BONKOWSKI & ASSOCIATES, INC.
GEOTECHNICAL SERVICES AND HAZARDOUS MATERIALS MANAGEMENT

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9:45 am, Jul 11, 2008

Alameda County
Environmental Health

June 30, 2008
E27297-3

Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: Soil Gas Vapor Survey and Soil Sampling Work Plan, 421 23rd Avenue, Oakland, California

Dear Mr. Wickham,

This Soil Gas Vapor Survey and Soil Sampling Work Plan was prepared by Bonkowski & Associates, Inc. (B&A) on behalf of Golden Gate Petroleum for the underground storage tank site located at 421 23rd Avenue in Oakland, California (Figure 1). This Work Plan is submitted to the Alameda County Department of Environmental Health in response to the letter directives dated April 15, 2008. Based upon our understanding of this directive, B&A plans to: 1) conduct a soil gas survey which can be used (if needed) to evaluate various indoor air exposure scenarios; 2) complete confirmation soil and groundwater sampling in the area of GP-4 and GP-6 to further evaluate plume stability or degradation, and 3) update Golden Gate Petroleum's Geotracker EDF submittal data base. These tasks are being conducted to further evaluate Site Closure. This Work Plan was prepared in accordance with the Department of Toxic Substances Control (DTSC), "Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air" (DTSC, 2004) (References). The work elements required to complete these tasks are described in subsequent sections below.

Site Description

The Golden Gate Petroleum Oakland Cardlock (Site) is located at 421 23rd Avenue in Oakland, California. The Site is situated at the northwest corner of the intersection of Kennedy Street and 23rd Avenue. The site includes two 20,000 gallon double wall steel fiberglass reinforced tanks, and supporting product lines and dispensers; seven groundwater monitor wells, and a building. A Site Plan map is provided in Figure 2.

Task 1: Soil Gas Survey

A soil gas survey will be conducted to evaluate the potential for vapor intrusion to indoor air pathways. A soil gas survey will be conducted at the locations shown in

Figure 3. The object of this work will be to evaluate the concentrations of any petroleum hydrocarbon vapor that may be present in the soil. In order to reduce the effects of barometric pumping, all vapor samples will be collected from greater than five (5) feet below the ground surface. The depth to groundwater at the site is about 7 to 8 feet bgs. At each sampling location, B&A will attempt to collect a vapor sample from the capillary zone just above the groundwater table. If the target depth cannot be reached, a vapor sample from the closest practical depth will be collected.

Soil gas probes will be advanced using direct push technology. After each probe is advanced to the target depth, the probe will be allowed to set 20 to 30 minutes to allow the vapor and fluid pressures in the ground to equilibrate. At each given soil gas sampling location point, two attempts will be made to obtain gas samples. If the first attempt fails, the sampling probe will be withdrawn and re-driven a few feet away. If soil gas sampling fails, or is too difficult to be practical, soil matrix samples will be collected. This field procedure is in accordance with Cal-EPA (2003) and Los Angeles RWQCB (1997) guidance documents.

The soil gas samples will be tested in the field using a mobile GC/MS laboratory using modified EPA Method 8260 for aromatic and volatile hydrocarbons. The vapor sample collected from each probe location will be tested for:

- TPH as gasoline (TPHG),
- Benzene, toluene, ethylbenzene and xylenes (BTEX), and
- Five oxygenates; methyl tertiary butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl ether (TAME) and tertiary butyl alcohol (TBA).

In accordance with DTSC (2003) guidelines, duplicates of ten (10) percent of the vapor samples will be collected in Summa™, or equivalent, canisters and transported to a California Certified analytical laboratory. The samples will be analyzed using method TO-14A or TO-15. These duplicates will confirm the mobile laboratory detection limits.

Task 2: Confirmation Soil and Grab Groundwater Sampling

In order to more accurately evaluate the degradation rates and/or stability of the existing plume, a C-57 drilling subcontractor will advance two (2) geoprobe borings to the top of the shallowest groundwater at the approximate locations shown on Figure 3. The geoprobe will contain a 4-foot-long rigid clear acrylic tube which will be used to continuously collect soil samples. Soils will be logged at five foot intervals by a B&A field geologist, or at every major change in lithology, according to the Uniform Soils Classification System Description and Identification of Soils Visual-Manual Procedure ASTM Designation D2488-84. Soil samples will be

collected at five foot intervals for hydrocarbon vapor field screening and potential chemical analysis.

Each five-foot sample will be field screened for volatile hydrocarbons using an Organic Vapor Meter (OVM). The selected soil sample will be placed in a plastic zip-lock bag and allowed to sit in the sun and volatilize for about five minutes. The tip of the OVM will be inserted into the bag and a reading will be recorded on the geologic log of the boring. One soil sample will be collected from each geoprobe boring in the capillary fringe just above the water table for chemical testing. Sample selection will be based on OVM readings and lithologic changes. The selected samples will be placed in a cooler on ice and transported to a California Certified Analytical Laboratory under formal EPA chain-of-custody.

One grab groundwater sample will be collected from each Geoprobe boring. If it takes more than 30 minutes for the boring to produce enough water for a sample, a 1-inch slotted PVC casing will be placed in the hole overnight and the water sampling will be attempted the next day. Groundwater samples will be collected in containers prepared by the analytical laboratory and sealed to prevent loss of volatile constituents. The selected groundwater samples will be placed in a cooler on ice and transported to a California Certified Analytical Laboratory under formal EPA chain-of-custody. Soil and groundwater samples will be analyzed for TPHG, MTBE and BTEX using modified EPA Method 8260.

Task 3: Geotracker Well Survey and Submittals

The location and elevation of the existing groundwater monitor wells will be located by licensed land surveyor to a local datum. The well survey will be plotted on a base map showing both the horizontal and vertical position of the well, using GeoTracker coordinates. All existing site data pertinent to Geotracker that exists in Golden Gate Petroleum's files to the year 2001 will be transferred to Geotracker.

Task 4: Data Analysis and Reporting

A report will be prepared by B&A describing the results of the field investigation. The letter report will make recommendations to continue with the Closure procedure, or, if the concentrations of MTBE or BTEX soil gas samples collected adjacent to the building exceed indoor air exposure pathway screening levels, to complete a RBCA evaluation.

Schedule

Bonkowski & Associates, Inc. will proceed with this work within 5 days of authorization to proceed from both the Health Services Department and Golden Gate Petroleum. Laboratory testing will require approximately two weeks to complete. A final report can be prepared within 60 days of beginning this work.

Health and Safety and Permitting
Bonkowski & Associates, Inc. will prepare a Site Health and Safety Plan prior to conducting any fieldwork in anticipation of the site conditions. The Health and Safety Plan will address 29 Code of Federal Regulations (CFR) 1910.120 requirements regarding basic 40-hour health and safety training, supervisor training and annual refresher training. The work will be performed in Level D protection. Permits will be obtained from Alameda County to advance geoprobe or soil gas survey borings on this Site.

Certification Statement
This Work Plan has been prepared by the staff of Bonkowski & Associates, Inc. under contract to Golden Gate Petroleum and has been reviewed and approved by the professionals whose signatures appear below. The findings, recommendations, specifications, or professional opinions are presented, within the limits prescribed by the Client, and are true and correct to the best of our knowledge, after being prepared in accordance with generally accepted engineering practice in Northern California at the time this Work Plan was prepared. No other warranty is either expressed or implied.

Please feel free to contact either of the undersigned professionals at (510) 450-0770 if you have any questions or need any additional information.

Sincerely,
Bonkowski & Associates, Inc.

Michael S. Bonkowski, PG CEG 1329
Senior Managing Principal
Environmental and Engineering Services

Cynthia A. Dittmar, PG 7213
Project Geologist

ATTACHMENTS

Figure 1 Site Location Map
Figure 2 Site Plan Map
Figure 3 Sampling Plan Map

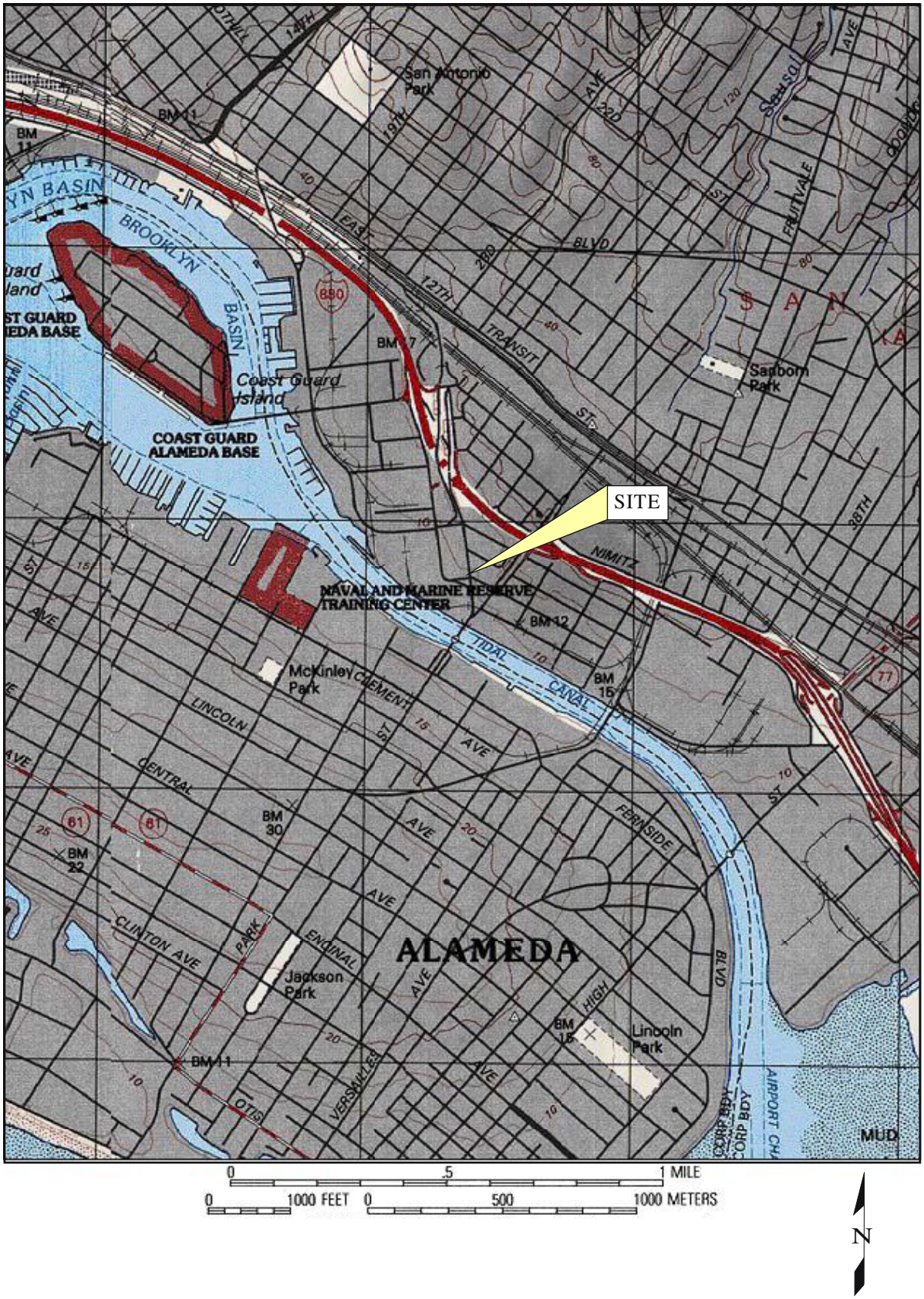
REFERENCES

DTSC, "Interim Final, Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air", December 15, 2004.

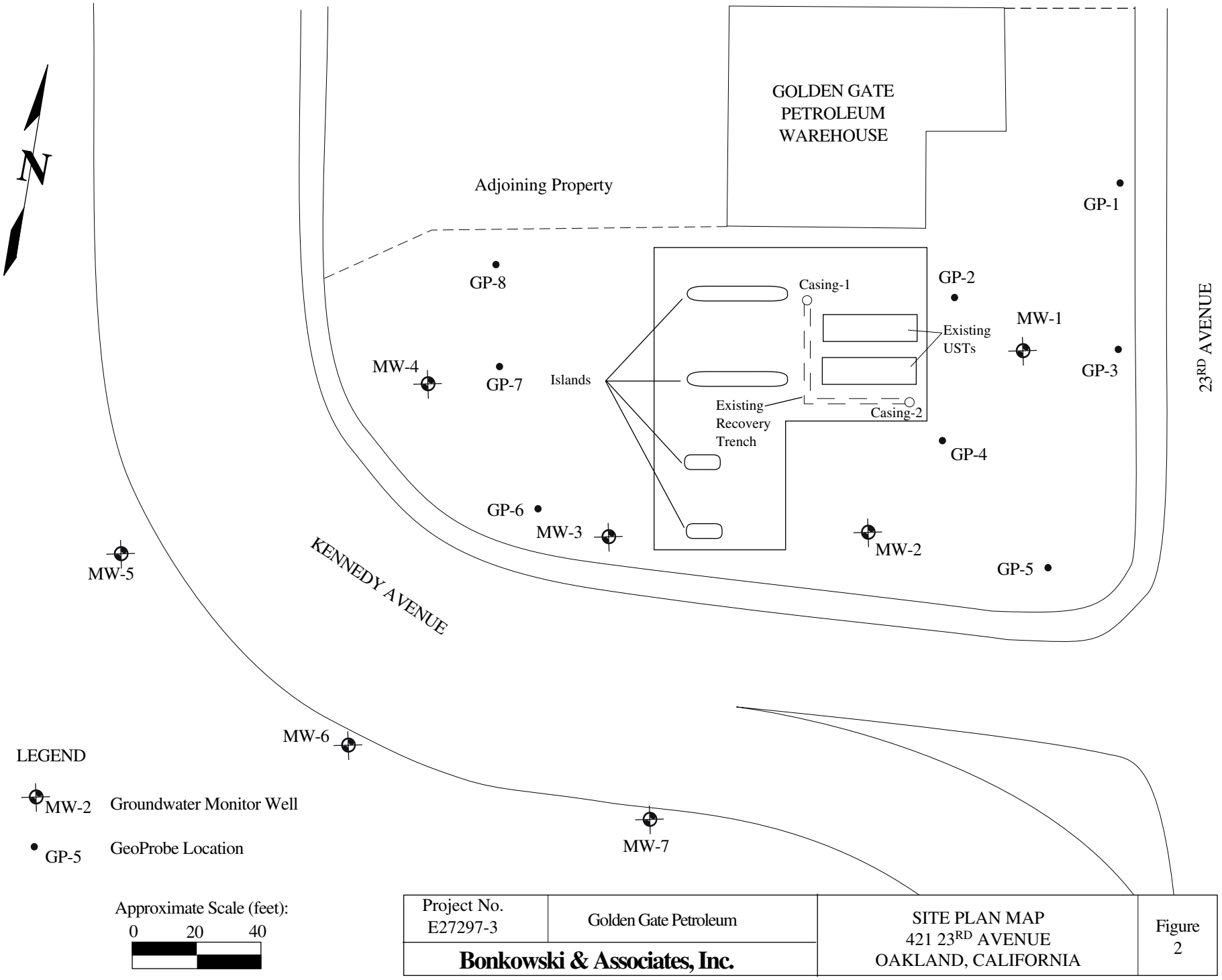
RWQCB, Los Angeles Region, "Interim Guidance for Active Soil Gas Investigation", February 25, 1997.

USEPA, "Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)": Office of Solid Waste and Emergency Response, November 29, 2002.

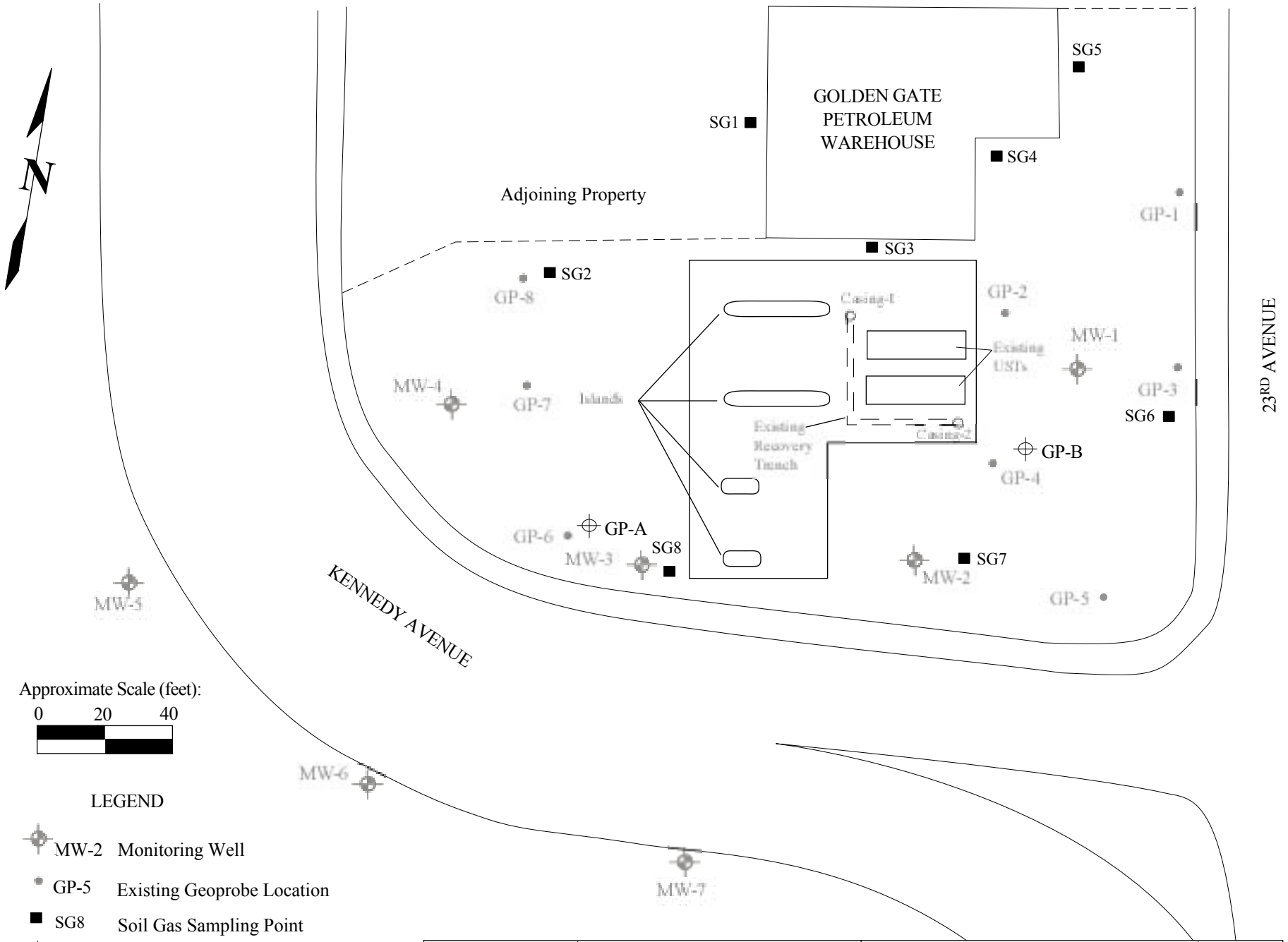
FIGURES



Project No. E27297-3	Golden Gate Petroleum	SITE LOCATION MAP 421 23RD AVENUE OAKLAND, CALIFORNIA	Figure 1
Bonkowski & Associates, Inc.			



Project No. E27297-3	Golden Gate Petroleum	SITE PLAN MAP 421 23RD AVENUE OAKLAND, CALIFORNIA	Figure 2
Bonkowski & Associates, Inc.			



Project No. E27297-3	Golden Gate Petroleum	SAMPLING PLAN MAP 421 23RD AVENUE OAKLAND, CALIFORNIA	Figure 3
Bonkowski & Associates, Inc.			