Weiss Associates
Environmental and Geologic Services
5500 Shellmound Street, Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: **510-450-6000**

9/5/96

August 12, 1996

Amy Leech
Hazardous Materials Specialist
Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway
Alameda, California 94502-6577

RE: **System Pulsing Update Report**
Former Chevron Service Station 9-2960
2416 Grove Way
Castrol Valley, California
WA Job #4-0552-88

Dear Ms. Leech:

As you requested, Weiss Associates (WA), on behalf of Chevron Products Company (Chevron), presents an update on the soil vapor extraction system performance under pulsing conditions at the site referenced above. Your June 12, 1996, letter to Kenneth Kan of Chevron requested an evaluation of the system performance while operating the system on a pulsing schedule to possibly enhance the system performance. The following report describes the historic system operating cycle and the June pulsing cycle. It also presents the analytic results for the samples collected from the soil vapor extraction well after the system had been cycled off in June, and describes a proposed system pulsing schedule through October 1996.

Since start-up, the system has operated on a continuous cycle. Each month, WA measured hydrocarbon vapor concentrations at vapor extraction well C-1 and the system influent and effluent sample ports using a flame ionization detector (FID). Well hydrocarbon vapor concentrations were correlated with well vacuum, well vapor flow rates, influent hydrocarbon concentrations and system flow rates. The well vacuum was adjusted to draw the greatest flow rate from well C-1 to maximize mass removal. The minimum amount of dilution air was used to achieve the system's operating flow rate in order to maximize the thermal oxidizer's operating efficiency. Although the system was on a continuos operation cycle, the system did experience shutdown events of varying lengths between regular site visits due to variations in site conditions. Before restarting the system after a shutdown event, WA collected well vapor concentrations. Table 1 follows and summarizes the hydrocarbon concentrations measured with the FID from the vapor extraction well C-1.

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TABLE 1. WELL VAPOR HYDROCARBON CONCENTRATIONS

Date	Well C-1 Vapor Concentration (ppmv)	Depth to Water in Well C-1 (feet)	System Status Upon Arrival (on/off)	Notes
28-Jun-94	49,700	17.9	on	
13-Jul-94	43,500		off	a
26-Jul-94	40,500		on	
2-Aug-94	25,200	16.67	off	a
6-Sep-94	20,700	17.63	on	a
4-Oct-94	4,200		on	a
22-Nov-94	3,500		off	
12-Dec-94	5,350	16.53	off	
5-Jan-95	6,000	16.65	off	
1-Feb-95	400	14.48	off	
1-Mar-95	2,750	15.57	off	
12-Apr-95	250	14.32	on	
22-May-95	250		on	
29-Jun-95	4,750	16.93	off	
27-Jul-95	560	15.8	on	
28-Aug-95	150	15.75	on	
13-Sep-95	3,800	16.91	off	
30-Oct-95	6,250	15.8	on	
21-Nov-95	1,250		off	
14-Dec-95	9,850	17.4	off	
17-Jan-96	1,500	16.01	off	
29-Feb-96	1,600		on	
21-Mar-96	5	13.85	on	
17-Apr-96	1	15.87	off	
23-May-96	2,500	16.33	off	
13-Jun-96	1,000	16.67	off	
26-Jun-96	1,800	14.72	off	b

Notes:

Hydrocarbon concentrations were measured in the field with a flame ionization detector (FID).

a) Well vapor concentration is estimated by multiplying the system influent concentration by 3 (the approximated dilution factor of the system influent).

b) A sample was sent to Sequoia Analytical for total petroleum hydrocarbon as gasoline (TPH-G) and benzene analysis. Results: TPH-G = 680 ppmv and benzene = 5 ppmv.

On June 13, 1996, WA shut-off the SVE system to begin a two week off pulsing cycle. On June 26, 1996, WA returned to the site and collected a vapor sample from the SVE well C-1. The sample was submitted to Sequoia Analytical of Redwood City, California, for analysis for total petroleum hydrocarbons as gasoline by EPA method 8015 modified and benzene, toluene, ethyl benzene, and total xylenes (BTEX) by EPA method 8020. WA also collected a well vapor sample from C-1 and analyzed it in the field with a FID for comparison with historic data.

The C-1 hydrocarbon vapor sample results indicated that the equilibrium soil vapor concentration was 680 ppmv TPH-G and 5.0 ppmv benzene. The FID result from June 26 is 1,800 ppmv and is consistent with recent equilibrium well vapor concentrations. The analytic report is included as Attachment A.

WA will continue system pulsing for three months. The system will be run for a one month period, the extraction well will be sampled, the system will be shut down for a one month period and the extraction well will be sampled again. This pulsing schedule will be continued through October and the final pulsing samples will be collected in November. The SVE system pulsing will be evaluated and the results summarized in a report. The pulsing schedule is summarized in Table 2 below:

TABLE 2. SOIL VAPOR EXTRACTION PULSING SCHEDULE

Month	Sampling	System Status Upon Arrival	System Status Upon Departure
August	Well vapor during SVE operation.	On	Turn SVE system off
September	Static well vapor.	Off	Turn SVE system on
October	Well vapor during SVE operation.	On	Turn SVE system off.
November	Static well vapor.	Off	SVE system off, and prepare a system pulsing status report.

If you have any questions please contact us at (510) 450-6000.

Sincerely,
Weiss Associates

Paul M. Nuti
Senior Staff Engineer

Fatima Lelic, P.E.
Principal Engineer

Enclosures: Attachment A - Analytical Report

CC: Kenneth Kan, Chevron Products Company

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ATTACHMENT A

ANALYTICAL REPORT

Sequoia Analytical
680 Chesapeake Drive, Redwood City, CA [illegible] (415) 364-9600 FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598 (510) 988-9600 FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

Weiss Associates
5500 Shellmound
Emeryville, CA 94608

Attention: Paul Nuti

Client Proj. ID: Chevron 9-2960, Castro Valley
Sample Descript: C-1
Matrix: AIR
Analysis Method: 8015Mod/8020
Lab Number: 9606F56-01

Sampled: 06/26/96
Received: 06/27/96

Analyzed: 06/28/96
Reported: 07/05/96

QC Batch Number: GC062896BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ppmv	Sample Results ppmv
TPPH as Gas	94	680
Benzene	0.78	5.0
Toluene	0.66	N.D.
Ethyl Benzene	0.58	N.D.
Xylenes (Total)	0.58	0.83
Chromatogram Pattern:		Gas
Unidentified HC		< C8

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	190 Q

alytes reported as N.D. were not present above the stated limit of detection.

EQUOIA ANALYTICAL - ELAP #1210

ie Gregory
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