aqua science engineers inc.

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July 19, 2000

WORKPLAN
for
SOIL AND GROUNDWATER ASSESSMENT
at
Romak Iron Works
3250 Hollis Street
Oakland, California

8/5/00 Faxed to Robert Kitay

Submitted by:
AQUA SCIENCE ENGINEERS, INC.
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(925) 820-9391

INTRODUCTION

This submittal outlines Aqua Science Engineers, Inc. (ASE)'s workplan for a soil and groundwater assessment at Romak Iron Works located at 3250 Hollis Street in Oakland, California (Figure 1). The scope of work for this assessment is to perform the tasks required to determine whether the case may be closed. The scope of work in this workplan was discussed with Ms. Susan Hugo of the Alameda County Health Care Services Agency (ACHCSA) on February 15, 2000.

BACKGROUND INFORMATION

On January 15, 1992, two underground gasoline storage tanks (USTs) were removed from the site. ASE collected one soil sample from beneath each former tank location. Total petroleum hydrocarbons as gasoline (TPH-G) was detected at 180 parts per million (ppm) in one of the two samples. On January 16, 1992, approximately 20 cubic yards of soil were overexcavated and additional soil samples were collected to confirm that all hydrocarbon-bearing soil was removed. One of the confirmation samples still contained 11 ppm TPH-G. Since hydrocarbons were still detected in the soil, the ACHCSA requested in a letter dated April 29, 1993 that a soil and groundwater investigation be preformed at the site. Although the April 29, 1993 letter from ACHCSA requests that three monitoring wells be installed at the site, Ms. Susan Hugo of ACHCSA, in a conversation with David Allen of ASE, stated that it would be acceptable to install only one groundwater monitoring well at the site if a reliable gradient could be established in the site vicinity.

ASE researched the groundwater flow direction in the site vicinity by reviewing the ACHCSA and San Francisco Bay Regional Water Quality Control Board files for the Guiton Charter Bus Company at the opposite corner of the 34th Street and Hollis Street intersection at 3421 Hollis Street in Oakland, California. ASE also contacted Epigene International and Hageman-Aguiar, Inc. (Guiton's former environmental consultants) for information in their files concerning the groundwater flow direction beneath their site. ASE also measured depths to groundwater in the Guiton wells on June 25, 1993. Groundwater appeared to flow to the southwest beneath the Guiton site.

In July 1993, ASE installed groundwater monitoring well MW-1 at the site. No hydrocarbons were detected in the soil sample collected from the boring. Since the well installation, groundwater samples have been collected from the site well on a quarterly basis up until September 1998

and on a semi-annual basis since September 1998. During this time there has been a steady decrease in hydrocarbon concentrations in groundwater samples collected from this well. TPH-G and benzene concentrations have dropped from as high as 24,000 parts per billion (ppb) and 6,200 ppb, respectively, in 1994 to as low as 2,300 ppb and 330 ppb, respectively during the past year. See Table One for tabulated groundwater monitoring results.

PROPOSED SCOPE OF WORK (SOW)

The scope of work in this workplan was discussed with Ms. Susan Hugo of the ACHCSA on February 15, 2000. For the case to be closed, the following three requirements must be met:

I) The horizontal extent of contamination must be defined. This can be accomplished by collecting soil and groundwater samples from temporary borings. At least three borings will be required.

II) The bottom of the utility lines in Hollis Street must be shown to be above the shallowest water table beneath the site. Otherwise, additional borings will be required along the utility trenches.

III) A human health risk assessment will need to be performed showing no unacceptable threat to human health.

To complete the requirements outlined above, ASE proposes the following scope of work:

1) Prepare this workplan and health and safety plan for approval by the ACHCSA.

2) Contract with an underground utility locating service to locate as precisely as possible the underground utility line locations in the site vicinity. Underground Service Alert will also be contacted.

3) Visit the various utility company offices and review their utility line maps for the site vicinity.

4) Obtain an excavation permit from the City of Oakland to drill in the street.

5) Obtain a drilling permit from the Alameda County Public Works Agency (ACPWA).

6) Drill three soil borings at the site in an attempt to define the horizontal extent of contamination, and collect soil and groundwater samples from the borings for analysis.

7) Analyze one soil and one groundwater sample from each boring at a CAL-EPA certified analytical laboratory for total petroleum hydrocarbons as gasoline (TPH-G) by modified EPA Method 5030/8015, total petroleum hydrocarbons as diesel (TPH-D) by modified EPA Method 3510/8015, and benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8020.

8) Backfill the borings with neat cement.

9) Prepare a report outlining the methods and findings of this assessment.

10) ASE will prepare a human health risk assessment for the site using the Risk-Based Corrective Action (RBCA) model.

Details of the assessment are presented below.

TASK 1 - PREPARE A HEALTH AND SAFETY PLAN

The site-specific health and safety plan will be updated for the site. A nearby hospital will be designated in the site safety plan as the emergency medical facility of first choice. A copy of the site specific Health and Safety Plan will be available on-site at all times.

TASK 2 - CONTRACT WITH AN UNDERGROUND UTILITY LINE LOCATING SERVICE TO ACCURATELY LOCATE UNDERGROUND UTILITY LINES IN THE CITY STREET

Besides contacting Underground Service Alert (USA) at least 48 hours prior to drilling, a private underground utility locating service will be contracted to pinpoint the location of underground utility lines. This information will be used to assess whether any utility lines could act as conduits for the migration of contamination near the site.

TASK 3 - REVIEW UTILITY LINE MAPS FOR THE SITE VICINITY

ASE will visit various utility company offices and review their utility line maps for the site vicinity. Information on the various utility lines such a depths and locations will be compiled for our report. The utility lines will be plotted on a map.

TASK 4 - OBTAIN AN EXCAVATION PERMIT FROM THE CITY OF OAKLAND

Obtain an excavation permit from the City of Oakland to allow for drilling in the city street.

TASK 5 - OBTAIN A DRILLING PERMIT

A drilling permit will be obtained from the ACPWA prior to beginning field activities.

TASK 6 - DRILL AT LEAST THREE SOIL BORINGS AND COLLECT SOIL AND GROUNDWATER SAMPLES FROM THE BORINGS

At least three (3) soil borings will be drilled in the locations shown on Figure 2. Additional borings may be added if obvious soil and groundwater contamination is encountered in these borings. The borings will be drilled using a Geoprobe or similar type drill rig. The drilling will be directed by a qualified geologist.

Undisturbed soil samples will be collected continuously for subsurface hydrogeologic description and possible chemical analysis. The samples will be described by the geologist according to the Unified Soil Classification System. The samples will be collected in acetate tubes using a drive sampler advanced ahead of the boring as the boring progresses. Samples to be retained for analysis will be immediately removed from the sampler, trimmed, sealed with Teflon tape and plastic caps, secured with duct tape, labeled with the site location, sample designation, date and time the sample was collected, and the initials of the person collecting the sample. The samples will be placed into an ice chest containing wet ice for delivery under chain of custody to a CAL-EPA certified analytical laboratory.

Soil from the remaining tubes not sealed for analysis will be removed for hydrogeologic description and will be screened for volatile compounds with an organic vapor meter (OVM). The soil will be screened by emptying soil from one of the tubes into a plastic bag. The bag will be

sealed and placed in the sun for approximately 10 minutes. After the hydrocarbons have been allowed to volatilize, the OVM will measure the vapor through a small hole, punched in the bag. These OVM readings will be used as a screening tool only since these procedures are not as rigorous as those used in an analytical laboratory.

A groundwater sample will be collected from each boring. Drilling will be halted at the water table and a Powerpunch or similar type device will be utilized to collect groundwater samples from the borings. The groundwater samples will be contained in 40-ml volatile organic analysis (VOA) vials, preserved with hydrochloric acid, sealed without headspace, labeled with the site location, sample designation, date and time the samples were collected, and the initials of the person collecting the samples, sealed in plastic bags, and cooled in an ice chest with wet ice for transport to a state-certified analytical laboratory under chain-of-custody.

All sampling equipment will be cleaned in buckets with brushes and a TSP or Alconox solution, then rinsed twice with tap water. Rinsates will be contained on-site in 55-gallon steel drums and stored on-site until off-site disposal can be arranged.

TASK 7 - ANALYZE THE SOIL AND GROUNDWATER SAMPLES

At least one soil sample from each boring, as well as each groundwater sample, will be analyzed at a CAL-EPA certified analytical laboratory for TPH-G by modified EPA Method 5030/8015, TPH-D by modified EPA Method 3510/8015, and BTEX and MTBE by EPA Method 8020. The soil samples analyzed will be chosen based on field observations such as odors, staining and OVM readings. If no field indications of contamination are present, the unsaturated sample closest to the water table (capillary zone) will be analyzed.

TASK 8 - BACKFILL THE BORINGS WITH NEAT CEMENT

Following collection of the soil and groundwater samples, the boreholes will be backfilled with neat cement placed by tremie pipe.

TASK 9 - PREPARE A SUBSURFACE ASSESSMENT REPORT

A report will be prepared outlining the methods and findings of this assessment. The report will be submitted under the seal of state registered civil engineer or geologist. This report will include a summary of all work completed during this assessment including tabulated soil and

groundwater analytical results, conclusions and recommendations. Copies of the analytical reports and chain of custody documents will be included as appendices.

TASK 10 - PREPARE A HUMAN HEALTH RISK ASSESSMENT

ASE will prepare a Risk Based Corrective Action (RBCA) report for the site. ASE will utilize the Groundwater Services, Inc. (GSI) RBCA model in completing this assessment. Site specific parameters will be used wherever possible, and the models conservative default parameters will be used when site specific parameters are not available. Average hydrocarbon concentrations for the last year of groundwater monitoring will be used to determine the hydrocarbon concentration to use for the on-site well. The highest hydrocarbon concentrations detected in any of the borings will be used for any off-site residential scenario.

The risk factor used will be 1 in 100,000 (1.0 E-5) cancer risk for on-site industrial, on-site residential, and off-site residential scenarios.

The following scenarios will be considered:

a) Vapor intrusion from groundwater to on-site industrial and residential buildings.

b) Vapor intrusion from groundwater to an off-site residential building.

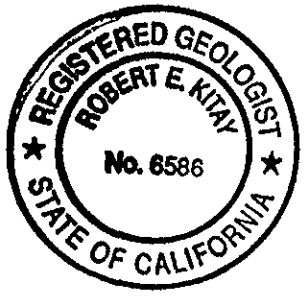
SCHEDULE

ASE will begin work on this project immediately upon approval of this workplan by the ACHCSA.

Should you have any questions or comments, please call us at (925) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.



Robert E. Kitay, R.G., R.E.A.
Senior Geologist

cc: Mr. Kevin Romak, Romak Iron Works, 3250 Hollis Street, Oakland, CA 94662-088

Ms. Susan Hugo, Alameda County Health Care Services Agency, 1131 Harbor Bay Parkway, Suite 250, Alameda, CA 94502

Mr. Chuck Headlee, California Regional Water Quality Control Board, San Francisco Bay Region, 1515 Clay Street, Suite 1400, Oakland, CA 94612

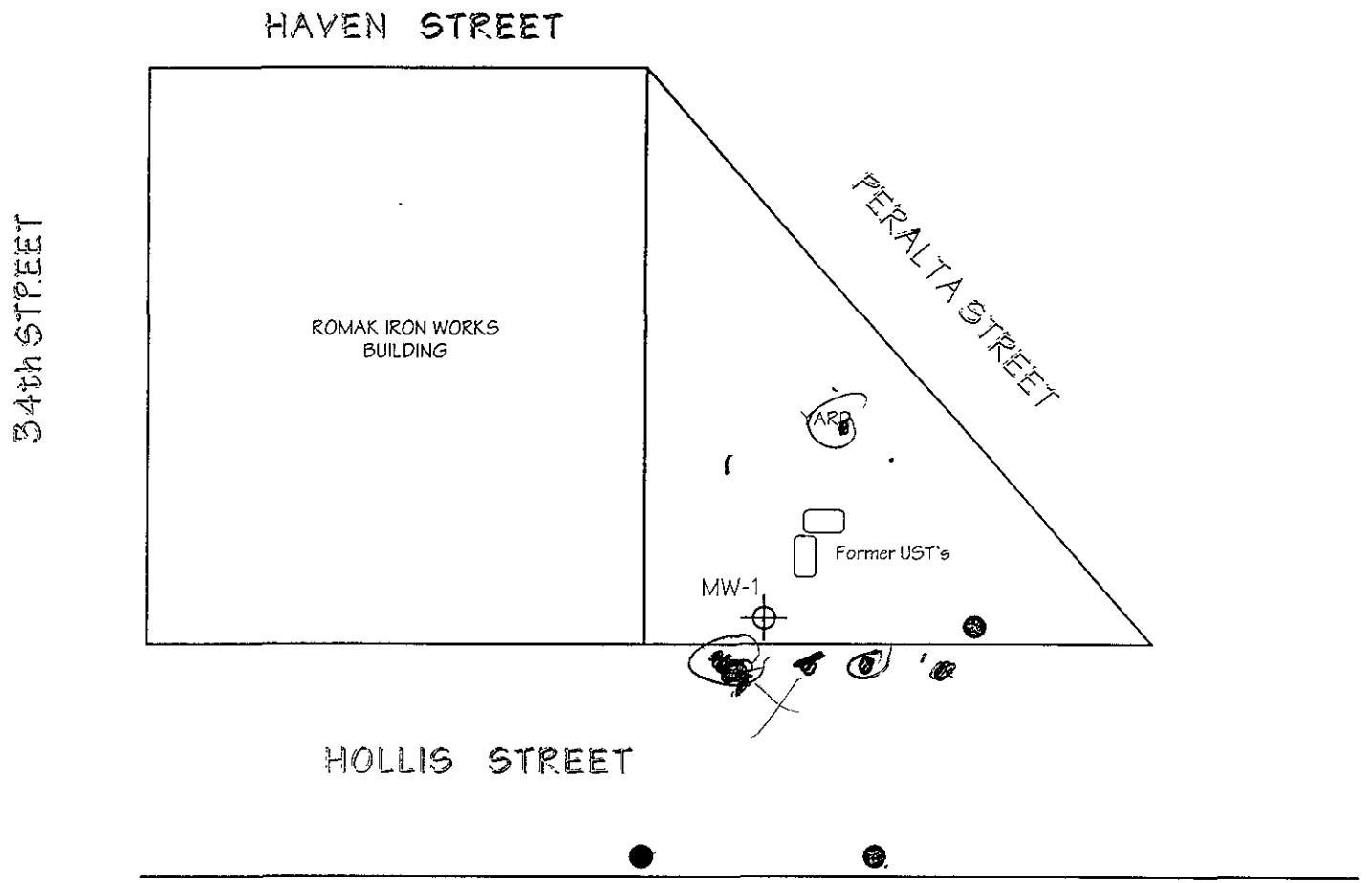
FIGURES

BASE USGS Oakland West 7.5 minute quadrangle topographic
dated 1980 scale 1:24,000

SITE LOCATION MAP

Romak Iron Works
3250 Hollis Street
Oakland, California

Aqua Science Engineers | Figure 1



LEGEND

PROPOSED SOIL BORING

MW-1 EXISTING MONITORING WELL

NORTH

SCALE
1" = 30'

PROPOSED SOIL BORING LOCATION MAP

Romak Iron Works
3250 Hollis Street
Oakland, California

AQUA SCIENCE ENGINEERS, INC.

Figure 2

TABLES

TABLE ONE

Certified Analytical Results of **GROUNDWATER** Samples
TPH-G, TPH-D, BTEX and MTBE
All results are in **parts per billion**

Sampling Date	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE
08-04-93	12,000	---	7.6	9.7	9.9	29	---
11-18-93	10,270	---	3,169	38.3	661.2	659.4	---
02-09-94	17,000	---	6,200	64	770	420	---
05-25-94	24,000	---	6,200	27	1,100	210	---
08-18-94	22,000	---	5,000	10	740	150	---
11-14-94	20,000	4,200	4,200	25	860	450	---
02-03-95	20,000	4,600[1]	3,400	11	810	100	---
05-02-95	21,000	3,400	3,100	21	910	130	---
08-08-95	17,000	1,800	2,800	11	680	63	---
11-13-95	17,000	<1,000	2,300	8	550	69	---
02-16-96	8,900	7,600	3,100	21	760	474	<40
05-17-96	9,900	1,400	2,100	6	560	23	120
08-01-96	11,000	5,100[2]	1,600	14	580	66	<50
11-12-96	13,000	6,000[2]	910	27	440	440	85
02-06-97	16,000	7,000[1]	1,200	170	660	410	<500
05-21-97	8,600	2,900[1]	720	<10	460	41	170
09-24-97	6,400	2,600	520	12	310	13	210
03-04-98	6,500	3,300[2]	650	2.3	290	35	98
09-18-98	5,400	2,000[2]	980	11	150	24	<50
03-10-99	6,600	2,500[2]	470	85	130	20	<50
09-09-99	2,300	2,400[2]	330	11	48	19	61
03-02-00	**6,700[2]**	**670[2]**	**440**	**< 2.5**	**65**	**< 2.5**	**77**
DHS MCL	NE	NE	1.0	150	700	1,750	13

Notes:
--- = Not analyzed
NE = Not established
DHS= California Department of Health Services
MCL = maximum contaminant level for drinking water
1 = motor oil detected
2 = Fuel pattern does not match hydrocarbon standard

TPH not sample collected same time