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April 9, 2002

Scott Seery
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **Sensitive Receptor Survey Report**
Shell-branded Service Station
3790 Hopyard Road
Pleasanton, California
Incident #98995842
Cambria Project #244-0497

Dear Mr. Seery:

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Sensitive Receptor Survey Report* on behalf of Shell Oil Products US.

WELL RECEPTOR SURVEY

Cambria reviewed State Department of Water Resources (DWR) files to locate records of municipal and private wells within a ½-mile radius of the Shell-branded service station located at 3790 Hopyard Road, Pleasanton, California. Cambria also contacted the City of Pleasanton and Zone 7 Water Agency (Zone 7) for information on municipal wells in the area.

FINDINGS

A total of six wells, not including monitoring wells, were identified through the DWR and Zone 7 records within a ½-mile radius of the site. The well locations identified in the well survey are shown on Figure 1, and well details are summarized in Table 1. Since DWR records are confidential, the DWR records are not included with this report. However, a copy of the DWR records will be maintained in Cambria's files and will be made available for review upon request.

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The predominant groundwater flow direction, as calculated from depth to water measurements in on- and off-site monitoring wells, is toward the southeast (see rose diagram on Figure 2). One abandoned well is located either onsite or immediately downgradient of the site. According to Wyman Hong of Zone 7, the well was an old farm well formerly owned by Volk Mc Clain Company in 1960. Records show the well specifications to be 12 inches in diameter with a total depth of 172 feet below grade (fbg). The well was last sampled in 1978 by Zone 7. Mr. Hong also stated that Zone 7 could not locate the well, its status is "unlocatable", and it is considered closed by Zone 7. Zone 7 did not perform a magnetic survey during their location attempt. One active and one destroyed Zone 7 municipal well are located approximately 0.3 miles southeast of the site. Two additional active wells of unknown use are located 0.43 miles to the southeast. One destroyed irrigation well is located approximately ½-mile east of the site.

Given the distance from the site to the municipal wells, it is unlikely that hydrocarbons originating from the site will reach these wells. Wells S-7, S-9, and S-10 presently serve as sentry wells to monitor possible migration of methyl tert-butyl ether to the municipal well. Additional actions to monitor site conditions and protect the municipal well are proposed in the recommendations section of this report.

CONDUIT STUDY AND RECEPTOR SURVEY

A utility conduit survey was conducted to determine the location of potential preferential pathways that may exist in the site vicinity. Conduit trenches are often back-filled with materials that are more permeable than the surrounding native soils, thus providing a path of least resistance for chemically-impacted groundwater to migrate. Conduits that extend below high groundwater levels are of particular interest for this study, as they may provide the greatest potential for chemical migration. On- and offsite utility locations are shown on Figure 2.

Cambria used information acquired from the City of Pleasanton and Pacific Gas and Electric (PG&E), in addition to conducting a site visit to identify underground utilities and potential receptors in the vicinity and onsite. The identified locations of sanitary and storm sewers, and water, natural gas, and electric utility lines are mapped on Figure 2 and summarized below:

- One 16-inch diameter water main and one 20-inch diameter water main trends north along Hopyard Road, and another 16-inch diameter water main line trends east along Las Positas Boulevard. City of Pleasanton engineering maps of the region indicate that the water mains are typically buried at a depth of approximately 5.6 to 7.2 feet to the top of the pipe. The bottom of the deepest trench backfill is estimated to be approximately 9 fbg.

- One 15-inch diameter storm drain flows north along Hopyard Road and one 18-inch diameter storm drain flows east along Las Positas Boulevard. City of Pleasanton engineering maps of the region indicate that the storm drain conduits are typically buried at a depth of approximately 6.5 to 10.2 to the top of the pipe. The bottom of the deepest trench backfill is estimated to be approximately 12.5 fbg.
- According to the most recent map of utilities for the area, which predates construction of Las Positas Boulevard, an electric line runs northeast from the site into an electric-line of unknown diameter that trends west-east along Las Positas Boulevard. Electric lines are typically buried at a depth of approximately 2 to 3 fbg.
- A gas line runs along the eastern edge of Hopyard Road and runs across the northern portion of Hopyard Road. An electric line runs west along Las Positas Boulevard and branches off to run across Hopyard Road diagonally to the service station. PG&E lines are typically buried 2 to 3 fbg.
- No sanitary sewer lines were identified on any of the available utility maps.

Groundwater depths have historically ranged from 11.52 fbg to 18.45 fbg, although average depths range from 13 to 15 fbg. Groundwater typically flows to the southeast. Given the approximated depth to the bottom of the aforementioned pipes, it is possible that the storm drain trench backfill intercepts groundwater during times of high water elevation. However, the storm drains are located at shallower depths than groundwater has typically been measured; therefore they are not likely to influence chemical migration from the site.

Arroyo Mocho, a canal located approximately 400 feet south of the site, is the closest potential surface water receptor to the site. Surface water in Arroyo Mocho flows to the west/southwest at a depth of approximately 25 feet below the surrounding grade. Given the low analyte concentrations in offsite wells S-7 through S-9, it is unlikely that water in Arroyo Mocho has been impacted by chemicals from the site.

CONCLUSIONS

Since of the utilities identified, only the storm drain trench on Hopyard Road is located at a depth which has historically intercepted groundwater, and then only infrequently, it is unlikely that utility trenches provide a potential pathway for migration of onsite chemicals. Based on low analyte concentrations in wells S-7 through S-9, it is unlikely that water in Arroyo Mocho has been impacted by chemicals from the site.

Sentry wells S-7, S-9, and S-10 serve to monitor conditions between the site and the downgradient municipal well. An elevation survey of Arroyo Mocho has not been performed, but it may also be acting as a hydraulic barrier between the site and the municipal well. Further recommendations are made below.

RECOMMENDATIONS

We recommend performing a magnetic survey to locate the 172-foot-deep well near the site as it could serve as a vertical conduit for impacted fluids. We will assess the well's condition, and obtain proper permits to destroy it.

We also recommend having a licensed surveyor locate and measure the depth of sanitary sewer lines in the vicinity of the site to complete the conduit study. This will ensure that these lines are not located at a depth which would allow preferential migration from the site and possibly to the municipal well.

We recommend installing an additional well downgradient monitoring well to act as a sentry well for both the canal and the municipal well. It appears that the best location for this well is on the northeast corner of the intersection of Hopyard Road and Arroyo Mocho. Upon approval of this recommendation by Alameda Health Care Services Agency, we will submit a work plan with a more defined proposed well location, and will begin pursuing right-of-entry and/or encroachment permits.

CLOSING

We appreciate the opportunity to work with you on this project. Please call Diane Lundquist at (510) 420-3334 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc

Diane M. Lundquist, P.E.
Principal Engineer

Figures: 1 - Area Well Survey
2 - Utility Map

Table: 1 - Well Survey Results

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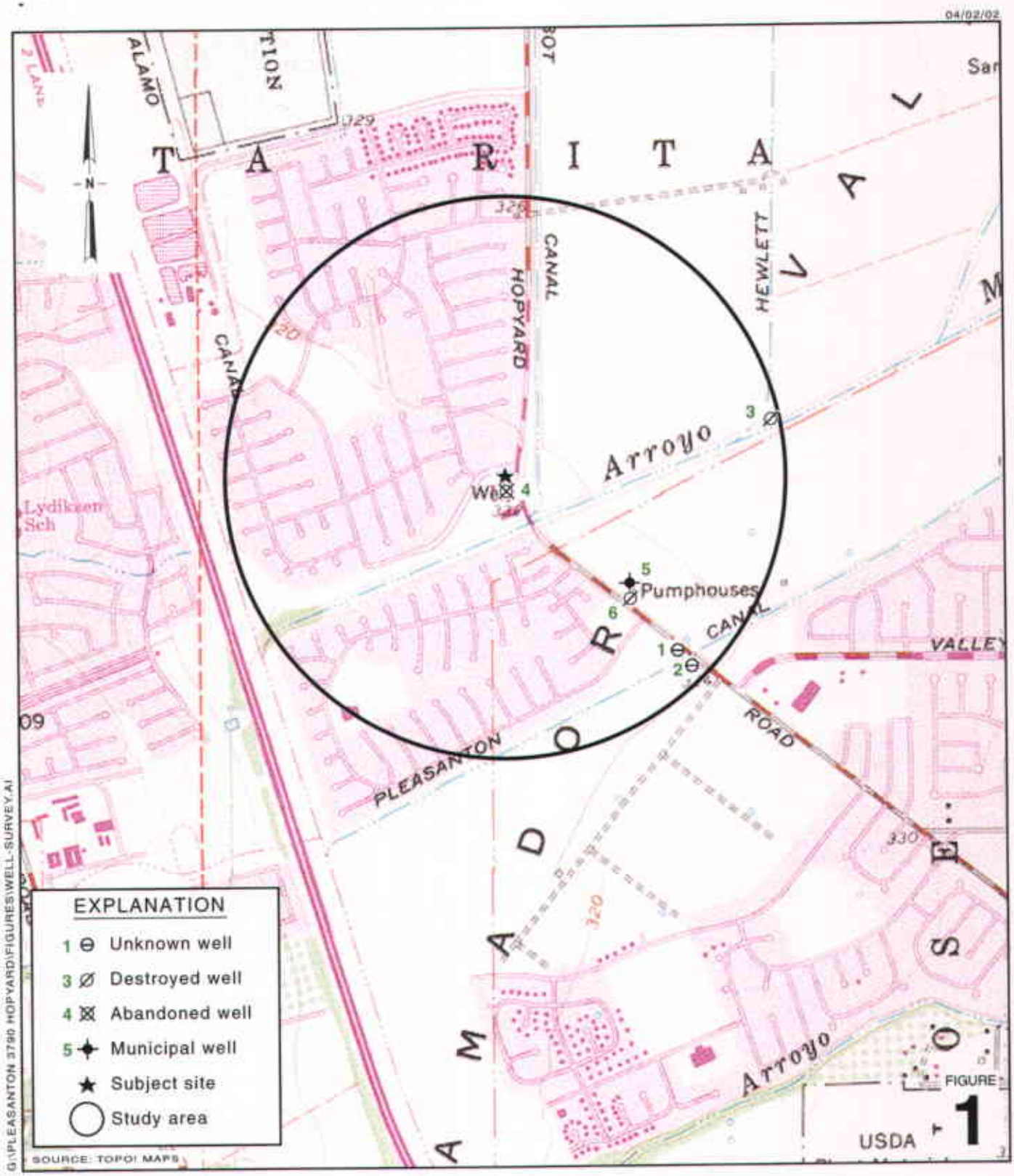

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Area Well Survey

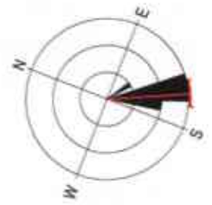
1/2 Mile Radius

Utility Map

EXPLANATION

- MW-1 — Monitoring well
- SR-1 — Groundwater Recovery well
- Storm Drain line (SD)
- Sanitary Sewer line (SS)
- Water Main (W)
- Gas line (G)
- Electrical line (E)
- fbg — Feet below grade
- Flow direction
- FH — Fire hydrant
- PG&E — PG&E vault

Note: Utility locations are approximate



Groundwater Flow Direction
(2Q97 to 4Q01)

HOPYARD ROAD

LAS POSITAS BOULEVARD

G (unknown diameter)

W (20"ϕ, 9 fbg)

SD (15"ϕ, 11.5 fbg)

W (16"ϕ, 9 fbg)

E (unknown diameter)

SD (14"ϕ, 11.3 fbg)

SD (18"ϕ, 12.5 fbg)

W (16"ϕ, 8.5 fbg)

S-10

S-6

S-7

S-4

SR-2

S-5

SR-1

S-9

S-2

SR-3

S-3

S-8

storm drain

water

FH

USTs

former underground fuel tanks

PG&E

service islands

Shell-branded service station building

waste oil tanks

planter

Arroyo Mocho Canal

0 30 60
Scale (ft)

FIGURE
2

Shell-branded Service Station
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Table 1. Well Survey Results - Shell-branded Service Station, 3790 Hopyard Road, Pleasanton, California. Incident # 98995842

Number	Well ID	Installation Date	Location	Use	Depth (ft bgs)	Screened Interval (ft bgs)	Sealed Interval (ft bgs)
1	3S/1E-72	Sept. 1943	On NW corner of Hopyard Rd. and Pleasanton Canal intersection	UNK	205.0	UNK	UNK
2	3S/1E-71	Aug. 10, 1949	On SW corner of Hopyard Rd. and Pleasanton Canal intersection	UNK	205.0	UNK	UNK
3	3S/1E-7R1	March 10, 1962	0.4 mi from Hopyard Rd. along Arroyo Mocho	DEST IRR	324.0	Formerly 143-158, 192-208, 240-309	DEST
4	3S/1E-7Q1	unknown	--	ABD	172.0	--	--
5	3S/1E-18A6	February 1943	Parkside and Hopyard Rd.	MUN	--	215-235, 275-305, 355-375, 400-490	--
6	3S/1E-18A1	October 1943	Parkside and Hopyard Rd.	DEST MUN	--	Formerly 101-114, 154-166, 186-199	DEST

Notes and Abbreviations:

Number = Column number refers to map location on Figure 2.
Well ID = California State well identification number as recorded by the Department of Water Resources in Sacramento, California.
UNK = Unknown.
IRR = Irrigation
DEST= Destroyed
ABD = Abandoned
MUN = Municipal