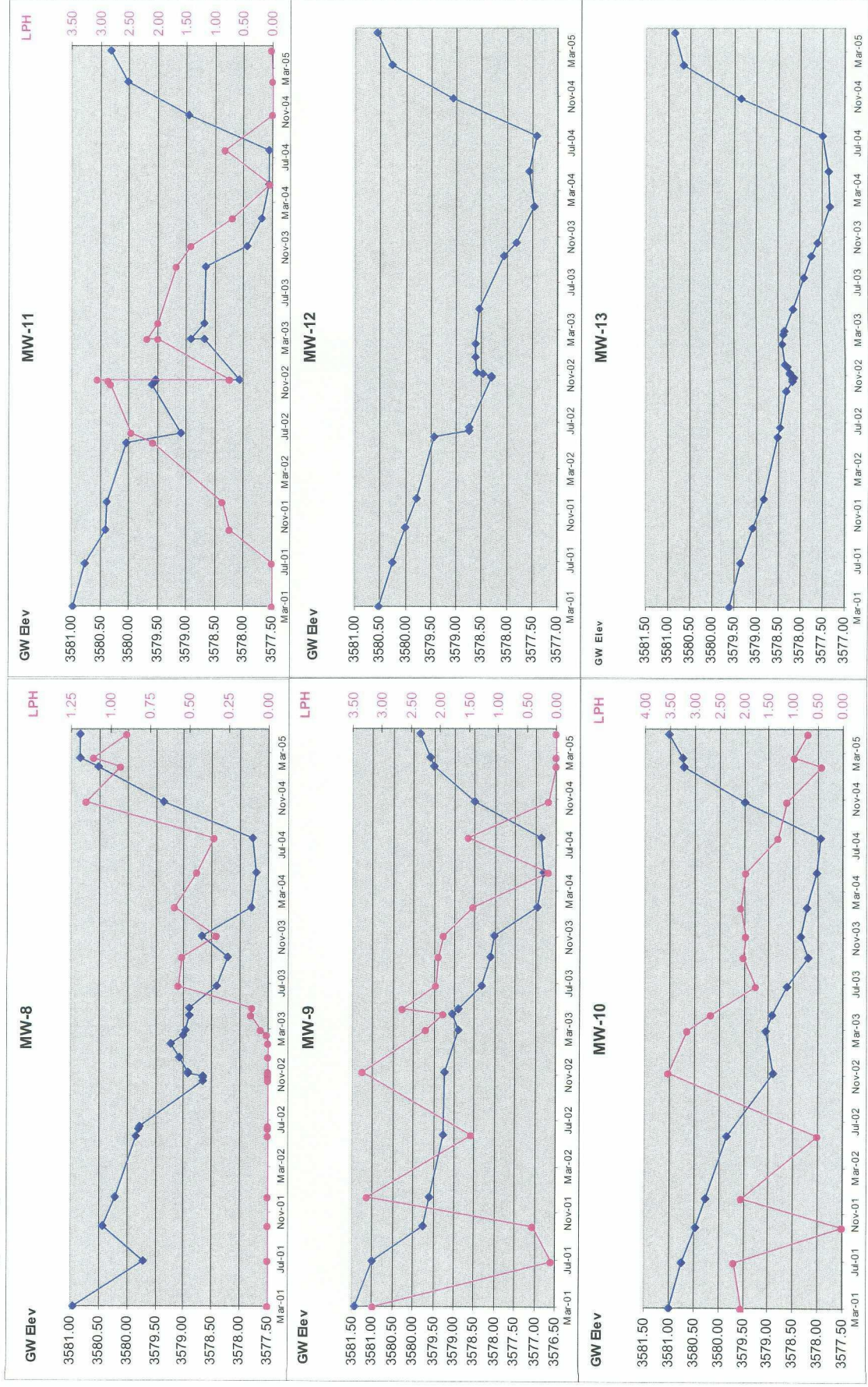
SVE VOC Effluent Concentrations Graph



Hydrographs



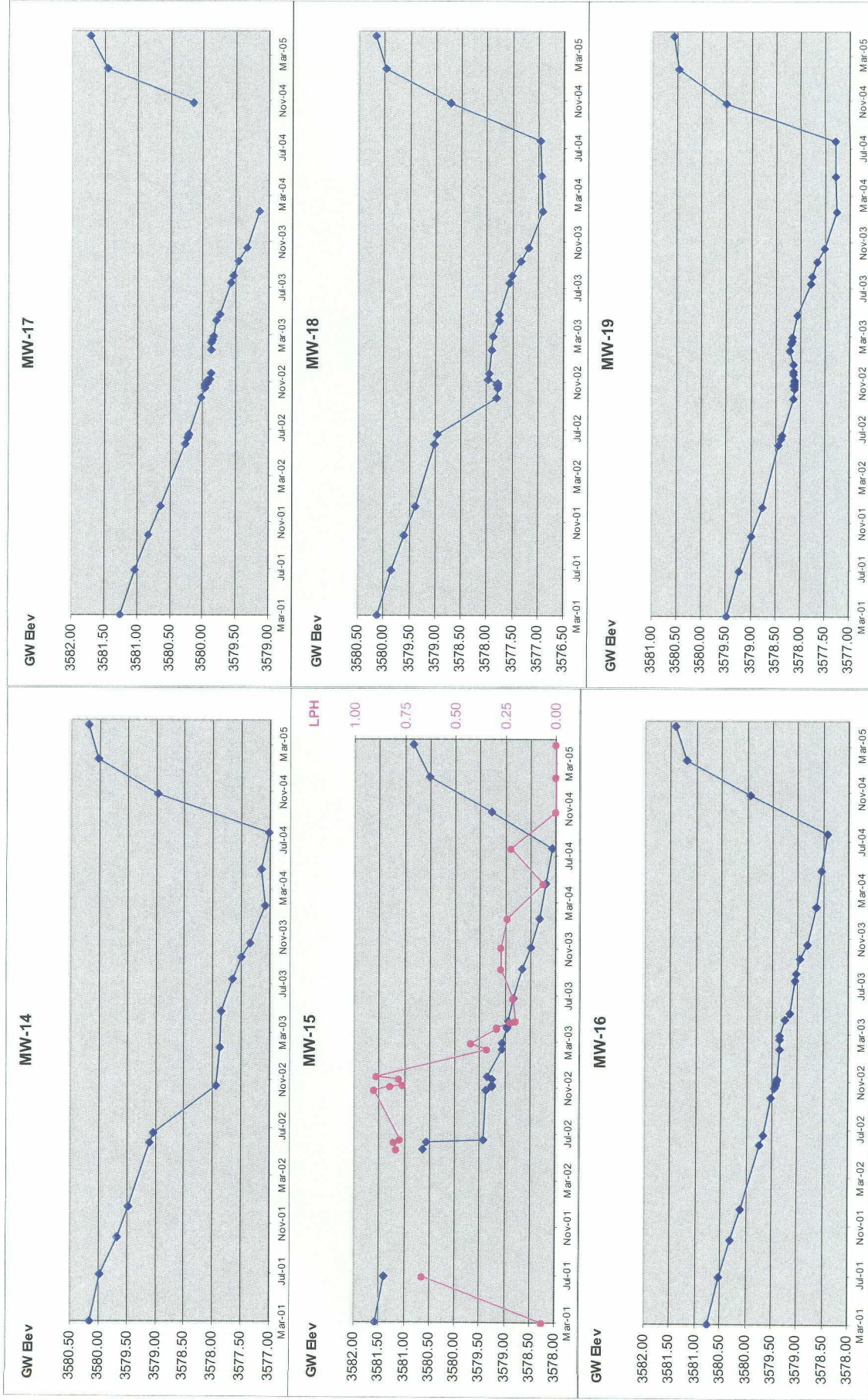
Hydrographs



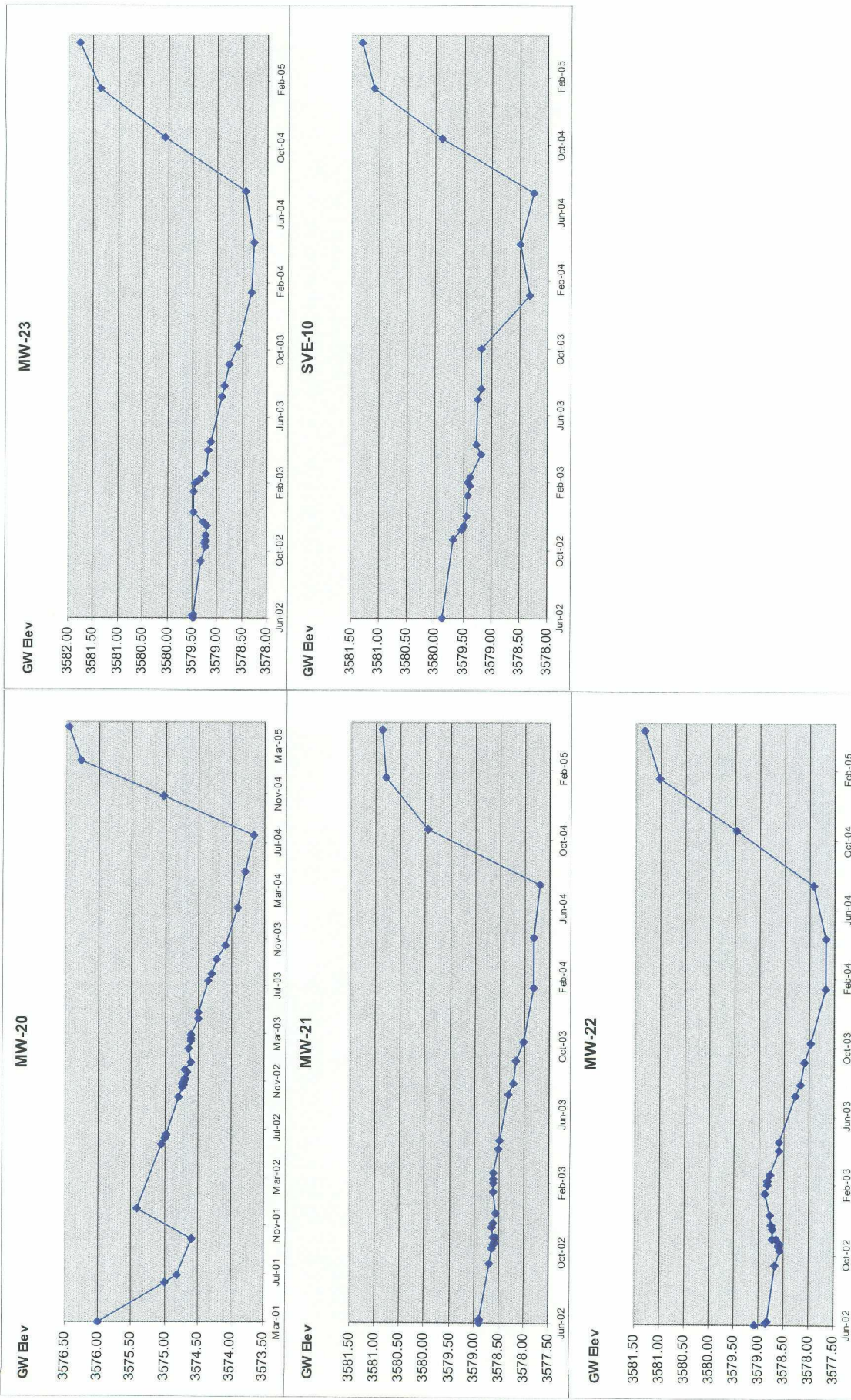


East Hobbs Junction Remediation Site

Hydrographs



Hydrographs



Groundwater Analytical Data Summary

Well Number	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)	TPH-CRO (mg/L)	TPH-DRO (mg/L)
MW-4	07/22/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-4	10/28/2004	2.0	<1.0	<1.0	<3.0	2	<0.10	0.19
MW-4	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.19
MW-4	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-5	07/23/2004	11	10	1.2	<3.0	22.2	0.13	<0.048
MW-5	10/28/2004	28	29	1.5	8.1	66.6	0.20	0.077
MW-5	01/26/2005	8.9	9.1	2.0	4.9	24.9	<0.10	0.069
MW-5	04/20/2005	79.0	36.0	<1.0	43.0	158.0	0.4	0.064
MW-12	07/23/2004	3,200	<1.0	66	160	3,426	12	0.33
MW-12	10/28/2004	3,200	16	46	140	3,402	14	0.52
MW-12	01/27/2005	4,000	<2.0	66	130	4,196	15	1.2
MW-12	04/21/2005	2,700	41	120	140	3,001	12	1.2
MW-13	07/23/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-13	10/27/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-13	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-13	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-14	07/22/2004	4	<1.0	<1.0	<3.0	4	<0.10	0.059
MW-14	10/28/2004	2.4	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-14	01/26/2005	6.1	<1.0	<1.0	<3.0	6.1	<0.10	<0.048
MW-14	04/20/2005	4.4	<1.0	<1.0	<3.0	4.4	<0.10	0.086
MW-16	07/21/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-16	10/26/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.087
MW-16	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-16	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.080
MW-17	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-17	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-18	07/23/2004	520	<1.0	110	70	700	4.0	0.150
MW-18	10/28/2004	300	<1.0	8.7	19	327.7	1.6	0.12
MW-18	01/26/2005	310	<1.0	14	24	348	1.8	0.15
MW-18	04/20/2005	550	<1.0	49	31	630	2.7	0.15

Well Number	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)	TPH-CRO (mg/L)	TPH-DRO (mg/L)
MW-19	07/22/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-19	10/27/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-19	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-19	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.10
MW-20	07/21/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-20	10/26/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-20	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-20	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-21	07/21/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-21	10/26/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.090
MW-21	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-21	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.25
MW-22	07/22/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-22	10/27/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-22	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-22	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-23	07/22/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-23	10/27/2004	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-23	01/26/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
MW-23	04/20/2005	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.089
MW-24	07/22/2004	400	36	37	35	508	2.2	0.45
MW-24	10/27/2004	48	4.9	11	<3.0	63.9	0.65	0.33
MW-24	01/26/2005	80	<1.0	17	12	109	0.65	0.32
MW-24	04/20/2005	150	<1.0	38	14	202	2.20	0.53
MW-25	07/22/2004	5.8	<1.0	28	25	58.8	0.71	0.094
MW-25	10/27/2004	7.1	<1.0	36	9.9	53.0	0.63	0.35
MW-25	01/26/2005	3.4	<1.0	25	8.9	37.3	0.28	0.29
MW-25	04/20/2005	7.4	3.6	55	16	82.0	0.60	0.23
SVE-10	07/23/2004	77	<1.0	14	<3.0	91	0.46	0.48
SVE-10	10/28/2004	24	1.5	10	7.8	43.3	0.40	1.2
SVE-10	01/27/2005	12	<1.0	12	<3.0	24	0.19	0.68
SVE-10	04/20/2005	<1.0	<1.0	14	<3.0	14	0.12	0.35

Notes:
 µg/L = micrograms per liter
 mg/L = milligrams per liter
 BDL = below detection limit
 D = duplicate sample

Recommended Path Forward

- ✓ ■ Pipeline excavation backfill.
- ✓ ■ Request variance to temporarily discontinue operation of SVE and air sparge systems with option to use for residual removal once plume reduction is realized. *may Reexamine hsoo / variance.*
- ✓ ■ Optimize crude oil recovery system with focus on physical removal of crude oil using skimmer system and reduce amount of groundwater recovery.
- ✓ ■ Continue quarterly groundwater monitoring and annual reporting.

GW0349

 **ConocoPhillips**

**LINE NM1-1
REMEDIATION SITE
Hobbs, New Mexico**

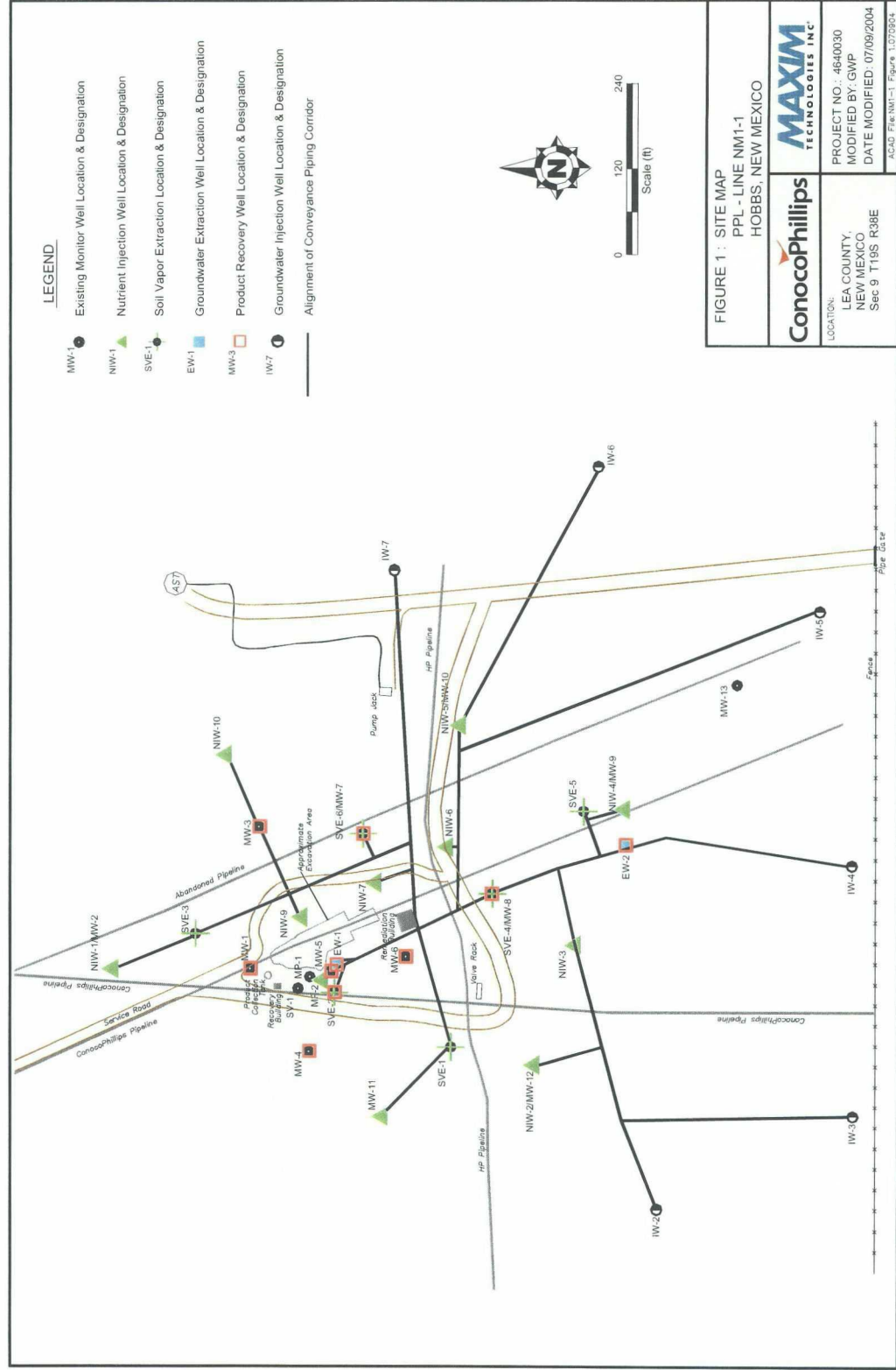
**OPERATION & MAINTENANCE
PERFORMED BY**



Project History

- Project activities commenced at the site in 1999 following the discovery of a release of crude oil from gathering line NM1-1.
- Assessment and remediation activities have been conducted at the site to define and address the crude oil impacts.
- An abatement action was enacted consisting of the installation of a comprehensive soil and groundwater remediation system.
- The remediation system consists of a crude oil recovery system using pneumatic skimmer pumps, a groundwater extraction, treatment and re-injection system, and an enhanced-bioremediation system consisting of bio-venting and nutrient injection.
- Recovered and treated groundwater is re-injected into the aquifer utilizing on-site groundwater injection wells according to a discharge permit issued by the OCD.
- Recovered crude oil is transferred to an on-site storage tank and periodically transported to the Gaines Pump Station where it is injected into the main crude oil pipeline.

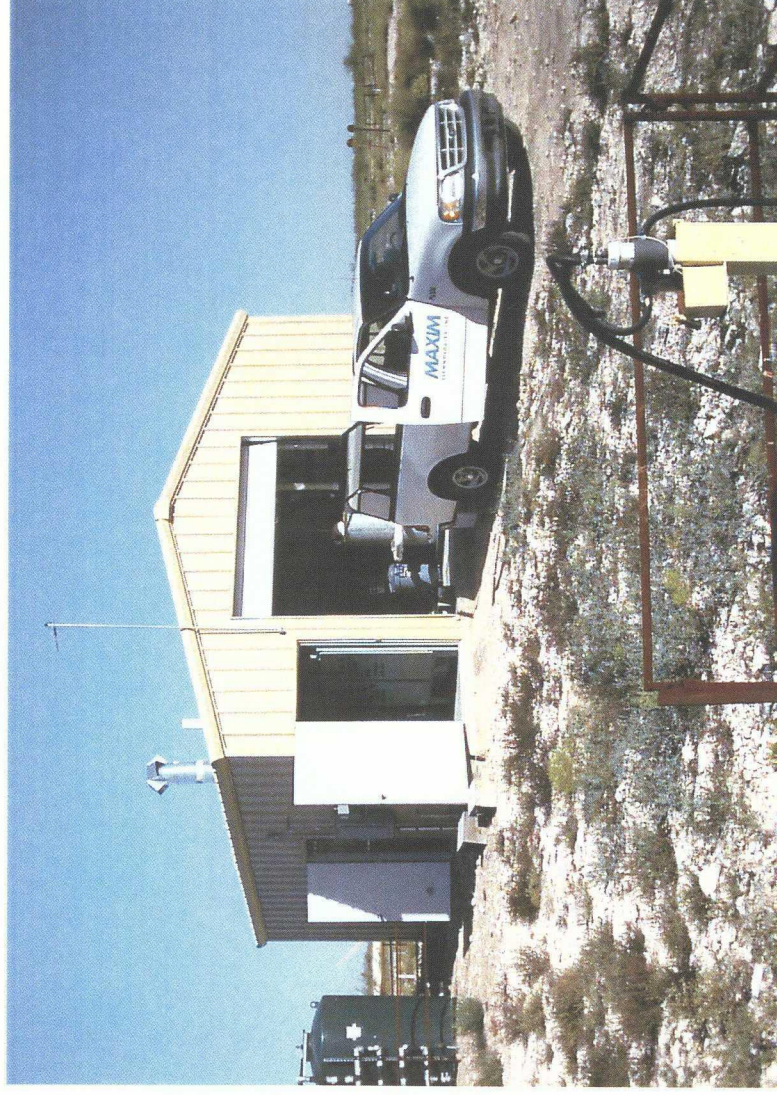
Site Layout



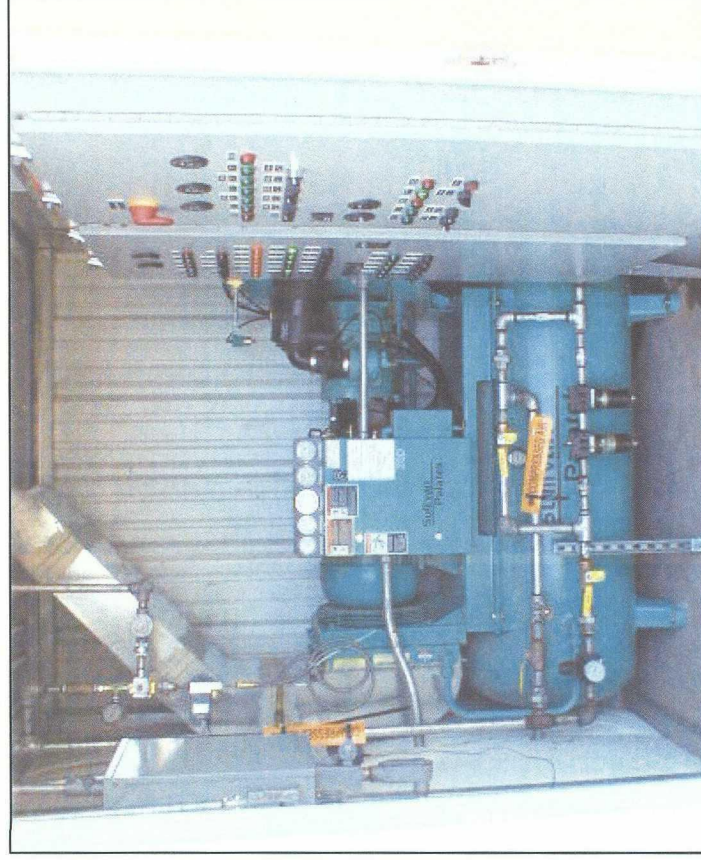
Site Facilities

- Main remediation building with soil vapor extraction (SVE) blower system; air compressor; nutrient injection system; oil/water separator (OWS); air stripper tower and water filtration system; SVE, nutrient injection, and groundwater extraction and re-injection well headers; two 3,000 gallon GAC vessels; a 525 gallon oil storage tank and secondary containment for OWS; and associated electrical controls.
- Secondary remediation shed with standby air compressor, recovery well headers, electrical controls and supplies storage.
- 140-barrel crude oil storage tank with secondary containment berm and perimeter security fencing.

Main Remediation Building



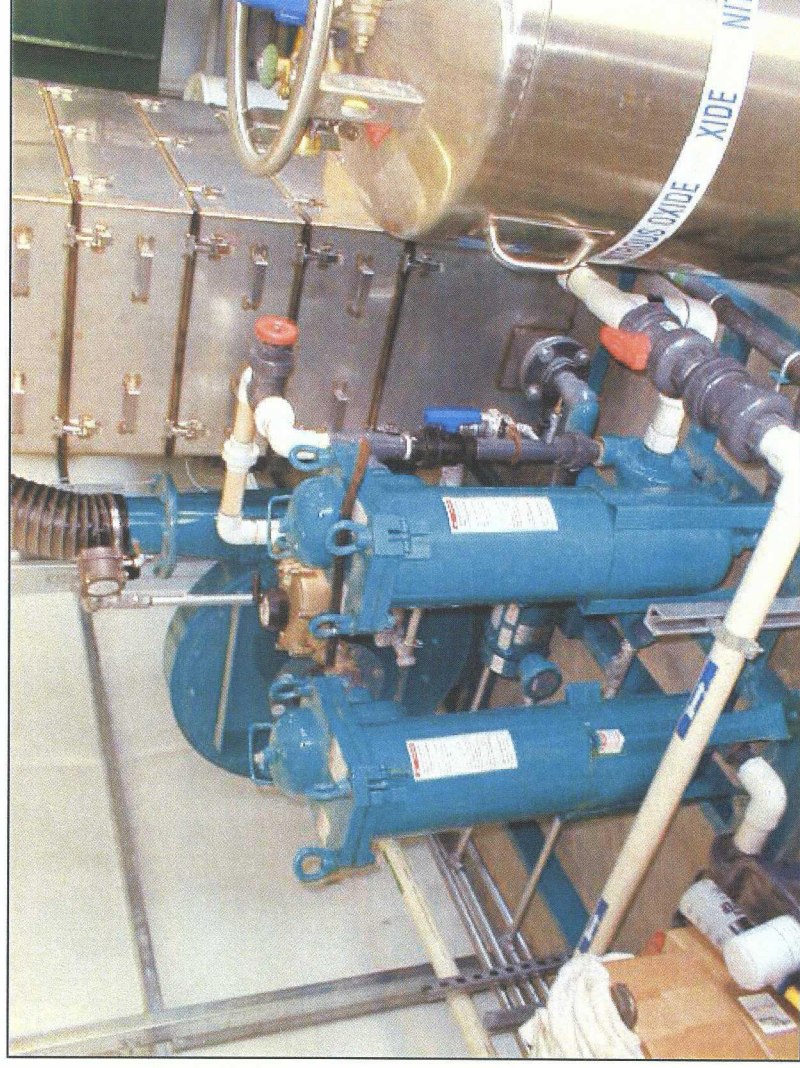
**Primary Air Compressor and
System Controls Room**



**Main Remediation System
Components Room**



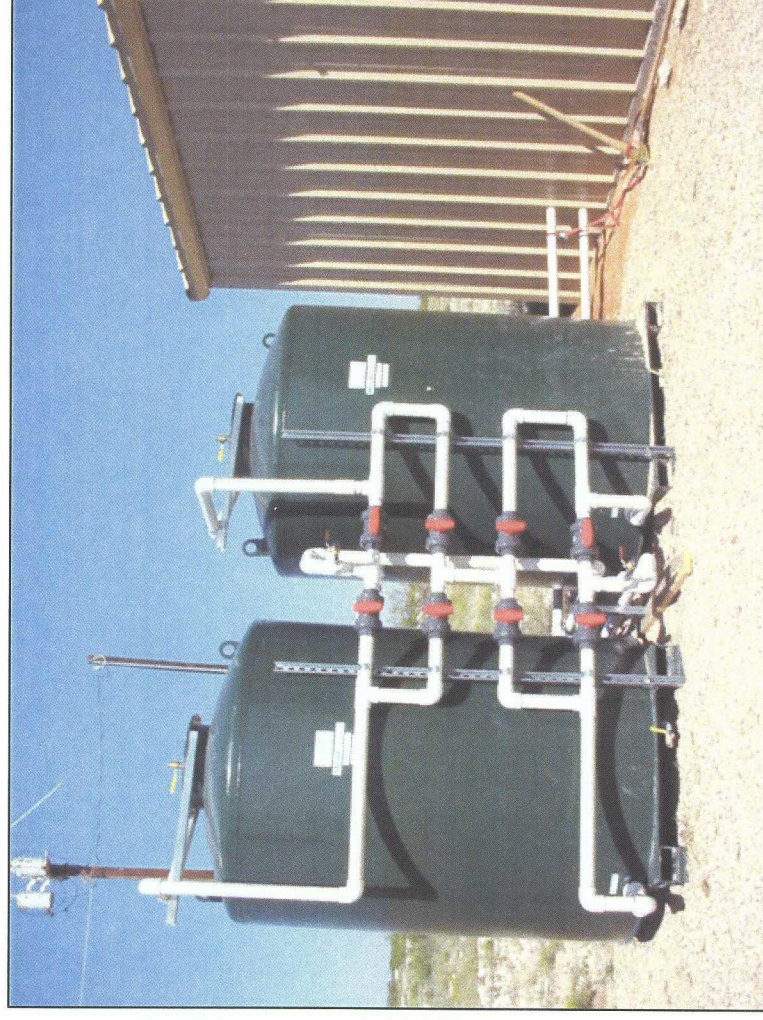
Groundwater Extraction and Treatment System Air Stripping and Filtration



Groundwater Extraction and Treatment System Oil/Water Separator



Groundwater Extraction and Treatment System GAC Vessels



**Roton EN14 Explosion-Proof
Regenerative Blower Skid**



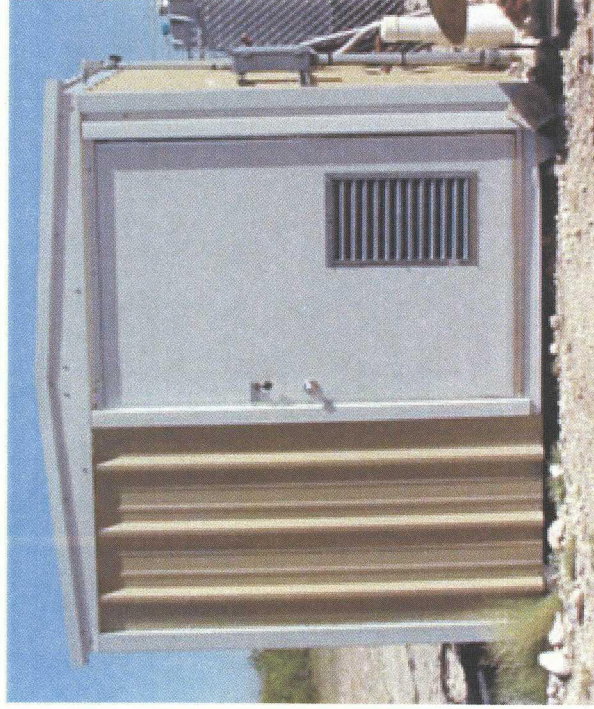
Groundwater Re-injection & Nutrient Injection Flow Control Headers





Line NM1-1 Remediation Site

Secondary Remediation
Shed With Standby
Compressor



Main 140-bbl Crude Oil
Storage Tank



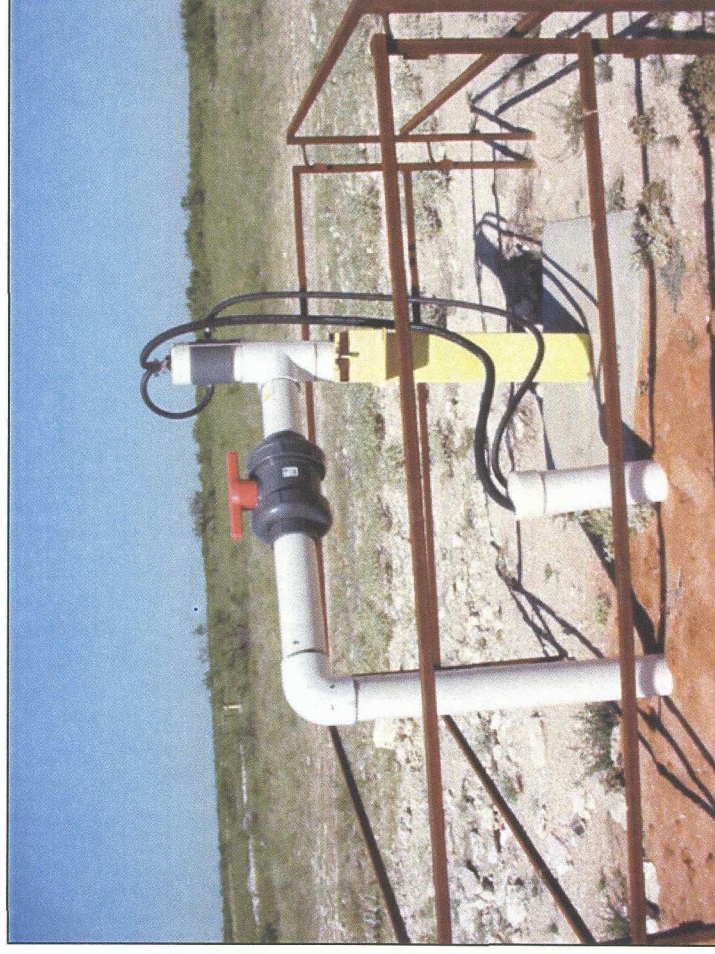
Remediation Wells

- Five (5) crude oil recovery wells only with pneumatic skimmer pumps.
- Three (3) dual phase wells with pneumatic skimmer pumps for crude oil recovery and SVE bioventing.
- Six (6) SVE wells for bioventing only.
- Ten (10) nutrient injection wells for nitrous oxide injection only.
- Two (2) groundwater extraction wells with submersible groundwater pumps and oil skimmer pumps also.
- Six (6) groundwater re-injection wells.

**Crude Oil Recovery Well With
Pneumatic Skimmer Pump**



**Dual-Phase Recovery Well
With SVE & Skimmer Pump**



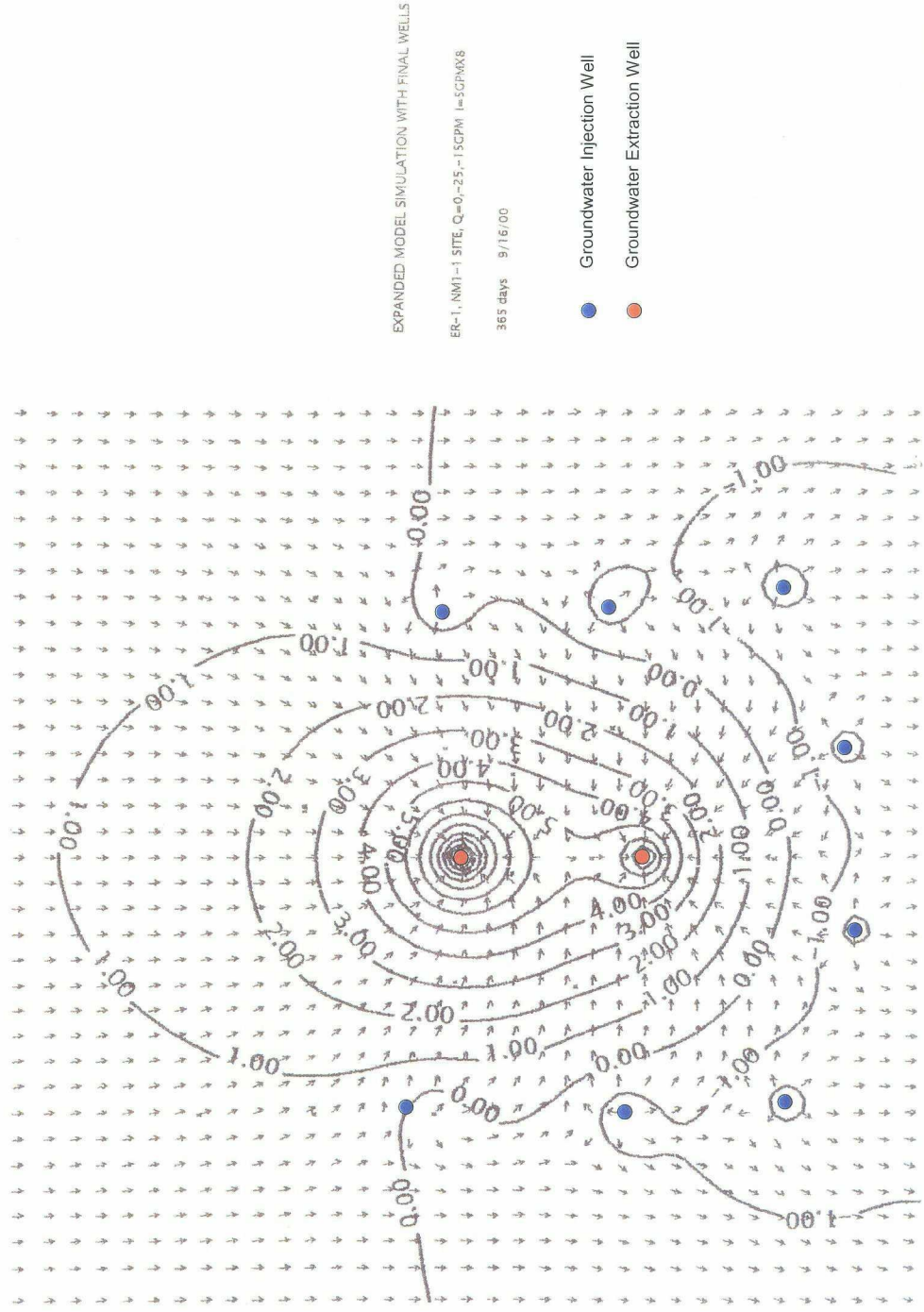
Nutrient Injection Well



Initial Groundwater Modeling Parameters

- Hydraulic Conductivity (K) $\approx 1.4 \times 10^{-3}$ cm/sec (3.97 feet/day). *too high*
- Hydraulic Gradient (*i*) = 0.0047 feet/foot.
- Average Velocity (*v*) = 27 feet/year.
- Effective Porosity (*n_e*) $\approx 25\%$. *too high*
- Bulk Density ≈ 1.54 g/mL
- Groundwater Depth = 22 feet below ground surface.
- Pumping Rate (Q) = 25 gpm @ EW-1 + 15 gpm @ EW-2
- Injection Rate = 5 gpm X 8 injection wells

Groundwater Model Simulation Output



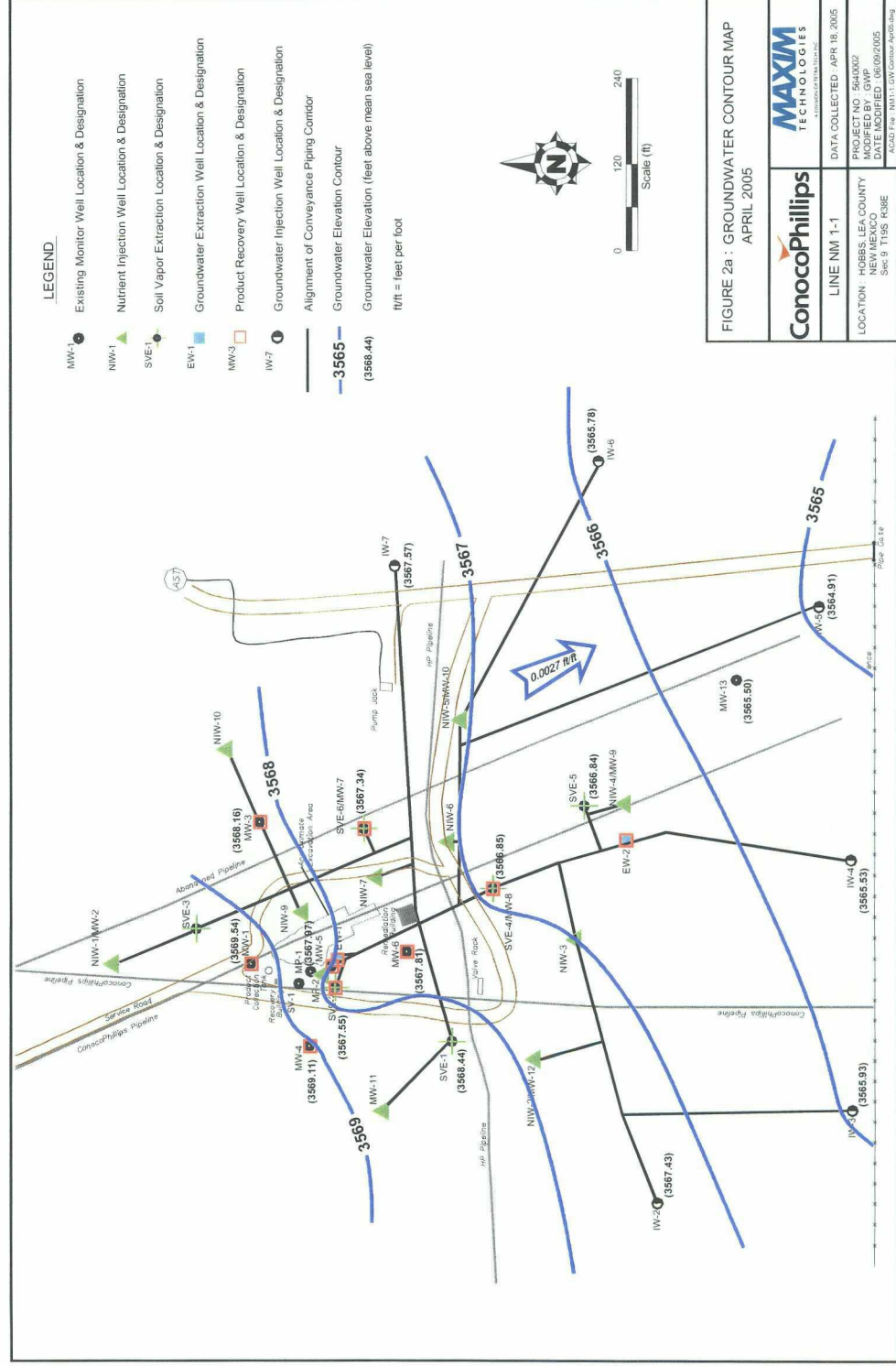
Actual Groundwater Parameters

- Hydraulic Gradient (i) = 0.0015 – 0.0027 feet/foot.
- Flow Direction = south-southeast
- Groundwater Depth = 30 – 36 feet below ground surface.
- Pumping Rate (Q) = 1.5 – 10.4 gpm @ EW-1
0.3 – 2.4 gpm @ EW-2

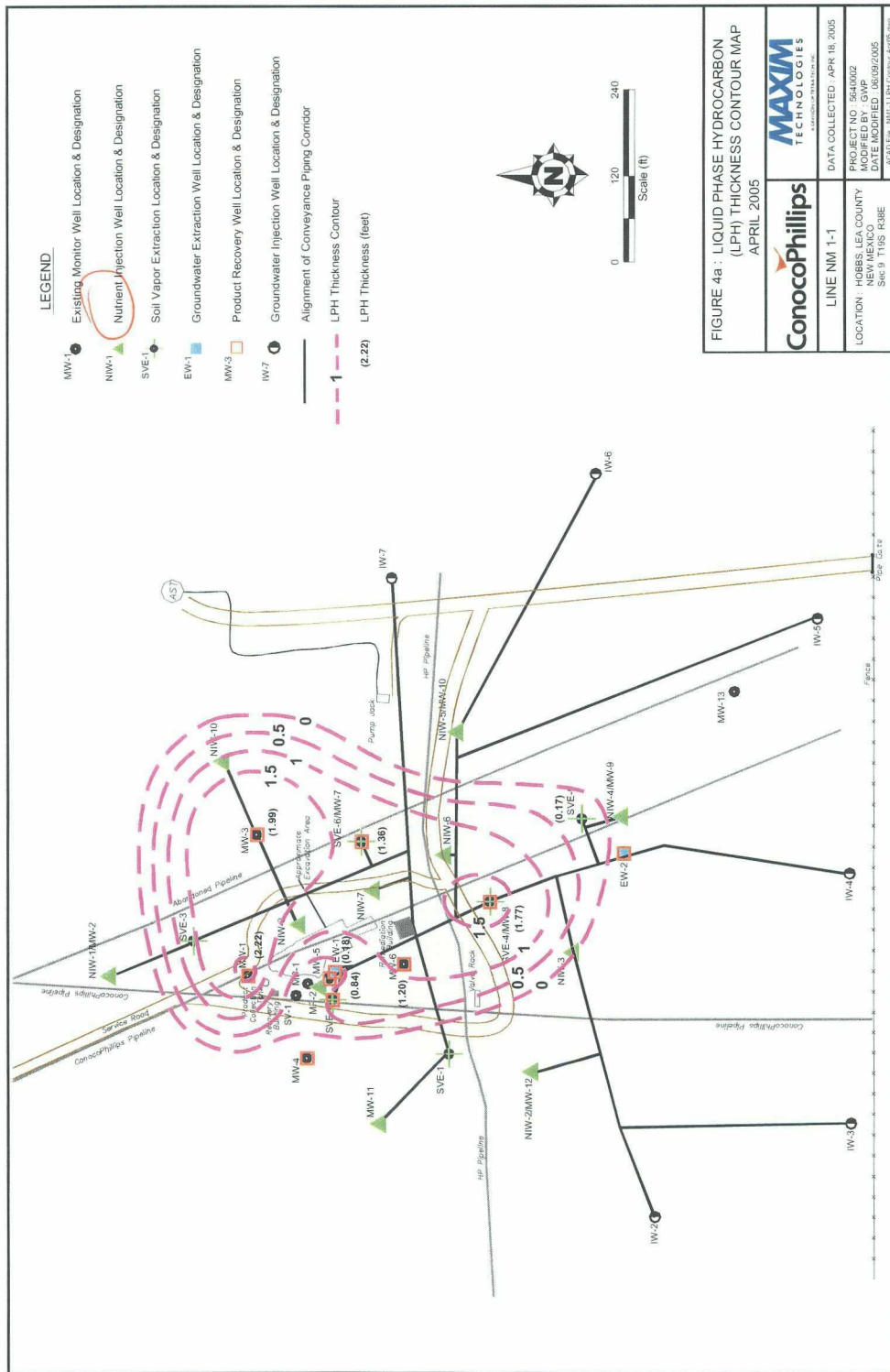
Groundwater Elevations & Liquid-Phase Hydrocarbon (LPH) Thickness Table

Well Number	Sample Date	Casing Elevation	Depth to Water	Depth to L.P.H.	L.P.H. Thickness	L.P.H. Thickness X 0.8	Adjusted Depth to Water	Groundwater Elevation	Jan-Apr GW Elev Diff	Jan-Apr L.P.H. ThickDiff	Apr04-05 GW Elev Diff	Apr04-05 L.P.H. ThickDiff
MW-1	04/18/05	3603.30	35.54	33.32	2.22	1.78	33.76	3569.54	-0.76	1.78	4.48	-2.56
MW-2	NM	3601.57			0.00							
MW-3	04/18/05	3602.77	36.20	34.21	1.99	1.59	34.61	3568.16	-0.76	0.28	4.46	-1.78
MW-4	04/18/05	3601.70	32.59	32.59	0.00	0.00	32.59	3569.11	-0.35	-0.01	4.28	-2.54
MW-5	04/18/05	3601.54	33.71	33.53	0.18	0.14	33.57	3567.97	-0.43	-0.11	4.27	-2.99
MW-6	04/18/05	3599.83	32.98	31.78	1.20	0.96	32.02	3567.81	-0.40	0.06	4.13	-2.55
MW-7	04/18/05	3602.11	35.86	34.50	1.36	1.09	34.77	3567.34	-0.60	0.64	4.14	0.27
MW-8	04/18/05	3598.87	33.44	31.67	1.77	1.42	32.02	3566.85	-0.35	-0.14	4.02	-2.44
MW-9	NM	3601.05			0.00							
MW-10	NM	3602.96			0.00							
MW-11	NM	3600.67			0.00							
MW-12	NM	3599.35			0.00							
MW-13	04/18/05	3601.67	36.17		0.00	0.00	36.17	3565.50	-0.14		3.58	
IW-2	04/18/05	3597.87	30.44		0.00	0.00	30.44	3567.43	0.12		3.35	
IW-3	04/18/05	3597.30	31.37		0.00	0.00	31.37	3565.93	0.04		2.81	
IW-4	04/18/05	3596.13	30.60		0.00	0.00	30.60	3565.53	-0.01		3.25	
IW-5	04/18/05	3599.89	34.98		0.00	0.00	34.98	3564.91	-0.07		3.48	
IW-6	04/18/05	3599.71	33.93		0.00	0.00	33.93	3565.78	-0.39		4.00	
IW-7	04/18/05	3600.64	33.07		0.00	0.00	33.07	3567.57	-0.71		4.29	
SVE-1	04/18/05	3598.68	30.24		0.00	0.00	30.24	3568.44	-0.23		3.76	
SVE-2	04/18/05	3601.17	34.29	33.45	0.84	0.67	33.62	3567.55				
SVE-3	NM	3601.40										
SVE-5	04/18/05	3600.54	33.84	33.67	0.17	0.14	33.70	3566.84	-0.30	0.05	3.90	-3.52
EW-1	NM	3598.57										
EW-2	NM	3597.95										
MP-1	04/18/05	3601.87	21.90		0.00	0.00	21.90					
MP-2	NM	3601.87										
SV-1	04/18/05	3602.16	22.86		0.00	0.00	22.86					

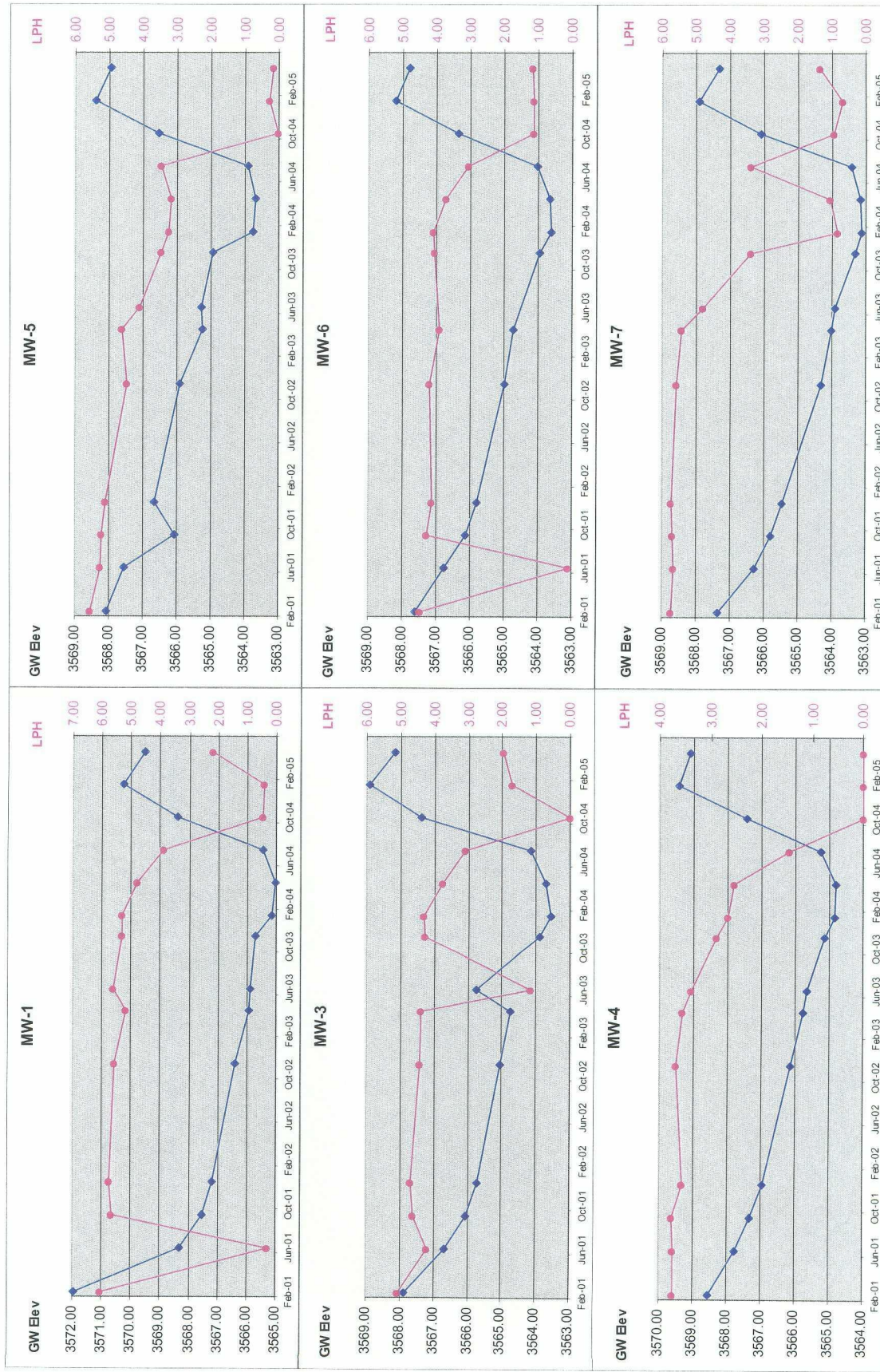
Groundwater Elevation Contour Map – April 18, 2005



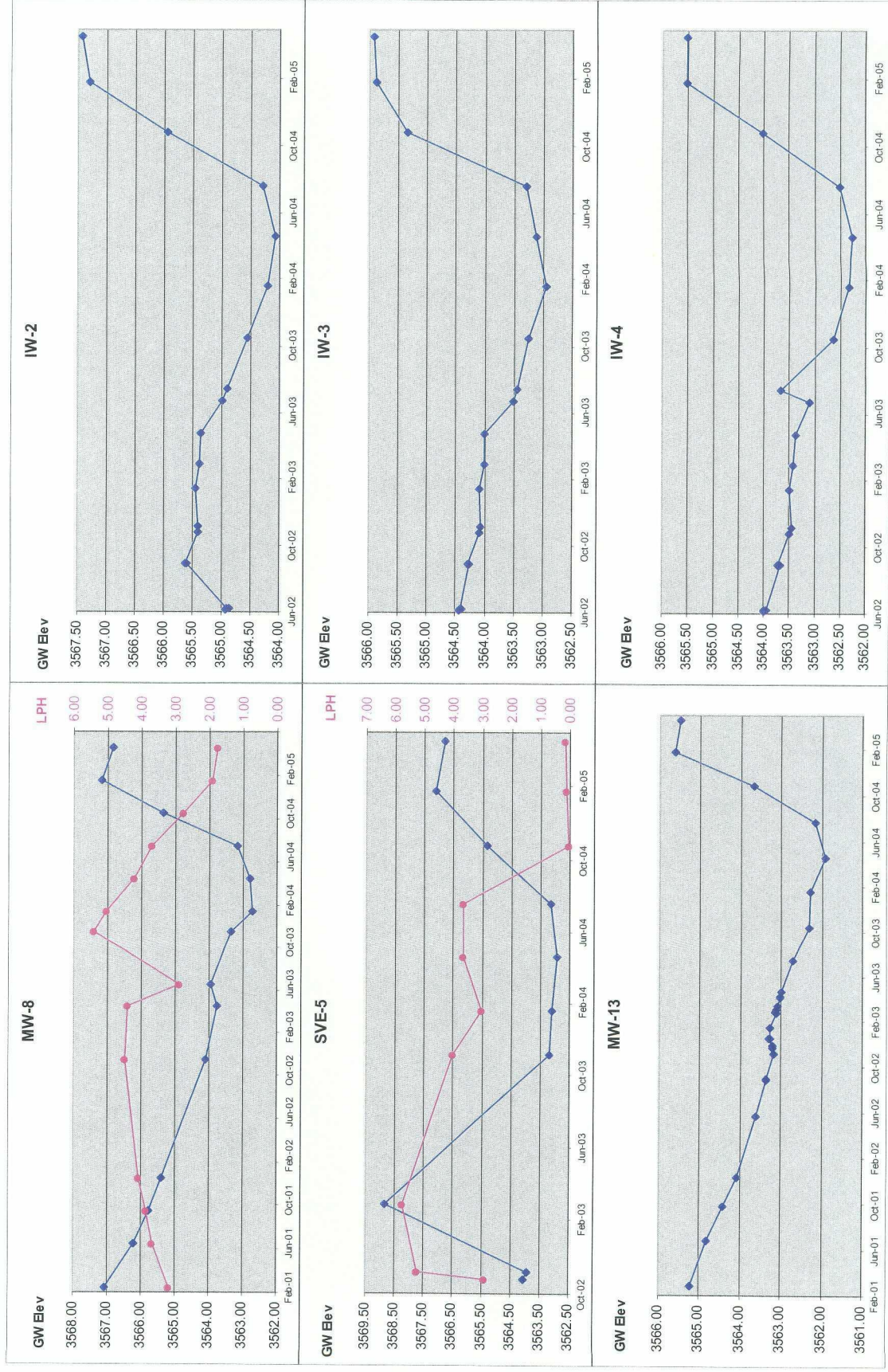
Liquid Phase Hydrocarbon Thickness Contour Map – April 18, 2005



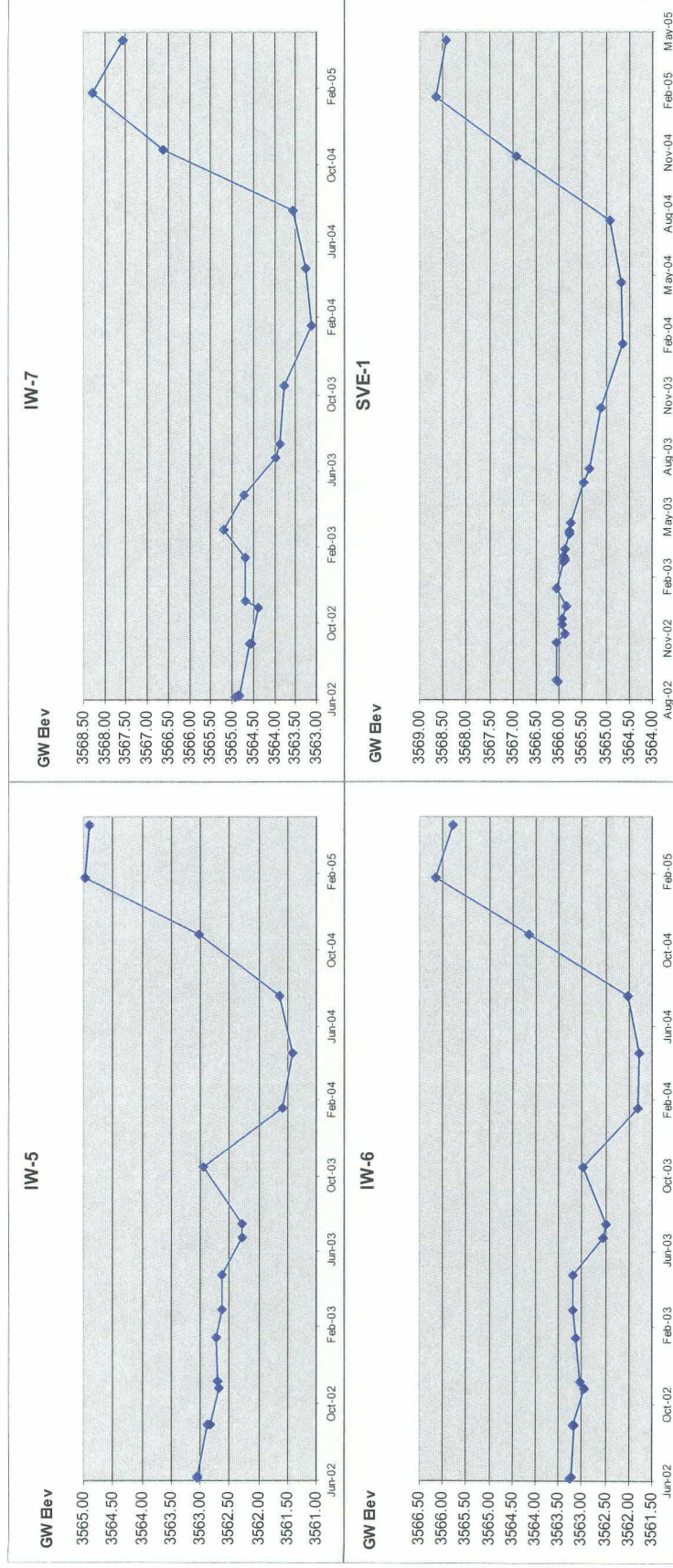
Hydrographs



Hydrographs



Hydrographs



Groundwater Analytical Data Summary

Well Number	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)	TPH-GRO (mg/L)	TPH-DRO (mg/L)
MW-13	10/26/04	14	<1.0	300	<3.0	314	1.2	3.0
MW-13	01/25/05	1,000	<1.0	1,400	<3.0	2,400	4.7	0.79
MW-13	04/19/05	1,400	<1.0	780	<3.0	2,180	4.9	0.90
IW-2	04/20/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.20
IW-2	07/21/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
IW-2	10/26/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
IW-2	01/25/05	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.062
IW-2	04/19/05	<1.0	<1.0	1.3	<3.0	1.3	<0.10	5.2
IW-3	04/20/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.20
IW-3	07/21/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.061
IW-3	10/26/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.072
IW-3	01/25/05	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
IW-3	04/19/05	1.5	2.4	5.0	7.4	16.3	0.27	14
IW-4	04/20/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.20
IW-4	07/21/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.048
IW-4	10/26/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.082
IW-4	01/25/05	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.31
IW-4	04/19/05	2.6	3.0	5.4	8.2	19.2	0.33	10
IW-5	04/20/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.25
IW-5	07/21/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	2.7
IW-5	10/26/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.048
IW-5	01/25/05	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.43
IW-5	04/19/05	1.1	1.2	1.4	<3.0	3.7	<0.10	2.0
IW-6	10/26/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	1.4
IW-6	01/25/05	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.76
IW-6	04/19/05	3.1	3.0	4.7	<3.0	10.8	0.19	2.0
IW-7	04/20/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	1.7
IW-7	07/21/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	18
IW-7	10/26/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	3.3
IW-7	01/25/05	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.21
IW-7	04/19/05	1.4	4.2	8.7	6.7	21.0	0.55	2.10
SVE-1	04/20/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	<0.20
SVE-1	07/21/04	<1.0	<1.0	<1.0	<3.0	BDL	<0.10	0.059
SVE-1	10/26/04	79	2.8	<1.0	<3.0	81.8	0.32	0.099
SVE-1	01/25/05	62	3.4	1.9	12	79.3	0.41	0.34
SVE-1	04/19/05	54	1.4	1.7	8	64.8	0.21	0.048

Notes:

µg/L = micrograms per liter
mg/L = milligrams per liter

BDL = below detection limit
D = duplicate sample

Recommended Path Forward

- Pipeline excavation backfill.
- Request variance to permanently discontinue operation of groundwater extraction, treatment and re-injection system.
- Request variance to temporarily discontinue operation of enhanced bioremediation system with option to use for residual removal once plume reduction is realized.
- Optimize crude oil recovery system with focus on physical removal of crude oil using skimmer system and reduce amount of groundwater recovery.
- Continue quarterly groundwater monitoring and annual reporting.