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7:49 am, Sep 18, 2012

Alameda County
Environmental Health

August 23, 2012

Mr. Mark Detterman
Hazardous Materials Specialist
Alameda County Environmental Health Services
Environmental Protection, Local Oversight Program
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: Letter of Transmittal for Third Quarter 2012 Groundwater Monitoring Letter Report, Former McGrath Steel, 6655 Hollis Street, Emeryville, California 94608, ACEH Fuel Leak Case No. RO0000063, GeoTracker Global ID No. T0600102099

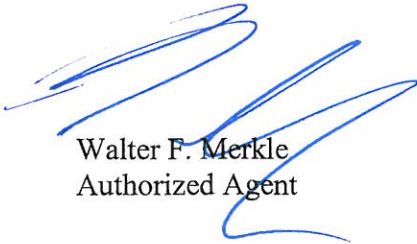
Dear Mr. Detterman:

As required in your letters of May 2, 2012, November 19, 2010 and April 7, 2006 for plume delineation and interim remediation at the above-referenced subject site, and proposed in the AllWest Environmental, Inc. *Additional Site Characterization Workplan Addendum* dated July 31, 2012, we submit this transmittal letter and accompanying *Third Quarter 2012 Groundwater Monitoring* letter report.

I declare under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

Sincerely,

MCG Investments LLC,
A California limited liability
Company



Walter F. Merkle
Authorized Agent



AllWest Environmental, Inc.

Specialists in Physical Due
Diligence and Remedial Services

530 Howard Street, Suite 300
San Francisco, CA 94105
Tel 415.391.2510
Fax 415.391.2008

August 23, 2012

Mr. Mark Detterman
Hazardous Materials Specialist
Alameda County Environmental Health Services
Environmental Protection, Local Oversight Program
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

**Subject: Third Quarter 2012 Groundwater Monitoring, Former McGrath Steel,
6655 Hollis Street, Emeryville, California 94608, ACEH Fuel Leak Case No.
RO0000063, GeoTracker Global ID No. T0600102099
AllWest Project Number 12071.23/11124.23**

Dear Mr. Detterman:

AllWest Environmental, Inc. (AllWest) has performed free product removal, redevelopment and sampling of the groundwater monitoring well MW-3 at the above-referenced subject site (Figures 1 and 2). The work was performed in response to the requests by Alameda County Health Care Services Agency, Environmental Health Department (ACEH) in their letters of May 2, 2012, November 19, 2010 (revised December 6, 2010) and April 7, 2006 requesting additional characterization of the downgradient extent and distribution of dissolved phase petroleum hydrocarbons and residual free product, and implementation of interim remedial action, at the subject site.

Purpose and Scope of Work

The purpose of the field activities performed by AllWest was to evaluate current groundwater conditions in monitoring well MW-3, which was installed in 1995 adjacent to former underground storage tanks (USTs) at the subject site (Figure 2). Monitoring has not been conducted in MW-3 since December 2005. The scope of work was proposed in our *Additional Site Characterization and Interim Remedial Action Workplan* dated September 27, 2011 and our *Additional Site Characterization Workplan Addendum* dated July 31, 2012 (AllWest, September 2011 and July 2012). Site background information is presented in the AllWest workplans (AllWest September 2011 and July 2012).

The scope of work performed included measuring the free product thickness in monitoring well MW-3, collecting a free product sample for laboratory analysis, skimming free product to the

extent practicable, re-developing the monitoring well using surging and pumping methods to remove potential bio-fouling and sediment. Following well development by at least 48 hours, free product thickness was again measured, product removed, the well purged, and a groundwater sample collected for laboratory analysis.

Field Activities

On July 30, 2012, Blaine Tech Services, Inc. (BTS), under the supervision of AllWest, measured floating free product thickness at 2.65 feet in monitoring well MW-3 using an electronic oil/water interface probe. A free product sample was collected for laboratory analysis in two non-preserved 40 milliliter (ml) volatile organic analysis (VOA) glass vials. Initial depth to water was measured at 11.52 feet below top-of-casing (TOC). Approximately 2 gallons of floating free product were removed using a positive air displacement skimming pump. The rate of free product thickness recovery was measured at approximately 0.007 feet per minute. The well was swabbed for approximately 15 minutes using a surge block, and then purged of approximately 15 casing volumes of water using a positive air displacement pump until purged water was relatively free of fines and water parameters including pH, temperature, conductivity and turbidity had stabilized. Approximately 43 gallons of water were removed during purging.

On August 2, 2012, AllWest measured floating free product thickness at 1.12 feet and depth to water at 9.22 feet below TOC in monitoring well MW-3 using an electronic oil/water interface probe. Free product was removed to the extent possible using a disposable polyethylene bailer. Three casing volumes (approximately 10 gallons) of water were then purged prior to sample collection using a disposable polyethylene bailer. Samples were collected in three 40 ml VOA vials and one 1-liter amber glass bottle, all preserved with hydrochloric acid (HCl). All soil and groundwater samples were preserved by storing in an ice chest cooled to 4°C with crushed ice immediately after their collection and during transportation to the laboratory. Purged groundwater and free product were stored onsite in a 55-gallon drum pending test results for profiling to determine the proper disposal method.

Well construction, depth to water and product thickness data are included in Table 1. Standard operating procedures for groundwater monitoring well development and sampling are included in Attachment A. Field development, purge and sampling logs are included in Attachment B.

Analytical Results

Free product and groundwater samples were transported in a chilled cooler under chain of custody to a State of California certified independent analytical laboratory, McCampbell Analytical, Inc., (McCampbell) of Pittsburg, California. The free product sample collected from MW-3 on July 30, 2012 was analyzed for total petroleum hydrocarbons fuel fingerprint by EPA Method 8015Bm. Total petroleum hydrocarbons as gasoline (TPH-g) in the C6-C12 range, with weakly modified or unmodified gasoline characterized as significant in the chromatogram, were detected at a concentration of 850,000 milligrams per liter (mg/L), equivalent to 85%. Total petroleum hydrocarbons as mineral spirits (TPH-ms) in the C9-C12 range, with weakly modified or unmodified gasoline characterized as significant in the chromatogram, were detected at a

concentration of 470,000 mg/L, equivalent to 47%. Total petroleum hydrocarbons as diesel (TPH-d) in the C10-C23 range, with gasoline range compounds characterized as significant in the chromatogram, were detected at a concentration of 150,000 mg/L, equivalent to 15%. Total petroleum hydrocarbons as motor oil (TPH-mo) in the C18-C36 range were not detected. The fuel fingerprint hydrocarbon pattern in the chromatogram was characterized as resembling gasoline between the C6 and C12 hydrocarbon range, and in the opinion of McCampbell the hydrocarbons detected in the C9 to C12 range are probably gasoline not mineral spirits. Copies of the laboratory data sheets and chain-of-custody documents are attached as Attachment C.

The groundwater sample collected from monitoring well MW-3 on August 2, 2012 was analyzed for total petroleum hydrocarbons as mineral spirits (TPH-ms) by EPA Method 8015Bm, TPH-d and TPH-mo by EPA Method 8015B with silica gel clean-up, and TPH-g and volatile organic compounds (VOCs) by EPA Method 8260B. TPH-g, TPH-ms, TPH-d and TPH-mo were detected at respective concentrations of 27,000 micrograms per liter ($\mu\text{g/L}$), 14,000 $\mu\text{g/L}$, 33,000 $\mu\text{g/L}$ and 680 $\mu\text{g/L}$. Based on the TPH chromatogram, McCampbell characterized the TPH-ms range hydrocarbons as being primarily gasoline. Benzene, toluene, ethylbenzene and total xylenes (BTEX) were detected at respective concentrations of 1,300 $\mu\text{g/L}$, 3,800 $\mu\text{g/L}$, 400 $\mu\text{g/L}$ and 4,500 $\mu\text{g/L}$.

The fuel oxygenates methyl tertiary butyl ether (MTBE) and tert-butyl alcohol (TBA) were detected at concentrations of 630 $\mu\text{g/L}$ and 400 $\mu\text{g/L}$. Other VOCs detected included were trans-1,3-dichloropropene, naphthalene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene at respective concentrations of 110 $\mu\text{g/L}$, 250 $\mu\text{g/L}$, 1,100 $\mu\text{g/L}$, and 280 $\mu\text{g/L}$. No other analytes were detected. A summary of groundwater sample analytical results is included in Table 2. Copies of the laboratory analytical and QA/QC reports, and chain-of-custody records, are included in Attachment C.

Environmental Screening Levels

To assess if the identified petroleum hydrocarbons in the groundwater pose a risk to human health and the environment, concentrations were compared with their corresponding California Regional Water Quality Control Board, San Francisco Bay Region (SFRWQCB) Environmental Screening Levels (ESLs) for commercial/industrial land use where groundwater is not a potential drinking water resource (RWQCB, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Tables B and F-1b*, Interim Final November 2007, revised May 2008). The subject site lies within the Emeryville Brownfields Groundwater Management Zone, and has been designated as Groundwater Management Zone B by the SFRWQCB, defined as a zone where groundwater is unlikely to be used as a drinking water resource (SFRWQCB, *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report*, June 1999).

TPH-g, TPH-ms, TPH-d, TPH-mo, BTEX, trans-1,3-dichloropropene and naphthalene were detected in the groundwater sample from well MW-3 at concentrations exceeding their respective ESLs of 210 $\mu\text{g/L}$, 210 $\mu\text{g/L}$, 210 $\mu\text{g/L}$, 210 $\mu\text{g/L}$, 46 $\mu\text{g/L}$, 130 $\mu\text{g/L}$, 43 $\mu\text{g/L}$, 100 $\mu\text{g/L}$, 24 $\mu\text{g/L}$ and 24 $\mu\text{g/L}$. MTBE and TBA were detected at concentrations below their ESLs of 1,800 $\mu\text{g/L}$ and 18,000 $\mu\text{g/L}$. ESLs are not established for the other detected VOCs (Table 2).

Conclusions and Recommendations

The thickness of floating free product measured on groundwater in monitoring well MW-3 since September 2011 is greater than recorded in any previous historical monitoring events and, along with the presence of relatively non-degraded gasoline, is inconsistent with the removal of the adjacent USTs 16 years ago. This may imply a different release source than the removed onsite USTs. Although TPH-ms range hydrocarbons were reported in the free product and groundwater sample analyses, these were characterized by the analytical laboratory as probably gasoline based on the chromatogram pattern.

AllWest recommends evaluation of interim remedial alternatives for the removal of free product in MW-3 pending additional site characterization, and continuation of semiannual groundwater monitoring. AllWest submitted an *Additional Site Characterization Workplan Addendum* dated July 31, 2012 to ACEH proposing additional subsurface investigation, and is awaiting ACEH response.

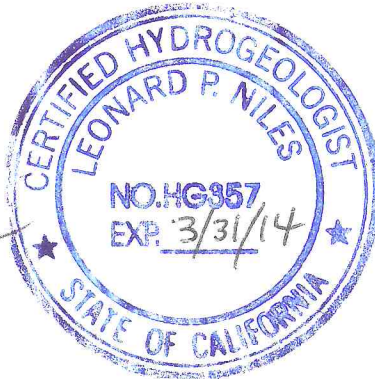
If you have any questions, or would like to further discuss the above issues, please call me at (415) 391-2510, extension 109.

Sincerely,

AllWest Environmental, Inc.



Leonard P. Niles, R.G., C.H.G.
Senior Project Manager



CC: Walter F. Merkle, MCG Investments LLC

FIGURES:

- Figure 1: Site Map
- Figure 2: Site Plan with Boring and Well Locations

TABLES:

- Table 1: Summary of Well Construction Details, Product Thickness and Groundwater Elevation Data
- Table 2: Summary of Groundwater Analytical Data

ATTACHMENTS:

- Attachment A: Groundwater Monitoring Well Development and Sampling Standard Operating Procedures
- Attachment B: Groundwater Monitoring Well Development, Purging and Sampling Field Logs
- Attachment C: Laboratory Analytical Reports and Chain-of-Custody Documents

FIGURES

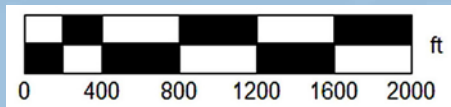
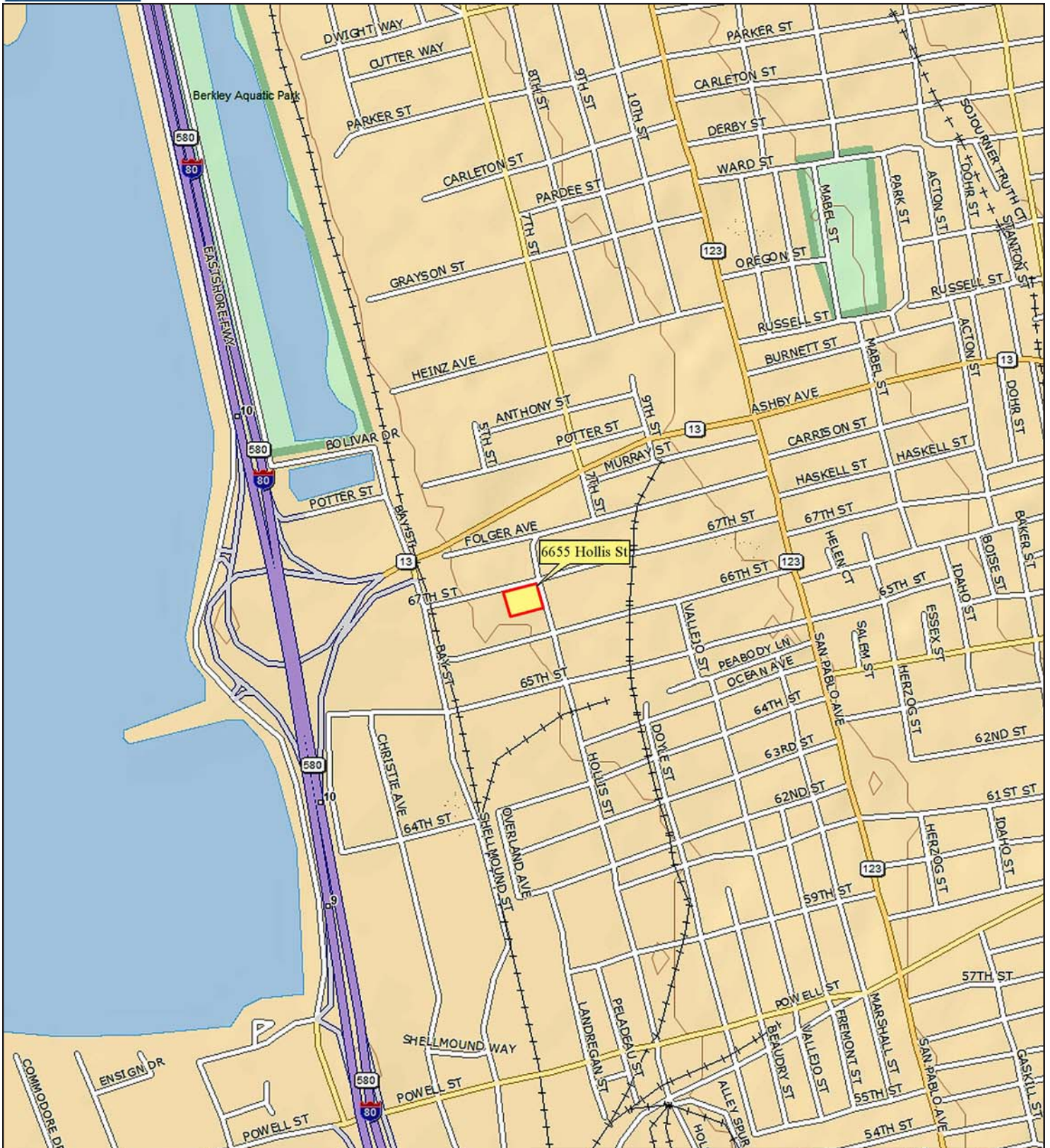


FIGURE 1
SITE MAP

6655 HOLLIS STREET
EMERYVILLE, CALIFORNIA
SOURCE: DELORME TOPO 8.0

PROJECT NO.
12071.23/11124.23

PREPARED BY: C. RAMELB
DATE: 09/22/11

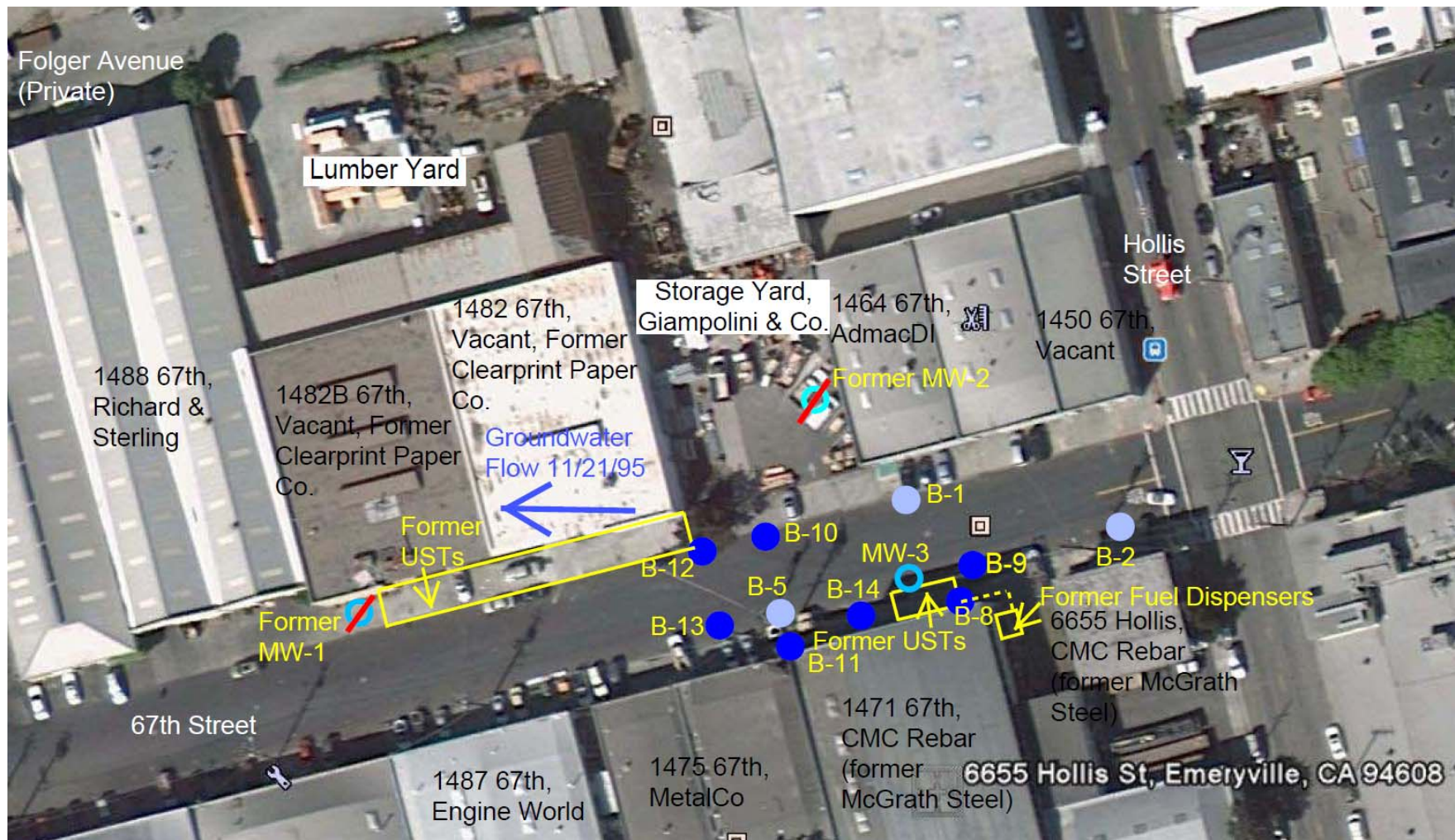


FIGURE 2: SITE PLAN WITH BORING AND WELL LOCATIONS

Scale: 1 in = 80 ft
Photo: Google Earth

N ↑



- Legend**
- MW-3 Existing Monitoring Well (ESC, 1995)
 - MW-1 Former Monitoring Well (Clearprint / ESC, Destroyed 2005)
 - B-1 Boring (Weiss Associates, 1998)
 - B-8 Boring (Weiss Associates, 2005)
 - Former USTs and Fuel Dispensers

Site Name: Former McGrath Steel, 6655 Hollis Street, Emeryville, CA

Date: 7/18/12
By: Leonard Niles

Project Number:
12071.23 / 11123.23

TABLES

TABLE 1
Summary of Well Construction Details,
Product Thickness and Groundwater Elevation Data

Former McGrath Steel
6655 Hollis Street
Emeryville, California
AllWest Project No. 12071.23/11124.23

Well Number	Casing Diameter (inches)	Borehole Diameter (inches)	Total Depth of Well (feet bgs)	Top-Bottom of Screen (feet bgs)	Screen Length (feet)	Top-Bottom of Filter Pack (feet bgs)
MW-3	2	8	29	9-29	20	7-29.5

Well Number	Date	TOC Elevation (feet msl)	Ground Surface Elevation (feet msl)	Depth to Groundwater (feet below TOC)	Product Thickness (feet)	Groundwater Surface Elevation (feet msl) ^a
MW-3	10/17/1995	22.73	23.17	9.42	0.00	13.31
	11/21/1995	22.73	23.17	9.85	0.00	12.88
	12/23/1995	22.73	23.17	8.52	0.00	14.21
	1/15/1996	22.73	23.17	8.72	0.00	14.01
	2/16/1996	22.73	23.17	7.08	0.04	15.68
	3/28/1996	22.73	23.17	6.78	0.03	15.97
	8/22/2005	22.73	23.17	12.36	0.00	10.37
	12/20/2005	22.73	23.17	10.82	0.00	11.91
	9/14/2011	22.73	23.17	11.05	3	13.93
	7/30/2012	22.73	23.17	11.52	2.65	13.20
	8/2/2012	22.73	23.17	9.22	1.12	14.35

Notes:

bgs below ground surface

TOC Top of Well Casing

feet msl Ground surface and TOC elevations surveyed to feet above mean sea level (msl) per City of Emeryville Datum, BM#5 by Triad/Holmes Associates October 17, 1995.

a Groundwater elevation corrected for free product thickness, assuming density of 0.75 for gasoline.

NM Not Measured

TABLE 2
Summary of Groundwater Analytical Data
Former McGrath Steel
6655 Hollis Street
Emeryville, California
AllWest Project No. 12071.23/11124.23

Sample / Field Point Name	Date Sampled	TPH-g (µg/L)	TPH-ms (µg/L)	TPH-d (µg/L)	TPH-mo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Other VOCs (µg/L)
MW-3	10/17/1995	8,600	ND (<100)	220	NA	730	2,100	270	1,400	NA	NA
MW-3 (qualifiers)	8/22/2005	39,000	NA	2,500 L,Y	NA	3,100	3,800	1,100	4,700	7,200	Oxygenates - ND (varies)
MW-3 (qualifiers)	12/20/2005	54,000	NA	2,600 L,Y	NA	6,000	10,000	1,700	9,600	12,000	Oxygenates - ND (varies)
MW-3 (qualifiers)	8/2/2012	27,000	14,000 d1	33,000 e4, e2	680 e4, e2	1,300	3,800	400	4,500	630	400 (TBA), 110 (trans-1,3-dichloropropene), 250 (naphthalene), 1,100 (1,2,4-trimethylbenzene), 280 (1,3,5-trimethylbenzene), ND (others - varies)
RWQCB Commercial/Industrial ESLs, non-drinking water*		210	210	210	210	46	130	43	100	1,800	18,000 (TBA) 24 (1,3-dichloropropene) 24 (naphthalene) NE or varies (others)

Notes:

All results are reported in micrograms per liter (µg/L) [equivalent to parts per billion (ppb)], except where noted.
TPH-g - Total petroleum hydrocarbons as gasoline (EPA Method SW8015Bm, 10/17/95, 8/22/05 & 12/20/05; EPA Method SW8260B on 8/2/12)
TPH-ms - Total petroleum hydrocarbons as mineral spirits (EPA Method SW8015Bm, 10/17/95 & 8/2/12)
TPH-d - Total petroleum hydrocarbons as diesel, C10-C23 (EPA Method SW8015B with silica gel cleanup for 8/2/12)
TPH-mo - Total petroleum hydrocarbons as motor oil, C18-C36 (EPA Method SW8015B with silica gel cleanup for 8/2/12)
MTBE - Methyl tert-butyl ether (EPA Method SW8260B)
TBA - tert-butyl alcohol (EPA Method SW8260B)
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) (EPA Method SW8021B on 10/17/95 only; SW8260B on all other dates)
VOCs - Volatile organic compounds (EPA Method SW8260B)
ND (<0.5) - Not detected at or above listed reporting limit
NE - Not established
NA - Not analyzed

Laboratory Qualifiers:

L - lighter hydrocarbons contributed to the quantitation
Y - sample exhibits chromatographic pattern which does not resemble standard
d1 - weakly modified or unmodified gasoline is significant
e2 - diesel range compounds are significant; no recognizable pattern
e4 - gasoline-range compounds are significant

San Francisco Bay Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESLs) for commercial/industrial land use where groundwater is not a potential drinking water resource from Tables B and F1b, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*. RWQCB, Interim Final November 2007, revised May 2008.

* The subject site lies within the Emeryville Brownfields Groundwater Management Zone, and has been designated as Groundwater Management Zone B by the SFRWQCB, defined as a zone where groundwater is unlikely to be used as a drinking water resource (SFRWQCB, East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, June 1999).

Attachment A



Groundwater Monitoring Well Development and Sampling

Groundwater monitoring wells will be developed with the combination of surging and pumping actions. The wells will be alternately surged with a surging block for five minutes and pumped with a submersible pump for two minutes. The physical characteristics of the groundwater, such as water color and clarity, pH, temperature, and conductivity, will be monitored during well development. Well development will be considered complete when the groundwater is relatively sediment-free and groundwater characteristic indicators are stabilized (consecutive readings within 10% of each other).

Groundwater will be sampled from the developed wells no sooner than 48 hours after well development to allow stabilization of groundwater conditions. Prior to groundwater sampling, a proper purging process will be performed at each well. The purpose of well purging is to remove fine grained materials from the well casing and to allow fresh and more representative water to recharge the well. Prior to well purging, an electric water depth sounder will be lowered into the well casing to measure the depth to the water to the nearest 0.01 feet. A clear poly bailer will then be lowered into the well casing and partially submerged. Upon retrieval of the clear bailer, the surface of the water column retained in the bailer will be carefully examined for any floating product or product sheen.

After all initial measurements are completed and recorded, the well will be purged by an electrical submersible pump or a bailer. A minimum of 3 well volumes of groundwater will be purged and groundwater characteristics (temperature, pH, and conductivity) monitored at each well volume interval. Purging is considered complete when indicators are stabilized (consecutive readings within 10% of each other) and the purged water is relatively free of sediments.

Groundwater sampling will be conducted after the water level has recovered to at least 80% of the initial level, recorded prior to purging. The groundwater sample will be collected by a disposable bailer. Upon retrieval of the bailer, the retained water will be carefully transferred to appropriate sample bottle furnished by the analytical laboratory. All sample bottles will have a Teflon lined septum/cap and be filled such that no headspace is present. Then the sample bottles will be labeled and immediately placed on ice to preserve the chemical characteristics of its content.

To prevent cross contamination, all groundwater sampling equipment that comes in contact with the groundwater will be thoroughly decontaminated prior to sampling. A disposable bailer will be used to collect the groundwater samples. Sample handling, storage, and transport procedures described in the following sections will be employed. All well development and purging water will be temporarily stored on-site in 55-gallon drums awaiting test results to determine the proper disposal method.

Attachment B

FIELD NOTES

Project #: 121730-107 Client / Project: Allwest Environmental
 Date: 7-30-12 BTS Technician: Jo

Time	Activity
0900	Arrived on site
0910	Grouted well for SPH 2.65' Detected
0938	removed 2 gals SPH + 1 gal H ₂ O
0945	checked recharge of SPH 0.05'
0950	removed SPH
1000	Started development Surgical! Swabbed well for toxins
1020	Begin purging Well
1112	10' case volumes removed per client continued purging
1158	ended purge @ 15 case volumes
1225	Decan Equipment
1300	Departed site

WELL DEVELOPMENT DATA SHEET

Project #: <u>120730-102</u>	Client: <u>Allwest Environmental</u>
Developer: <u>Jo</u>	Date Developed: <u>7-30-12</u>
Well I.D. <u>MW-3</u>	Well Diameter: (circle one) <u>(2)</u> 3 4 6
Total Well Depth: Before <u>28.55</u> After <u>29.40</u>	Depth to Water: Before <u>11.52</u> After <u>21.90</u>
Reason not developed: <u>NA</u>	If Free Product, thickness: <u>0.0</u>
Additional Notations: <u>Surge well for 15 mins</u>	

Volume Conversion Factor (VCF): $\{12 \times (d^2/4) \times \pi\} / 231$	Well dia.	VCF
where	2" =	0.16
12 = in / foot	3" =	0.37
d = diameter (in.)	4" =	0.65
$\pi = 3.1416$	6" =	1.47
231 = in ³ /gal	10" =	4.08
	12" =	6.87

<u>2.7</u>	X	<u>10</u>	=	<u>27.0</u>	gallons
1 Case Volume		Specified Volumes			

- Purging Device:
- Bailer
 - Electric Submersible
 - Suction Pump
 - Positive Air Displacement

Type of Installed Pump None
 Other equipment used Surge Block

TIME	TEMP (F)	pH	Cond. (mS or μ S)	TURBIDITY (NTUs)	VOLUME REMOVED:	NOTATIONS:
1031	65.2	6.17	1764	7100	2.7	Grey silty / Hard Bottom
1038	64.6	6.48	1811	7000	5.4	Grey silty odor
1043	64.6	6.40	1815	7000	7.1	Grey silty odor
1048	64.5	6.44	1260	7000	10.8	Grey green
1052	64.5	6.44	1747	7000	13.5	NO silt grey Hard Bottom
1056	64.4	6.48	1699	7000	16.2	" "
1100	64.3	6.52	1679	7000	18.9	Hard Bottom
1104	64.2	6.61	1669	7000	21.6	grey odor
1108	64.3	6.59	1665	7000	24.3	" "
1112	64.4	6.56	1661	7000	27.0	grey Hard Bottom
1136	64.5	6.59	1672	574	29.7	" "
1136	64.5	6.57	1680	580	32.4	Hard Bottom
1143	64.4	6.72	1692	595	35.1	" "
Did Well Dewater? <u>NO</u>		If yes, note above.		Gallons Actually Evacuated:		<u>43.2</u>



PURGE TABLE

WELL ID: MW-3

Page ___ of ___

AllWest

SITE NAME: Former McGrath Steel	LOCATION: 6655 Hollis, Emeryville, CA
PROJECT NO: 12071.23	DATE PURGED: 8/2/12
PURGED/SAMPLED BY: C. Houghan	DATE SAMPLED: 8/2/12
TIME SAMPLED: 1045	DEPTH TO BOTTOM (feet): 29.4'
DEPTH TO WATER (feet): 9.22 ft. (1.12 ft FP)	WATER COLUMN HEIGHT (feet): 20.2 ft
CALCULATED PURGE (gallons): 9.69 gal	CASING VOLUME (gallons): 3.23 gal
ACTUAL PURGE (gallons) 10 gal	

DEVELOPMENT _____ QUARTERLY _____ BIENNIAL _____ OTHER

SAMPLE TYPE: Groundwater Surface Water _____ Other _____

CASING DIAMETER: 2" 3" _____ 4" _____

Casing Volume (0.16) (0.38) (0.66)

(gallons per foot): 0.16 (29.4 - 9.22) = 3.23 x 3 = 9.69 gal

FIELD MEASUREMENTS

VOLUME (gal)	TIME	TEMP (degrees C)	PH (units)	CONDUCTIVITY ($\mu\text{mhos/cm}$)	TDS		TURBIDITY (NTU)
					DISSOLVED OXYGEN (ppm)	(mg/L)	
2	0932	19.0	5.12	1845 μS		928	Cloudy ↓ ↓
4	0944	18.8	5.02	1816 μS		909	
6	0955	18.5	4.85	1787 μS		897	
8	1007	18.7	5.11	1790 μS		896	
10	1017	18.8	4.49	1795 μS		891	

SAMPLE INFORMATION

SAMPLE DEPTH TO WATER (feet): _____ Analyses: TPH-d, ms
 80% RECHARGE: Y/N SAMPLE TURBIDITY: _____
 ODOR: HC odor SAMPLE BOTTLE/PRESERVATIVE: 3 x 40 mL VOAs, 1 x 1L Amber w/HCl

PURGING EQUIPMENT

___ Centrifugal Pump ___ Bailer (Teflon)
 ___ Submersible Pump Bailer (PVC or disposable)
 ___ Peristaltic Pump ___ Bailer (Stainless Steel)
 ___ Purge Pump
 Other: _____

SAMPLING EQUIPMENT

___ Centrifugal Pump ___ Bailer (Teflon)
 ___ Submersible Pump Bailer (PVC or disposable)
 ___ Peristaltic Pump ___ Bailer (Stainless Steel)
 ___ Purge Pump
 Other: _____

Comments: DTP 8.10.12 1.12 feet of free product on top of water
 DTW 9.22 ft. Column. Bailed product before sampling.

9.22
 8.10
 1.12 ft of product

Attachment C



Analytical Report

All West Environmental, Inc 530 Howard Street, Ste.300 San Francisco, CA 94105	Client Project ID: #12071.23; Hollis Emeryville	Date Sampled: 07/30/12
		Date Received: 07/31/12
	Client Contact: Leonard Niles	Date Reported: 08/03/12
	Client P.O.:	Date Completed: 08/03/12

WorkOrder: 1207780

August 23, 2012

Dear Leonard:

Enclosed within are:

- 1) The results of the **1** analyzed sample from your project: **#12071.23; Hollis Emeryville,**
- 2) QC data for the above sample, and
- 3) A copy of the chain of custody.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing

McC Campbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius
 Laboratory Manager
 McC Campbell Analytical, Inc.

The analytical results relate only to the items tested.



1534 Willow Pass Rd
 Pittsburg, CA 94565-1701
 (925) 252-9262

WorkOrder: 1207780

ClientCode: AWE

WaterTrax
 WriteOn
 EDF
 Excel
 EQulS
 Email
 HardCopy
 ThirdParty
 J-flag

Report to:
 Leonard Niles
 All West Environmental, Inc
 530 Howard Street, Ste.300
 San Francisco, CA 94105
 (415) 391-2510 FAX: (415) 391-2008

Email: Leonard@allwest1.com
 cc:
 PO:
 ProjectNo: #12071.23; Hollis Emeryville

Bill to:
 Darlene Torio
 All West Environmental, Inc
 530 Howard Street, Ste.300
 San Francisco, CA 94105
 darlene@allwest1.com

Requested TAT: 5 days

Date Received: 07/31/2012

Date Printed: 07/31/2012

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1207780-001	MW-3-FP	Product	7/30/2012 9:30	<input type="checkbox"/>	A	A	A										

Test Legend:

1	G-MBTEx_Product	2	PREDF REPORT	3	TPH(FF)_P	4		5	
6		7		8		9		10	
11		12							

The following SampID: 001A contains testgroup.

Prepared by: Zoraida Cortez

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
 Hazardous samples will be returned to client or disposed of at client expense.



Sample Receipt Checklist

Client Name: **All West Environmental, Inc**

Date and Time Received: **7/31/2012 5:25:06 PM**

Project Name: **#12071.23; Hollis Emeryville**

LogIn Reviewed by: **Zoraida Cortez**

WorkOrder N°: **1207780** Matrix: Product

Carrier: Rob Pringle (MAI Courier)

Chain of Custody (COC) Information

Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sample IDs noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Date and Time of collection noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sampler's name noted on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper containers/bottles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature	Cooler Temp: 6°C		NA <input type="checkbox"/>
Water - VOA vials have zero headspace / no bubbles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Sample labels checked for correct preservation?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Metal - pH acceptable upon receipt (pH<2)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Samples Received on Ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

(Ice Type: WET ICE)

* NOTE: If the "No" box is checked, see comments below.

 Comments:



McC Campbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

All West Environmental, Inc 530 Howard Street, Ste.300 San Francisco, CA 94105	Client Project ID: #12071.23; Hollis Emeryville	Date Sampled: 07/30/12
	Client Contact: Leonard Niles	Date Received: 07/31/12
	Client P.O.:	Date Analyzed 08/01/12
		Date Extracted: 07/31/12

Fuel FingerPrint *

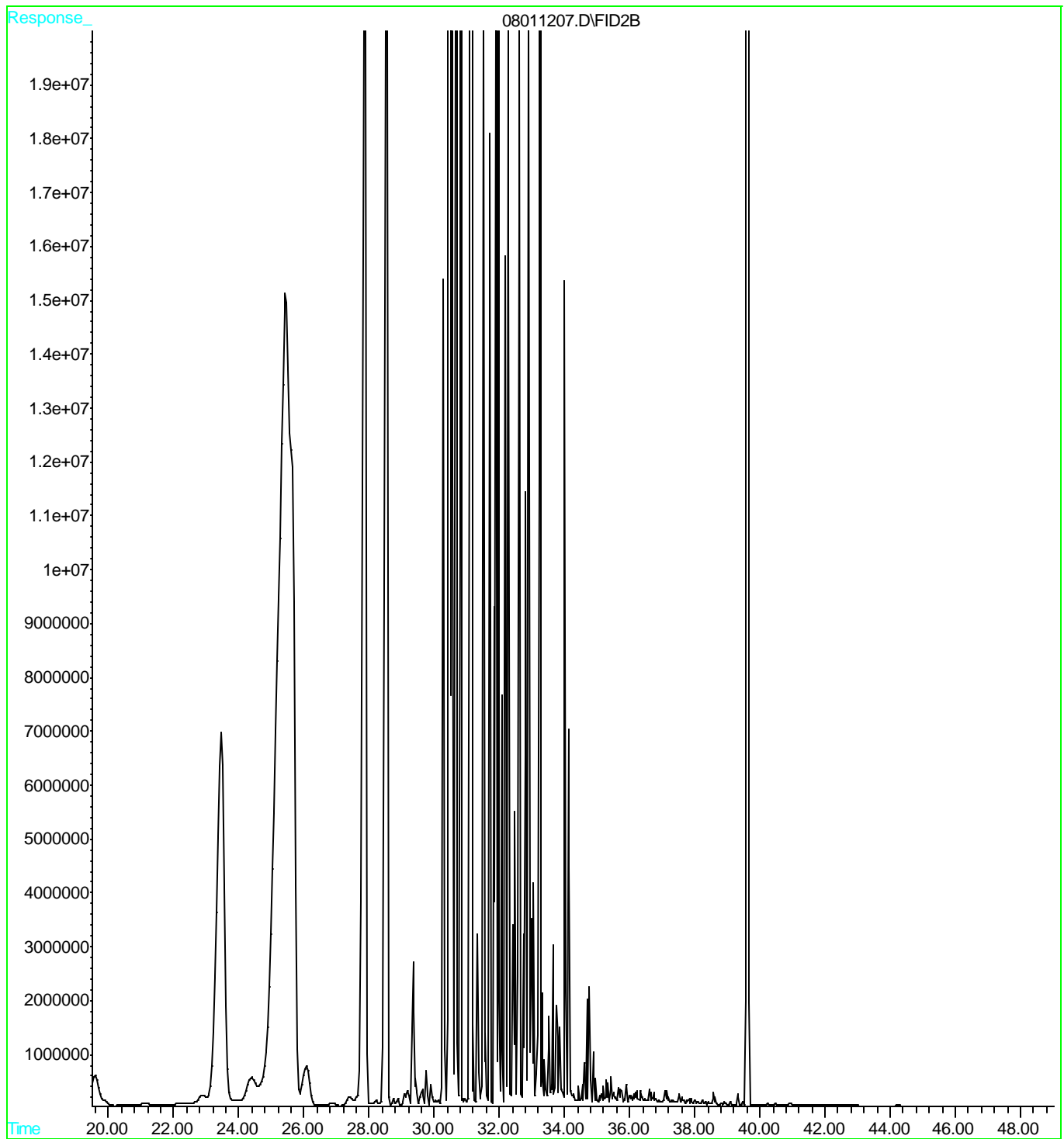
Extraction method: SW3550B

Analytical methods: SW8015B

Work Order: 1207780

Lab ID	Client ID	Matrix	Fuel Fingerprint
1207780-001A	MW-3-FP	P	This sample has a significant hydrocarbon pattern between C6 and C12 that resembles gasoline. Chromatogram enclosed.

File : D:\HPCHEM\GC11\DATAB\08011207.D
Operator : Mariel
Acquired : 1 Aug 2012 6:00 pm using AcqMethod GC11AB.M
Instrument : GC-11
Sample Name: 1207780-001A P +FF
Misc Info : TPH(DMO)_PRODUCT
Vial Number: 54





QC SUMMARY REPORT FOR SW8021B/8015Bm

Test Method: SW8021B/8015Bm (GMBTEX)

Matrix: P

WorkOrder: 1207780

EPA Method: SW8021B/8015Bm

BatchID: 69550

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 69550 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1207780-001A	07/30/12 9:30 AM	07/31/12	08/02/12 2:03 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = $100 * (MS - Sample) / (Amount\ Spiked)$; RPD = $100 * (MS - MSD) / ((MS + MSD) / 2)$.

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



QC SUMMARY REPORT FOR SW8015B

Test Method: SW8015B (Diesel & Motor Oil)

Matrix: P

WorkOrder: 1207780

EPA Method: SW8015B

BatchID: 69549

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 69549 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1207780-001A	07/30/12 9:30 AM	07/31/12	08/01/12 6:00 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = $100 * (MS - Sample) / (Amount\ Spiked)$; RPD = $100 * (MS - MSD) / ((MS + MSD) / 2)$.

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



Analytical Report

All West Environmental, Inc 530 Howard Street, Ste.300 San Francisco, CA 94105	Client Project ID: #11124.23; Former Mc Grath Steel	Date Sampled: 08/02/12
		Date Received: 08/02/12
	Client Contact: Leonard Niles	Date Reported: 08/08/12
	Client P.O.:	Date Completed: 08/08/12

WorkOrder: 1208046

August 09, 2012

Dear Leonard:

Enclosed within are:

- 1) The results of the **1** analyzed sample from your project: **#11124.23; Former Mc Grath Steel**,
- 2) QC data for the above sample, and
- 3) A copy of the chain of custody.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing

McC Campbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius
Laboratory Manager
McC Campbell Analytical, Inc.

The analytical results relate only to the items tested.



1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

WorkOrder: 1208046

ClientCode: AWE

WaterTrax
 WriteOn
 EDF
 Excel
 EQUIS
 Email
 HardCopy
 ThirdParty
 J-flag

Report to:
Leonard Niles
All West Environmental, Inc
530 Howard Street, Ste.300
San Francisco, CA 94105
(415) 391-2510 FAX: (415) 391-2008

Email: Leonard@allwest1.com
 cc:
 PO:
 ProjectNo: #11124.23; Former Mc Grath Steel

Bill to:
Darlene Torio
All West Environmental, Inc
530 Howard Street, Ste.300
San Francisco, CA 94105
darlene@allwest1.com

Requested TAT: 5 days

Date Received: 08/02/2012

Date Printed: 08/02/2012

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1208046-001	MW-3	Water	8/2/2012 10:45	<input type="checkbox"/>	A	B	A										

Test Legend:

1	GAS8260_W	2	G-MBTEX_W	3	PREFD REPORT	4		5	
6		7		8		9		10	
11		12							

The following SampIDs: 001A, 001B contain testgroup.

Prepared by: Zoraida Cortez

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.



Sample Receipt Checklist

Client Name: **All West Environmental, Inc**

Date and Time Received: **8/2/2012 2:44:42 PM**

Project Name: **#11124.23; Former Mc Grath Steel**

LogIn Reviewed by: **Zoraida Cortez**

WorkOrder N°: **1208046** Matrix: Water

Carrier: Rob Pringle (MAI Courier)

Chain of Custody (COC) Information

Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sample IDs noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Date and Time of collection noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sampler's name noted on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper containers/bottles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature	Cooler Temp: 2.8°C		NA <input type="checkbox"/>
Water - VOA vials have zero headspace / no bubbles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Sample labels checked for correct preservation?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Metal - pH acceptable upon receipt (pH<2)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Samples Received on Ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

(Ice Type: WET ICE)

* NOTE: If the "No" box is checked, see comments below.

 Comments:



Table with 3 columns: Client Information (All West Environmental, Inc, 530 Howard Street, Ste.300, San Francisco, CA 94105), Project ID (Client Project ID: #11124.23; Former Mc Grath Steel), and Sampling Dates (Date Sampled: 08/02/12, Date Received: 08/02/12, Date Extracted: 08/07/12, Date Analyzed: 08/07/12).

Volatile Organics by P&T and GC/MS (Basic Target List)*

Extraction Method: SW5030B

Analytical Method: SW8260B

Work Order: 1208046

Table with 2 columns: Lab ID (1208046-001A), Client ID (MW-3), Matrix (Water).

Main data table with 8 columns: Compound, Concentration *, DF, Reporting Limit, Compound, Concentration *, DF, Reporting Limit. Lists various organic compounds and their detection results.

Surrogate Recoveries (%)

Table showing surrogate recoveries: %SS1: 97, %SS2: 94, %SS3: 109.

Comments:

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L, wipe samples in µg/wipe.
ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor
surrogate diluted out of range or coelutes with another peak; &) low surrogate due to matrix interference.



QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 69725

WorkOrder: 1208046

EPA Method: SW8260B		Extraction: SW5030B					Spiked Sample ID: 1208113-017A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS	
tert-Amyl methyl ether (TAME)	ND	10	89	87.8	1.33	83.9	70 - 130	20	70 - 130	
Benzene	0.66	10	81.6	77.7	4.53	87.2	70 - 130	20	76 - 106	
t-Butyl alcohol (TBA)	ND	40	106	103	3.11	87.1	70 - 130	20	70 - 130	
Chlorobenzene	ND	10	88.9	86.7	2.42	90.7	70 - 130	20	79 - 105	
1,2-Dibromoethane (EDB)	ND	10	99.2	97.8	1.38	93.9	70 - 130	20	76 - 116	
1,2-Dichloroethane (1,2-DCA)	ND	10	89.7	85.9	4.31	87.1	70 - 130	20	69 - 111	
1,1-Dichloroethene	ND	10	76.4	71.6	6.60	75	70 - 130	20	70 - 104	
Diisopropyl ether (DIPE)	ND	10	89.1	87.1	2.23	87	70 - 130	20	79 - 111	
Ethyl tert-butyl ether (ETBE)	ND	10	93.9	92.2	1.81	86.5	70 - 130	20	70 - 130	
Methyl-t-butyl ether (MTBE)	ND	10	97.9	95.6	2.37	86.6	70 - 130	20	70 - 130	
Toluene	ND	10	84.2	80.5	4.45	86.4	70 - 130	20	70 - 130	
Trichloroethene	ND	10	87.5	83.1	5.04	87.3	70 - 130	20	70 - 130	
%SS1:	99	25	101	98	2.69	102	70 - 130	20	70 - 130	
%SS2:	93	25	94	93	0.822	94	70 - 130	20	70 - 130	
%SS3:	109	2.5	110	111	1.20	111	70 - 130	20	70 - 130	

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
 NONE

BATCH 69725 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1208046-001A	08/02/12 10:45 AM	08/07/12	08/07/12 5:39 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.
 $\% \text{ Recovery} = 100 * (\text{MS-Sample}) / (\text{Amount Spiked}); \text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2).$
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.
 # surrogate diluted out of range or coelutes with another peak; &) low surrogate due to matrix interference.
 Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.



QC SUMMARY REPORT FOR SW8021B/8015Bm

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 69694

WorkOrder: 1208046

EPA Method: SW8021B/8015Bm		Extraction: SW5030B					Spiked Sample ID: 1208060-001A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS	
TPH(btex) £	ND	60	106	116	8.48	113	70 - 130	20	70 - 130	
MTBE	ND	10	98.5	104	5.16	122	70 - 130	20	70 - 130	
Benzene	ND	10	98	99.3	1.29	116	70 - 130	20	70 - 130	
Toluene	ND	10	97	97.7	0.722	114	70 - 130	20	70 - 130	
Ethylbenzene	ND	10	95.6	97.7	2.21	114	70 - 130	20	70 - 130	
Xylenes	ND	30	92.2	98.3	6.39	114	70 - 130	20	70 - 130	
%SS:	99	10	96	94	2.75	101	70 - 130	20	70 - 130	

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
 NONE

BATCH 69694 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1208046-001B	08/02/12 10:45 AM	08/06/12	08/06/12 7:31 PM	1208046-001B	08/02/12 10:45 AM	08/06/12	08/06/12 7:31 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.
 % Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.
 £ TPH(btex) = sum of BTEX areas from the FID.
 # cluttered chromatogram; sample peak coelutes with surrogate peak.
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.
 NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content, or inconsistency in sample containers.



QC SUMMARY REPORT FOR SW8015B

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 69593

WorkOrder: 1208046

EPA Method: SW8015B		Extraction: SW3510C/3630C					Spiked Sample ID: N/A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS	
TPH-Diesel (C10-C23)	N/A	1000	N/A	N/A	N/A	102	N/A	N/A	70 - 130	
%SS:	N/A	625	N/A	N/A	N/A	91	N/A	N/A	70 - 130	

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
 NONE

BATCH 69593 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1208046-001B	08/02/12 10:45 AM	08/02/12	08/03/12 5:37 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.
 $\% \text{ Recovery} = 100 * (\text{MS} - \text{Sample}) / (\text{Amount Spiked})$; $\text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2)$.
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.