Department of Toxic Substances Control

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June 2016 Groundwater Sampling
Riverside Agricultural Park
7020 Crest Avenue
Riverside, California

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Introduction

The Riverside Agricultural Park (Site) is an approximate 60 acre property located in the City of Riverside between Van Buren Boulevard and Tyler Street, south of the Santa Ana River. The property formerly housed a sewage treatment plant initially constructed by the United States Army in 1942 to address waste water generated at Camp Anza. Between 1947 and 1954 various private or municipal entities continued operation of the plant to accept waste water from the surrounding community which included residential, commercial and industrial uses. In 1965 the plant ceased to operate and sat idle until 2003 when the Site was slated for redevelopment.

Concerns over the current quality of groundwater beneath the Site prompted the installation of two groundwater monitoring wells (MW-6R and MM-7R) in areas of highest historic groundwater concentrations. The wells were installed and initially sampled in September 2015 as part of a site investigation program undertaken by DTSC. On June 8, 2016, DTSC staff with the support of its zone contactor, The Source Group, Inc., conducted the fourth episode of groundwater surface measurement as well as purge and sample the two groundwater monitoring wells.

Groundwater Well Gauging, Purging and Sampling

The groundwater surface was measured, to the nearest 0.01 feet using a Solinst 101 water level indicator and then wells were purged and sampled. Purging and sampling activities were conducted using a 1.5-inch diameter Proactive 4 stage Mini Monsoon pump using low flow (minimal drawdown) procedures. Stabilization criteria (temperature, pH, oxidation reduction potential, conductivity, dissolved oxygen, total dissolved solids and turbidity) were monitored throughout the purging process using a YSI Professional Series Plus water quality meter equipped with a flow through cell and

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a LaMotte model 2020WE turbidity meter. Water quality measurements were recorded approximately every ¼ gallon until parameters stabilized within approximately 10% of the previous two readings. Groundwater sample field forms are included as Attachments.

Upon achieving stabilization, collection of groundwater samples into laboratory provided containers commenced. Sample containers were sealed and labeled with sample identification, site name, time of collection and initials of sampler prior to placement into a cooler with ice. Sample information was transferred to chain-of-custody documents for transportation.

All groundwater samples were placed and transported in chilled coolers under chain-of-custody protocols to the DTSC contract lab, Advanced Technology Laboratories (ATL) in Signal Hill, California.

All groundwater samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082, dioxins/furans by EPA Method 8290, metals by EPA Methods 6020 and perchlorate by EPA Method 314. Laboratory analytical summary data tables and laboratory reports are attached.

Investigation Derived Waste

Investigation derived waste (IDW) generated during this event consisted only of decontamination and well purge water. All generated IDW was stored in a single labeled United Nations (U.N.)-rated, 55-gallon drum prior to transport offsite.

Groundwater Sampling Results

The measured groundwater surface elevations were 683.64 and 711.33 feet above mean sea level for MW-6R and MW-7R, respectively.

No PCB species were identified above method detection limits in groundwater samples collected from groundwater monitoring wells MW-6R nor MW-7R. Reported method detection limits for each species were 0.06 micrograms per liter (µg/L). Laboratory results for PCBs in groundwater are included on the attached Table 2.

Metals including antimony, arsenic, barium, cadmium, calcium, cobalt, copper, iron, manganese, molybdenum, nickel, potassium, selenium, sodium, vanadium and zinc were detected above their respective reporting limits. For screening purposes, metals were compared to the California Modified Maximum Contaminant Levels (California MCLs) and Public Health Goals (PHG) for drinking water. With the exception of iron and lead, all detected metals concentrations are below the MCLs and PHG where

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promulgated. Iron results were above the secondary MCL for taste and odor thresholds and lead was above the action level in MW-6R during the March 2016 sampling but was not detected in this sampling event. It should be noted that iron and lead were not identified as chemicals of concern during the previous investigations at the Site. Laboratory results for metals in groundwater are included on the attached Table 3.

A laboratory quality assurance/quality control issue resulted in a estimated maximum potential total pentachlorodibenzo-p-dioxin (total PeCDD) concentration of 9.73 picograms per liter (pg/L) in MW-6R, Although this reported concentration is below the lower quantitation limit (J flagged) they were also present in the method blank resulting in the estimated maximum potential concentration designation. A concentration below the lower quantitation limit of 26.8 pg/L octachlorodibenzo-p-dioxin (OCDD) and a total tetrachlorobibenzofuran result of 5.06 pg/L were identified in well MW-6R. Laboratory reporting limits for individual congeners ranged from 1.86 to 25.8 pg/L. The calculated Total Toxic Equivalency (TEQ) for well MW-6R was 0.00804 pg/L and 0.0 pg/L for MW-7R. The detection in MW-6R is significantly below the MCL for dioxin/furan TEQ of 30 pg/L. Laboratory results for dioxin/furans in groundwater are included on the attached Table 4.

Perchlorate was detected at concentrations of 2 ug/L and 13 ug/L in wells MW-6R and MW-7R, respectively. The MCL for perchlorate is 6 ug/L. Laboratory results for perchlorate in groundwater are included on the attached Table 4.

Conclusions and Recommendations

The groundwater beneath the Site has been monitored for a period of one year through the collection of quarterly groundwater samples from two onsite groundwater wells, MW-6R and MW-7R. During this period, PCBs have not been identified above laboratory lower quantitation limits. Metals were identified in samples collected from both wells, and only iron and lead were identified above drinking water regulatory standards. However, these two metals are not chemicals of concern for the Site. A single dioxin/furan TEQ was identified with a result of 0.00804 pg/L which is significantly below the MCL of 30 pg/L. Perchlorate was identified in one out of four events above the MCL of 6 ug/L in one sample (MW-7R). Information provided by the California Regional Water Quality Control Board indicates that perchlorate is a commonly identified constituent in the Site vicinity due the regions historic agricultural history.

Based upon the groundwater monitoring results collected since September 2015, activities conducted at the Site do not appear to have impacted groundwater in a significant manner. The replacement wells were placed in areas of historically highest PCB results in an effort to assess current groundwater conditions. The data results do

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not exhibit any discernable trends which would suggest that the Site is a threat to groundwater in its current condition. The groundwater data collected during this investigation indicate that no further investigation is warranted and the investigation specific to groundwater should be closed.

Attachments:

Tables

Table 1 – Well Construction Details
Table 2 – Polychlorinated Biphenyls (PCBs) in Groundwater
Table 3 – Metals in Groundwater
Table 4 - Perchlorate and Dioxin/Furans in Groundwater

Figures

Figure 1 - Site Location Map
Figure 2 – Soil Sample Location Map

Field Forms

Laboratory Report

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Tables

Table 1
Well Construction Details
Riverside Agricultural Park
7020 Crest Avenue
Riverside, California

Well ID	Boring Total Depth (feet bgs)	Top of Casing Elevation (feet NAVD88)	Borehole Diameter (inches)	Filter Pack Sand Size	Filter Pack Interval (feet bgs)	Well Casing Diameter (inches)	Well Screen Size (inches)	Screen Interval (feet bgs)
MW-6R	43.5	720.43	18 / 0-30ft 8 / 30-43.5ft	#2/12	28.5-43.5	2	0.010	28.5 - 43.5
MW-7R	29	735.77	18 / 0-19ft 8 / 19-29ft	#2/12	19-29	2	0.010	19 - 29

Notes
bgs - below ground surface
ft - feet

Table 2
Polychlorinated Biphenyls (PCBs) in Groundwater
Riverside Agricultural Park
7020 Crest Avenue
Riverside, California

Sample ID	Sample Date	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268
MW-6R	9/24/15	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06
	12/9/15	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06
	3/2/16	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06
	6/8/16	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06
MW-7R	9/24/15	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06
	12/9/15	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06
	3/2/16	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06
	6/8/16	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06	ND<0.06

Notes:
Data reported in micrograms per liter (µg/L).
Polychlorinated Biphenyls analysis preformed using EPA Method 8082.
ND<## = Not detected above method detection limit shown.

Table 3
Metals in Groundwater
Riverside Agricultural Park
7020 Crest Avenue
Riverside, California

Sample ID	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
MW-6R	9/24/15	1.0	3.2	62	ND<0.74	0.12J	79000	1.4	0.44J	6.2	440	0.33J	100	29	13	12000	1.4	ND<0.03	210000	ND<0.50	5.8	28
	12/9/15	1.1	2.6	69	ND<0.74	0.07J	100000	1.0	0.47	10	470	0.41J	180	15	33	11000	0.55	ND<0.03	210000	ND<0.05	8.5	64
	3/2/16	0.9	2	81	ND<0.74	0.04J	85000	2.1	0.34J	140	640	48	6.4	4	19	5000	0.81	ND<0.03	190000	ND<0.05	24	110
	6/8/16	0.73	1.9	110	ND<0.83	0.04J	100000	ND<3.7	0.45J	83	590	ND>1.0	ND>13	5.6	43	7100	0.76	ND>0.03	200000	ND>0.88	23	68
MW-7R	9/24/15	1.1	3.2	50	ND<0.74	0.06J	96000	1.6	0.66	8.0	480	0.33J	42	11	16	8200	0.96	ND<0.03	200000	ND<0.50	23	36
	12/9/15	1.2	2.7	49	ND<0.74	0.06J	110000	2.9	0.59	17	690	0.36J	55	13	19	8400	0.52	ND<0.03	190000	ND<0.05	22	60
	3/2/16	1.2	3	50	ND<0.74	0.06J	110000	1.5	0.52	33	670	0.57J	77	8.9	41	8400	0.38J	ND<0.03	170000	ND<0.05	19	53
	6/8/16	0.41	2.5	51	ND<0.83	0.04J	110000	ND>3.7	0.60J	50	540	ND>1.0	82J	6.2	32	7600	0.51	ND<0.03	160000	ND>0.88	26	47
MCL		6	10	1000	4	5	NA	50	NA	1300 (1)	300 (2)	15 (1)	500 (3)	NA	100	NA	50	100 (2)	NA	2	50 (3)	5000 (2)

Notes:
Data reported in micrograms per liter (µg/L).
Total metals analysis preformed using EPA Method 6020.
ND<## = Not detected above method detection limit shown.
J = Estimated result; analyte detected below the practical quantitation limit but above or equal to the method detection limit.
MCL = Maximum contaminant level
PHG = Public health goal
NA = Not applicable
(1) = USEPA Action level
(2) = Secondary MCL (taste & odor or welfare-based)
(3) = CDPH Notification level

Table 4
Perchlorate and Dioxin/Furans in Groundwater
Riverside Agricultural Park
7020 Crest Avenue
Riverside, California

Sample ID	Sample Date	Perchlorate	2,3,7,8-TCDD	12378-PeCDD	123478-HxCDD	123678-HxCDD	123789-HxCDD	1234678-HpCDD	OCDD	2,3,7,8-TCDF	12378-PeCDF	23478-PeCDF	123478-HxCDF	123678-HxCDF	234678-HxCDF	123789-HxCDF	1234678-HpCDF	1234789-HpCDF	OCDF	Total TCDD	Total PeCDD	Total HxCDD	Total HpCDD	Total TCDF	Total PeCDF	Total HxCDF	Total HpCDF	Total Toxic Equivalency (TEQ)
MW-6R	9/24/15	ND<10	ND<1.91	ND<2.61	ND<3.56	ND<4.32	ND<3.89	ND<6.30	ND<17.3	ND<2.67	ND<2.60	ND<5.38	ND<2.18	ND<2.21	ND<2.27	ND<3.58	ND<5.68	ND<7.28	ND<9.67	ND<1.91	ND<2.61	ND<4.32	ND<6.30	ND<2.67	ND<5.38	ND<3.58	ND<7.28	0.0
	12/9/15	ND<3.5	ND<2.41	ND<2.48	ND<4.23	ND<4.89	ND<4.52	ND<7.69	ND<24.8	ND<2.34	ND<2.22	ND<2.21	ND<3.36	ND<3.26	ND<3.70	ND<5.10	ND<4.24	ND<6.63	ND<15.9	ND<2.41	16.5(1)	ND<4.89	ND<7.69	ND<2.34	ND<2.22	ND<5.1	ND<6.63	0.0
	3/2/16	ND<0.69	ND<2.85	ND<4.78	ND<6.77	ND<7.34	ND<6.78	ND<10.0	ND<20.4	ND<2.16	ND<3.14	5.71(1)	ND<2.90	ND<2.90	ND<3.08	ND<4.21	ND<6.86	ND<8.35	ND<12.1	ND<2.85	46.5(1)	ND<7.34	ND<10.0	ND<2.16	5.71(1)	ND<4.21	ND<8.35	0.0
	6/8/16	2	ND<1.86	ND<3.88	ND<5.13	ND<5.09	ND<4.91	ND<8.10	26.8J	ND<3.76	ND<2.98	ND<3.37	ND<2.50	ND<2.64	ND<2.71	ND<3.03	ND<6.07	ND<6.91	ND<8.04	ND<1.86	9.73(1)	ND<5.13	ND<8.1	5.06	ND<6.22	ND<3.03	ND<6.91	0.00804
MW-7R	9/24/15	4.1J	ND<1.99	ND<2.03	ND<3.54	ND<4.14	ND<3.80	ND<6.66	ND<14.5	ND<2.65	ND<2.60	ND<5.47	ND<2.05	ND<2.05	ND<2.13	ND<3.05	ND<4.26	ND<5.50	ND<8.87	ND<1.99	ND<2.03	ND<4.14	ND<6.66	ND<2.65	ND<5.47	ND<3.05	ND<5.50	0.0
	12/9/15	ND<3.5	ND<2.21	ND<5.73	ND<6.02	ND<6.39	ND<6.16	ND<8.93	ND<21.2	ND<2.81	ND<5.30	ND<5.53	ND<4.69	ND<4.34	ND<5.00	ND<6.15	ND<5.12	ND<7.60	ND<25.1	ND<2.21	13.5(1)	ND<6.39	ND<8.93	ND<2.81	ND<5.53	ND<6.15	ND<7.60	0.0
	3/2/16	0.85J	ND<3.24	ND<4.40	ND<4.14	ND<4.54	ND<4.17	ND<7.17	ND<14.1	ND<3.46	ND<3.48	ND<3.03	ND<1.61	ND<1.74	ND<1.83	ND<2.35	ND<2.76	ND<3.39	ND<9.97	ND<3.24	21.9(1)	ND<4.54	ND<7.17	9.63J	2.89(1)	ND<2.35	ND<3.39	0.0
	6/8/16	13	ND<2.04	ND<4.52	ND<5.95	ND<6.30	ND<5.88	ND<16.7	ND<25.8	ND<2.50	ND<2.58	ND<3.02	ND<2.61	ND<3.01	ND<2.68	ND<3.46	ND<8.52	ND<9.53	ND<9.26	ND<2.04	ND<4.52	ND<6.30	ND<16.7	ND<2.50	ND<3.02	ND<3.46	ND<9.53	0.0

Notes:
Perchlorate analysis preformed using EPA Method 314.0, reported in micrograms per liter (µg/L).
Dioxin/furan analysis preformed using EPA Method 8290A, reported in picograms per liter (pg/L).
ND<## = Not detected above method detection limit shown.
J = Estimated result; analyte detected below the practical quantitation limit but above or equal to the method detection limit.
(1) = Estimated maximum possible concentration due to ion abundance ratio failure

Figures

Field Forms

Laboratory Report