Eric Hetrick
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August 30, 2013

Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Former Chevron Service Station 95607
5269 Crow Canyon Road
Castro Valley, CA
ACEH Case #RO 0350

I have reviewed the attached Work Plan for Soil Vapor Investigation.

I agree with the conclusions and recommendations presented in the referenced report. This information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Conestoga Rovers Associates, upon who assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Sincerely,

Eric Hetrick
Project Manager

Attachment: Work Plan for Soil Vapor Investigation

CONESTOGA-ROVERS & ASSOCIATES

5900 Hollis Street, Suite A
Emeryville, California 94608
Telephone: (510) 420-0700 Fax: (510) 420-9170
http://www.craworld.com

August 30, 2013 Reference No. 311950

Mr. Mark Detterman
Alameda County Environmental Health Services
1131 Harbor Bay Parkway
Alameda, California 94502

Re: Work Plan for Soil Vapor Investigation
Former Chevron Station 95607
5269 Crow Canyon Road
Castro Valley, California
Fuel Leak Case RO0350

Dear Mr. Detterman:

Conestoga-Rovers & Associates (CRA) is submitting this for *Work Plan for Soil Vapor Investigation* on behalf of Chevron Environmental Management Company (Chevron) for the site referenced above (Figure 1). According to the State Water Resources Control Board (SWRCB) Low-Threat Underground Storage Tank Case Closure Policy (LTCP) Title 23, 2923 (OAL File No. 2012-0618-02 S) adopted on May 1, 2012 and effective as of August 17, 2012, one of the media specific criteria is related to petroleum vapor intrusion to indoor air, and another related to direct contact and outdoor air exposure by petroleum hydrocarbons. CRA plans to install six onsite and four offsite nested vapor wells, and to collect soil vapor and shallow soil data in order to evaluate whether the site meets these criteria (Figure 2). To accomplish the scope of work, CRA proposes to conduct the following.

Site-Specific Health and Safety Plan

CRA will prepare a site-specific health and safety plan to protect site workers. The plan will be reviewed and signed by site workers and visitors. The plan will be kept onsite during the field work.

Permits and Access

CRA will obtain drilling permits from Alameda County Public Works Agency (ACPWA) and schedule the required inspections prior to beginning field work. CRA will also notify the landowners and gain access to the site and offsite properties to install the vapor probes and complete the sampling.

Underground Utility Location and Utility Clearance
Underground Service Alert will be contacted to notify utility companies to mark their utilities at the site. CRA will also conduct a geophysical survey of pertinent areas to confirm utility locations and identify any previously unidentified utilities. A licensed geophysicist will be contracted to perform the task. Vapor well locations will additionally be cleared of utilities using hand augers to 8 feet below grade (fbg). No air-knife equipment will be used to ensure that soil vapor is not disturbed.

During our meeting on August 21, 2013, ACEH, CRA, and Chevron discussed the potential for hydrocarbon vapors to migrate through subsurface pathways, such as utility corridors. As discussed in the meeting, CRA has addressed this issue by performing a comprehensive utility survey and preferential pathway analysis, which was presented in the August 28, 2012, *Site Conceptual Model and Work Plan*. Additional assessment of utilities is not included in this investigation; however, additional preferential pathway analysis would be considered based on the results of the soil vapor assessment proposed in this work plan.

Soil Borings
Using 3-inch outside diameter hand augers, CRA will advance onsite soil borings up to 12 fbg at each vapor probe location. Offsite locations will be advanced to approximately 7 fbg, due to lower surface elevation and shallower groundwater offsite.

Soil Logging and Sampling
CRA geologists will continuously log soils using the ASTM D2488-06 Unified Soil Classification System. Soils will be field-screened using a photo-ionization detector and visual observations. A minimum of three undisturbed soil samples, at least two within the top 5 fbg, will be collected between grade and 10 fbg for comparison to the LTCP direct contact and outdoor air exposure criteria. Additionally at least one undisturbed soil sample will be collected within each screen interval of all soil vapor probes to collect soil petroleum analytical data to compare against soil vapor data. The samples, collected using a slide hammer sampler lined with a steam-cleaned liner, will be sealed, capped, labeled, logged on a chain-of-custody form, placed on ice, and transported to a Chevron and State-approved laboratory for analysis.

At least four undisturbed soil samples, two from an onsite boring and two from an offsite boring, will be collected to test for soil porosity and moisture content. The samples will be collected either directly above or below the soil vapor probe screened intervals. This data is being collected to provide site specific data in case a more robust soil vapor risk assessment is needed. The samples will be sealed, capped, labeled, logged on a chain-of-custody form, and transported to an approved laboratory for analysis.

Soil Vapor Probe Construction

Vapor probes will be constructed of a permeable stainless steel filter with a ¼-inch push-to-connect fitting connected to ¼-inch outside diameter Teflon®. The onsite vapor probes will be installed at 5-foot intervals with the shallowest probe at least 5 feet below the bottom of the building foundation. The onsite and offsite buildings are slab-on-grade; therefore, CRA proposes to install the shallow probes at approximately 7 fbg. The deeper probes onsite will be installed at approximately 12 fbg. The offsite probes will be installed at approximately 3.5 and 7 fbg. Each probe will be surrounded by a 12-inch sand pack consisting of #2/12 sand. Above the sand pack, 12 inches of dry granulated bentonite will be topped with at least 12 inches of hydrated granular bentonite. Each probe will be separated from the others by a grout mixture. The probe tubing will be labeled and capped, and a sealed, traffic-rated well vault will be installed flush to grade. A diagram of the typical soil vapor probe construction is shown on Figure 3.

Soil Vapor Sampling Protocol

Vapor samples collected for all analyses, except TO-17, will be collected at least 48 hours after the installation of the probes using 100 percent laboratory certified 1-liter Summa™ canisters. Prior to collecting a sample, a closed circuit sampling train is created by attaching the sample Summa™ canister in series with the purge Summa™ canister via a steam-cleaned, stainless-steel manifold. A "shut-in" test will be performed prior to connecting the sampling equipment to the vapor probe tubing. This test is performed by sealing all openings to ambient air, opening the purge Summa™ canister to establish a vacuum inside the sampling train and waiting to ensure the vacuum remained stable over time. The shut-in test reduces the potential for ambient air to dilute the soil vapor samples. Once the sampling train passes the "shut in" test, it is connected to the probe tubing. Using the same flow rate as is used during sampling, approximately three purge volumes will be purged from the sampling tubing using the purge Summa™ canister before sampling begins. While sampling, the vacuum of the sample Summa™ canister will be used to draw the soil vapor through the flow controller until a negative pressure of approximately 5 inches of mercury is observed on the vacuum gauge. In accordance with the Department of Toxic Substances Control (DTSC) *Advisory – Active Soil Gas Investigation* guidance document, dated April 2012, leak testing will be performed during sampling using laboratory grade helium. The vapor probe vault, probe tubing, and entire sampling train will be enclosed in a rigid shroud. The helium concentration inside the shroud will be maintained above 20 percent helium and quantified using a helium meter. After sampling, the Summa™ canisters will be packaged and sent to the Air Toxics laboratory under chain-of-custody for analysis. A diagram of the soil vapor sampling apparatus is attached as Figure 4.

Vapor samples collected for TO-17 analysis will be collected at least 48 hours after the installation of the probes using 100 percent laboratory certified TO-17 Sorbent Tubes. A leak test will be performed prior to connecting the sampling equipment to the vapor tubing. The test is performed by inserting the sorbent tube into the tube holder on the syringe assembly, turning the valve into the 'off' position, pulling the plunger of the syringe. If the plunger does not move or immediately returns to the starting position, the system is leak tight and is ready for sampling. To sample, the plunger of the syringe will be pulled to the desired volume. When the desired volume has been collected, the sorbent tube will be removed from the tube holder and the ends re-capped. The sample volume will be recorded and the tubes will be packaged and sent to the Air Toxics laboratory under chain-of-custody for analysis. A diagram of the TO-17 soil vapor sampling apparatus is attached as Figure 5.

CRA's *Standard Field Procedures for Soil Vapor Probe Installation and Sampling* is included as Attachment A.

Chemical Analysis
Select soil samples will be analyzed for:

- Total petroleum hydrocarbons as gasoline (TPHg) by Environmental Protection Agency (EPA) Method 8015B modified
- Benzene, toluene, ethylbenzene, total xylenes (BTEX) methyl tertiary-butyl ether (MTBE) and naphthalene by EPA Method 8260B

Select undisturbed soil samples will also be collected and analyzed for soil porosity and moisture content by API RP 40/ASTM D2216.

Soil vapor samples will be analyzed for:

- TPHg, BTEX, MTBE and naphthalene by EPA Method TO-15
- Naphthalene by EPA Method TO-17
- Oxygen (O2), carbon dioxide (CO2), nitrogen (N2), methane (CH4), and helium by ASTM D-1946 (GC/TCD)
- Air phase hydrocarbon (APH) fractions (Sp) aromatics C8-C12 modified TO-15 GC/MS Full Scan
- APH fractions (Sp) aliphatics C5-C12 modified TO-15 GC/MS Full Scan

Data Interpretation
Soil vapor analytical data will be compared to the LTCP petroleum vapor intrusion to indoor air criteria.

Waste Disposal
Soil cuttings generated during the drilling will be placed in Department of Transportation approved 55-gallon drums and stored onsite pending analytical profiling. Once characterized, these wastes will be disposed of at the appropriate Chevron-approved facility.

Reporting
Upon completion of field work and review of the analytical results, CRA will prepare a *Soil Vapor Investigation Report* that at a minimum will contain:

- Descriptions of the drilling and sampling methods
- Boring logs with soil description and probe construction details
- Tabulated soil and soil vapor analytical results with a comparison to LTCP criteria
- Laboratory analytical reports and chain-of-custody forms
- Waste disposal details
- Conclusions and recommendations

CLOSING

CRA will proceed with the proposed scope of work upon receipt of written or email approval from ACEHS. After approval, CRA will obtain the necessary drilling permits, access agreements, and schedule the subcontractors at their earliest availability. We will submit a summary of our findings within a week of receipt of the laboratory analytical report in preparation for the community outreach. Our assessment report will be submitted approximately 6 weeks after completion of field activities and receipt of final laboratory analytical reports.

CONESTOGA-ROVERS & ASSOCIATES

We appreciate your assistance with this project. Please contact Judy Gilbert of CRA at (510) 420-3314 or Mr. Eric Hetrick of Chevron at (925) 790-6491 if you have any questions or comments.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Judy Gilbert

Brandon S. Wilken, PG 7564

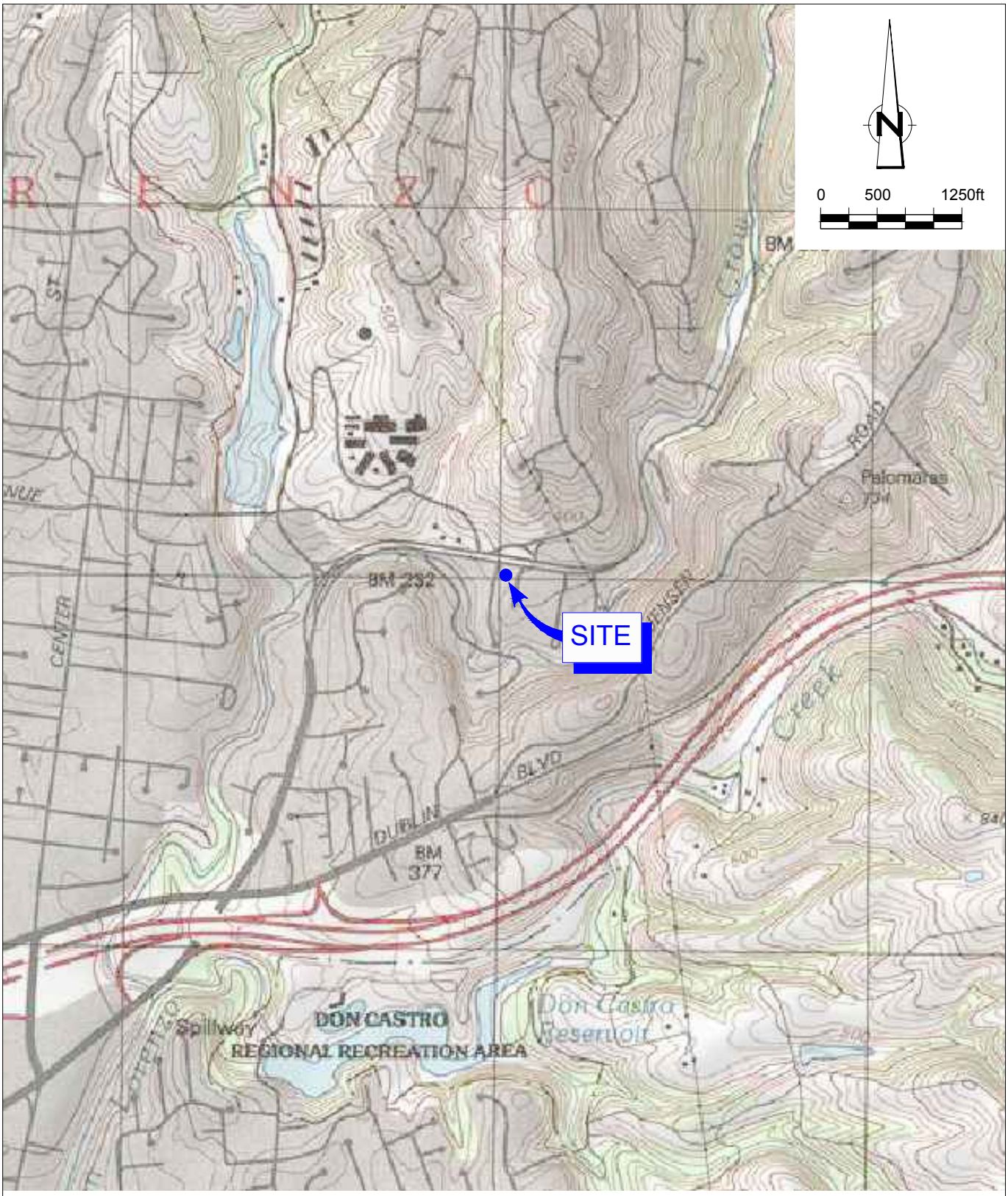
BY/aa/25
Encl.

Figure 1	Vicinity Map
Figure 2	Site Plan with Proposed Vapor Probe Locations
Figure 3	Typical Nested Soil Vapor Probe Construction
Figure 4	TO-15 Soil Vapor Sampling Apparatus Diagram
Figure 5	TO-17 Soil Vapor Sampling Apparatus Diagram

Attachment A: Standard Field Procedures for Soil Vapor Probe Installation and Sampling

c.c.: Mr. Eric Hetrick, Chevron EMC *(electronic copy)*
Mr. Kevin Hinkley, Property Owner
Ms. Diane Riggs, Forest Creek Townhomes Association

FIGURES



SOURCE: TOPO! MAPS.

Figure 1

VICINITY MAP
FORMER CHEVRON STATION 95607
5269 CROW CANYON ROAD
Castro Valley, California

311950-2013(021)GN-EM001 MAR 12/2013

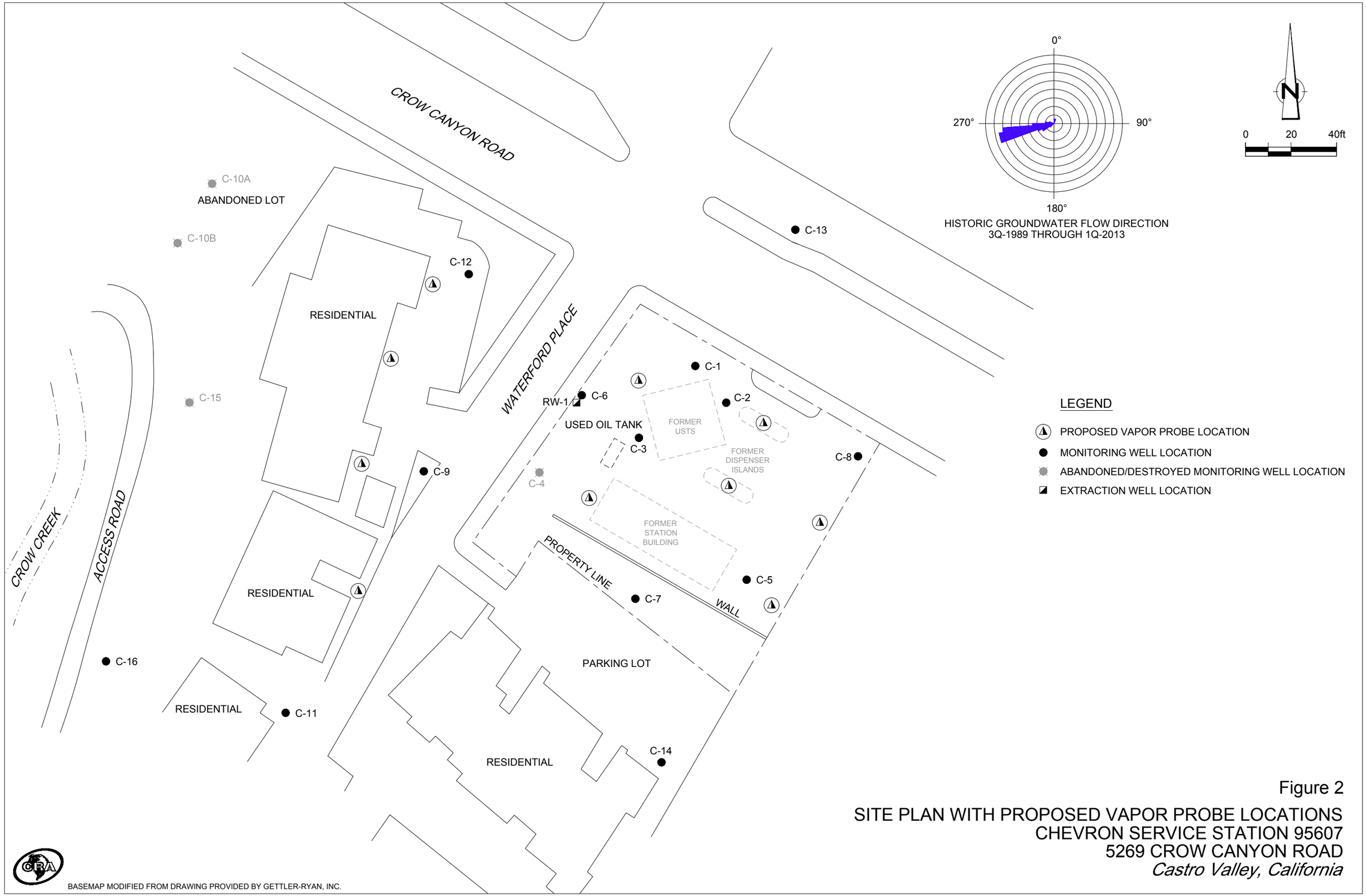
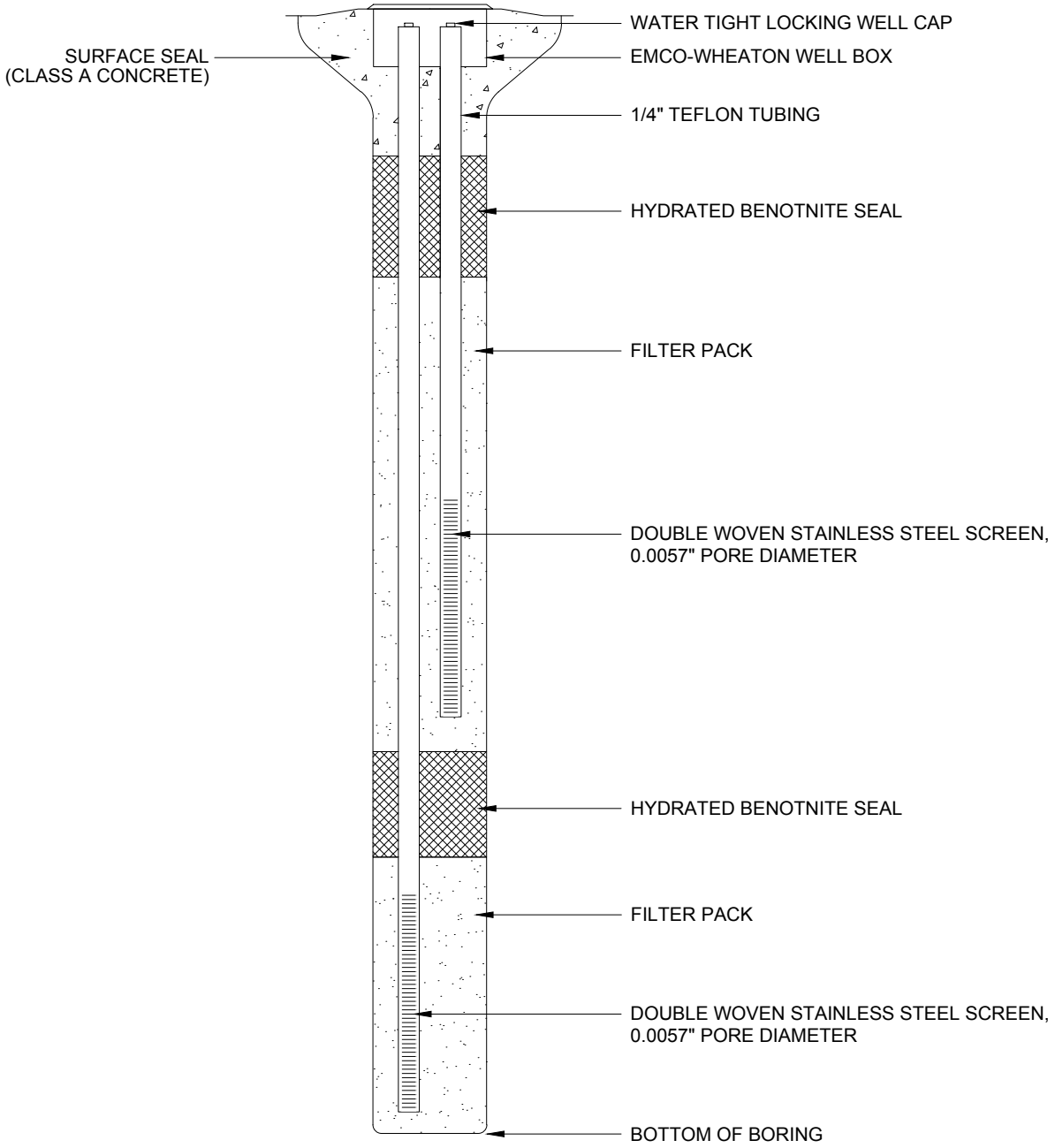


Figure 2

SITE PLAN WITH PROPOSED VAPOR PROBE LOCATIONS
CHEVRON SERVICE STATION 95607
5269 CROW CANYON ROAD
Castro Valley, California

BASEMAP MODIFIED FROM DRAWING PROVIDED BY GETTLER-RYAN, INC.

311950-95(025)GN-EM002 AUG 29/2013



DRAWING NOT TO SCALE

Figure 3

TYPICAL NESTED SOIL VAPOR PROBE CONSTRUCTION DIAGRAM
CHEVRON SERVICE STATION 95607
5269 CROW CANYON ROAD
Castro Valley, California

311950-2013(025)GN-EM003 AUG 27/2013

DRAWING NOT TO SCALE

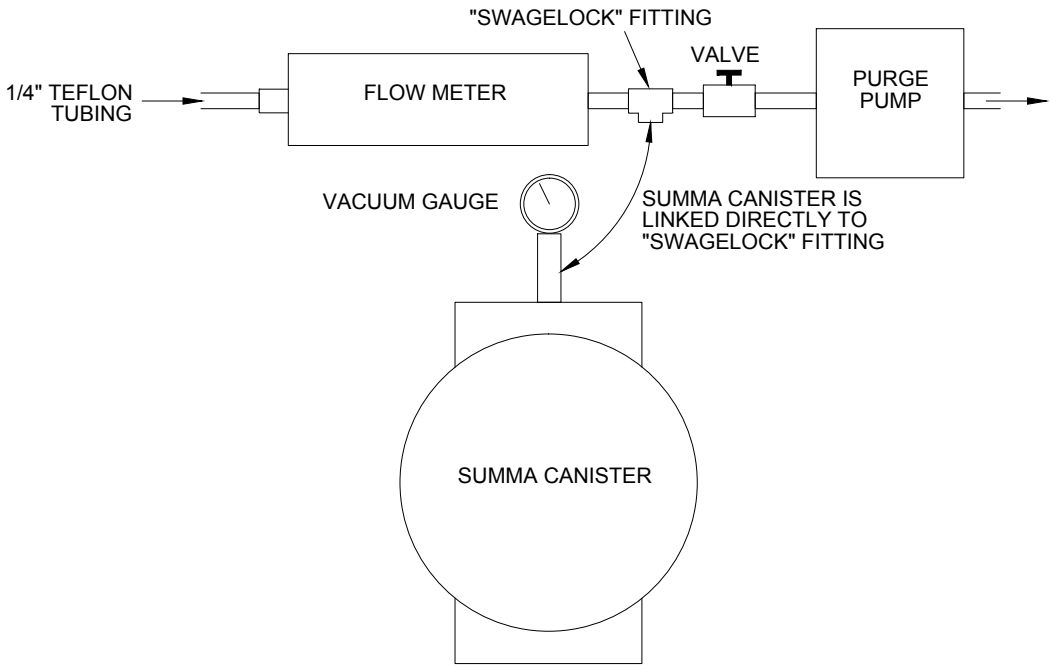


Figure 4

TO-15 SOIL VAPOR SAMPLING APPARATUS DIAGRAM
CHEVRON SERVICE STATION 95607
5269 CROW CANYON ROAD
Castro Valley, California

311950-2013(025)GN-EM004 AUG 26/2013

DRAWING NOT TO SCALE

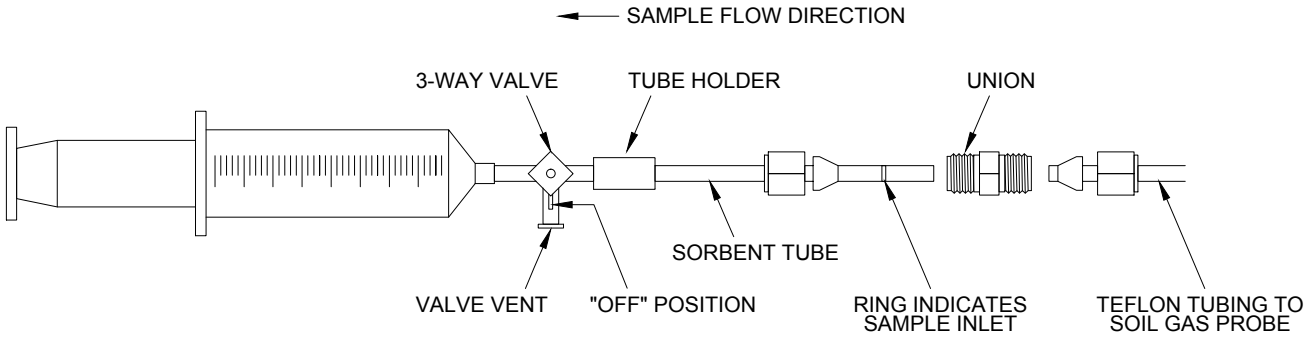


Figure 5

TO-17 SOIL VAPOR SAMPLING APPARATUS DIAGRAM
CHEVRON SERVICE STATION 95607
5269 CROW CANYON ROAD
Castro Valley, California

ATTACHMENT A

STANDARD FIELD PROCEDURES FOR SOIL VAPOR PROBE INSTALLATION AND SAMPLING

STANDARD FIELD PROCEDURES FOR
SOIL VAPOR PROBE INSTALLATION AND SAMPLING

This document describes Conestoga-Rovers & Associates' standard field procedures for soil vapor probe installation and sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil vapor samples are collected and analyzed to assess whether vapor-phase subsurface contaminants pose a threat to human health or the environment.

Shallow Soil Vapor Probe Installation

The shallow soil vapor probe method for soil vapor sampling utilizes a hand auger or drill rig to advance a boring for the installation of a soil vapor sampling probe. Soil vapor probes facilitate the collection of in-situ vapor samples. Once the boring is advanced to the final depth, #2/12 filter pack is poured through a tremie pipe to fill the bottom 6 inches of the boring. A permeable, stainless-steel probe tip is connected to ¼-inch outside diameter Teflon tubing via a push-to-connect fitting. The probe tip is then placed approximately 6 inches from the bottom of the boring and covered by 6 inches of #2/16 filter sand. A 12 inch layer of dry granular bentonite is placed on top of the filter pack. Pre-hydrated granular bentonite is then poured to fill the borehole. The tube is labeled, capped, and placed within a traditional well box finished flush to grade. Soil vapor samples will be collected no sooner than 48 hours after installation of the soil vapor probe to allow adequate time for representative soil vapors to accumulate. Soil vapor sample collection will not be scheduled until after a minimum of three consecutive precipitation-free days and irrigation onsite has ceased.

Purging

At least three purge volumes of vapor are removed from the soil vapor probe prior to sampling. The purge volume is defined as the amount of air within the probe and tubing. Purging is performed using the vacuum of a dedicated Summa canister, a flow regulator set to the same flow rate used for sampling, and vacuum gauges. Immediately after purging, soil vapor samples will be collected using the appropriate size Summa canister with attached flow regulator and sediment filter.

Sampling Soil Vapor Probes

Samples collected using a SUMMA™ canister will have the SUMMA™ canister connected to the sampling tube of each vapor probe. Prior to collecting soil vapor samples, the initial vacuum of the canisters is measured and recorded on the

chain-of-custody. The vacuum of the SUMMA™ canister is used to draw the soil vapor through the flow controller until a negative pressure of approximately 5 inches of mercury is observed on the vacuum gauge and recorded on the chain-of-custody. The flow controllers should be set to 100-200 milliliters per minute. Field duplicates should be collected for every day of sampling and/or for every 10 samples collected.

In accordance with the DTSC guidance document titled *Advisory-Active Soil Gas Investigations*, dated March 2010, leak testing is necessary during sampling. Helium is recommended, although shaving cream is acceptable. Helium is pumped into a shroud that contains the entire sampling apparatus and the soil vapor probe well vault. A helium meter is used to quantify the percentage helium in the shroud during sampling.

Samples collected for TO-17 analysis will be collected using a TO-17 Sorbent Tubes connected to the sampling tube of each vapor probe. A 60 cc syringe will be used to draw the sample into the sorbent tubes. Field duplicates should be collected for each day of sampling and/or for every 10 samples collected.

A leak test will be performed prior to connecting the sampling equipment to the vapor tubing. The test is performed by inserting the sorbent tube into the tube holder on the syringe assembly, turning the valve into the 'off' position, pulling the plunger of the syringe. If the plunger does not move or immediately returns to the starting position, the system is leak tight and is ready for sampling.

Vapor Sample Storage, Handling and Transport

Samples are stored and transported under chain-of-custody to a state-certified analytic laboratory. Samples should never be cooled due to the possibility of condensation within the canister.

Soil Vapor Probe Destruction

The soil vapor probes will be preserved until they are no longer needed for risk evaluation purposes. At that time, they will be destroyed by extracting the tubing, hand augering to remove the sand and bentonite, and backfilling the boring with neat cement. The boring will be patched with asphalt or concrete, as appropriate.