SECOR

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REGISTERED GEOLOGIST
CAROLE M. FARR
NO. 7434
EXP. 6/30/06
STATE OF CALIFORNIA

Carole M. Farr

DATE: April 30, 2005

GROUNDWATER MONITORING REPORT

Facility No.: 6128 Address:	4498 Clairemont Mesa Blvd., San Diego, CA (Figures 1 & 2)
ARCO Environmental Engineer:	Mr. Roy Thun
Consulting Co./Contact Person:	SECOR/ Carole Farr
SECOR Project No.:	08BP.U6128.05
Primary Agency/Regulatory ID No.:	County of San Diego, Land and Water Quality Division Program/H21241-001

WORK PERFORMED THIS PERIOD [Second - 2005]:

1. Performed First quarter groundwater sampling and prepared report.
2. Initiated 30-day Public Review of CAP dated November 4, 2004.

WORK PROPOSED FOR NEXT PERIOD [First - 2005]:

1. Upon completion of public review period of CAP, implement CAP.

Current Phase of Project:	Monitoring	(Assmnt, Remed., etc.)
Frequency of Sampling:	Semi-annual	(Quarterly, etc.)
Frequency of Monitoring:	Semi-annual	(Monthly, etc.)
Are Liquid-Phase Hydrocarbons (LPH) Present On-Site:	No	(Yes/No)
Cumulative LPH Recovered:	1.0	(gallons)
LPH recovered This Quarter:	None	(gallons)
Bulk Soil Removed to Date:	1,400	(cubic yards)
Bulk Soil Removed This Quarter:	None	(cubic yards)
Water Wells or Surface Waters within a 2000' Radius and Their Respective Directions:	None	(Distance and Direction)
Current Remediation Techniques:	SVE	(SVES, LPH Removal, ect.)
Permits for Discharge:	APCD	(NPDES, POTW, etc.)
Approximate Depth to Groundwater:	19.75 to 46.81	(Measured Feet)
Groundwater Gradient:	East-southeast	(Direction)
	0.31	(Magnitude)

DATE: April 30, 2005

GROUNDWATER MONITORING REPORT (Continued)
ARCO #6128

DISCUSSION: Depth to static water in wells and calculated groundwater elevations for January 28, 2005 are presented in Table 1. Depth to static water in wells ranged from 19.75 feet below top of well casing in VEW-12 to 46.81 feet below top of well casing in VEW-29. Groundwater elevations ranged from 322.83 feet to 350.69 feet above mean sea level (MSL). Groundwater flows to the east-southeast with a hydraulic gradient of approximately 0.31 (Figure 3). Monitoring wells VEW 12, VEW-13, VEW-29, and VEW-30 were purged and sampled in general accordance with the attached procedures. VEW-14 was not purged or sampled due to an obstruction in the well. VEW-11 and VEW-15 were not gauged, purged or sampled because the wells were dry. The samples collected were analyzed for total petroleum hydrocarbons as gasoline (TPHg); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and the fuel oxygenates methyl tert-butyl ether (MTBE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), tert-butyl alcohol (TBA), di-isopropyl ether (DIPE), and ethanol. Analytical results are presented in Table 2 and Table 3. TPHg, Benzene, and MTBE concentration distributions are presented on Figures 4 and 5. Historic liquid-phase hydrocarbon (LPH) measurements and recovered volumes are summarized in Table 4. Hydrographs showing groundwater elevations, and benzene and MTBE concentrations versus time are also attached.

Pursuant to a SAM letter dated May 6, 2002, this site is on a semi-annual groundwater sampling program.

CONCLUSIONS AND RECOMMENDATIONS: A CAP including a recommendation for remediation by natural attenuation of residual petroleum hydrocarbon impact has received conditional concurrence from SAM and is currently under public review.

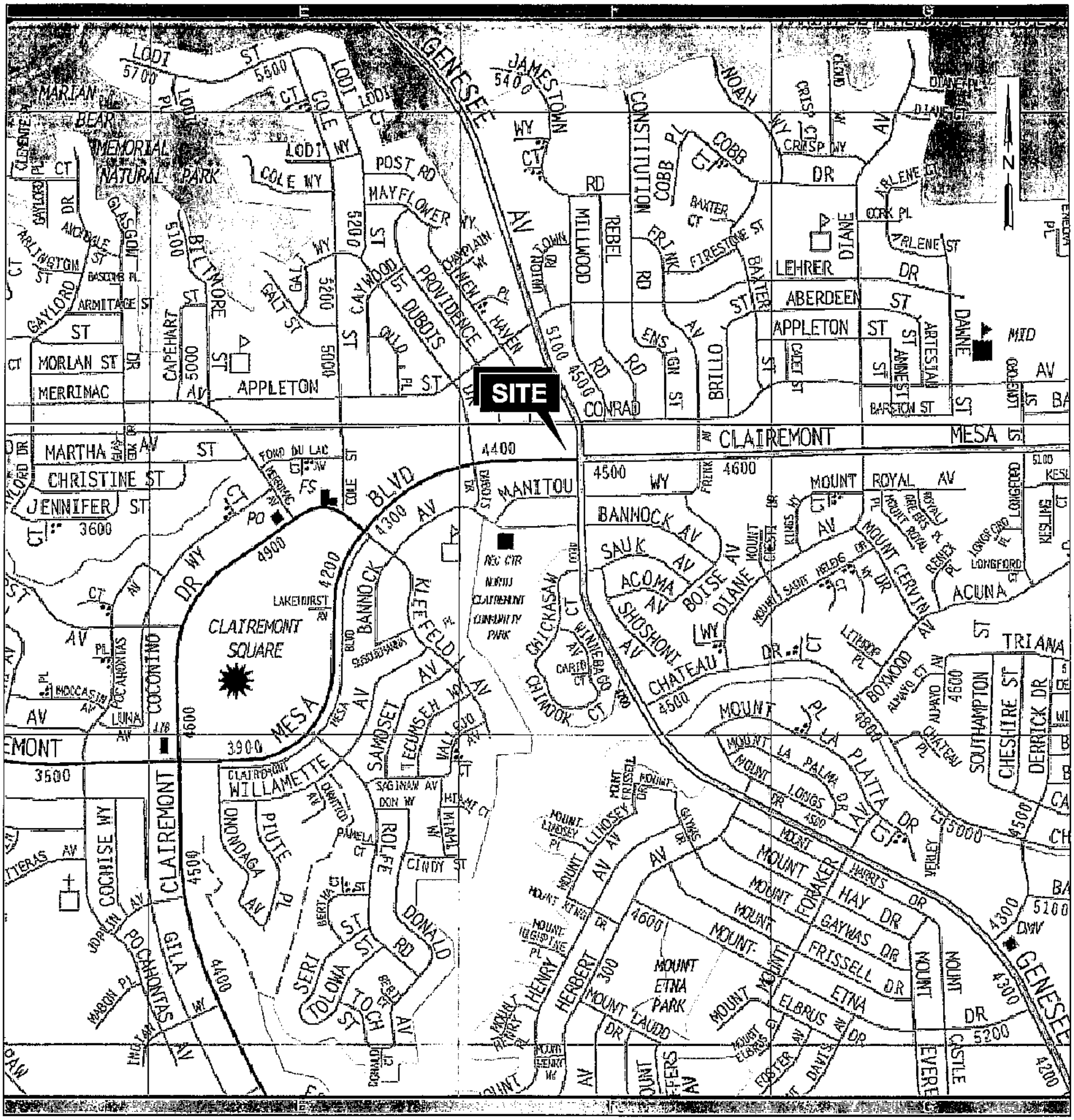
UNUSUAL ACTIVITIES: VEW-11, VEW-14, and VEW-15 were not sampled.

AGENCY DIRECTIVE REQUIREMENTS: Once the public review period has been completed (est. 4/30/05, a request for no further action as recommended in the CAP for the site will be requested.

ATTACHED:

- Site Location Map (Figure 1)
- Site Plan (Figure 2)
- Groundwater Elevation Contour Map, Jan 28, 2005 (Figure 3)
- TPHg, Benzene, and MTBE Concentrations in Groundwater, Jan 28, 2005 (Figure 4)
- Benzene and MTBE Isoconcentration Map, Jan 28, 2005 (Figure 5)
- Summary of Groundwater Elevations, 2000 to Present (Table 1)
- Summary of Groundwater Sample Analytical Results, 2000 to Present (Table 2)
- Additional Oxygenates Analysis (Table 3)
- Summary of Liquid-Phase Hydrocarbons Recovered (Table 4)
- Hydrographs
- Monitoring Well Purging and Sampling Procedures; San Diego County
- Monitoring Well Gauging Log
- Well Purging/Sampling Logs
- Laboratory Report and Chain-of-Custody Documentation

cc: Roy Thun, Atlantic Richfield Company



REFERENCE: THOMAS GUIDE CD-ROM, PAGE & GRID 1248 F1.

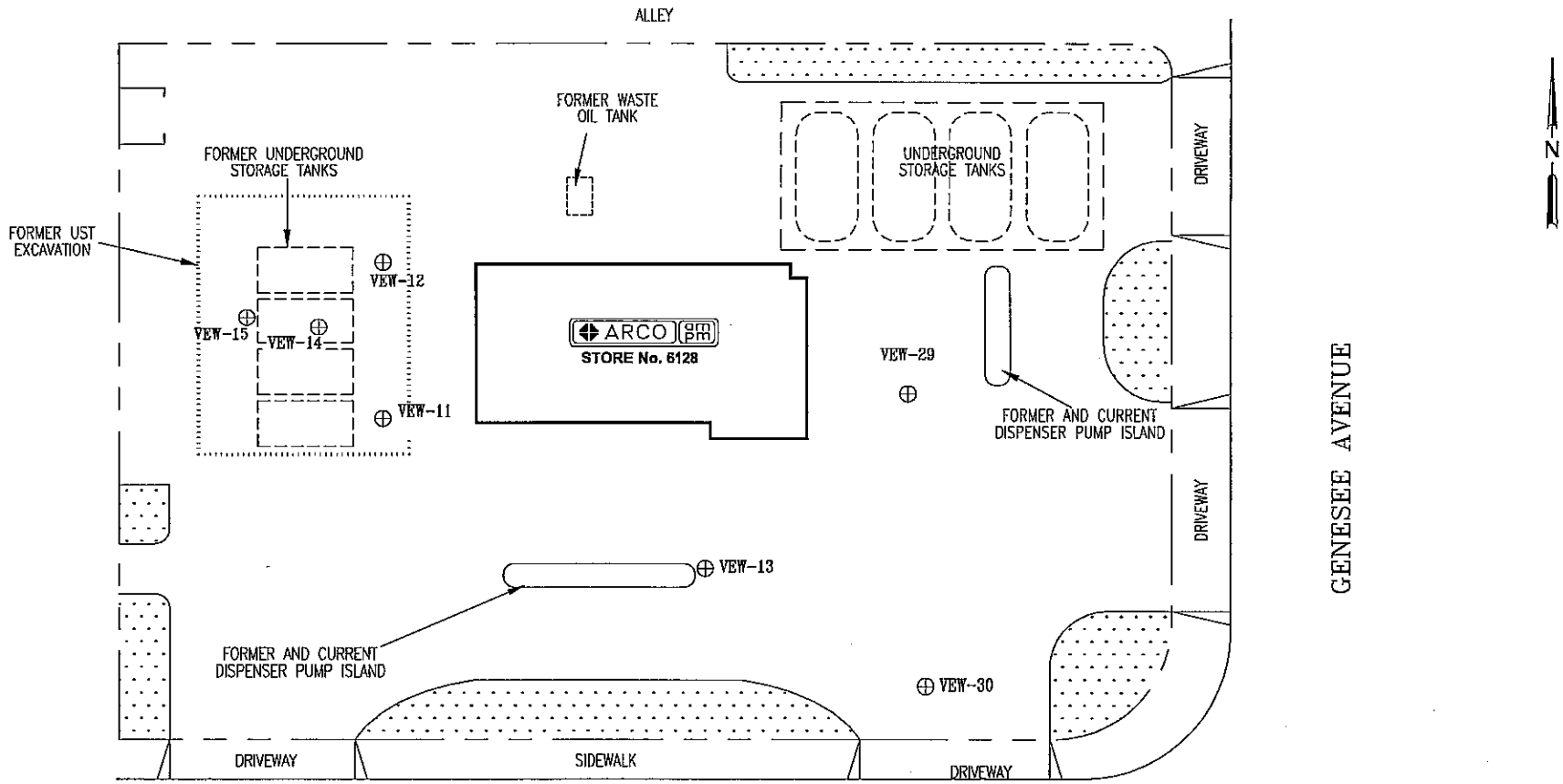
0 1320 2640

APPROXIMATE SCALE IN FEET

SECOR 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195/296-6199 (FAX)	FOR: ARCO FACILITY #6128 4498 Clairemont Mesa Blvd. San Diego, California		SITE LOCATION MAP		FIGURE: 1
	JOB NUMBER: 06BP.06128.06	DRAWN BY: RO	CHECKED BY: SM	APPROVED BY:	DATE: 03/30/05

FILEPATH:P:\CAD\ALLPROJECTS2005DWGS\ARCO 2005\6128-2K5\6128-STLOC.DWG|ROCAMPO|MAR 30, 2005 AT 15:53|LAYOUT: MODEL

6128-STLOC



CLAIREMONT MESA BOULEVARD

LEGEND:

VEW-1 ⊕ VAPOR EXTRACTION WELL LOCATION

— — — APPROXIMATE PROPERTY BOUNDARY

PLANTER

0 30 60

APPROXIMATE SCALE (FEET)

SECOR 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195/296-6199 (FAX)	FOR: ARCO FACILITY #6128 4498 Clairemont Mesa Blvd. San Diego, California		SITE PLAN		FIGURE: 2
	JOB NUMBER: 08BP.06128.06	DRAWN BY: RO	CHECKED BY: SM	APPROVED BY:	DATE: 03/30/04

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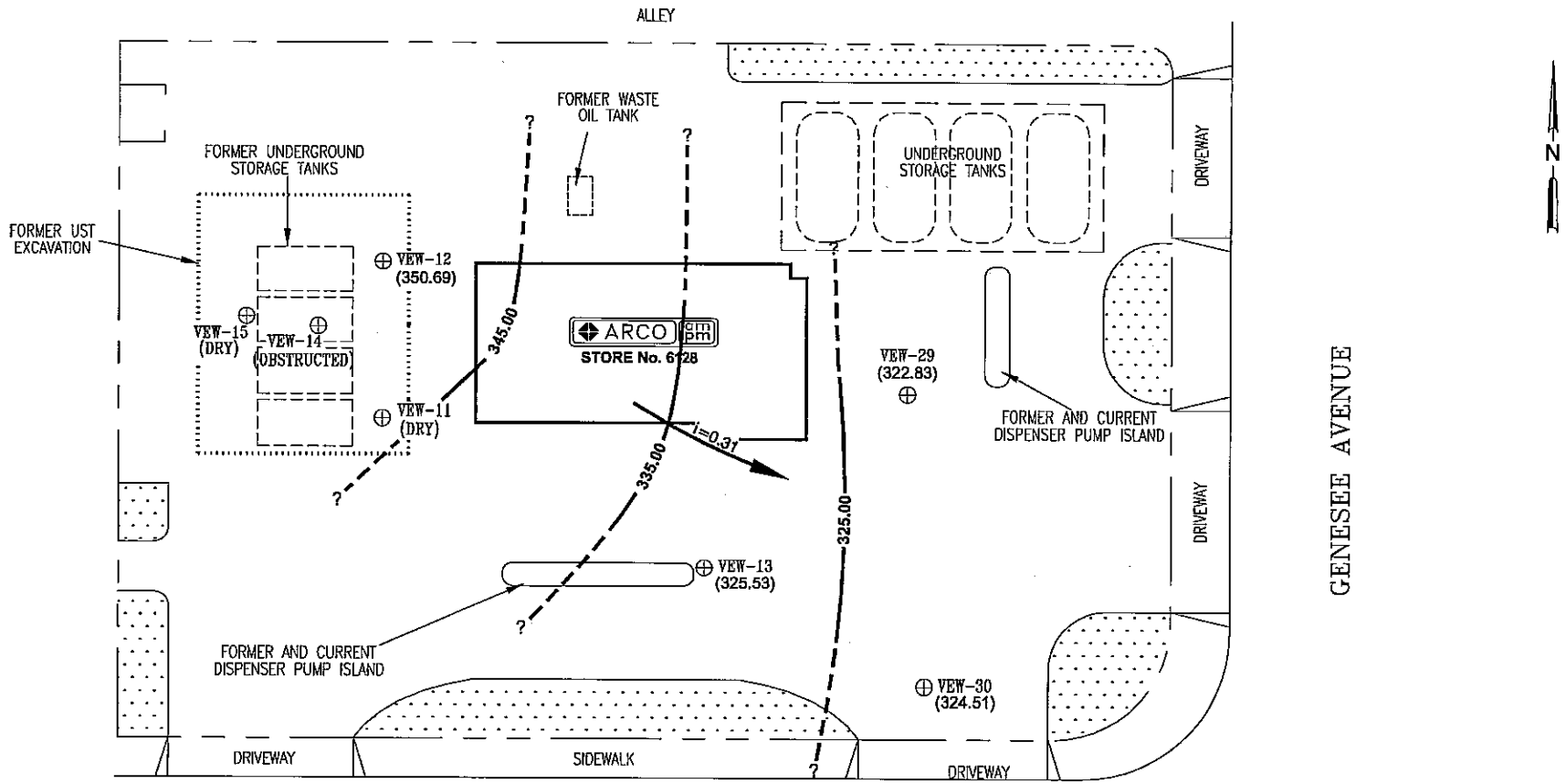
6128SP1-05



LEGEND:

VEW-1 ⊕ VAPOR EXTRACTION WELL LOCATION

PLANTER

(350.69) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

i=0.31 APPROXIMATE DIRECTION OF GROUNDWATER FLOW AND HYDRAULIC GRADIENT, (i)

? - - - 325.00 — GROUNDWATER ELEVATION CONTOUR IN FEET.

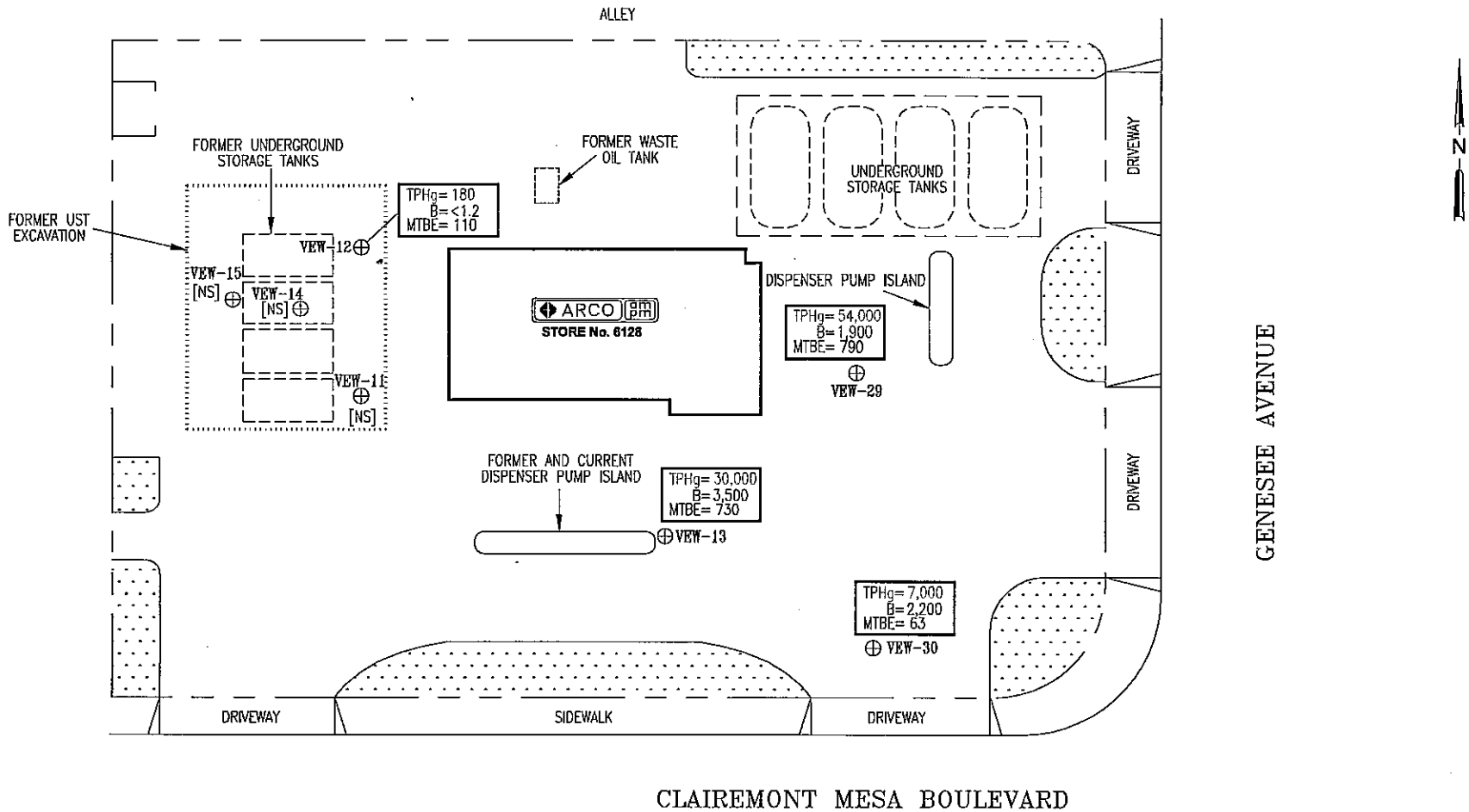
0 30 60

APPROXIMATE SCALE (FEET)

SECOR 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195/296-6199 (FAX)	FOR: ARCO FACILITY #6128 4498 Clairemont Mesa Blvd. San Diego, California		GROUNDWATER GRADIENT MAP JANUARY 28, 2005		FIGURE: 3
	JOB NUMBER: 08BP.06128.06	DRAWN BY: BDF	CHECKED BY: SM	APPROVED BY:	DATE: 03/30/04

FILEPATH:P:\CAD\ALLPROJECTS2005DWGS\ARCO 2005\6128-2K5\6128GW1-05.DWG|LHUNTER|APR 11, 2005 AT 15:22|LAYOUT: MODEL

6128GW1-05



LEGEND:

VEW-11 ⊕	VAPOR EXTRACTION WELL LOCATION
	PLANTER
TPHg= <500 B= <0.50 MTBE= 1.2	TPHg/BENZENE/MTBE CONCENTRATIONS IN GROUNDWATER SAMPLES COLLECTED ON JULY 13, 2004. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (ug/L).

TPHg	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
B	BENZENE
MTBE	METHYL TERT-BUTYL ETHER
<	BELOW LABORATORY REPORTING LIMIT INDICATED.
[NS]	NOT SAMPLED, DUE TO INSUFFICIENT WATER COLUMN OR INSUFFICIENT RECHARGE

0 30 60

APPROXIMATE SCALE (FEET)

SECOR
2655 CAMINO DEL RIO NORTH, SUITE 302
SAN DIEGO, CALIFORNIA
PHONE: (619) 296-6195/296-6199 (FAX)

FOR:
ARCO FACILITY #6128
4498 Clairemont Mesa Blvd.
San Diego, California

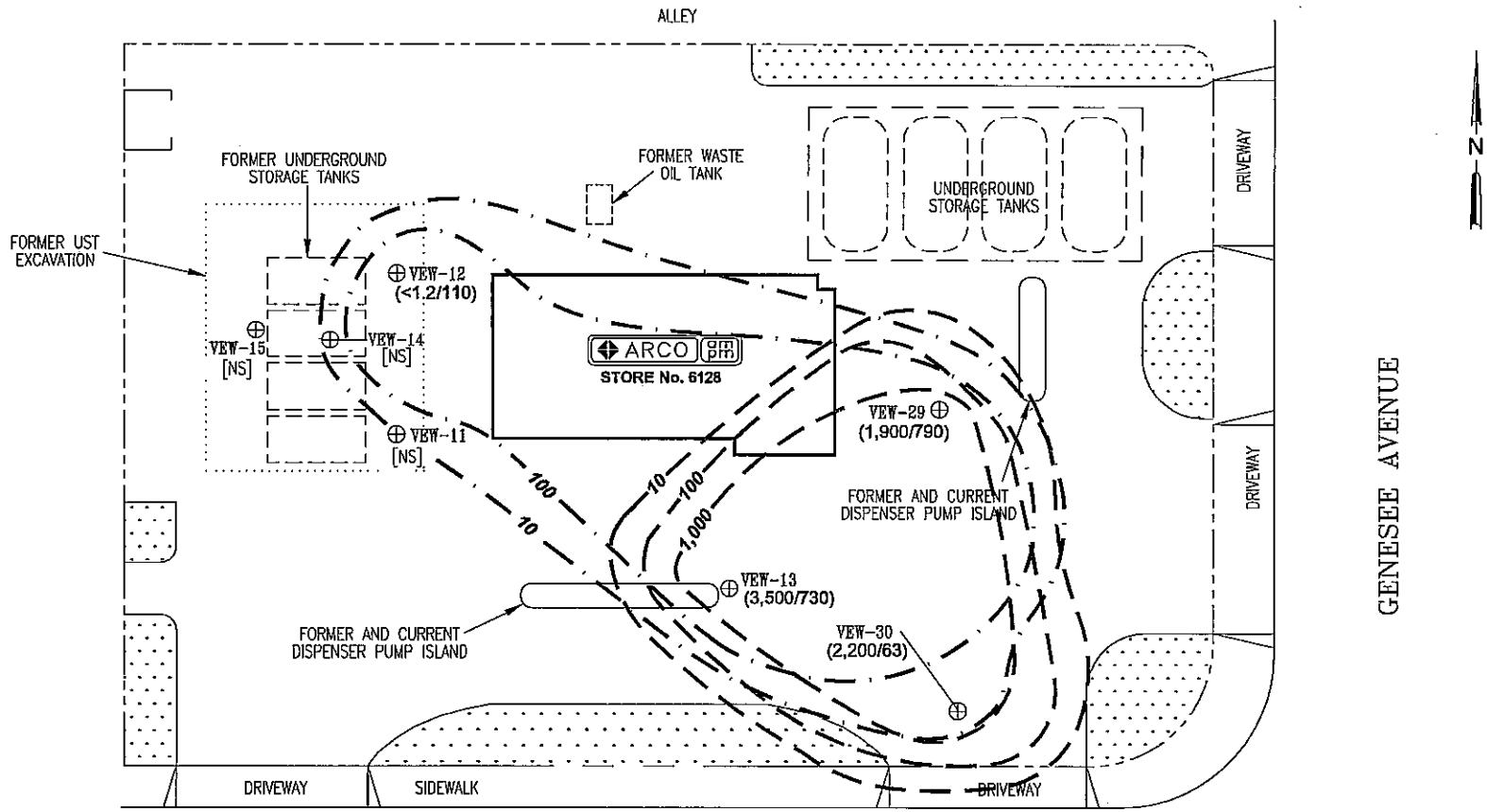
TPHg, BENZENE AND MTBE CONCENTRATIONS IN GROUNDWATER
JANUARY 28, 2005

FIGURE: 4

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
08BP.06128.06	BDF	SM		03/30/04

FILEPATH:P:\CAD\ALLPROJECTS2005DWGS\ARCO 2005\6128-2K5\6128CONI-05.DWG|ROCAMPO|MAR 30, 2005 AT 15:35|LAYOUT: MODEL

6128CON1-05



LEGEND:

VEW-1 ⊕	VAPOR EXTRACTION WELL LOCATION
(<5.0/290)	BENZENE AND MTBE CONCENTRATION IN MICROGRAMS PER LITER (μg/L)
10 ?	ESTIMATED BENZENE ISOCONCENTRATION CONTOUR IN μg/L, QUERIED WHERE UNKNOWN
10 ?	ESTIMATED MTBE ISOCONCENTRATION CONTOUR IN μg/L, QUERIED WHERE UNKNOWN
MTBE	METHYL TERT-BUTYL ETHER
<	BELOW LABORATORY REPORTING LIMIT
[NS]	NOT SAMPLED
	PLANTER

0 30 60

APPROXIMATE SCALE (FEET)

SECOR
2655 CAMINO DEL RIO NORTH, SUITE 302
SAN DIEGO, CALIFORNIA
PHONE: (619) 296-6195/296-6199 (FAX)

FOR:

ARCO FACILITY #6128
4498 Clairemont Mesa Blvd.
San Diego, California

BENZENE AND MTBE ISOCONCENTRATION MAP
JANUARY 28, 2005

FIGURE: 5

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
08BP.06128.06	BDF	SM		03/30/04

FILEPATH:P:\CAD\ALLPROJECTS2005DWGS\ARCO 2005\6128-2K5\6128ISO1-05.DWG|ROCAMPO|APR 13, 2005 AT 15:40|LAYOUT: MODEL

6128ISO1-05

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #6128

Well Identification / Surveyed Well Elevation[1] (Feet AMSL)	Date Measured	Depth to Static Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2] (Feet AMSL)
VEW-11 370.33	02/12/02	20.78	--	349.55
	05/16/02	21.20	--	349.13
	10/31/02	21.25	--	349.08
	04/28/03	20.15	--	350.18
	11/05/03	20.73	--	349.60
	05/13/04	20.92	--	349.41
	07/13/04	20.88	--	349.45
	01/28/05	Dry - Depth to Water Could Not Be Measured		
VEW-12 370.44	02/12/02	21.06	--	349.38
	05/16/02	21.53	--	348.91
	10/31/02	21.50	--	348.94
	04/28/03	20.19	--	350.25
	11/05/03	20.74	--	349.70
	05/13/04	20.99	--	349.45
	07/13/04	21.10	--	349.34
	01/28/05	19.75	--	350.69
VEW-13 369.12	02/12/02	47.11	--	322.01
	05/16/02	46.55	--	322.57
	10/31/02	46.57	sheen	322.55
	04/28/03	46.03	--	323.09
	11/05/03	46.05	0.03	323.09 [3]
	05/13/04	45.95	--	323.17
	07/13/04	45.81	--	323.31
	01/28/05	43.59	--	325.53
VEW-14 370.57	02/12/02	Well Not Monitored Due To Obstruction		
	05/16/02	Well Not Monitored Due To Obstruction		
	10/31/02	Well Not Monitored Due To Obstruction		
	04/28/03	Well Not Monitored Due To Obstruction		
	11/05/03	12.28	--	358.29
	05/13/04	12.32	--	358.25
	07/13/04	12.35	--	358.22
	01/28/05	Well Not Monitored Due To Obstruction		

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #6128

Well Identification / Surveyed Well Elevation[1] (Feet AMSL)	Date Measured	Depth to Static Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2] (Feet AMSL)
VEW-15 370.77	02/12/02	21.11	--	349.66
	5/16/200	21.55	--	349.22
	10/31/02	23.24	--	347.53
	04/28/03	21.80	--	348.97
	11/05/03	22.99	--	347.78
	05/13/04	23.23	--	347.54
	07/13/04	23.10	--	347.67
	01/28/05	Dry - Depth to Water Could Not Be Measured		
VEW-29 369.64	02/12/02	45.65	sheen	323.99
	05/16/02	48.67	sheen	320.97
	10/31/02	48.70	sheen	320.94
	04/28/03	48.15	--	321.49
	11/05/03	48.62	0.02	321.04 [3]
	05/13/04	48.64	--	321.00
	07/13/04	48.73	--	320.91
	01/28/05	46.81	--	322.83
VEW-30 368.03	02/12/02	44.03	--	324.00
	05/16/02	43.90	--	324.13
	10/31/02	Dry*	--	--
	04/28/03	43.45	--	336.00
	11/05/03	44.08	--	323.95
	05/13/04	43.69	--	324.34
	07/13/04	Dry*	--	--
	01/28/05	43.52	--	324.51

Notes:

[1] = Elevations are in feet above mean sea level (AMSL).
[2] = Groundwater elevation in feet AMSL = surveyed well elevation - depth to water.
[3] = Elevation adjusted by adding (0.75 x LPH Thickness) to measured groundwater elevation
LPH = Liquid-Phase Hydrocarbons
-- = Not applicable

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #6128

All Results Reported in Micrograms per Liter (ug/L)

Well Identification	Sampling Date	TPHg	Benzene**	Toluene**	Ethyl-Benzene**	Total Xylenes**	MTBE**
VEW-11	02/12/02	<500	<1.0	<1.0	<1.0	<3.0	140
	05/16/02	<500	1.0	<0.50	<0.50	<1.5	170
	10/31/02	<500	<0.50	<0.50	<0.50	<1.5	280
	04/28/03	<500	<0.50	<0.50	<0.50	<1.5	290
	11/05/03	<500	<2.5	<2.5	<2.5	<7.5	420
	05/13/04	<500	<2.5	<2.5	<2.5	<7.5	480
	07/13/04	<500	<5.0	<5.0	<5.0	<15	510
	01/28/05	Not Sampled - Dry Well					
VEW-12	02/12/02	<500	<0.50	0.57	1.9	4.2	25
	05/16/02	<500	1.1	<0.50	3.2	<1.5	55
	10/31/02	<500	<0.50	<0.50	14	2.16	91
	04/28/03	<500	0.87	<0.50	3.8	1.8	110
	11/05/03	<500	<0.50	<0.50	<0.50	<1.5	200
	05/13/04	<500	<1.2	<1.2	2.8	<3.8	150
	07/13/04	<500	3.6	<0.50	9.1	1.6	200
	01/28/05	180	<1.2	<1.2	<1.2	2.5	110
VEW-13	02/12/02	12,000	530	27	230	940	420
	05/16/02	20,000	1,300	22	160	413	700
	10/31/02	7,200	950	37	100	196	340
	04/28/03	14,000	2,200	470	290	720	1,100
	11/05/03	Not Sampled - LPH Detected					
	05/13/04	Not Sampled - Insufficient Recharge					
	07/13/04	Not Sampled - Insufficient Recharge					
	01/28/05	30,000	3,500	910	840	2,700	730
VEW-14	02/12/02	Not Sampled - Dry Well					
	05/16/02	Not Sampled - Dry Well					
	10/31/02	Not Sampled - Due to Obstruction					
	04/28/03	Not Sampled - Due to Obstruction					
	11/05/03	Not Sampled - Due to Obstruction					
	05/13/04	Not Sampled - Due to Obstruction					
	07/13/04	Not Sampled - Due to Obstruction					
	01/28/05	Not Sampled - Due to Obstruction					
VEW-15	02/12/02	<500	0.62	<0.50	0.58	1.0	3.1
	05/16/02	<500	4.9	<0.50	<0.50	<1.5	3.0

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #6128

All Results Reported in Micrograms per Liter (ug/L)

Well Identification	Sampling Date	TPHg	Benzene**	Toluene**	Ethyl-Benzene**	Total Xylenes**	MTBE**
VEW-15 con't	10/31/02	<500	1.6	<0.50	0.60	<1.5	1.9
	04/28/03	<500	0.73	<0.50	<0.50	<1.5	2.2
	11/05/03	<500	<0.50	<0.50	<0.50	<1.5	1.2
	05/13/04	Not Sampled - Insufficient Water Column					
	07/13/04	<500	0.80	<0.50	<0.50	1.6	1.5
	01/28/05	Not Sampled - Dry Well					
VEW-29	02/12/02	Not Sampled - LPH Sheen					
	05/16/02	Not Sampled - LPH Detected					
	10/31/02	Not Sampled - LPH Sheen					
	04/28/03	Not Sampled - LPH Sheen					
	11/05/03	Not Sampled - LPH Detected					
	05/13/04	Not Sampled - Insufficient Water Column					
	07/13/04	Not Sampled - Insufficient Water Column					
	01/28/05	54,000	1,900	1,300	380	13,000	790
VEW-30	02/12/02 NP	56,000	6,300	730	3,400	16,200	300
	05/16/02	Not Sampled - Dry Well					
	10/31/02	Not Sampled - Dry Well					
	04/28/03	Not Sampled - Trace LPH					
	11/05/03	Not Sampled - Insufficient Recharge					
	05/13/04	Not Sampled - Insufficient Recharge					
	07/13/04	Not Sampled - Dry Well					
	01/28/05	7,000	2,200	210	130	830	63

Notes:

TPHg = Total Petroleum Hydrocarbons as gasoline (DHS Modified EPA Method 8015)
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total xylenes
BTEX = BTEX (EPA Method 8021B)
MTBE = Methyl-tert-Butyl Ether (EPA Method 8021B, unless noted otherwise)
I = MTBE analyzed by EPA Method 8260
* = Reflects analytical result of sample collected on May 15, 1998
** = BTEX and MTBE analyzed by EPA Method 8260 beginning with 05/30/00 sampling event
NP = Samples collected in accordance with no-purge sampling procedures.
--- = Not analyzed

TABLE 3

ADDITIONAL OXYGENATES ANALYSIS
ARCO Facility #6128
All Results Reported in Micrograms Per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
VEW-11	02/12/02	82	<10	<10	<10	--
	05/16/02	99	<5.0	<5.0	<5.0	--
	10/31/02	64	<5.0	<5.0	<5.0	--
	04/28/03	94	<5.0	<5.0	<5.0	<150
	11/05/03	<250	<25	<25	<25	<750
	05/13/04	<250	<25	<25	<25	<750
	07/13/04	<500	<50	<50	<50	<1,500
	01/28/05	Not Sampled - Dry Well				
VEW-12	02/12/02	<25	<5.0	<5.0	<5.0	--
	05/16/02	<25	<5.0	<5.0	<5.0	--
	10/31/02	<50	<5.0	<5.0	<5.0	--
	04/28/03	<50	<5.0	<5.0	<5.0	<150
	11/05/03	<50	<5.0	<5.0	<5.0	<150
	05/13/04	<120	<12	<12	<12	<380
	07/13/04	<50	<5.0	<5.0	<5.0	<150
	01/28/05	<62	<5.0	<5.0	<5.0	<1,200
VEW-13	02/12/02	3,600	<120	<120	<120	--
	05/16/02	2,800	<50	<50	<50	--
	10/31/02	4,000	<20	<20	<20	--
	04/28/03	2,200	<50	<50	<50	--
	11/05/03	Not Sampled - LPH Detected				
	05/13/04	Not Sampled - Insufficient Recharge				
	07/13/04	Not Sampled - Insufficient Recharge				
	01/28/05	<1,600	<120	<120	<120	<31,000
VEW-14	02/12/02	Not Sampled - Well Dry				
	05/16/02	Not Sampled - Well Dry				
	10/31/02	Not Sampled - Due to Obstruction				
	04/28/03	Not Sampled - Due to Obstruction				
	11/05/03	Not Sampled - Due to Obstruction				
	05/13/04	Not Sampled - Due to Obstruction				
	07/13/04	Not Sampled - Due to Obstruction				
	01/28/05	Not Sampled - Due to Obstruction				

TABLE 3

ADDITIONAL OXYGENATES ANALYSIS
ARCO Facility #6128
All Results Reported in Micrograms Per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
VEW-15	02/12/02	<25	<5.0	<5.0	<5.0	--
	05/16/02	<25	<5.0	<5.0	<5.0	--
	10/31/02	<50	<5.0	<5.0	<5.0	--
	04/28/03	82	<5.0	<5.0	<5.0	<150
	11/05/03	<50	<5.0	<5.0	<5.0	<150
	05/13/04	Not Sampled - Insufficient Water Column				
	07/13/04	<50	<5.0	<5.0	<5.0	<150
	01/28/05	Not Sampled - Well Dry				
VEW-29	02/12/02	Not Sampled - LPH Sheen				
	05/16/02	Not Sampled - LPH Detected				
	10/31/02	Not Sampled - LPH Sheen				
	04/28/03	Not Sampled - LPH Sheen				
	11/05/03	Not Sampled - LPH Detected				
	05/13/04	Not Sampled - Insufficient Water Column				
	07/13/04	Not Sampled - Insufficient Water Column				
	01/28/05	<3,100	<250	<250	<250	<62,000
VEW-30	02/12/02	<5,000	<1,000	<1,000	<1,000	--
	05/16/02	Not Sampled - Well Dry				
	10/31/02	Not Sampled - Well Dry				
	04/28/03	Not Sampled - Trace LPH				
	11/05/03	Not Sampled - Insufficient Recharge				
	05/13/04	Not Sampled - Insufficient Recharge				
	07/13/04	Not Sampled - Well Dry				
	01/28/05	<830	<67	<67	<67	<17,000

Notes:

TBA = tert-Butanol
DIPE = Di isopropyl Ether
ETBE = Ethyl tert-Butyl Ether
TAME = tert-Amyl methyl Ether

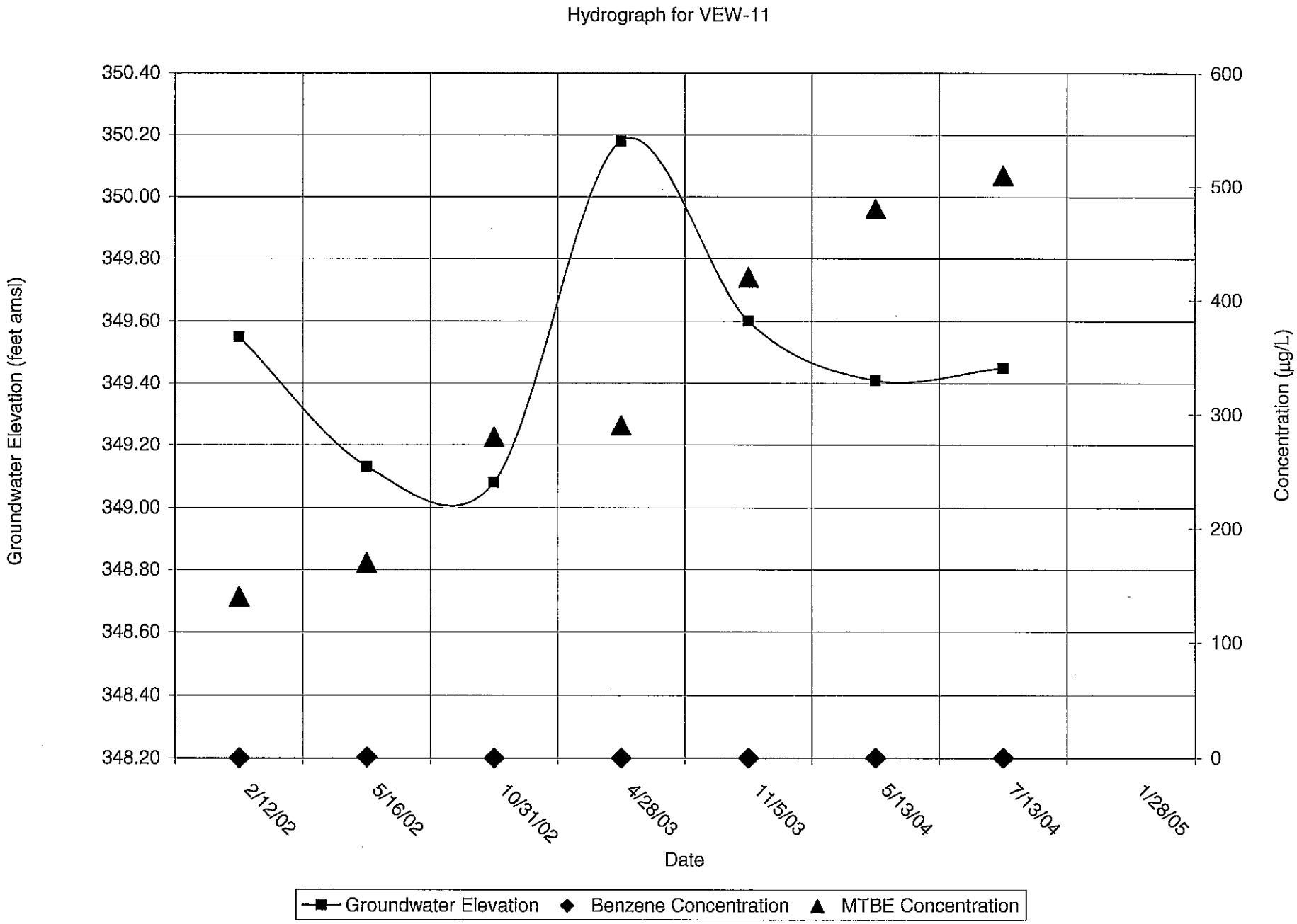
TABLE 4

SUMMARY OF LIQUID-PHASE HYDROCARBONS RECOVERED
ARCO Facility #6128

Well ID	Date	Depth to LPH (Feet)	Depth to Water (Feet)	LPH Thickness (Feet)	LPH Recovered (gal.)	LPH Recovery Method Used	Comments
VEW-29	08/06/98	45.54	45.90	0.36	0.5	vacuum truck	INITIAL LPH DETECTED in '98
	12/23/98	43.09	43.21	0.12	0.5	vacuum truck	
	03/05/99	0.00	35.86	0.00	*	*	
	03/15/99	0.00	35.28	0.00	*	*	sheen noted
	05/27/99	0.00	37.55	0.00	*	*	
	09/22/99	0.00	48.70	0.00	*	*	sheen noted
	12/13/99	0.00	45.74	0.00	*	*	sheen noted
	03/13/00	0.00	28.91	0.00	*	*	sheen noted
	05/30/00	0.00	28.46	0.00	*	*	
	09/18/00	0.00	27.93	0.00	*	*	
	11/01/00	0.00	29.08	0.00	*	*	
	02/13/01	0.00	29.80	0.00	*	*	
	05/29/01	0.00	26.52	0.00	*	*	
	08/07/01	0.00	29.89	0.00	*	*	strong odor noted
	11/16/01	0.00	48.61	0.00	*	*	strong odor noted
	02/12/02	0.00	45.65	0.00	*	*	sheen noted
	05/16/02	48.665	48.67	0.005	*	*	sheen noted
VEW-30	03/13/00	0.00	28.91	0.00	*	*	sheen noted
	05/30/00	0.00	32.04	0.00	*	*	
	09/18/00	0.00	33.75	0.00	*	*	
	11/01/00	0.00	31.82	0.00	*		
	02/13/01	0.00	32.43	0.00	*	*	
	05/29/01	0.00	33.51	0.00	*	*	odor noted
	08/07/01	0.00	34.58	0.00	*	*	
	11/16/01	0.00	47.67	0.00	*	*	strong odor noted
	02/12/02	0.00	44.03	0.00	*	*	strong odor noted
	05/16/02	0.00	43.90	0.00	*	*	odor noted

Notes:

Initial LPH detected in June 1998 (wells VEW-29 and VEW-30). Prior to 1998, an unknown quantity of LPH was recovered by previous consulting firm.
LPH recovered in ounces (LPH = 6.09 lbs/gallon) divided by 97.44 = gallons recovered.
LPH = Liquid-Phase Hydrocarbons
trace = continous, non-measurable thickness of LPH
sheen = discontinous, non-measurable thickness of LPH
gal. = gallons
* = monitoring only; no recovery performed



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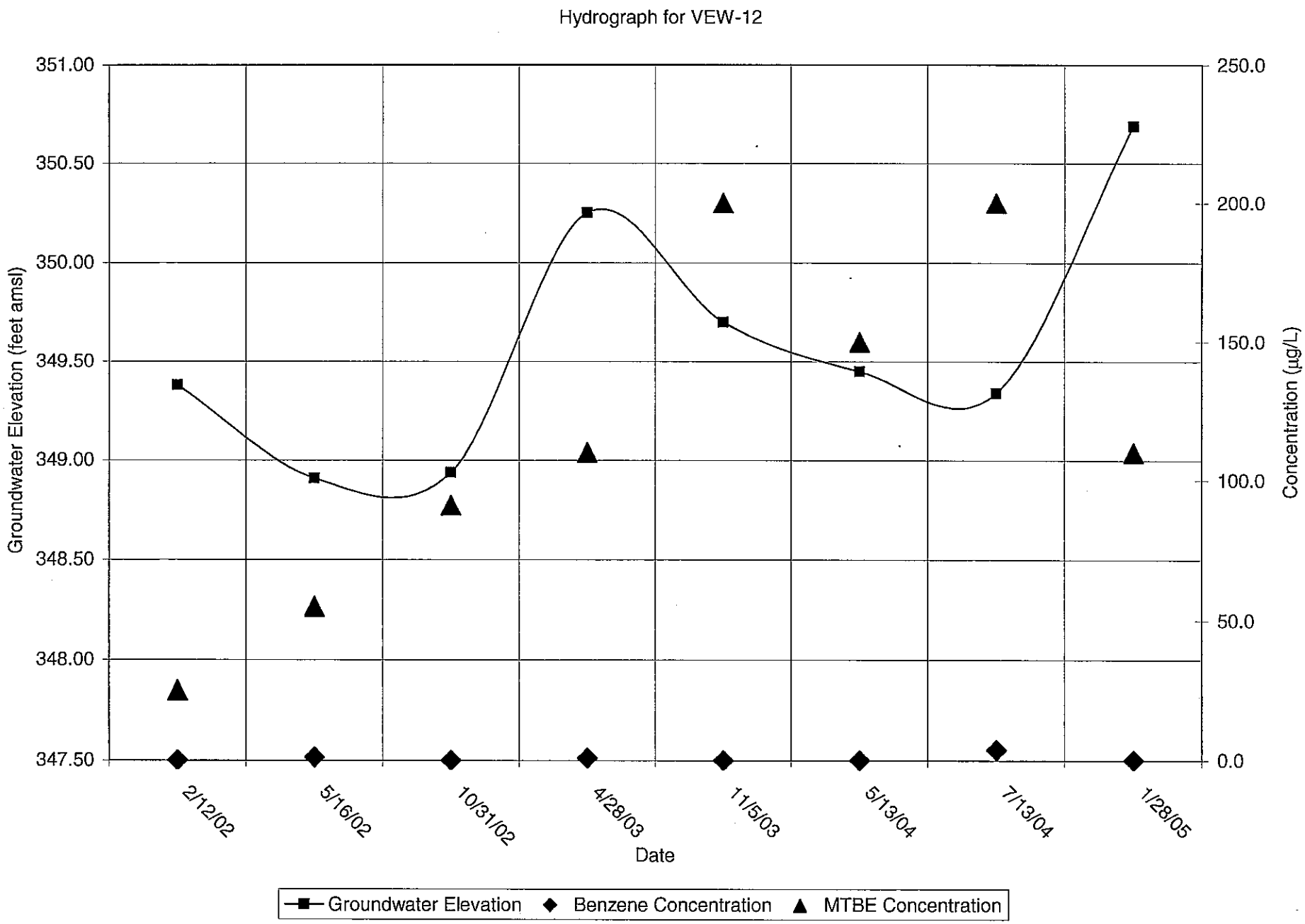

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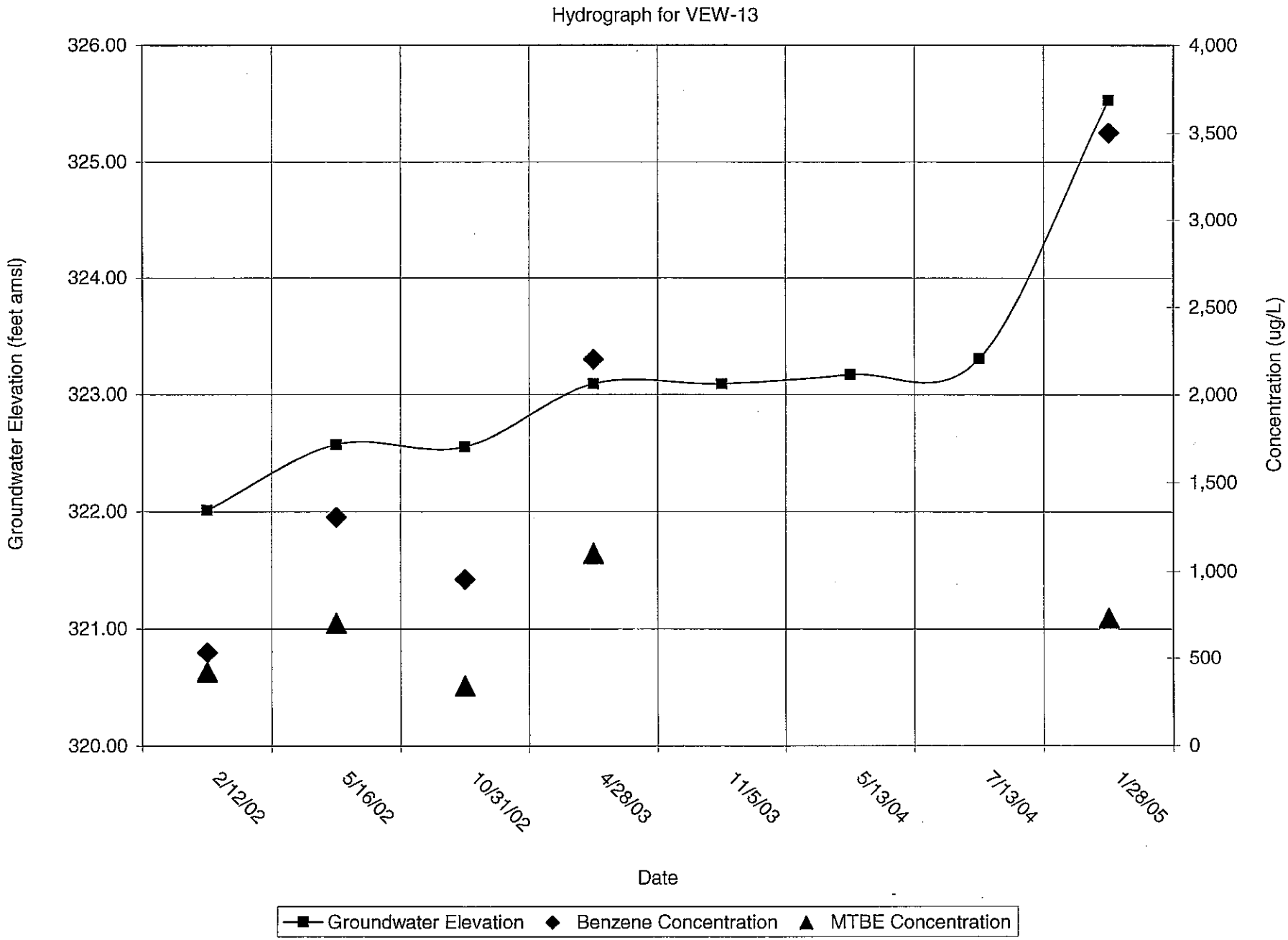

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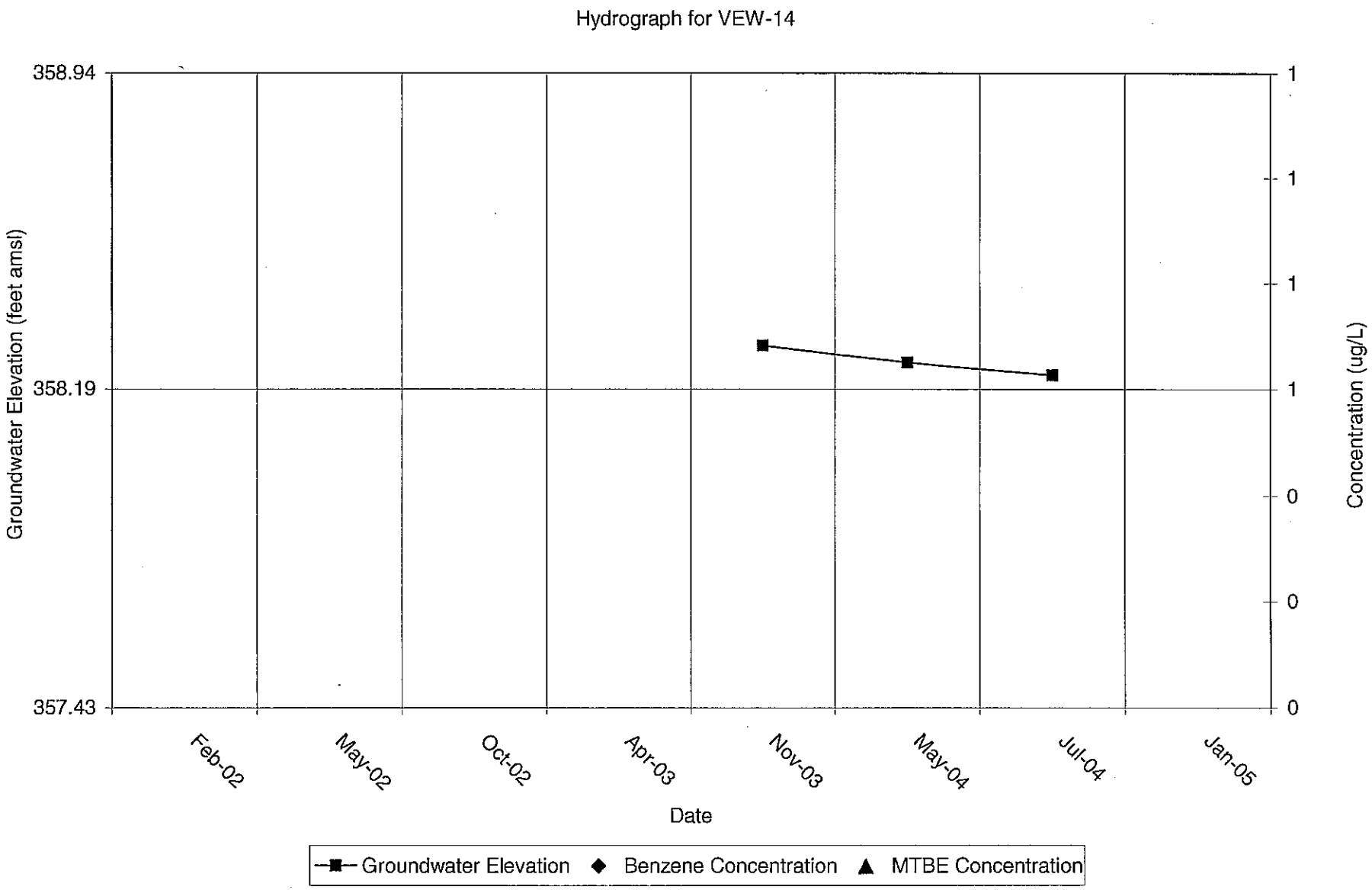

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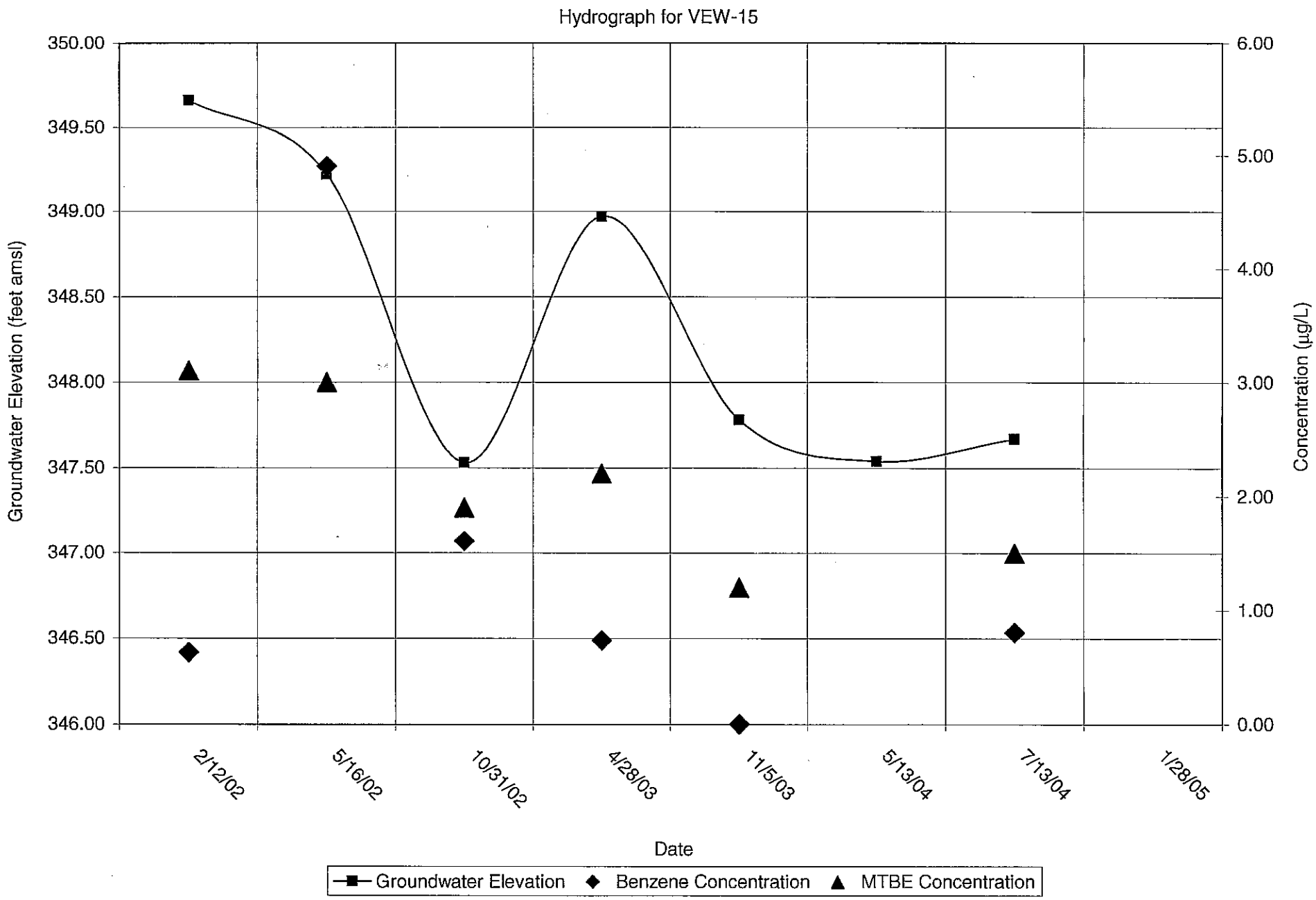

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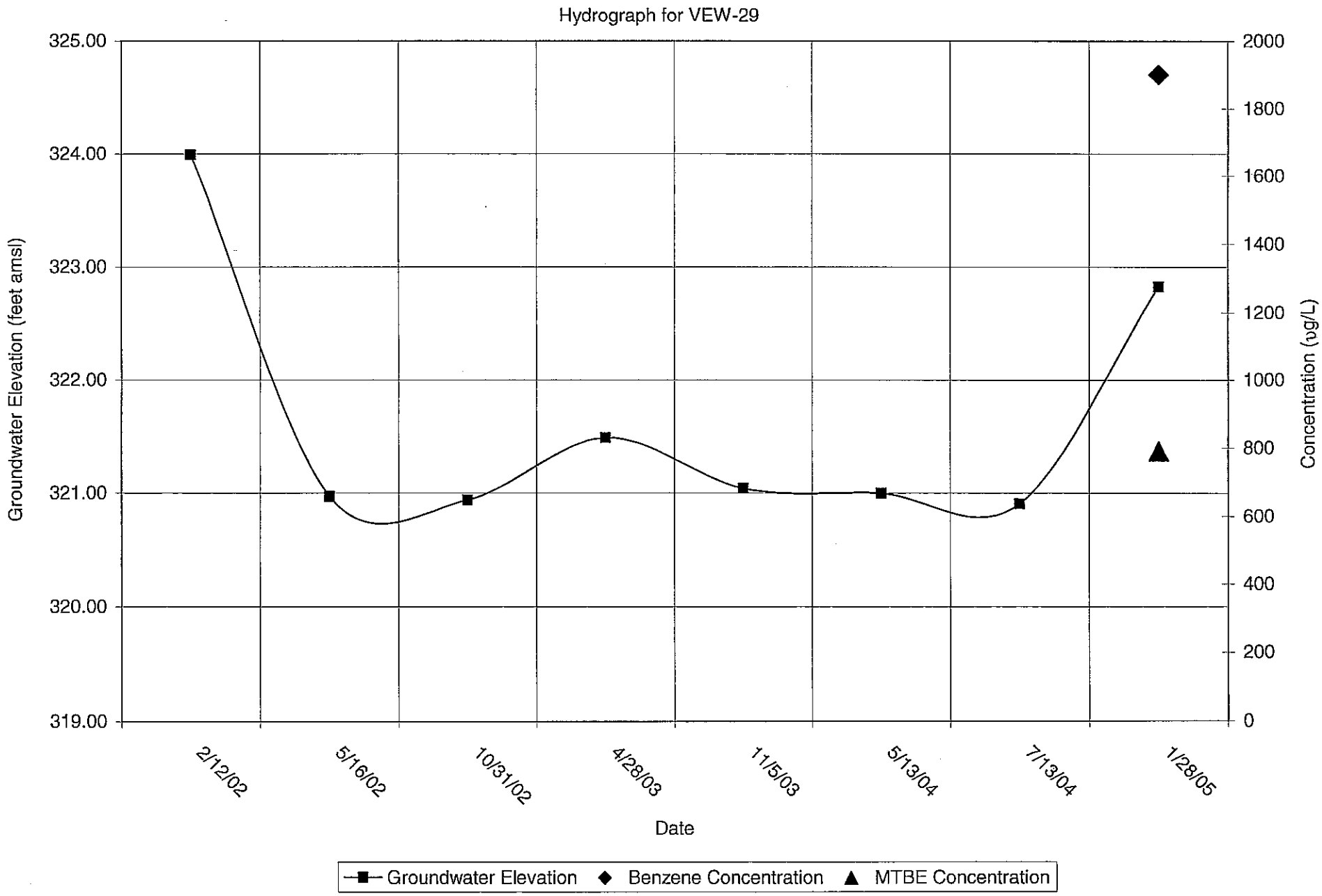

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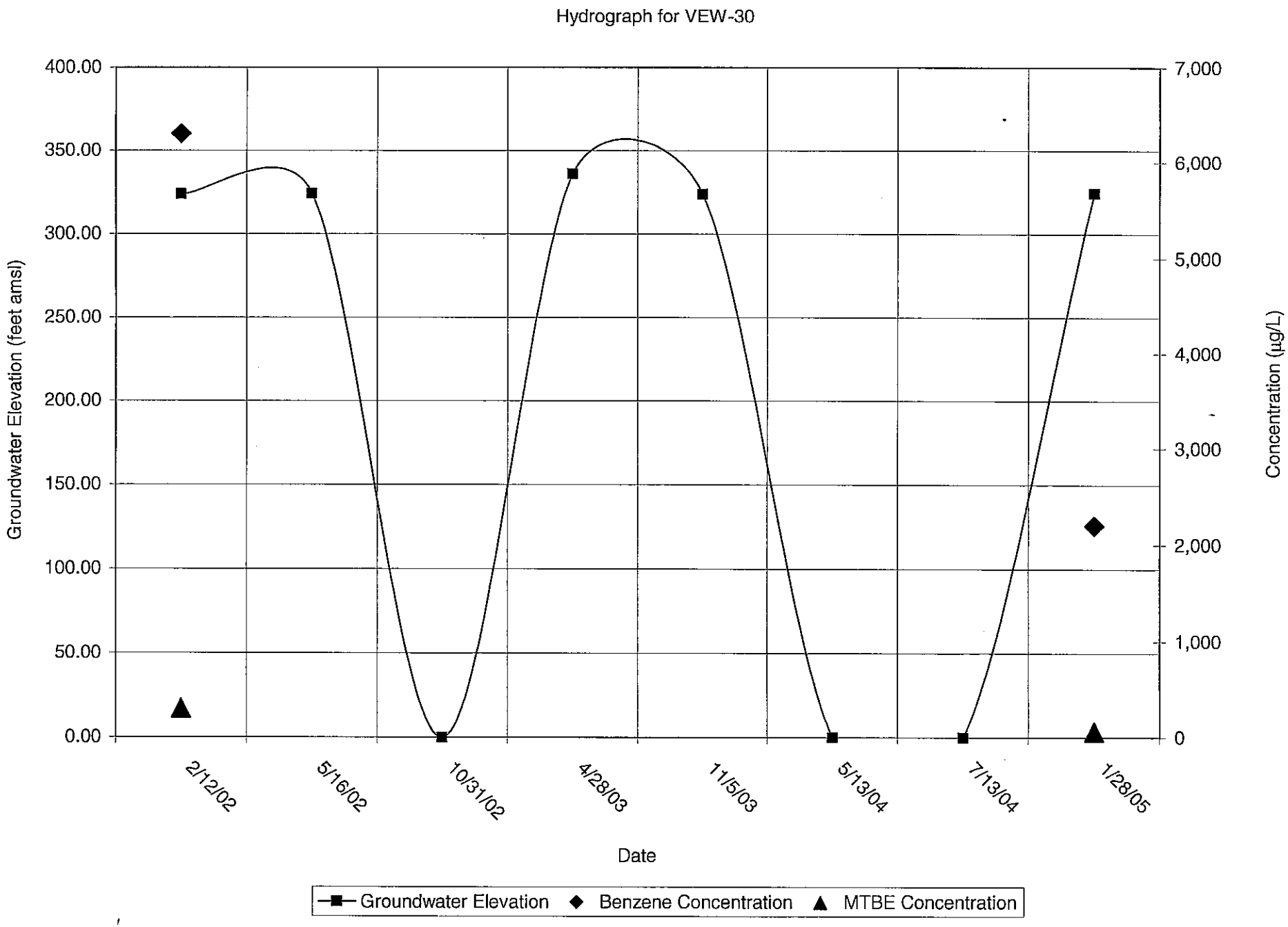

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MONITORING WELL PURGING AND SAMPLING PROCEDURES
SAN DIEGO COUNTY

Monitoring well purging and sampling methods follow the procedures outlined by the County of San Diego, Environmental Health Services, Site Assessment and Mitigation (SAM) Manual.

Purging Procedures

A. Using a decontaminated instrument (i.e., tape measure, continuity meter, or interface probe) measure the depth to groundwater in reference to the measuring point at the top of the casing. Measure the total depth of the well to calculate the height and volume of water in the borehole.

B. Based on previously obtained data, if a monitoring well is suspected of containing LPH concentrations, lower a transparent bailer into the well to evaluate the presence of a hydrocarbon sheen on the water table.

C. Decontaminate the purge pump and/or PVC bailers by scrubbing in Alconox detergent solution, followed by a tap water rinse and then a deionized water rinse.

D. Purge, by pumping, bailing, or using a vacuum truck with dedicated tubing, approximately one borehole volume of groundwater as calculated according to the thickness of the water column and the diameter of the borehole.

E. Conduct field measurements (i.e., pH and conductivity) after approximately one borehole volume has been purged, or if the water level in the well is so low as to prevent further purging (or dry).

1. If the well has not been purged dry, continue to bail and/or pump and conduct field measurements again following removal of each successive one-half borehole volume of water.

   a) If the first and third series of measurements vary by less than 10 percent, or if 3 borehole volumes of water have been removed, the well has been adequately purged. Allow the well to recover to 80 percent of its static condition and begin the sampling procedure.

   b) If the measurements vary by 10 percent or greater, repeat Step E1 above.

2. If the well has been purged dry, measure the water level and allow the well to recharge to 80 percent, or for two hours, whichever occurs first. Calculate the percent recovery.

   a) If the well recovers to greater than 80 percent in less than two hours, Repeat step E1 above.

   b) If the well recovers to less than 80 percent within two hours, it is a slow recharging well. Begin the sampling procedure.

Sampling Procedures

- Use a disposable bailer to collect the groundwater sample.
- Fit the stopcock onto the base of the bailer and transfer the groundwater sample into the appropriate container(s). Where applicable, some containers are completely filled to achieve zero headspace. Label the samples according to location and date of collection.
- Enter the samples into Chain-of-Custody and preserve on ice until delivery to the analytical laboratory. Complete the Well Development or Purging/Sampling Log to be stored in the project file.

When requested by the client, collect a bailer rinsate blank of deionized water to check decontamination procedure. In addition, trip blanks prepared by the laboratory and kept with the samples may be included to check for cross contamination of samples within the cooler. Additional and/or alternate QA/QC samples can be collected and analyzed upon client request.

NO-PURGE MONITORING WELL SAMPLING PROCEDURES
SAN DIEGO COUNTY

The following quarterly groundwater monitoring and sampling procedures were developed by environmental consultants for the Western States Petroleum Association's California Groundwater Purging Study for Petroleum Hydrocarbons.

1. Pre-Sampling Procedures

A. Note and remove any accumulated water inside the well monument.

B. Using a decontaminated instrument (i.e., tape measure, continuity meter, or interface probe) measure the depth to groundwater in reference to the measuring point at the top of the casing.

C. If a monitoring well is suspected of containing a measurable thickness of LPH, lower an interface probe to measure the depths to product and water to determine the LPH thickness.

D. Lower dissolved oxygen probe into the monitoring well to obtain dissolved oxygen reading.

E. Decontaminate field instruments by scrubbing in non-phosphate detergent solution, followed by a tap water rinse and then a deionized water rinse.

2. Sampling Procedures

A. Slowly lower a new, 36-inch long, factory-cleaned, polyethylene, disposable bailer into the monitoring well until it is fully submerged.

B. Withdraw the full bailer from the monitoring well.

C. Transfer the groundwater sample from the bailer into the appropriate laboratory-supplied and preserved containers. Where applicable, completely fill volatile contaminant sample containers to achieve zero headspace. Label the samples according to location and date of collection.

D. Preserve samples on ice until delivery to the analytical laboratory.

E. Record the collection of the samples onto the Chain-of-Custody document. Complete the No-Purge Monitoring and Sampling Log to be stored in the project file.

A laboratory-prepared trip blank should be included with and kept with the samples in the cooler.

SECOR

MONITORING WELL GAUGING LOG

Site Name & Facility No: **ARCO 6128** Date: 1/28/2005

Project Number: 08BP.U6128.04 / 4L57 Field Representative(s): JM, WIN

Checked by: SM CZ

Well No.	Previous DTW	Gauging Time	Depth to Floating Product	Depth to Water (ft)	Floating Product Thickness	Total Casing Depth (ft)	Casing Elevation[1]	Groundwater Elevation[1]	Corrected Groundwater Elevation[1*]	Comments
VEW-11	20.88	0930	—	Dry	—	24.70	~~349.41~~ 370.33	—		
VEW-12	21.10	0902	—	19.75	—	24.15	~~349.75~~ 370.44	~~329.70~~ 350.69		
VEW-13	45.81	0919	—	43.59	—	47.90	~~323.17~~ 369.14	~~279.58~~ 325.55 LA		
VEW-14	12.35	0903	—	N/A	—	NA	~~358.25~~ 370.57	—		obstructed at 12.55
VEW-15	23.10	0910	—	DRY	—	23.95	~~347.54~~ 370.77	—		
VEW-29	48.73	0926	—	46.81	—	49.20	~~321.00~~ 369.64	~~274.19~~ 322.83		
VEW-30	Dry	0923	—	43.52	—	48.40	~~324.34~~ 368.03	~~290.82~~ 324.51		

Notes:
1 = feet above mean sea level unless noted otherwise
* = elevation adjusted by adding (.75 x product thickness) to measured water elevation
\- = not measured due to the presence of liquid-phase hydrocarbons

Sheen = discontinuous, non-measurable thickness of LPH
Trace = continuous, non-measurable thickness of LPH

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VEW- 11
	Project Name: ARCO 6128		Date: 1/28/2005
	Project Number: 08BP.U6128.04 / 4L57		Sample Time:
	SECOR Rep:	Checked by:	Sample No: VEW- 11

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist #	Borehole Diameter (in): 8 (10) 12	
Purging Equipment / Method: ___Vac Truck ___Bailer ___Submersible Pump ___Other	Casing Diameter (in): (2) 4	
pH Temp/Conductivity Meter Type / ID:	Depth to Water (DTW_1) (ft):	
Sampling Method: ____Teflon Bailer ____Disposable Bailer ____Other:____	Total Well Depth (DTB) (ft): 24.70	Water Column:
Decontamination Method: ___Steam / High Pressure Wash ___3 Stage (Alconox, Tap & DI rinse) ___Other:	Floating Product:	Thickness (in):
	Borehole Volume (gal):	1.5 Borehole Volumes (gal):

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
	Started Purging					
			Dry			

Maximum Drawdown (DTW_2) (ft) =

Pump Rate (GPM) =

____Fast Recharging Well

____Slow Recharging Well

SAMPLING INFORMATION

Time Sampled:

Depth to Water at time of sampling (DTW_3):

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
6 x 40ml VOAs	N	(HCL & ICE) or NONE	TPHg, BTEX, MTBE, (8015, 8260)
			DIPE, TAME, ETBE, TBA (8260b)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Casing Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes:

RECOVERY CALCULATIONS

$$\%\ of\ Recovery = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\%\ of\ Recovery = 1 - \frac{(\quad)-(\quad)}{(\quad)-(\quad)} = \_\_\_\_$$

$$= \_\_\_\_\ \%$$

80% Recharge = _____

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VEW- 12
	Project Name: ARCO 6128		Date: 1/28/2005
	Project Number: 08BP.U6128.04 / 4L57		Sample Time: 1258
	SECOR Rep: W. Wilong	Checked by: SM CJ	Sample No: VEW- 12

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 2	Borehole Diameter (in): 8 (10) 12	
Purging Equipment / Method: ___Vac Truck ✗ Bailer ___Submersible Pump ___Other	Casing Diameter (in): (2) 4 6	
pH Temp/Conductivity Meter Type / ID: 6	Depth to Water (DTW_1) (ft): 19.75	
Sampling Method: ___Teflon Bailer ✗ Disposable Bailer ___Other:	Total Well Depth (DTB) (ft): 24.15	Water Column: 4.40
Decontamination Method: ___Steam / High Pressure Wash ✗ 3 Stage (Alconox, Tap & DI rinse) ___Other:	Floating Product: —	Thickness (in): —
	Borehole Volume (gal): 5.02	1.5 Borehole Volumes (gal): 7.53

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1038	Started Purging					
1047	dry	~~5.5~~ 4	7.02	23.9	1580	brown/black, med silt, odor
1058	dry	~~8~~ 5.5	7.03	23.3	1596	"
1258	20.68	sample				

Maximum Drawdown (DTW_2) (ft) = dry / ~~19.75~~ 24.15

Pump Rate (GPM) = 0.28

___Fast Recharging Well

✗ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1258

Depth to Water at time of sampling (DTW_3): 20.68

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
6 x 40ml VOAs	N	(HCL & ICE) or NONE	TPHg, BTEX, MTBE, (8015, 8260)
			DIPE, TAME, ETBE, TBA (8260b)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Casing Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 ($DTB-DTW_1$)
2	10	1.14 ($DTB-DTW_1$)
4	10	1.50 ($DTB-DTW_1$)
4	12	1.95 ($DTB-DTW_1$)
6	10	2.11 ($DTB-DTW_1$)

Notes: H. Slow

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(19.75) - (20.68)}{(19.75) - (24.15)} = \frac{-.93}{-4.4}$$

$$= 79\ \%$$

80% Recharge = 20.63

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VEW- 13
	Project Name: ARCO 6128		Date: 1/28/2005
	Project Number: 08BP.U6128.04 / 4L57		Sample Time: 1208
	SECOR Rep: W Wong	Checked by: SM	Sample No: VEW- 13

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 2	Borehole Diameter (in): 8 (10) 12	
Purging Equipment / Method: ___ Vac Truck ✗ Bailer ___ Submersible Pump ___ Other	Casing Diameter (in): 2 (4)	
pH Temp/Conductivity Meter Type / ID: 6	Depth to Water (DTW_1) (ft): 43.59	
Sampling Method: ___ Teflon Bailer ✗ Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 47.90	Water Column: 4.31
	Floating Product: —	Thickness (in): —
Decontamination Method: ___ Steam / High Pressure Wash ✗ 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Borehole Volume (gal): 6.47	1.5 Borehole Volumes (gal): 9.71

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
0953	Started Purging					
0958	dry	6.55	7.04	23.7	1739	black, silty, v. strong odor
1008	dry	16.5	7.05	23.5	1717	
1208	46.96	sample				

Maximum Drawdown (DTW_2) (ft) = dry / 47.90

Pump Rate (GPM) = 0.43

___ Fast Recharging Well

✗ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1208

Depth to Water at time of sampling (DTW_3): 46.96

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
6 x 40ml VOAs	N	(HCL & ICE) or NONE	TPHg, BTEX, MTBE, (8015, 8260)
			DIPE, TAME, ETBE, TBA (8260b)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Casing Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes: H. Slow

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(43.59) - (46.96)}{(43.59) - (47.90)} = \frac{-3.37}{-4.31}$$

$$= 22\ \%$$

80% Recharge = 44.45

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VEW- 14
	Project Name: ARCO 6128		Date: 1/28/2005
	Project Number: 08BP.U6128.04 / 4L57		Sample Time:
	SECOR Rep:	Checked by: SN	Sample No: VEW- 14

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist #	Borehole Diameter (in): 8 (10) 12	
Purging Equipment / Method: ___Vac Truck ___Baller ___Submersible Pump ___Other	Casing Diameter (in): (2) 4	
pH Temp/Conductivity Meter Type / ID:	Depth to Water (DTW_1) (ft): Obstructed @ 12.55	
Sampling Method: _____Teflon Bailer _____Disposable Bailer _____Other:_____	Total Well Depth (DTB) (ft):	Water Column:
	Floating Product:	Thickness (in):
Decontamination Method: ___Steam / High Pressure Wash ___3 Stage (Alconox, Tap & DI rinse) ___Other:	Borehole Volume (gal):	1.5 Borehole Volumes (gal):

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
	Started Purging					
		Obstructed				

Maximum Drawdown (DTW_2) (ft) =	____Fast Recharging Well
Pump Rate (GPM) =	____Slow Recharging Well

SAMPLING INFORMATION

Time Sampled:	Depth to Water at time of sampling (DTW_3):

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
6 x 40ml VOAs	N	(HCL & ICE) or NONE	TPHg, BTEX, MTBE, (8015, 8260)
			DIPE, TAME, ETBE, TBA (8260b)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Casing Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes:

RECOVERY CALCULATIONS

$$\%\ of\ Recovery = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\%\ of\ Recovery = 1 - \frac{(\quad)-(\quad)}{(\quad)-(\quad)} = \_\_\_\_$$

$$= \_\_\_\_\ \%$$

80% Recharge = _____

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VEW- 15
	Project Name: ARCO 6128		Date: 1/28/2005
	Project Number: 08BP.U6128.04 / 4L57		Sample Time:
	SECOR Rep:	Checked by: SMCH	Sample No: VEW- 15

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist #	Borehole Diameter (in): 8 (10) 12	
Purging Equipment / Method: ___Vac Truck ___Bailer ___Submersible Pump ___Other	Casing Diameter (in): (2) 4	
pH Temp/Conductivity Meter Type / ID:	Depth to Water (DTW_1) (ft):	
Sampling Method: ____Teflon Bailer ____Disposable Bailer ____Other:____	Total Well Depth (DTB) (ft): 23.95	Water Column:
	Floating Product:	Thickness (in):
Decontamination Method: ___Steam / High Pressure Wash ___3 Stage (Alconox, Tap & DI rinse) ___Other:	Borehole Volume (gal):	1.5 Borehole Volumes (gal):

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
	Started Purging					
		DRY				

Maximum Drawdown (DTW_2) (ft) =	____Fast Recharging Well
Pump Rate (GPM) =	____Slow Recharging Well

SAMPLING INFORMATION

Time Sampled:	Depth to Water at time of sampling (DTW_3):

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
6 x 40ml VOAs	N	(HCL & ICE) or NONE	TPHg, BTEX, MTBE, (8015, 8260)
			DIPE, TAME, ETBE, TBA (8260b)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Casing Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 ($DTB-DTW_1$)
2	10	1.14 ($DTB-DTW_1$)
4	10	1.50 ($DTB-DTW_1$)
4	12	1.95 ($DTB-DTW_1$)
6	10	2.11 ($DTB-DTW_1$)

Notes:

RECOVERY CALCULATIONS

$$\%\ of\ Recovery = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\%\ of\ Recovery = 1 - \frac{(\quad)-(\quad)}{(\quad)-(\quad)} = \_\_\_\_$$

$$= \_\_\_\_\ \%$$

80% Recharge = _____

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VEW- 29
	Project Name: ARCO 6128		Date: 1/28/2005
	Project Number: 08BP.U6128.04 / 4L57		Sample Time: ~~1405~~ 1305
	SECOR Rep: J. Morell	Checked by: SMB	Sample No: VEW- 29

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 5	Borehole Diameter (in): 8 (10) 12	
Purging Equipment / Method: ___ Vac Truck X Bailer ___ Submersible Pump ___ Other	Casing Diameter (in): 2 (4)	
pH Temp/Conductivity Meter Type / ID: 6	Depth to Water (DTW_1) (ft): 46.81	
Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 49.20	Water Column: 2.39
	Floating Product: ___	Thickness (in): ___
Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Borehole Volume (gal): 3.59	1.5 Borehole Volumes (gal): 5.39

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1034	Started Purging					
1040	Dry	~~4~~ 3	6.68	23.3	1365	Black, strong odor, cloudy, sheen
1105	Dry	~~5.5~~ 4	6.71	23.5	1380	"
1305	47.67	sample				

Maximum Drawdown (DTW_2) (ft) = 49.20

Pump Rate (GPM) = .12

___ Fast Recharging Well

X Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1305

Depth to Water at time of sampling (DTW_3): 47.67

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
6 x 40ml VOAs	N	(HCL & ICE) or NONE	TPHg, BTEX, MTBE, (8015, 8260)
			DIPE, TAME, ETBE, TBA (8260b)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Casing Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 ($DTB-DTW_1$)
2	10	1.14 ($DTB-DTW_1$)
4	10	1.50 ($DTB-DTW_1$)
4	12	1.95 ($DTB-DTW_1$)
6	10	2.11 ($DTB-DTW_1$)

Notes:

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(46.81) - (47.67)}{(46.81) - (49.20)} = \frac{-.86}{-2.39}$$

$$= 64\ \%$$

80% Recharge = 47.29

SECOR

INTERNATIONAL INCORPORATED

WELL PURGING / SAMPLING LOG

Project Name:	ARCO 6128	Well No:	VEW- 30
Project Number:	08BP.U6128.04 / 4L57	Date:	1/28/2005
SECOR Rep: J. Morell	Checked by: SM	Sample Time:	1307
		Sample No:	VEW- 30

PURGING & SAMPLING EQUIPMENT / METHOD

Water Level Meter Type & ID: Solinist # 5

Purging Equipment / Method: ___ Vac Truck ___ Submersible Pump X Bailer ___ Other

pH Temp/Conductivity Meter Type / ID: 6

Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:

Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:

WELL SPECIFICATIONS & MEASUREMENTS

Borehole Diameter (in): 8 (10) 12

Casing Diameter (in): 2 (4)

Depth to Water (DTW_1) (ft): 43.52

Total Well Depth (DTB) (ft): 48.40

Water Column: 4.88

Floating Product: —

Thickness (in): —

Borehole Volume (gal): 7.32

1.5 Borehole Volumes (gal): 10.98

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
0954	Started Purging					
1000	Dry	~~7.5~~ 4	6.65	23.5	350	Black, strong odor, cloudy, Sheen
1200	Dry	~~7.5~~ ~~7.5~~	6.69	23.8	340	" " "
1307	48.20	sample				

Maximum Drawdown (DTW_2) (ft) = 48.40

Pump Rate (GPM) = 0.67

___ Fast Recharging Well

X Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1307

Depth to Water at time of sampling (DTW_3): 48.20

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
6 x 40ml VOAs	N	(HCL & ICE) or NONE	TPHg, BTEX, MTBE, (8015, 8260)
			DIPE, TAME, ETBE, TBA (8260b)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Casing Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes: H. Slow
Sheen observed.

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(43.52) - (48.20)}{(43.52) - (48.40)} = \frac{-4.68}{4.88}$$

$$= 4 \%$$

80% Recharge = 44.49

SEVERN TRENT STL

STL Los Angeles
1721 South Grand Avenue
Santa Ana, CA 92705

Tel: 714 258 8610 Fax: 714 258 0921
www.stl-inc.com

February 15, 2005

STL LOT NUMBER: **E5B020336**
PO/CONTRACT: GEM-6-21909

CAROLE FARR
SECOR International Inc
2655 Camino Del Rio North
Suite 302
San Diego, CA 92108-1633

Dear CAROLE FARR,

This report contains the analytical results for the six samples received under chain of custody by STL Los Angeles on February 1, 2005. These samples are associated with your ARCO #6128 project.

STL Los Angeles certifies that the test results provided in this report meet all the requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of the report. NELAP Certification Number for STL Los Angeles is 01118CA/E87652.

Any matrix related anomaly is footnoted within the report. A cooler receipt temperature between 2-6 degrees Celsius is within EPA acceptance criteria. The temperature(s) of the coolers received for this project can be found on the Project Receipt Checklist.

This report shall not be reproduced except in full, without the written approval of the laboratory.

000024

This report contains _____ pages.

CASE NARRATIVE

Historical control limits for the LCS are used to define the estimate of uncertainty for a method.

All applicable quality control procedures met method-specified acceptance criteria.

Secor personnel provided the Enfos number and other additional information regarding this project on February 3, 2005 and February 15, 2005. This information was not indicated on the chain of custody.

If you have any questions, please feel free to call me at 714.258.8610.

Sincerely,

Sabina Sudoko
Project Manager
CC: Project File

ESB020336

Page 1 of 1

Chain of Custody Record

Project Name: Groundwater Monitoring
BP BU/AR Region/Enfos Segment: Atlantic Richfield
State or Lead Regulatory Agency:
Requested Due Date (mm/dd/yy): Standard TAT

On-site Time: Temp:
Off-site Time: Temp:
Sky Conditions:
Meteorological Events:
Wind Speed: Direction:

Lab Name: S.T.L.
Address: 1721 S. Grand Ave, Santa Ana, CA
Lab PM: Beth Riley
Tele/Fax: 714.258.8610/0924
BP/AR PM Contact: Roy Thun
Address: 4 Centerpointe Dr, La Palma, CA 90623
Tele/Fax: 661.287.3855/222.2349

BP/AR Facility No.: 6128
BP/AR Facility Address: 4488 Clairemont Mesa, San Diego, CA
Site Lat/Long:
California Global ID No.: T0607300693
Enfos Project No.: Pending
Provision or RCOP (circle one)
Phase/WBS: Monitoring / ~~Analytical~~
Sub Phase/Task: Analytical
Cost Element: Subcontracted Cost

Consultant/Contractor: Secor
Address: 2655 Camino Del Rio N #302, San Diego, CA 92108
Consultant/Contractor Project No.: 08BP116128.04
Consultant/Contractor PM: Carole Farr
Tele/Fax: 619.296.6195/6199
Report Type & QC Level:
E-mail EDD To: cfarr@secor.com
Invoice to: Consultant or BP or Atlantic Richfield Co. (circle one)

Lab Bottle Order No:

Item No.	Sample Description	Time	Date	Matrix: Soil/Solid	Matrix: Water/Liquid	Matrix: Air	Laboratory No.	No. of Containers	Preservative: Unpreserved	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: HCl	Preservative: Methanol	Requested Analysis: BTEX 8021	Requested Analysis: BTEX/TPH	Requested Analysis: BTEX/Oxy/TPH	Requested Analysis: EPA 8260 BTEX Oxys	Requested Analysis: EPA 8270	Requested Analysis: 8015 626 05-OR	Sample Point Lat/Long and Comments
1	VEW-12	1258	1/28/05		X			6				X					X		X	Oxys include: MTBE, ETBE, TAME, TBA, DIPE, EtOH
2	VEW-13	1208	1/28/05		X			6				X					X		X	
3	VEW-29	1305	1/28/05		X			6				X					X		X	
4	VEW-30	1307	1/28/05		X			6				X					X		X	
5																				
6																				
7																				
8																				
9	TB-6128-20050128		1/28/05		X			6				X					X		X	
10	EB-6128-20050128		1/28/05		X			6				X								

Sampler's Name: Wilson Wong
Sampler's Company: Secor
Shipment Date:
Shipment Method:
Shipment Tracking No:

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
[signature]	2/1/05	1800	[signature]	2/1/05	1755
			[signature]	2-1-05	18:20

Special Instructions:

Custody Seals In Place Yes ___ No ___ Temp Blank Yes ___ No ___ Cooler Temperature on Receipt N/A °F/C Trip Blank Yes ✓ No ___

Distribution: White Copy - Laboratory / Yellow Copy - BP/Atlantic Richfield Co. / Pink Copy - Consultant/Contractor

BP COC Rev. 4 10/1/04

Sudoko, Sabina

From: cfarr [cfarr@secor.com]
Sent: Tuesday, February 15, 2005 8:35 AM
To: Sudoko, Sabina
Subject: RE: E5B020336

G0BNR-0001

Thanks!
Carole

Carole M. Farr
Senior Geologist
SECOR International Incorporated
2655 Camino del Rio N., Suite 302
San Diego, CA 92108
(619) 296-6195/fax 296-6199

-----Original Message-----
From: Sudoko, Sabina [mailto:ssudoko@stl-inc.com]
Sent: Monday, February 14, 2005 5:57 PM
To: cfarr; Brian Auchard
Subject: E5B020336
Importance: High

Greetings,

Pls provide the Enfos No.

thank you..

Sabina

-----Original Message-----
From: cfarr [mailto:cfarr@secor.com]
Sent: Thursday, February 03, 2005 10:05 AM
To: Sudoko, Sabina
Subject: RE: Information for E5B020336

Provision/G0BNR-0001/monitoring (4)/Analytical/sub. cost

Carole M. Farr
Senior Geologist
SECOR International Incorporated
2655 Camino del Rio N., Suite 302
San Diego, CA 92108
(619) 296-6195/fax 296-6199

-----Original Message-----
From: ssudoko@stl-inc.com [mailto:ssudoko@stl-inc.com]

Sent: Wednesday, February 02, 2005 6:05 PM
To: cfarr@secor.com; bauchard@secor.com
Subject: Information for E5B020336

* *

Lot ID: E5B020336

Project Number: 08BP.U6128.04
Project Name/Site: ARCO #6128

Acknowledgment of samples received for ARCO #6128

Pls check the sample confirmation sheet.

Please provide the Enfos. # when you get it..

thank you..

Sabina Sudoko
(714)258-8610
ssudoko@stl-inc.com

This message and any files transmitted with it are confidential and intended solely for the use of the addressee. If you have received this message in error please notify the sender and destroy your copies of the message and any attached files.

[C0177184]
Version: 2.1.9

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Sudoko, Sabina

From: cfarr [cfarr@secor.com]
Sent: Thursday, February 03, 2005 10:05 AM
To: Sudoko, Sabina
Subject: RE: Information for E5B020336

Provision/G0BNR-0001/monitoring (4)/Analytical/sub. cost

Carole M. Farr
Senior Geologist
SECOR International Incorporated
2655 Camino del Rio N., Suite 302
San Diego, CA 92108
(619) 296-6195/fax 296-6199

-----Original Message-----
From: ssudoko@stl-inc.com [mailto:ssudoko@stl-inc.com]
Sent: Wednesday, February 02, 2005 6:05 PM
To: cfarr@secor.com; bauchard@secor.com
Subject: Information for E5B020336

* *

Lot ID: E5B020336
Project Number: 08BP.U6128.04
Project Name/Site: ARCO #6128

Acknowledgment of samples received for ARCO #6128

Pls check the sample confirmation sheet.

Please provide the Enfos. # when you get it..

thank you..

Sabina Sudoko
(714)258-8610
ssudoko@stl-inc.com

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STL LOS ANGELES - PROJECT RECEIPT CHECKLIST Date: 2-1-05

LIMS Lot #: ESB020336 Quote #: 62428

Client Name: Secor Project: Well Destruction for Site Closure

Received by: MB Date/Time Received: 2-1-05 / 18:20

Delivered by : ☐ Client ☒ STL ☐ DHL ☐ Fed Ex ☐ UPS ☐ Other

****

	Initial / Date
Custody Seal Status Cooler: ☐Intact ☐Broken ☒None	MB 2-1-05
Custody Seal Status Samples: ☐Intact ☐Broken ☒None	
Custody Seal #(s): ☒No Seal #	
Sampler Signature on COC ☐ Yes ☐No ☒N/A	
IR Gun # 1 Correction Factor -.2 °C IR passed daily verification ☒ Yes ☐No	
Temperature - BLANK 2.5 °C +/- .2 CF = 2.3 °C	
Temperature – COOLER (___ °C ___ °C ___ °C ___ °C) = ___ avg °C +/- ___ CF = ___ °C	
Samples outside temperature criteria but received within 6 hours of final sampling ☐ Yes ☒N/A	
Sample Container(s): ☒ STL-LA ☐ Client	
One COC/Multiple coolers: ☐ Yes- # coolers ___ All within temp criteria ☐ Yes ☐No ☒N/A	MB 2-1-05
One or more coolers with an anomaly: ☐ Yes – (fill out PRC for each) ☐N/A	
Samples: ☒Intact ☐Broken ☐Other	MB 2-1-05
pH measured: ☐ Yes ☐ Anomaly (if checked, notify lab and file NCM) ☒N/A	A Bozhalos
Anomalies: ☒No ☐Yes – complete CUR and Create NCM NCM #	
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times. ☒Yes ☐ N/A	
Labeled by: AB Labeling checked AB	

****

Turn Around Time: ☐RUSH–24HR ☐RUSH–48HR ☐RUSH–72HR ☒NORMAL MB 2-1-05

Short-Hold Notification: ☐ pH ☐Wet Chem ☐Metals (Filter/Pres) ☐Encore ☐ >1/2 HT expired...

Outside Analysis(es) (Test/Lab/Date Sent Out) :

_____

_____

_____

********** LEAVE NO BLANK SPACES ; USE N/A **********

Headspace Anomaly ☒N/A A Bozhalos

Lab ID	Container(s) #	Headspace	Lab ID	Container(s) #	Headspace
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm

LIMS Lot # ESB 020336

PROJECT RECEIPT CHECKLIST Cont'd

Fraction	176													
VOAH/ *	6													

* VOA with headspace/bubbles < 6mm

H: HCL, S: H2SO4, N: HNO3, V: VOA, SL, Sleeve, E: Encore, PB: Poly Bottle, CGB: Clear Glass Bottle, AGJ: Amber Glass Jar, T: Terracore
AGB: Amber Glass Bottle, n/f/l:HNO3-Lab filtered, n/f:HNO3-Field filtered, znna: Zinc Acetate/Sodium Hydroxide, Na2s2o3: sodium thiosulfate

Condition Upon Receipt Anomaly Form

☒ N/A Ms 02/02/05

- **COOLERS**
  - _ Not Received (received COC only)
  - _ Leaking
  - _ Other:
- **TEMPERATURE (SPECS 4 ± 2°C)**
  - _ Cooler Temp(s)
  - _ Temperature Blank(s)
- **CONTAINERS**
  - _ Leaking
  - _ Voa Vials with Bubbles > 6mm
  - _ Broken
  - _ Extra
  - _ Without Labels
  - _ Other:
- **SAMPLES**
  - _ Samples NOT RECEIVED but listed on COC
  - _ Samples received but NOT LISTED on COC
  - _ Logged based on Label Information
  - _ Logged based on info from other samples on COC
  - _ Logged according to Work Plan
  - _ Logged on HOLD UNTIL FURTHER NOTICE
- **CUSTODY SEALS (COOLER(S)**
  - _ None
  - _ Not Intact
  - _ Other

  CONTAINER(S)
  - _ None
  - _ Not Intact
  - _ Other
- **CHAIN OF CUSTODY (COC)**
  - _ Not relinquished by Client; No date/time relinquished
  - _ Incomplete information provided
  - _ Other _ COC not received – notify PM
- **LABELS**
  - _ Not the same ID/info as in COC
  - _ Incomplete Information
  - _ Markings/Info illegible
  - _ Torn
- _ Will be noted on COC--Client to send samples with new COC
- _ Mislabeled as to tests, preservatives, etc.
- _ Holding time expired – list sample ID and test
- _ Improper container used
- _ Not preserved/Improper preservative used
- _ Improper pH _____ Lab to preserve sample and document
- _ Insufficient quantities for analysis
- _ Other

Comments:

_____

_____

_____

_____

_____

_ Corrective Action Implemented:

_ Client Informed: verbally on _____ By: _____ _ In writing on _____ By: _____

_ Sample(s) on hold until: _____ _ Sample(s) processed "as is."

Logged by/Date: Ms 02/02/05

PM Review/Date: 2/2 SZ

SECOR International Inc

Client Sample ID: VEW-12

GC/MS Volatiles

Lot-Sample #...:	E5B020336-001	Work Order #...:	G3MR11AA	Matrix.....:	W
Date Sampled...:	01/28/05 12:58	Date Received..:	02/01/05 18:20	MS Run #.....:	5041273
Prep Date.....:	02/09/05	Analysis Date..:	02/09/05		
Prep Batch #...:	5041502	Analysis Time..:	17:45		
Dilution Factor:	2.5				
Analyst ID.....:	000038	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	5.0	ug/L
Benzene	ND	1.2	ug/L
Ethanol	ND IO,IB	1200	ug/L
Ethylbenzene	ND	1.2	ug/L
tert-Butyl alcohol	ND	62	ug/L
Toluene	ND	1.2	ug/L
o-Xylene	ND	2.5	ug/L
Xylenes (total)	**2.5**	**2.5**	**ug/L**
m-Xylene & p-Xylene	ND	2.5	ug/L
Methyl tert-butyl ether (MTBE)	**110**	**2.5**	**ug/L**
Ethyl-t-Butyl Ether (ETBE)	ND	5.0	ug/L
Tert-amyl methyl ether (TAME)	ND	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	96	(75 - 120)
1,2-Dichloroethane-d4	109	(65 - 130)
Toluene-d8	106	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: VEW-12

GC Volatiles

Lot-Sample #...:	E5B020336-001	Work Order #...:	G3MR11AC	Matrix.....:	W
Date Sampled...:	01/28/05 12:58	Date Received..:	02/01/05 18:20	MS Run #.....:	5039122
Prep Date.....:	02/02/05	Analysis Date..:	02/03/05		
Prep Batch #...:	5039283	Analysis Time..:	06:21		
Dilution Factor:	1				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	180	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(70 - 130)

SECOR International Inc

Client Sample ID: VEW-13

GC/MS Volatiles

Lot-Sample #...:	E5B020336-002	Work Order #...:	G3MR21AA	Matrix.....:	W
Date Sampled...:	01/28/05 12:08	Date Received..:	02/01/05 18:20	MS Run #.....:	5041273
Prep Date.....:	02/09/05	Analysis Date..:	02/09/05		
Prep Batch #...:	5041502	Analysis Time..:	17:23		
Dilution Factor:	62.5				
Analyst ID.....:	000038	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	120	ug/L
Benzene	3500	31	ug/L
Ethanol	ND IO,IB	31000	ug/L
Ethylbenzene	840	31	ug/L
tert-Butyl alcohol	ND	1600	ug/L
Toluene	910	31	ug/L
o-Xylene	530	62	ug/L
Xylenes (total)	2700	62	ug/L
m-Xylene & p-Xylene	2200	62	ug/L
Methyl tert-butyl ether (MTBE)	730	62	ug/L
Ethyl-t-Butyl Ether (ETBE)	ND	120	ug/L
Tert-amyl methyl ether (TAME)	ND	120	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	99	(75 - 120)
1,2-Dichloroethane-d4	104	(65 - 130)
Toluene-d8	106	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: VEW-13

GC Volatiles

Lot-Sample #...:	E5B020336-002	Work Order #...:	G3MR21AC	Matrix.....:	W
Date Sampled...:	01/28/05 12:08	Date Received..:	02/01/05 18:20	MS Run #.....:	5039122
Prep Date.....:	02/02/05	Analysis Date..:	02/03/05		
Prep Batch #...:	5039283	Analysis Time..:	04:57		
Dilution Factor:	50				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	30000	5000	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	108	(70 - 130)

SECOR International Inc

Client Sample ID: VEW-29

GC/MS Volatiles

Lot-Sample #...:	E5B020336-003	Work Order #...:	G3MR41AA	Matrix.....:	W
Date Sampled...:	01/28/05 13:05	Date Received..:	02/01/05 18:20	MS Run #.....:	5041273
Prep Date.....:	02/09/05	Analysis Date..:	02/09/05		
Prep Batch #...:	5041502	Analysis Time..:	17:01		
Dilution Factor:	125				
Analyst ID.....:	000038	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	250	ug/L
Benzene	**1900**	**62**	**ug/L**
Ethanol	ND IO,IB	62000	ug/L
Ethylbenzene	**380**	**62**	**ug/L**
tert-Butyl alcohol	ND	3100	ug/L
Toluene	**1300**	**62**	**ug/L**
o-Xylene	**5200**	**120**	**ug/L**
Xylenes (total)	**13000**	**120**	**ug/L**
m-Xylene & p-Xylene	**7600**	**120**	**ug/L**
Methyl tert-butyl ether (MTBE)	**790**	**120**	**ug/L**
Ethyl-t-Butyl Ether (ETBE)	ND	250	ug/L
Tert-amyl methyl ether (TAME)	ND	250	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	103	(75 - 120)
1,2-Dichloroethane-d4	113	(65 - 130)
Toluene-d8	108	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: VEW-29

GC Volatiles

Lot-Sample #...:	E5B020336-003	Work Order #...:	G3MR41AC	Matrix.....:	W
Date Sampled...:	01/28/05 13:05	Date Received..:	02/01/05 18:20	MS Run #.....:	5039122
Prep Date.....:	02/02/05	Analysis Date..:	02/03/05		
Prep Batch #...:	5039283	Analysis Time..:	05:25		
Dilution Factor:	50				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	54000	5000	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	107	(70 - 130)

SECOR International Inc

Client Sample ID: VEW-30

GC/MS Volatiles

Lot-Sample #...:	E5B020336-004	Work Order #...:	G3MR71AA	Matrix.....:	W
Date Sampled...:	01/28/05 13:07	Date Received..:	02/01/05 18:20	MS Run #.....:	5041273
Prep Date.....:	02/09/05	Analysis Date..:	02/09/05		
Prep Batch #...:	5041502	Analysis Time..:	16:40		
Dilution Factor:	33.33				
Analyst ID.....:	000038	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	67	ug/L
Benzene	2200	17	ug/L
Ethanol	ND IO,IB	17000	ug/L
Ethylbenzene	130	17	ug/L
tert-Butyl alcohol	ND	830	ug/L
Toluene	210	17	ug/L
o-Xylene	270	33	ug/L
Xylenes (total)	830	33	ug/L
m-Xylene & p-Xylene	560	33	ug/L
Methyl tert-butyl ether (MTBE)	63	33	ug/L
Ethyl-t-Butyl Ether (ETBE)	ND	67	ug/L
Tert-amyl methyl ether (TAME)	ND	67	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	101	(75 - 120)
1,2-Dichloroethane-d4	96	(65 - 130)
Toluene-d8	105	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: VEW-30

GC Volatiles

Lot-Sample #...:	E5B020336-004	Work Order #...:	G3MR71AC	Matrix.....:	W
Date Sampled...:	01/28/05 13:07	Date Received..:	02/01/05 18:20	MS Run #.....:	5039122
Prep Date.....:	02/02/05	Analysis Date..:	02/03/05		
Prep Batch #...:	5039283	Analysis Time..:	05:53		
Dilution Factor:	50				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	7000	5000	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	97	(70 - 130)

SECOR International Inc

Client Sample ID: TB-6128-20050128

GC/MS Volatiles

Lot-Sample #...:	E5B020336-005	Work Order #...:	G3MR91AA	Matrix.....:	W
Date Sampled...:	01/28/05	Date Received..:	02/01/05 18:20	MS Run #.....:	5041273
Prep Date.....:	02/09/05	Analysis Date..:	02/09/05		
Prep Batch #...:	5041502	Analysis Time..:	16:18		
Dilution Factor:	1				
Analyst ID.....:	000038	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	2.0	ug/L
Benzene	ND	0.50	ug/L
Ethanol	ND IO,IB	500	ug/L
Ethylbenzene	ND	0.50	ug/L
tert-Butyl alcohol	ND	25	ug/L
Toluene	ND	0.50	ug/L
o-Xylene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L
Ethyl-t-Butyl Ether (ETBE)	ND	2.0	ug/L
Tert-amyl methyl ether (TAME)	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	86	(75 - 120)
1,2-Dichloroethane-d4	108	(65 - 130)
Toluene-d8	90	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: TB-6128-20050128

GC Volatiles

Lot-Sample #...:	E5B020336-005	Work Order #...:	G3MR91AC	Matrix.....:	W
Date Sampled...:	01/28/05	Date Received..:	02/01/05 18:20	MS Run #.....:	5039122
Prep Date.....:	02/02/05	Analysis Date..:	02/03/05		
Prep Batch #...:	5039283	Analysis Time..:	06:49		
Dilution Factor:	1				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	95	(70 - 130)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: E5B020336
MB Lot-Sample #: E5B100000-502

Work Order #...: G37NQ1AA

Matrix.....: WATER

Prep Date.....: 02/09/05

Analysis Time..: 13:47

Analysis Date..: 02/09/05

Prep Batch #...: 5041502

Instrument ID..: MSQ

Dilution Factor: 1

Analyst ID.....: 000038

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	0.50	ug/L	SW846 8260B
Ethanol	ND IO,IB	500	ug/L	SW846 8260B
Ethylbenzene	ND	0.50	ug/L	SW846 8260B
tert-Butyl alcohol	ND	25	ug/L	SW846 8260B
Toluene	ND	0.50	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
Xylenes (total)	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
Ethyl-t-Butyl Ether (ETBE	ND	2.0	ug/L	SW846 8260B
Tert-amyl methyl ether (T	ND	2.0	ug/L	SW846 8260B
Diisopropyl Ether (DIPE)	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	108	(75 - 120)
1,2-Dichloroethane-d4	126	(65 - 130)
Toluene-d8	109	(80 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

METHOD BLANK REPORT

GC Volatiles

Client Lot #...: E5B020336
MB Lot-Sample #: E5B080000-283

Analysis Date..: 02/02/05
Dilution Factor: 1

Work Order #...: G304V1AA

Prep Date.....: 02/02/05
Prep Batch #...: 5039283

Analyst ID.....: 001464

Matrix.....: WATER

Analysis Time..: 18:14
Instrument ID..: G13

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
GRO (C6 - C12)	ND	100	ug/L	SW846 8015B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	93	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: E5B020336 Work Order #...: G37NQ1AC Matrix.....: WATER
LCS Lot-Sample#: E5B100000-502
Prep Date.....: 02/09/05 Analysis Date..: 02/09/05
Prep Batch #...: 5041502 Analysis Time..: 11:28
Dilution Factor: 1 Instrument ID..: MSQ
Analyst ID.....: 000038

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	10.0	10.2	ug/L	102	SW846 8260B
tert-Butyl alcohol	50.0	42.6	ug/L	85	SW846 8260B
Ethanol	2000	2230	ug/L	112	SW846 8260B
		Qualifiers: IO,IB			
Tert-amyl methyl ether (T	10.0	10.3	ug/L	103	SW846 8260B
Ethyl-t-Butyl Ether (ETBE	10.0	11.0	ug/L	110	SW846 8260B
Ethylbenzene	10.0	10.5	ug/L	105	SW846 8260B
Diisopropyl Ether (DIPE)	10.0	11.5	ug/L	115	SW846 8260B
Methyl tert-butyl ether (MTBE)	10.0	9.92	ug/L	99	SW846 8260B
Toluene	10.0	9.97	ug/L	100	SW846 8260B
m-Xylene & p-Xylene	20.0	20.6	ug/L	103	SW846 8260B
o-Xylene	10.0	10.4	ug/L	104	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	109	(75 - 120)
1,2-Dichloroethane-d4	118	(65 - 130)
Toluene-d8	107	(80 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

LABORATORY CONTROL SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: E5B020336 Work Order #...: G304V1AC Matrix.....: WATER
LCS Lot-Sample#: E5B080000-283
Prep Date.....: 02/02/05 Analysis Date..: 02/02/05
Prep Batch #...: 5039283 Analysis Time..: 18:42
Dilution Factor: 1 Instrument ID..: G13
Analyst ID.....: 001464

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
GRO (C6 - C12)	1000	952	ug/L	95	SW846 8015B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	120	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: E5B020336 Work Order #...: G3KG91AH-MS Matrix.....: WATER
MS Lot-Sample #: E5B010250-009 G3KG91AJ-MSD
Date Sampled...: 01/31/05 12:22 Date Received..: 02/01/05 10:30 MS Run #.....: 5041273
Prep Date.....: 02/09/05 Analysis Date..: 02/09/05
Prep Batch #...: 5041502 Analysis Time..: 19:55
Dilution Factor: 166.7 Analyst ID.....: 000038 Instrument ID..: MSQ

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	350	1670	2020	ug/L	100		SW846 8260B
	350	1670	2010	ug/L	100	0.14	SW846 8260B
tert-Butyl alcohol	ND	8330	7440	ug/L	89		SW846 8260B
	ND	8330	7120	ug/L	85	4.3	SW846 8260B
Ethanol	ND	333000	558000	ug/L	167 LM		SW846 8260B
	ND	333000	399000	ug/L	120	33	SW846 8260B
Tert-amyl methyl ether (T	ND	1670	1760	ug/L	106		SW846 8260B
	ND	1670	1800	ug/L	108	2.4	SW846 8260B
Ethyl-t-Butyl Ether (ETBE	ND	1670	1850	ug/L	111		SW846 8260B
	ND	1670	1860	ug/L	112	0.86	SW846 8260B
Ethylbenzene	3900	1670	4670	ug/L	45 LN		SW846 8260B
	3900	1670	4630	ug/L	43 LN	0.77	SW846 8260B
Diisopropyl Ether (DIPE)	ND	1670	1900	ug/L	114		SW846 8260B
	ND	1670	1900	ug/L	114	0.10	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1670	1770	ug/L	106		SW846 8260B
	ND	1670	1800	ug/L	108	2.0	SW846 8260B
Toluene	1400	1670	2800	ug/L	85		SW846 8260B
	1400	1670	2810	ug/L	85	0.46	SW846 8260B
m-Xylene & p-Xylene	12000	3330	11900	ug/L	4.5 LN		SW846 8260B
	12000	3330	11700	ug/L	0.0 LN	0.0	SW846 8260B
o-Xylene	4700	1670	5550	ug/L	49 LN		SW846 8260B
	4700	1670	5500	ug/L	46 LN	0.83	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	102	(75 - 120)
	103	(75 - 120)
1,2-Dichloroethane-d4	94	(65 - 130)
	86	(65 - 130)
Toluene-d8	101	(80 - 130)
	102	(80 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Spiked analyte recovery is outside stated control limits.

LN MS and/or MSD below acceptance limits. See Blank Spike (LCS).

LM MS and/or MSD above acceptance limits. See Blank Spike (LCS).

MATRIX SPIKE SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: E5B020336 Work Order #...: G3MWP1AD-MS Matrix.....: WATER
MS Lot-Sample #: E5B020341-007 G3MWP1AE-MSD
Date Sampled...: 01/31/05 08:57 Date Received..: 02/01/05 18:20 MS Run #.....: 5039122
Prep Date.....: 02/02/05 Analysis Date..: 02/02/05
Prep Batch #...: 5039283 Analysis Time..: 22:26
Dilution Factor: 1 Analyst ID.....: 001464 Instrument ID..: G13

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
GRO (C6 - C12)	ND	1000	880	ug/L	88		SW846 8015B
	ND	1000	859	ug/L	86	2.3	SW846 8015B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	123	(70 - 130)
	120	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters