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Infrastructure, environment, facilities

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Mr. Steve Plunkett
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

ENVIRONMENT

Subject:
Supplemental Soil and Groundwater Investigation Work Plan
Former Chevron Asphalt Plant and Terminal #206265
1520 Powell Street
Emeryville, California

Date:
November 17, 2008

Contact:
Eric Larsen

Phone:
206.726.4728

Email:
Eric.Larsen@arcadis-us.com

Our ref:
B0046257.0000

Dear Mr. Plunkett:

This *Supplemental Soil and Groundwater Investigation Work Plan* (Work Plan) has been prepared by ARCADIS on behalf of Chevron Environmental Management Company (CEMC) to present the proposed additional soil and groundwater investigation activities at the former Chevron Asphalt Plant and Terminal No. 206265 (the Site) located at 1520 Powell Street in Emeryville, California (Figure 1). Installation of two soil borings and ten groundwater monitoring wells is proposed to gather additional data to further characterize hydrogeologic conditions, identify potential migration pathways, and better delineate the nature and extent of the chlorinated volatile organic compounds (CVOCs) in soil and groundwater on and adjacent to the Site.

Proposed Scope of Work

CEMC proposes to gather additional data to further characterize hydrogeologic conditions, identify potential migration pathways, and better delineate the nature and extent of the CVOCs in soil and groundwater on and adjacent to the Site since remediation activities took place. The scope of work proposed for this assessment includes the advancement of twelve soil borings, ten of which will be converted into groundwater monitoring wells at the approximate locations illustrated on Figure 2. Soil samples will be collected to evaluate the potential existence of any CVOCs in the area near the Site. Groundwater monitoring wells will be sampled to evaluate concentrations of any CVOCs in groundwater in the vicinity of the Site.

Site Specific Health and Safety Plan

As required by the Occupational Health and Safety Administration (OSHA) Standard "Hazardous Waste Operations and Emergency Response" guidelines (29 Code of Federal Regulations Section 1910.120), and by California Occupational Health and Safety Administration (Cal-OSHA) "Hazardous Waste Operations and Emergency Response" guidelines (California Code of Regulations Title 8, Section 5192), ARCADIS will prepare a site-specific health and safety plan (HASP) prior to commencement of fieldwork. Field staff and contractors will review the HASP before beginning field operations at the Site.

Permitting

All applicable permits will be obtained from the Alameda County Health Care Services Agency Department of Environmental Health (ACDEH) and the City of Emeryville, as necessary, prior to commencing field activities.

Underground Utility Locating

Underground Service Alert (USA) will be notified a minimum of 48 hours prior to commencing field activities to identify any public utility alignments that may be in conflict with the proposed borings. In addition, a private utility locating company will be utilized for clearing proposed borings locations for underground utilities.

Soil Borings

Two soil borings will be advanced at the locations shown on Figure 2. The two soil borings will be advanced using hand augers to approximately 3 feet bgs and then soil samples will be collected to approximately 4 feet bgs.

Soil Screening and Sampling

A minimum of 1 soil sample from each of the hand auger soil borings will be collected at approximately 3 to 4 feet bgs, and will be submitted for laboratory analysis. Soil samples will be analyzed in the field for ionized organic compounds using a photo-ionization detector (PID). The soil screening procedures will involve measuring approximately 30 grams from a relatively undisturbed soil sample, placing this sample in a sealed container (zip-lock bag). The bag will be warmed in the sun for approximately 20 minutes, then the head space within the bag will be tested for total

organic vapor, measured in parts per million (ppm: volume/volume). The PID results will be noted on the field logs. PID readings are useful for indicating relative levels of contamination, but cannot be used to evaluate organic compound levels with the confidence of laboratory results. Each sample will be retained in laboratory-supplied glass jars, sealed, labeled, placed in an ice-chilled cooler, cooled to approximately 4°C, and shipped along with appropriate chain-of-custody documentation to a CEMC-approved and California Department of Health Services (CDHS)-Certified laboratory for chemical analysis. Soil samples will be analyzed for the presence of CVOCs by United States Environmental Protection Agency (USEPA) Method 8260B.

Groundwater Monitoring Well Installation

Groundwater Monitoring Wells

Prior to drilling, the well locations will be hand cleared using either an air knife or hand auger to a minimum depth of 8 feet 1 inch (utility clearance depth) bgs. In addition, depth to water readings will be collected from the existing monitoring well network (see Figure 2).

The borings will be advanced using 8-inch outer diameter (OD) hollow stem augers to approximately 16 feet bgs using a hollow-stem auger rig and a continuous split-spoon soil sampler. Discrete soil samples will be collected approximately every 2 feet in each boring, using either a hand-sampling device (for depths shallower than 8-feet) or split-spoon sampler. Soil samples will be screened in the field using a PID, and described by the supervising geologist using visual and manual methods of the Unified Soil Classification System (USCS). Upon completion of drilling, each boring will be converted to a monitoring well. The monitoring well will be constructed using 2-inch ID schedule 40 poly vinyl chloride (PVC) casing with a 10-feet screen interval of 0.010-inch slotted PVC at the base of the well (16 to 6-feet bgs). A 2/12 sand filter pack will be placed around the well from the bottom of the bore hole to approximately 2-feet above the screen interval (16 to 4-feet bgs) followed by 2-feet of coated bentonite chips (4 to 2-feet bgs) which will be allowed to hydrate for approximately 30-minutes prior to the addition of the grout seal. The remainder of the space will be filled with grout (2 to 1-feet bgs). The well will be finished at grade with a traffic-rated well vault set in concrete (1 to 0-feet bgs).

Selected soil samples from the monitoring well borings will be submitted for laboratory analysis. Soil samples for chemical analysis will be retained in laboratory-supplied glass jars, sealed, labeled, packed on ice, cooled to approximately 4°C, and

shipped along with appropriate chain-of-custody documentation to a CEMC-approved and California Department of Health Services (CDHS)-Certified laboratory for chemical analysis. Soil samples will be analyzed for the presence of CVOCs by United States Environmental Protection Agency (USEPA) Method 8260B.

Groundwater Monitoring Well Development/Sampling

The newly installed groundwater monitoring wells will be developed a minimum of 48-hours following installation. Well development consists of rigorously surging the well with a surge block followed by removing approximately 10 case volumes of water from the well. During the purge cycle, groundwater field parameter measurements consisting of specific conductance, pH, and temperature will be measured using a groundwater water-quality meter.

Groundwater samples will be collected a minimum of 24 hours following development activities. A low-flow pre-sampling purge and disposable bailer sample collection technique will be used to collect groundwater samples from each well. Purging will be performed using a peristaltic pump with disposable polyethylene tubing and a flow-through cell. The purpose of low-flow sampling is to minimize the turbidity in a sample prior to sample collection. The low-flow technique is outlined in the USEPA Standard Operating Procedure "*Ground Water Sampling Procedure, Low Stress (Low-Flow) Purging and Sampling*" (USEPA, 1998).

Field parameters will be measured directly from the flow-through cell during pre-sample purging activities using the following series of sampling activities and protocols:

- Well water will be evacuated through disposable polyethylene tubing using a peristaltic pump.
- The tubing intake will be positioned at the middle of the saturated well screen to avoid aeration of the groundwater sample.
- The purging rate will be controlled to a rate of approximately 0.5-liter per minute so that the water level in the well is not lowered by more than 0.1 meter. The purging rate will be adjusted using a variable speed flow controller.

- Water levels will be monitored continuously during the purge cycle so that the drawdown does not exceed 0.1 meter. All water monitor level equipment will be washed thoroughly to avoid cross-contamination among wells.

- During the purge cycle, field parameters consisting of specific conductance, pH, dissolved oxygen (DO), turbidity, temperature, and oxidation/reduction potential (ORP) will be recorded and measured continuously using the flow-through assembly and a Horiba U-22 multifunction water-quality meter. Field parameter measurements will be recorded every 5 minutes in field parameter logs. Monitoring wells will be purged until three consecutive field measurements of specific conductance, pH, DO, and turbidity stabilized within the following ranges: specific conductance (3 percent); pH (0.10 standard units); temperature (10 percent); DO (10 percent); and turbidity (10 percent).

Once field parameters have stabilized, the intake line will be removed from the well. Samples will be collected using a new disposable polyethylene bailer and will be placed directly into laboratory-supplied glassware.

Collected samples will be packed on ice, cooled to approximately 4°C, and shipped along with appropriate chain-of-custody documentation to a CEMC-approved and California Department of Health Services (CDHS)-Certified laboratory for chemical analysis. Samples will be analyzed for the presence of CVOCs by United States Environmental Protection Agency (USEPA) Method 8260B. The requisite number of QA/QC samples will be collected including blind duplicates, field blanks, and trip blanks.

Investigation-Derived Waste Management

All down-hole drilling and sampling equipment will be steam-cleaned following the completion of the soil boring. Down-hole sampling equipment will be washed in a tri-sodium phosphate or Alconox® solution between samples.

Soil cuttings generated during drilling operations will be containerized in 55-gallon DOT-approved drums and temporarily stored on the subject property pending characterization and disposal. Soil cuttings will be removed by Chevron's disposal contractor to an appropriate disposal facility. Water generated during sampling

equipment decontamination, steam cleaning, and sampling of the monitoring wells will be temporarily stored in DOT-approved 55-gallon drums pending transport by Chevron's disposal contractor to an appropriate disposal or treatment facility.

Waste in the category of disposable sampling materials and personal protective equipment (PPE) will be placed in heavy-weight garbage bags or other appropriate containers and disposed of as general waste.

Reporting

A report will be prepared to document the results of site assessment activities. The report will include the following:

- Site conditions and background information;
- A scaled site plan illustrating soil boring locations and other relevant site features;
- Documentation of selected sampling activities performed in connection with the Site assessment;
- Results of the laboratory analyses performed on selected soil and groundwater samples; and
- Conclusions and recommendations relevant to the assessment objectives.

Schedule

ARCADIS is planning to initiate fieldwork by late November/early December, 2008, contingent on receiving all necessary permits and private property access. If you have any comments on the proposed scope of work, please let us know within 30 days of receiving this work plan.

If you have any questions or comments please contact Eric Larsen at 206.726.4728 (email: Eric.Larsen@arcadis-us.com) or Ben McKenna at 916.985.2079 ext. 30 (email: Ben.McKenna@arcadis-us.com).

Sincerely,

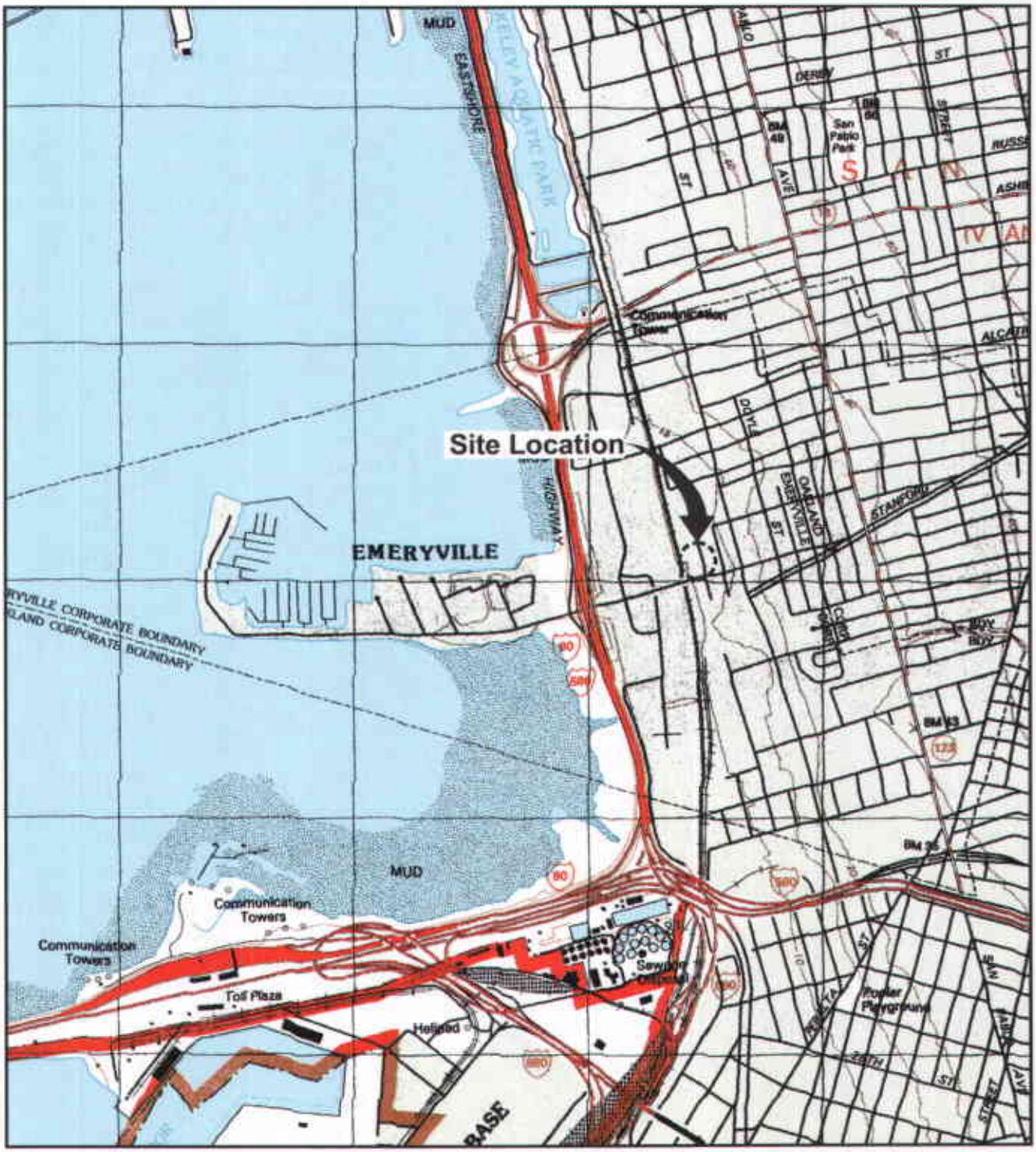
ARCADIS U.S., Inc.

Eric Larsen
Program Manager

Michael P. Fleischner, P.E.
Principal Engineer

Enclosures:
Figure 1 - Site Location Map
Figure 2 - Site Plan with Proposed Boring Locations

Copies:
Tom Bauhs, Chevron Environmental Management Company



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., OAKLAND WEST, CA., 1993.

2000' 0 2000'

Approximate Scale: 1" = 2000'

FORMER CHEVRON ASPHALT PLANT AND TERMINAL
1520 POWELL STREET
EMERYVILLE, CA

SITE LOCATION MAP

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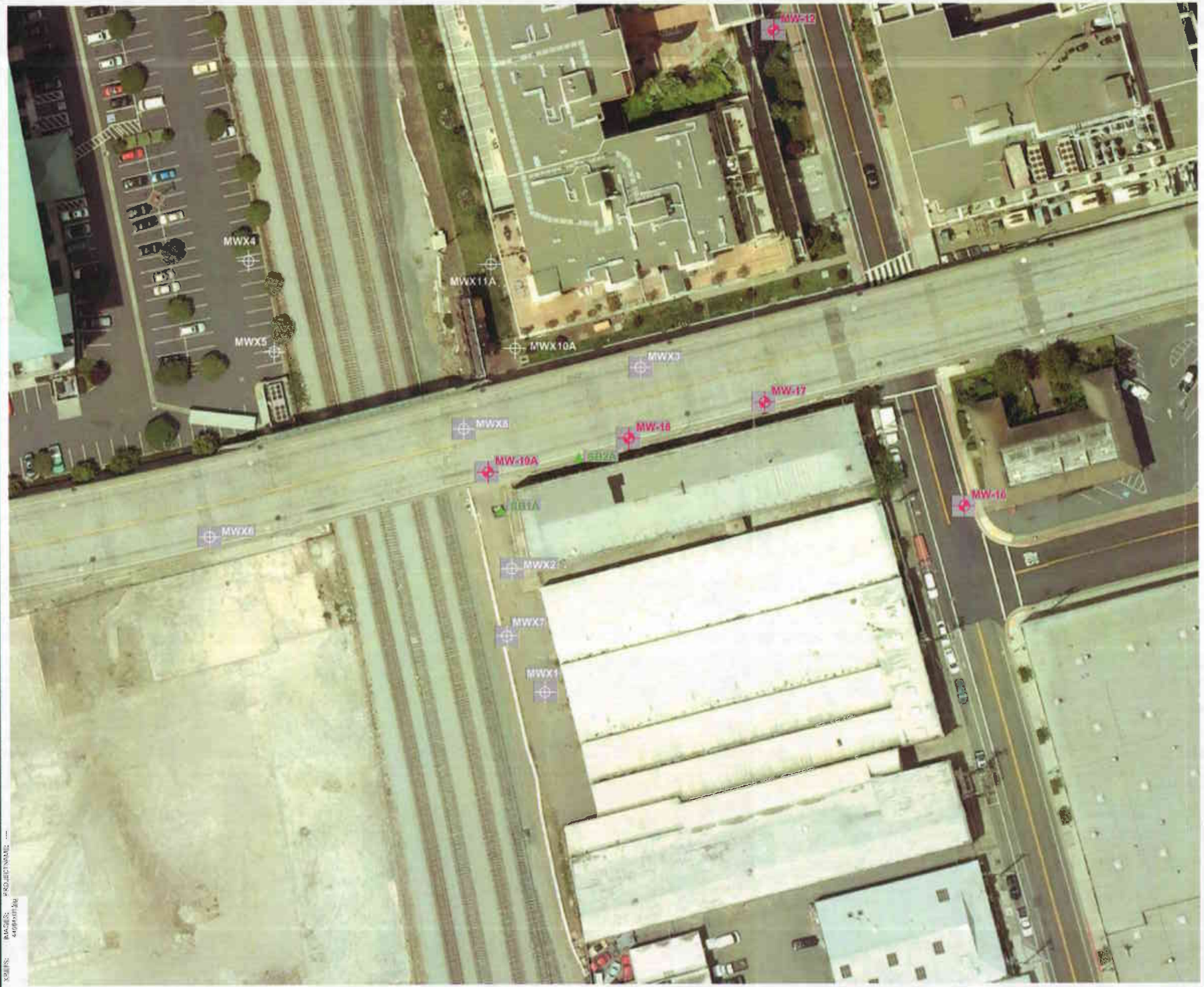
FIGURE
1

10/07/08 SYRACUSE, NY-ENV/141-KLS
B0044664M001\000002/CDR44664N01.CDR



LEGEND:

- PROPOSED MONITORING WELL
- PROPOSED SOIL BORING
- EXISTING MONITORING WELL

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH (2008).
2. PROPOSED MONITORING WELLS AND SOIL BORINGS FROM AN UNTITLED DRAWING BY GEOMEGA, FIGURE 1, @ A SCALE OF 1:800, DATED 3/21/08.
3. PROPOSED MONITORING WELLS MWX3, MWX6, AND MWX8 WILL BE DRILLED BENEATH THE OVERPASS.

0 60' 120'

GRAPHIC SCALE

FORMER CHEVRON ASPHALT TERMINAL 206265
1520 POWELL STREET
EMERYVILLE, CA

SITE PLAN WITH PROPOSED BORING LOCATIONS

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FIGURE 2