Eric Hetrick
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
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August 2, 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 Remedial Action Plan Implementation Plan.

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: Remedial Action Plan Implementation Plan

CONESTOGA-ROVERS & ASSOCIATES

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

August 2, 2013 Reference No. 311950

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

Re: Remedial Action Plan Implementation Plan
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 Remedial Action Plan Implementation Plan (RAP-IP) on behalf of Chevron Environmental Management Company (Chevron) for the site referenced above. In a letter dated July 2, 2013, Alameda County Environmental Health Services (ACEHS) requested submittal of a RAP-IP to address ACEHS's technical comments and submittal of additional documents.

Consistent with the California Code of Regulations (CCR) related to Underground Storage Tank (UST) site cleanup (CCR Title 23, Division 3, Chapter 16, Article 11), a *Corrective Action Plan (CAP)* was submitted by Weiss Associates on May 31, 2000*, and a Remedial Action Plan (RAP),* and *RAP Addendum* were submiited by CRA. The RAP and RAP addendum were approved by ACEHS on, February 7, 2007, and May 29, 2013, respectively. These documents contained the required technical elements in accordance with the cited regulation.

Below are ACEHS's technical comments (***in italics***) and CRA's responses. Requested documents are included as attachments.

RAP IMPLEMENTATION PLAN

(Provide) Design drawings and specifications for DPE system including installation details for the three DPE wells proposed in the RAP addendum.
Design drawings and specifications for the dual phase extraction (DPE) system are presented in Attachment A. The design drawings and specifications were developed by California-licensed Engineers for the purpose of permitting and construction of the system. CRA has started permitting and soliciting contractor bids for installation based on these drawings.

The three DPE wells will be advanced using 10-inch diameter hollow-stem augers. The wells will be constructed using 4-inch diameter Schedule 40 PVC casing with a 0.020-inch slotted screen. Proposed extraction wells adjacent to monitoring wells C-1 and C-3 will be screened from approximately 10 to 50 fbg with a 3-foot long blank-casing sump below the screen. Proposed extraction well adjacent to monitoring wells C-6 will be screened from approximately 7 to 42 fbg also with a 3-foot long blank-casing sump below the screen. The proposed screen interval is based on the depth interval between the high groundwater table elevation and base of hydrocarbon smear zone. Historic depth to groundwater measurements in wells C-1, C-3, and C-6 ranged from approximately 7.5 to 30 fbg, and the base of the smear zone has historically been defined at an approximate depth of 45 fbg onsite. The base of the smear zone will be better defined in the field with soil screening data collected during well installation and the total depth of each well may be altered based on this field data. The filter pack will consist of #2/12 sand from the bottom of the boring to approximately 2 feet above the screened interval. The well annulus will have a 2-foot bentonite seal above the screen and sand pack, with the remainder backfilled with Portland Type I/II cement to approximately 1 fbg. A well box equipped with a traffic rated lid will be installed flush with grade. Well construction may be further altered based upon all field observations. Well locations and top-of-casing elevation will be surveyed by a licensed land surveyor after installation.

(Provide) Operation and maintenance plans.
A standard DPE operation and maintenance (O&M) plan is included as Attachment B. A site specific plan will be prepared prior to system start-up.

(Provide) Post remediation monitoring and verification plans with proposed strategy for collecting groundwater, soil and soil vapor monitoring and confirmation samples.
After the DPE system is shut down, source area monitoring wells C-1, C-3, and C-6 will be sampled quarterly for one year to compare data to the Low Threat Closure Policy (LTCP) groundwater-specific criteria.[1] The remaining monitoring well network will be sampled as currently scheduled. Groundwater samples will be analyzed for the following:

- TPHg by EPA Method 8015B
- Benzene, toluene, ethylbenzene, xylenes and methyl-tertiary butyl ether (MTBE) by EPA Method 8260B.

During the installation of extraction wells, soil samples will be collected from the top 10 feet as proposed in the *RAP Addendum* and the results will be compared to the LTCP direct contact and outdoor air

[1] California State Water Resources Control Board (SWRCB), 2012, *Low-Threat Underground Storage Tank Case Closure Policy,* August 17, 2012.

exposure criteria. If soil concentrations prior to remediation exceed these criteria, then CRA will propose a scope of work following remediation to verify that post remedial concentrations are below the LTCP criteria or do not pose an unacceptable health risk. If the criteria are met prior to remediation, then no additional assessment will be completed.

Following remediation, CRA will evaluate site conditions to the LTCP petroleum vapor intrusion to indoor air scenarios. If additional data is required to confirm that petroleum vapor intrusion is not an unacceptable health risk, CRA will propose additional assessment. However, if post-remediation site conditions meet any of the LTCP petroleum vapor intrusion to indoor air scenarios, then no additional assessment will be completed.

(Provide) A detailed cost estimate for the proposed work.
Our cost estimate for the proposed work, which has been reviewed and approved by Chevron, is consistent with the Underground Storage Tank Cleanup Fund guidelines. The cost estimate is proprietary information and is therefore not provided in this document.

(Provide) Updated cleanup goals utilizing the 2013 Water Quality Board-San Francisco Region's Environmental Screening Levels and LTCP screening levels for petroleum hydrocarbons.
The cleanup goals for the site are to satisfy the LTCP criteria for low threat closure. If additional evaluation is needed, then CRA will compare the site to applicable water quality objectives and/or the updated 2013 environmental screening levels (ESLs). In addition, the State Water Resources Control Board's Resolution 92-49 that requires that cleanup goals be met within a reasonable time frame will be considered.

(Provide) Implementation schedule with milestone dates.
The implementation schedule with milestone dates is presented in Attachment C.

(Provide) A strategy for collecting soil data within the upper 10 feet of soil at the site during DPE well installation, if appropriate to fulfill the requirements of the LTCP Media Specific Criteria for direct Contact and Outdoor Air.
Soil samples will be collected at approximately 5 foot intervals to the total depth of each borehole including the 0 to 5 foot interval, the 5 to 10 foot interval, at obvious changes in soil types, and where indicators of petroleum hydrocarbons are observed. Soil concentrations will also be screened in the field using a photo-ionization detector (PID). Soil samples above 8 fbg will be collected by driving steel tubes inserted into a hand auger bucket. Soil samples collected below 8 fbg will be collected by driving 6-inch steam-cleaned steel or brass tubes into undisturbed sediments. CRA geologists will log collected soils using the ASTM D 2488 Unified Soil Classification System. The samples 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.

REMEDIAL PROGRESS REPORT

CRA believes that dissolved hydrocarbon trends in groundwater and soil vapor are more readily understood by reviewing quarterly rather than monthly data. Therefore, Remedial Progress Reports will be submitted quarterly. The first report will be submitted three (3) months, following system startup. As requested, CRA will include the as built diagrams of the DPE system in the first Remedial Progress Report.

GROUNDWATER MONITORING

CRA will install two offsite monitoring wells (C-17 and C-18) at the same time as the proposed DPE wells. CRA will provide the details of the well construction in the first remedial groundwater monitoring report.

PUBLIC PARTICIPATION NOTIFICATION

A fact sheet prepared and provided by ACEHS was distributed on July, 12, 2013, to the mailing list provided by ACEHS. Due to an informational error, a revised fact sheet was provided by ACEHS and was sent to the mailing list on July 15, 2013. Personal certification indicating that the fact sheet was distributed by U.S. Mail was provided by Eric Hetrick of Chevron on July 17, 2013.

LANDOWNER NOTIFICATION

The *List of Landowner Form* was submitted to ACEHS on July 19, 2013.

SCHEDULE FOR IMPLEMENTATION OF CLEANUP

August 2013 – CRA will install three extraction wells, two offsite monitoring wells and destroy remediation well RW-1, as indicated in the approved RAP Addendum.

September 2013 – CRA will start construction to reinforce the existing retaining wall, contingent upon construction permitting.

September 2013 – CRA will begin construction of the DPE system, contingent upon construction permitting.

December 2013 –CRA will start the DPE system, contingent upon construction and other permitting. CRA projects the system will operate for approximately one year to achieve remediation objectives.

December 2014 – CRA will begin post remediation groundwater monitoring

December 2015 – CRA will evaluate the site for low threat case closure.

March 2015 – CRA will destroy the well network in preparation of case closure.

A more detailed schedule is included as Attachment C.

CLOSING

Based on prior approval of the *RAP* and *RAP Addendum*, CRA will continue to move forward with the work as scheduled.

CONESTOGA-ROVERS & ASSOCIATES

August 2, 2013 Reference No. 311950

Please contact Judy Gilbert at (510) 420-3314 if you have any questions or require additional information.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Judy Gilbert Brandon S. Wilken, PG 7564

BY/mws/21

Attachment A Design Drawings and Specifications
Attachment B Standard Operations and Maintenance Plan
Attachment C Implementation Schedule

cc: Mr. Eric Hetrick, Chevron Environmental Management Company
Mr. Kevin Hinkley, Property Owner
Ms. Diane Riggs, Forrest Creek Townhomes Association

ATTACHMENT A

DESIGN DRAWINGS AND SPECIFICATIONS

REMEDIAL DESIGN PLANS

FORMER CHEVRON SERVICE STATION # 9-5607
(APN: 085-5300-003-06)
5269 Crow Canyon Road
Castro Valley, California

DUAL-PHASE EXTRACTION SYSTEM

Prepared for:
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

Prepared by:
CONESTOGA-ROVERS & ASSOCIATES

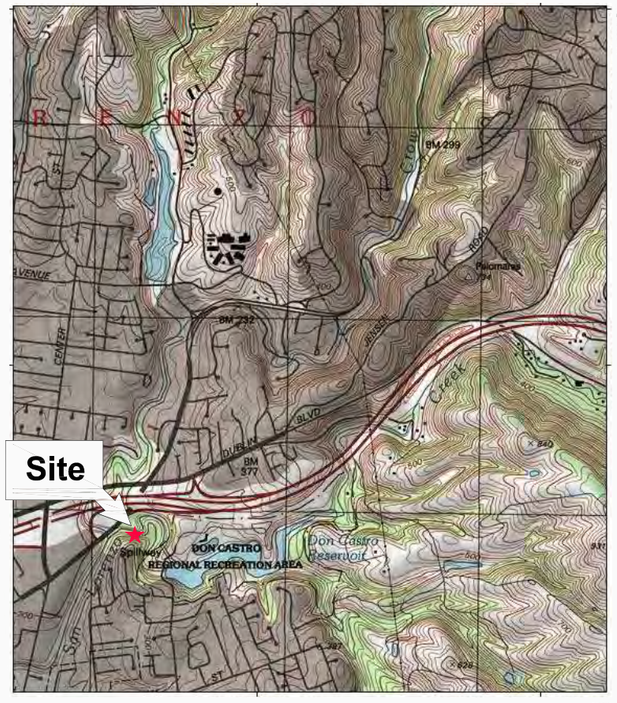
Scope of Work:

The following items define the scope of work to (1) provide dual-phase extraction from wells C-1, C-3, C6, C-9 and RW-1; (2) treat the extracted soil vapor and groundwater; (3) provide discharge of the treated groundwater; and 4) install electrical services.

1. Trench from remediation compound to designated wells as shown on Drawing 1 and referenced details.
2. Install remediation pipes to designated wells as shown on Drawing 1 and referenced details.
3. Backfill, compact, and resurface trenches as shown on Drawing 5.
4. Install well vaults as shown on Drawing 7.
5. Construct remediation compound as shown on Drawings 1 and 2, and referenced details.
6. Install remediation equipment as shown on Drawings 2, 3, and 4, and referenced details.
7. Install process pipe as shown on Drawings 3 and 4, and referenced details.
8. Install meter pedestal, conduit, wire, meter panel, grounding rod, and distribution panel for new electrical service as shown on Drawings 1 and 10, and referenced details.
9. Install fire extinguishers and eye wash station.
10. Install placards and signage.

Notes:

1. The design of this remediation system is based on the 2007 CBC, 2005 NEC, and the 1997 UFC, where applicable. Construction is to comply with the design basis and/or local agency requirements.
2. Remedial action is being implemented at the direction of and with the approval of the Alameda County Environmental Management Department (ACEMD)
3. Construction is to comply with OSHA and Chevron's LPS safety program.
4. Dual-phase extraction to be conducted under the authorization of a Bay Area Air Quality Management District(BAAQMD) permit to operate (to be obtained by Conestoga-Rovers & Associates).
5. Treated groundwater is to be discharged to the local santiary sewer under the authorization of a Castro Valley Sanitary District wastewater discharge permit. (to be obtained by Conestoga-Rovers & Associates).
6. Construction activites within the City of Castro Valley right-of-way is to be conducted under the authorization of an encroachment permit.



VICINITY MAP

CLIENT
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT
FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE
DUAL PHASE EXTRACTION SYSTEM
TITLE PAGE

DRAWING STATUS

NO	Revision	Date	Initial

SCALE VERIFICATION
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

CONESTOGA–ROVERS & ASSOCIATES
5900 HOLLIS STREET, SUITE A
EMERYVILLE, CA 94608
PHONE: 510.420.0700
FAX: 510.420.9170
WWW.CRAWORLD.COM

Source Reference:

Designed By: SVN	Date: 10/10/08	Drawing No: A
Drafted By: JS	Date: 10/10/08	
Reviewed By: DNL	Date:	
Scale: NOT TO SCALE		

10/10/08

1. INTRODUCTION

THE ENCLOSED DRAWINGS AND SPECIFICATIONS CONTAIN INFORMATION FOR THE CONSTRUCTION AND INSTALLATION OF A DUAL-PHASE EXTRACTION REMEDIATION SYSTEM ("SYSTEM"). THE FOLLOWING DRAWINGS DEPICTING THE REMEDIATION SYSTEM ARE REQUIRED FOR CONSTRUCTION AND INSTALLATION:

DRAWING NO.	REVISION	TITLE
A	0	TITLE PAGE
B	0	SPECIFICATIONS
1	0	SITE PLAN / LAYOUT
2	0	EQUIPMENT COMPOUND LAYOUT
3	0	PROCESS FLOW DIAGRAM - 1
4	0	PROCESS FLOW DIAGRAM - 2
5	0	CIVIL DETAILS - 1
6	0	CIVIL DETAILS - 2
7	0	CIVIL DETAILS - 3
8	0	MECHANICAL DETAILS - 1
9	0	MECHANICAL DETAILS - 2
10	0	ELECTRICAL SINGLE LINE DRAWING
11	0	ELECTRICAL DETAILS - 1
12	0	ELECTRICAL DETAILS - 2

THIS PACKAGE ALSO CONTAINS THE FOLLOWING SPECIFICATIONS REQUIRED FOR CONSTRUCTION AND INSTALLATION:

2. SPECIFICATIONS

2.1. GENERAL

2.1.1. THE SELECTED CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER'S PROJECT MANAGER SHALL BE NOTIFIED OF ANY DISCREPANCY.

2.1.2. ALL MATERIALS USED FOR CONSTRUCTION OF THE SYSTEM SHALL BE NEW UNLESS OTHERWISE NOTED.

2.1.3. EQUIPMENT AND INSTRUMENTS THAT ARE SPECIFIED TO BE SUPPLIED BY THE ENGINEER WILL BE PROVIDED BY THE ENGINEER FOR INSTALLATION BY THE CONTRACTOR UNLESS OTHERWISE NOTED. ALL OTHER MATERIALS SHALL BE PROVIDED BY THE CONTRACTOR.

2.1.4. ALL NECESSARY CONSTRUCTION PERMITS AND INSPECTIONS SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR, INCLUDING PERMITS FOR ELECTRICAL, MECHANICAL, AND CIVIL CONSTRUCTION. THE ENGINEER WILL OBTAIN THE REQUIRED DISCHARGE PERMITS.

2.1.5. THE CONTRACTOR SHALL RESTORE ALL EXCAVATED SURFACE AREAS TO MATCH EXISTING.

2.1.6. ALL CONSTRUCTION AREAS SHALL BE CLEARLY MARKED WITH BARRICADES, CONES, PLATES, OR OTHER APPROVED SAFETY MARKERS TO RESTRICT ACCESS AND PROVIDE A SAFE WORK ENVIRONMENT FOR THE CONTRACTOR AND SITE OCCUPANTS.

2.1.7. A PRE-CONSTRUCTION MEETING BETWEEN SITE OWNER, THE CONTRACTOR, AND ENGINEER WILL BE REQUIRED BEFORE ANY WORK BEGINS. THE MEETING WILL BE HELD AT THE SITE.

2.1.8. THE CONTRACTOR SHALL PROVIDE A TECHNICIAN FOR 4 HOURS DURING STARTUP OF THE EQUIPMENT.

2.1.9. THE CONTRACTOR SHALL WARRANTY ALL MATERIALS AND CONSTRUCTION FOR A PERIOD OF ONE YEAR. ALL DEFECTS SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.

2.1.10. ALL WORK SHALL BE CONDUCTED UNDER CHEVRON'S "PERMIT TO WORK" SYSTEM. NO WORK SHALL BE CONDUCTED WITHOUT A PERMIT TO WORK.

2.2. EXCAVATION

2.2.1. ALL EXCAVATED SOIL SHALL BE MONITORED BY THE CONTRACTOR IN ACCORDANCE WITH YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT (YSAQMD) GUIDELINES. SOIL SHALL BE PLACED IN A BERMED AREA LINED AND COVERED WITH A MINIMUM OF 6-MIL PLASTIC VISQUEEN. EARTHEN MATERIALS SHALL NOT BE USED TO SECURE THE PLASTIC LINERS OR COVERS. IF HYDROCARBON-IMPACTED SOIL IS DETECTED, THE SOIL SHALL BE SEGREGATED AND STOCKPILED IN AN AREA DESIGNATED BY THE ENGINEER AND COVERED WITH PLASTIC SHEETS IF NECESSARY. THE ENGINEER WILL SAMPLE THE EXCAVATED SOIL FOR HYDROCARBON ANALYSIS. THE ENGINEER WILL BE RESPONSIBLE FOR DISPOSAL OF SOILS WITH PETROLEUM HYDROCARBONS. THE CONTRACTOR SHALL DISPOSE OF ALL HYDROCARBON FREE SOIL AND CONSTRUCTION DEBRIS OF PAVEMENT REMOVED DURING TRENCHING.

2.2.2. WHERE PIPING IS INSTALLED BELOW GROUND, THE PIPE SHALL BE BURIED IN A TRENCH EXCAVATED TO A MINIMUM DEPTH OF 24 INCHES TO THE TOP OF THE PIPE, UNLESS OTHERWISE STATED. THE EXCAVATIONS SHALL BE SAWCUT TO PROVIDE A SQUARE VERTICAL JOINT FOR REPAVING. IF EXCAVATIONS MUST REMAIN OPEN AFTER NORMAL WORK HOURS, THEY SHALL BE COVERED AT THE CONTRACTOR'S EXPENSE, WITH METAL PLATES (TRENCH PLATES), CAPABLE OF SUPPORTING VEHICULAR TRAFFIC. EXCAVATIONS SHALL NOT REMAIN OPEN OVER A WEEKEND UNLESS COVERED BY TRENCH PLATES. IN CASES WHERE THE BUSINESS MUST REMAIN OPEN DURING CONSTRUCTION, ALL TRENCH PLATES SHALL BE ASPHALT COLD PATCHED TO PREVENT ACCIDENTAL TRIPS OR SLIPS BY THE GENERAL PUBLIC. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND CLEANING UP ANY STAINS LEFT BY ASPHALT, INCLUDING STEAM CLEANING ON SURFACE. CONTRACTOR SHALL BE RESPONSIBLE FOR WATER DISPOSAL FROM STEAM CLEANING (IF USED).

2.2.3. PIPING TRENCHES AND EXCAVATIONS SHALL BE BACKFILLED WITH IMPORTED SAND FROM 2 INCHES BELOW THE PIPING TO 6 INCHES ABOVE THE PIPING. NATIVE MATERIAL, IF NOT IMPACTED, SHALL BE USED AS BACKFILL MATERIAL FROM 6 INCHES ABOVE THE PIPING TO THE BOTTOM OF THE CONCRETE OR ASPHALT AGGREGATE BASE MATERIAL PROCESS. CONTRACTOR SHALL OBTAIN ENGINEER'S AUTHORIZATION PRIOR TO IMPORTING ANY FILL MATERIAL, IF REQUIRED, FOR BACKFILL. THE BACKFILL MATERIAL SHALL BE COMPACTED TO 95% OF THE RELATIVE DRY DENSITY. PAVEMENT REMOVED FOR TRENCHES OR OTHER EXCAVATIONS SHALL BE REPLACED WITH NEW MATERIAL TO MATCH EXISTING.

2.2.4. WHEN RESURFACING WITH ASPHALT, A MINIMUM OF 6 INCHES OF ASPHALTIC BASE MATERIAL SHALL BE USED OVER COMPACTED CLEAN BACKFILL MATERIAL. BASE MATERIAL SHALL BE COMPACTED TO 95% OF THE RELATIVE DRY DENSITY. THE ASPHALT MIX SHALL BE DESIGNED AND INSTALLED TO ALLOW FOR NORMAL SERVICE STATION TRAFFIC INCLUDING FUEL DELIVERY TRUCKS. COMPACT ASPHALT SURFACE USING TANDUM ROLLERS. ROLL UNTIL NO FURTHER COMPRESSION CAN BE OBTAINED AND ROLLING MARKS ARE ELIMINATED.

2.2.5. WHEN RESURFACING WITH CONCRETE, A MINIMUM OF 6-INCH THICK, 2,500 POUNDS PER SQUARE INCH (PSI) REINFORCED CONCRETE SHALL BE USED OVER 6-INCHES OF CONCRETE SLURRY. REINFORCING SHALL BE NO. 4 REBAR TIED TO AN EXISTING SLAB, STAGGERED ON EACH SIDE OF THE TRENCH ON 18-INCH CENTERS PLACED AT MID-HEIGHT. FOR TRENCHES LESS THAN 3 FEET WIDE, A FIBER-REINFORCED MESH MAY BE SUBSTITUTED FOR REBAR. CONCRETE SHALL BE DOWELLED WHERE APPLICABLE.

2.2.6. CONTRACTOR TO REMOVE AND DISPOSE OF CONCRETE PARKING BLOCKS, ASPHALT, AND ANY OTHER RECYCLABLE MATERIALS AS NEEDED.

2.2.7. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO UNDERGROUND UTILITIES, PIPING, AND ADJOINING STRUCTURES.

2.2.8. CONTRACTOR SHALL MAKE EVERY EFFORT TO UTILIZE EXISTING EDGES OF PAVEMENT WHEN SAWCUTTING TO REDUCE UNNECESSARY SAWCUTS.

2.2.9. CONTRACTOR SHALL USE AQUA CRETE OR EQUIVALENT SEALANT TO SEAL THE CONCRETE JOINTS.

2.2.10. CONTRACTOR SHALL RETURN TO THE SITE AFTER ONE WEEK AND APPLY ASPHALT JOINT SEALER TO ALL AREAS THAT WERE TRENCHED AND REPLACED.

2.3. CONCRETE MIX DESIGN SPECIFICATION

2.3.1. A. STRENGTH - 2,500 PSI, 5-1/2 BAG MIX

B. AGGREGATE SIZE - C2 GRAVEL 3/4" TO 1"

C. CEMENT TYPE AND BAG MIX - TYPE 1 PORTLAND CEMENT

D. CURE TIME - 28 DAYS 90% CURE

E. SLUMP - MIN 3" MAX 5-1/2"

F. MAX TURNS - 70 ROTATIONS G. MAX TRAVEL TIME - HOT WEATHER 1 HOUR 15 MINUTES, COLD WEATHER 2 HOURS.

2.4. PIPING

2.4.1. ALL UNDERGROUND PROCESS PIPING SHALL BE SCHEDULE 40 POLYVINYL CHLORIDE (PVC) (UNLESS OTHERWISE INDICATED) WITH GLUED SLIP FITTINGS. ALL ABOVEGROUND PROCESS PIPING SHALL BE SCHEDULE 80 PVC (UNLESS OTHERWISE INDICATED) WITH GLUED SLIP FITTINGS AS INDICATED BY THE DRAWINGS (UNLESS OTHERWISE INDICATED). CONTRACTOR TO USE LOW VOLATILE ORGANIC COMPOUND EMITTING PRIMERS AND SOLVENTS WHEN INSTALLING GLUED SLIP FITTINGS. UNLESS OTHERWISE STATED, ALL VALVES SHALL BE THREADED BRASS AS INDICATED BY THE DRAWINGS.

2.4.2. ALL ABOVEGROUND PIPING SHALL BE PERMANENTLY LABELED WITH DIRECTIONAL FLOW ARROWS AND LINE CONTENTS AT 5 FOOT INTERVALS, I.E.: COMPRESSED AIR, KO WATER, SOIL VAPOR, AND PRODUCT.

2.4.3. ALL ABOVEGROUND PIPING SHALL BE PAINTED WITH UV PROTECTIVE PAINT USING THE FOLLOWING COLORS:

A. GREY = ALL SOIL VAPOR LINES

B. BLUE = ALL WATER LINES

C. GREEN = ALL AIR LINES

2.4.4. ALL 90° BENDS SHALL BE CONSTRUCTED USING LONG-SWEEP 90° ELBOWS.

2.4.5. WHEN CONNECTING TO OR BYPASSING EXISTING UNDERGROUND PIPING, THE CONTRACTOR SHALL FIRST VERIFY THE EXISTING PIPING PATH.

2.4.6. WHERE PIPING IS ROUTED ABOVEGROUND INSIDE THE EQUIPMENT ENCLOSURE, THE PIPING SHALL BE SUPPORTED BY UNI-STRUT PIPE SUPPORTS AND CLAMPS. THE UNI- STRUT SUPPORTS SHALL BE FASTENED TO THE WALL OR MOUNTED ON A BASE THAT IS SECURED TO THE GROUND SURFACE.

2.4.7. ALL PROCESS PIPING SHALL BE PRESSURE TESTED ACCORDING TO LOCAL SPECIFICATIONS AND WITNESSED BY AN ENGINEER'S REPRESENTATIVE. NO TESTING WILL BE CONDUCTED THROUGH INSTRUMENTS OR EQUIPMENT. ALL VAPOR, AIR, WATER AND SECONDARY CONTAINMENT LINES WILL BE PRESSURE TESTED AT A MINIMUM PRESSURE OF 15 PSI FOR MINIMUM 1 HOUR.

2.4.8. ALL UNDERGROUND GROUNDWATER PROCESS PIPING SHALL BE 3/4" HOSE ENCLOSED IN SCHEDULE 40 PVC. ALL 90° BENDS SHALL BE CONSTRUCTED USING LONG-SWEEP 90° ELBOWS.

2.4.9. WHENEVER POSSIBLE, LATERAL PIPING SHALL BE SLOPED TOWARD WELLHEADS AT A RATIO OF 1:100. IF A TRENCH DEPTH OF GREATER THAN 4 FEET IS NEEDED TO ACHIEVE THE REQUIRED SLOPE, THEN CLEANOUT WYES (STUBBED UP AND CAPPED WITHIN TRAFFIC RATED WELLHEAD PROTECTION BOXES) MAY BE SUBSTITUTED. THE CLEAN- OUT WYES WILL BE INSTALLED AT LOW POINT OF PIPING RUN.

2.4.10. SEWER CONNECTIONS SHALL MEET LOCAL PLUMBING CODE REQUIREMENTS AND STANDARD SPECIFICATIONS. SEWER PIPING SHALL BE OF ABS MATERIAL FOR ALL UNDERGROUND LINES AND CAST IRON FOR ALL ABOVEGROUND STUBOUTS AND CONNECTIONS. SEWER CONNECTIONS MAY REQUIRE NEW SEWER CLEANOUT.

2.4.11. CONNECT DISCHARGE LINE TO EXISTING SEWER INLET.

2.4.12. THE CONTRACTOR WILL IDENTIFY (ID) ALL WELL MANIFOLD PIPING USING STEEL TAGS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO STAMP THE APPROPRIATE WELL ID'S ON THE STEEL TAGS AND ATTACH THE TAGS WITH CHAINS TO THE CORRESPONDING WELLS AT THE MANIFOLD.

2.5. ELECTRICAL

2.5.1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT NECESSARY TO EXTEND THE EXISTING PACIFIC GAS & ELECTRIC COMPANY (PG&E) ELECTRIC SERVICE AND ROUTE THE APPROPRIATE ELECTRIC SERVICE TO THE REMEDIATION SYSTEM AND REMEDIATION CONTROL PANEL(S). THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING POWER TO THE DUAL-PHASE EXTRACTION SYSTEM AND OBTAINING THE ELECTRICAL PERMIT FOR OPERATION OF THE EQUIPMENT. THE CONTRACTOR SHALL VERIFY OPERATION OF ALL ELECTRICAL EQUIPMENT UPON COMPLETION OF THE WORK.

2.5.2. THE CONTRACTOR SHALL ACQUIRE ALL NECESSARY PERMITS AND PAY ALL ASSOCIATED FEES INCLUDING CONNECTION AND DISCONNECTION FEES. THE CONTRACTOR SHALL PAY FOR POWER POLE INSTALLATION DEPOSIT, IF NECESSARY.

2.5.3. THE ELECTRIC SERVICE SHALL BE EQUIPPED WITH A POWER METER AND WEATHER-TIGHT MAIN PANEL WITH A LOCKABLE SHUTOFF SWITCH LOCATED OUTSIDE THE EQUIPMENT ENCLOSURE.

2.5.4. ALL ELECTRICAL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE NATIONAL ELECTRIC CODE (N.E.C.), THE LOCAL BUILDING DEPARTMENT, AND THE LOCAL FIRE DEPARTMENT. ANY DRAWINGS REQUIRED FOR PERMITS OTHER THAN THOSE PRESENTED HEREIN WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REVIEWED BY THE ENGINEER PRIOR TO USE.

2.5.5. THE INSTALLATION WITHIN THE EQUIPMENT ENCLOSURE SHALL COMPLY WITH THE APPROPRIATE ELECTRICAL CLASSIFICATION AS PER N.E.C. AND LOCAL CODES. ALL WIRING CONNECTORS, CONDUIT, AND CONTRACTOR SUPPLIED EQUIPMENT SHALL COMPLY AT A MINIMUM WITH CLASS I, DIVISION II REQUIREMENTS, AS SPECIFIED BY THE N.E.C. OR LOCAL CODES.

2.5.6. ABOVEGROUND WIRING SHALL BE CONTAINED IN RIGID CONDUIT AND ROUTED ALONG THE ENCLOSURE FLOOR AND WALLS OR BURIED AS ALLOWED BY LOCAL CODE. LIQUID TIGHT FLEX CONDUIT OF UP TO 36" IN LENGTH MAY BE USED.

2.5.7. ALL ELECTRICAL CONNECTIONS IN SUBSURFACE VAULTS OR PULL BOXES SHALL BE COMPLETED AT A MINIMUM IN WATERTIGHT JUNCTION BOXES. EXPOSED WIRING IS NOT ACCEPTABLE IN VAULTS OR PULL BOXES.

2.6. EQUIPMENT

2.6.1. EQUIPMENT TO BE PROVIDED TO THE CONTRACTOR BY THE ENGINEER FOR INSTALLATION IS INCLUDED ON DRAWING 3 (EQUIPMENT SKID LAYOUT) AND DRAWING 4 (PROCESS AND INSTRUMENTATION DIAGRAM).

2.6.2. CONTRACTOR SHALL LABEL ALL STORAGE TANKS WITH APPROPRIATE CONTENTS AND LABEL DIRECTION OF FLOW ON ALL PIPES.

2.7. EQUIPMENT ENCLOSURE

2.7.1. CONTRACTOR TO INSTALL THE FOLLOWING SIGNAGE ON THE ENCLOSURE, SEE SHEET C-2 FOR LOCATION OF EACH SIGN:

A. EMERGENCY CONTACT INFO

B. NO SMOKING SIGN

C. PROPOSITION 65 SIGN

D. EMERGENCY SHUTOFF SIGN

E. EYEWASH SIGN

2.7.2. CONTRACTOR TO SUPPLY AND INSTALL TWO FIRE EXTINGUISHERS IN AN ALL WEATHER FIRE EXTINGUISHER CABINETS AND IN ACCORDANCE WITH LOCAL FIRE CODES. CONTRACTOR TO SUPPLY MINIMUM 20 POUND ABC FIRE EXTINGUISHERS.

2.7.3. CONTRACTOR TO SUPPLY AND INSTALL EYEWASH KIT, FIRE BLANKET, AND FIRST AID KIT.

2.8. CONSTRUCTION

2.8.1. THE CONTRACTOR SHALL CONFIRM A CONSTRUCTION SCHEDULE WITH THE ENGINEER'S PROJECT MANAGER AT LEAST 14 DAYS PRIOR TO ANY WORK AT THE SITE.

2.8.2. THE PROPOSED CONSTRUCTION SCHEDULE SHALL BE PRESENTED IN A TIMELINE FORMAT SHOWING ESTIMATED START DATE, DURATION, AND, COMPLETION TIMES FOR EACH ACTIVITY. ANY DEVIATION FROM THE ORIGINALLY PROPOSED SCHEDULE MUST BE COMMUNICATED TO THE ENGINEER'S PROJECT MANAGER WITHIN 24 HOURS.

2.9. AS-BUILT DRAWINGS

2.9.1. THE CONTRACTOR SHALL PROVIDE AS BUILT RECORD DRAWINGS (RED LINES) SHOWING ACTUAL DETAILS, DIMENSIONS, AND OTHER PERTINENT FEATURES THAT VARY FROM THE ORIGINAL DESIGN.

3. SAFETY / CLEANUP

3.1. THE CONTRACTOR (INCLUDING WORKERS AND SUBCONTRACTORS) SHALL PREPARE A SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP) AND A JOURNEY MANAGEMENT PLAN (JMP) PRIOR TO BEGINNING ANY WORK, AND SHALL ABIDE BY THE HASP DURING ALL SITE WORK. A COPY OF THE HASP AND JMP SHALL BE PROVIDED TO THE ENGINEER PRIOR TO BEGINNING ANY SITE WORK.

3.2. PRIOR TO DEPARTURE FROM THE SITE, THE CONTRACTOR SHALL MAKE SURE THAT THE WORK AREA IS CLEAN AND ORDERLY. THE CONTRACTOR SHALL CONTAIN LOOSE DEBRIS AND STORE CONSTRUCTION MATERIALS ON A DAILY BASIS PRIOR TO DEPARTURE FROM THE SITE TO PROVIDE A CLEAN AND ORDERLY WORK AREA.

3.3. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL, AND CHEVRON-SPECIFIED HEALTH AND SAFETY REQUIREMENTS.

3.4. CONTRACTOR SHALL PROVIDE SAFETY SIGNS FOR TRENCHING INCLUDING, BUT NOT RESTRICTED TO, 5 MILES PER HOUR (MPH) AND TRENCH PLATES AHEAD.

3.5. CONTRACTOR SHALL ABIDE BY AN ENGINEER AND CHEVRON APPROVED JOB SAFETY ANALYSIS (JSA).

3.6. EXCLUSION ZONE SHALL BE CLEARLY SECTIONED OFF USING, BUT NOT RESTRICTED TO, DELINEATORS, CAUTION TAPE, AND SNOW FENCING.

3.7. ALL EMPLOYEES OF THE CONTRACTOR SHALL BE CURRENT WITH THEIR 40-HOUR HAZWOPER TRAINING AND 8-HOUR REFRESHER. ALL EMPLOYEES OF THE CONTRACTOR SHALL BE TRAINED IN CHEVRON'S LOSS PREVENTION SYSTEM (LPS) . PROOF OF SAID DOCUMENTS SHALL BE KEPT ONSITE. CONTRACTOR SHALL MEET REQUIREMENTS OF CHEVRON'S SHORT SERVICE EMPLOYEE PROCESS (SSE).

3.8. CONTRACTOR SHALL MARK ALL POTENTIAL OVERHEAD AND/OR TRIP HAZARDS IN YELLOW.

4. INSPECTIONS

4.1. ALL SITE INSPECTIONS REQUIRE A MINIMUM 24 HOURS NOTICE. ALL FIRE DEPARTMENT INSPECTIONS ARE TO BE REQUESTED. PLEASE BE SPECIFIC AS TO TYPE OF INSPECTION.

5. CHANGE ORDERS

5.1. ANY SCOPE OF WORK CHANGES OR ITEMS WHICH ARISE DURING A PRE-CONSTRUCTION SITE VISIT, PERMITTING PHASE, OR CONSTRUCTION PHASE SHALL BE COMMUNICATED TO THE ENGINEER WITHIN 24 HOURS. CONTRACTOR SHALL OBTAIN ENGINEER'S APPROVAL BEFORE FIELDWORK IS CONTINUED, UNLESS THE DELAY PRESENTS A SAFETY RISK. THE ENGINEER WILL USE BEST PROFESSIONAL JUDGEMENT IN THESE CASES. CONTRACTOR SHALL SUBMIT A WRITTEN CHANGE ORDER TASK REQUEST WITH DOLLAR AMOUNTS TO THE ENGINEER FOR APPROVAL WITHIN 3 BUSINESS DAYS.

CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT

FORMER CHEVRON STATION # 9-5607

5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL-PHASE EXTRACTION SYSTEM SPECIFICATIONS

DRAWING STATUS

N.O.	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

CONESTOGA–ROVERS & ASSOCIATES

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Source Reference:

Designed By: SVN	Date: 10/10/08	Drawing N#: B
Drafted By: SVN	Date: 10/10/08	
Reviewed By: DNL	Date:	
Scale: NA		

10/10/08

CROW CANYON ROAD

E
G

C-12

TS

W

PH

SS

?

47.1'

7.5'

8.2'

B
5

A
8

C-1

Proposed Rem.
Compound

D
5

--
2

A
5

6' high chain
link fence

C-2

former USTs

former Rem.
Compound

A
5

Concrete

C-3

C-6

RW-1

Trash

w/o
tank

62.3'

Service Desk

Shed

41.0'

Automotive
Repair Bays

25.1'

Office/Storage

8.1'

27.8'

21.1'

B
5

~45 deg slope

Retaining Wall

18.8'

C-7

~30 deg slope

32.2'

C-9

Pull Box

property line

WATERFORD PLACE

parking lot

Residential Property

Asphalt

C-8

30.9'

Proposed Eqpt.
Container

67.9'

Parking

? ?

Arbor

47.5'

Existing 5' Wood
Fence

C
5

C
5

1' Wide easement granted
to Western Pacific Housing

See Figure 14 of current PG&E
Document # 051122 for bollard type,
spacing, and installation details

28.0'

Parking

C-5

Proposed pad-mount
PG&E transformer

A
10

Residence

EXPLANATION

- C-1 Monitoring Well Location
- RW Recovery Well Location
- Underground Electrical Line (E)
- Underground Gas Line (G)
- Underground Phone/Cable Line
- Underground Water Line (W)
- Underground Sanitary Sewer (SS)
- Existing Underground Remediation Pipe
- W SS Utility Box/Vault/Cleanout
- Proposed Remediation Trench/Pipe
- Proposed Wall-Mounted Remediation Pipe
- Storm Drain Inlet / Catch Basin

N

0 10 20 40

Scale (ft)

Basemap modified from drawing provided by Gettler-Ryan, Inc.

CLIENT

CHEVRON ENVIRONMENTAL
MANAGEMENT COMPANY

PROJECT

FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL-PHASE EXTRACTION SYSTEM
SITE PLAN/LAYOUT

DRAFT

DRAWING STATUS

No	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

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Reviewed By: DNL	Date:	
Scale: 1" = 20'		

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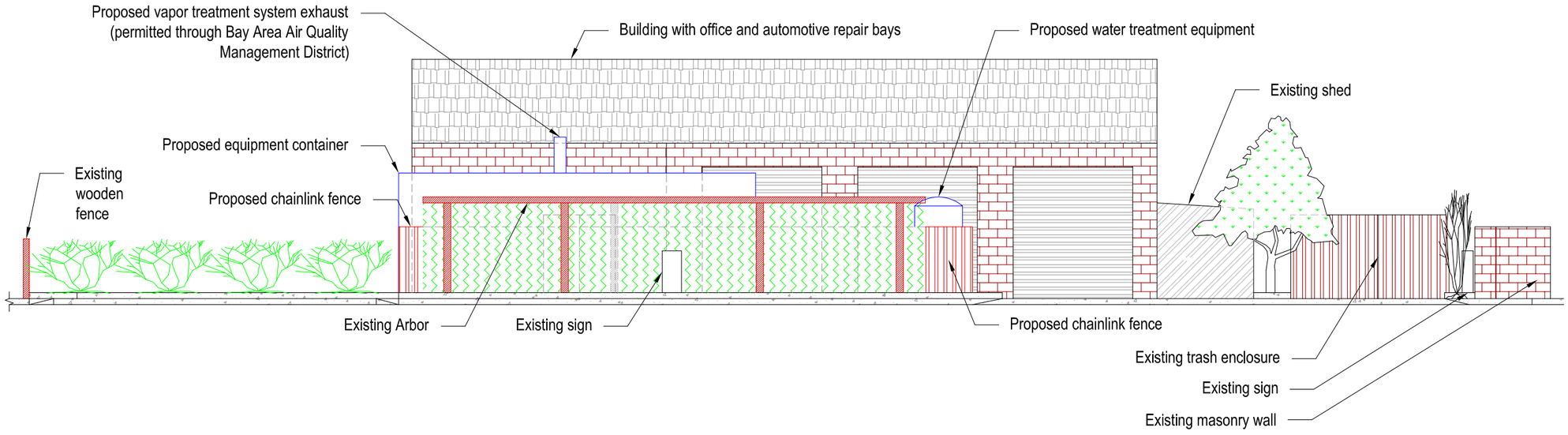

ELEVATION OF SITE - FRONT VIEW
(LOOKING FROM CROW CANYON ROAD)

CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT

FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL-PHASE EXTRACTION SYSTEM
ELEVATION OF SITE - FRONT VIEW

DRAFT

DRAWING STATUS

No	Revision	Date	Initial

SCALE VERIFICATION

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Drafted By: SVN	Date: 10/10/08	
Reviewed By: DNL	Date:	
Scale: 1" = 10'		

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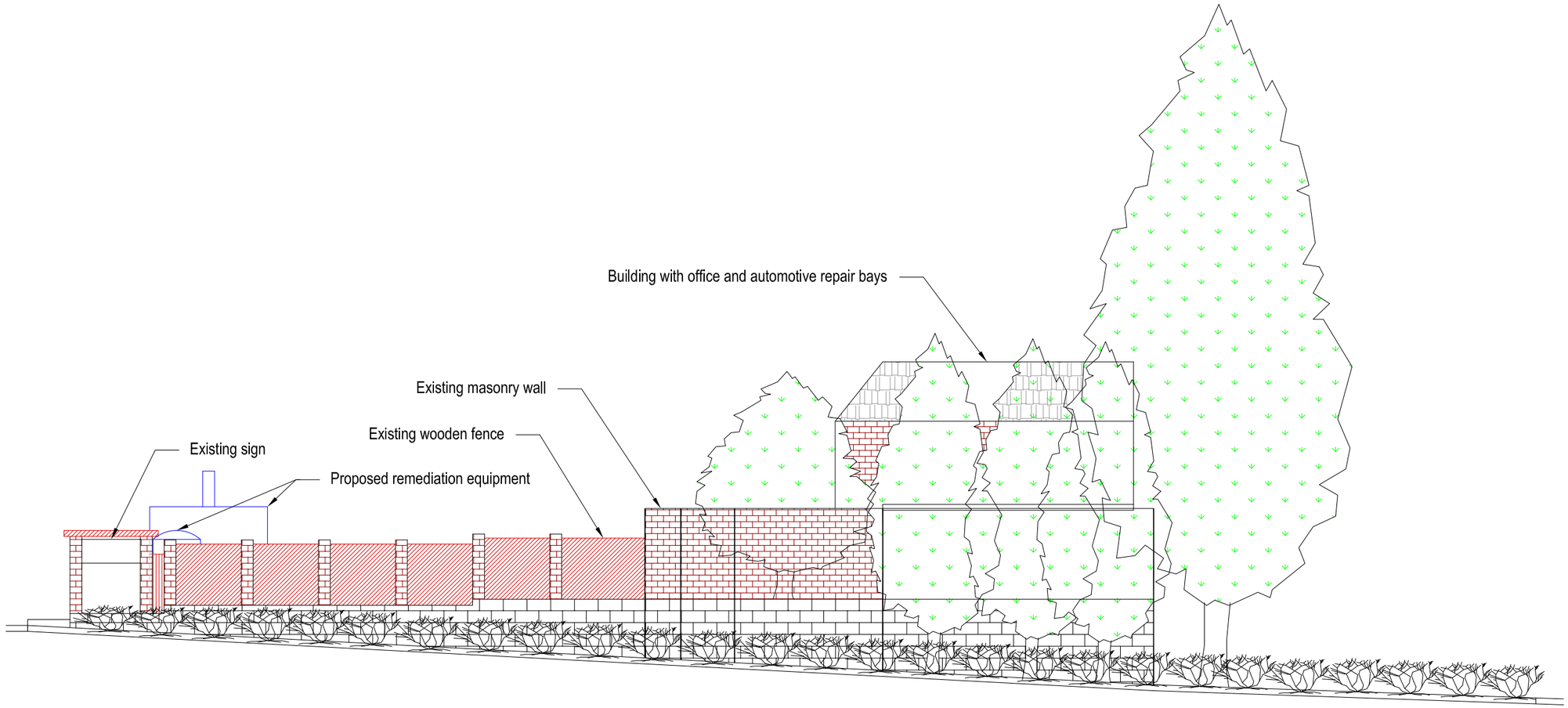

ELEVATION OF SITE - SIDE VIEW
(LOOKING FROM WATERFORD PLACE)

CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT

FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL-PHASE EXTRACTION SYSTEM
ELEVATION OF SITE - SIDE VIEW

DRAFT

DRAWING STATUS

No	Revision	Date	Initial

SCALE VERIFICATION

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Drafted By: SVN	Date: 10/10/08	
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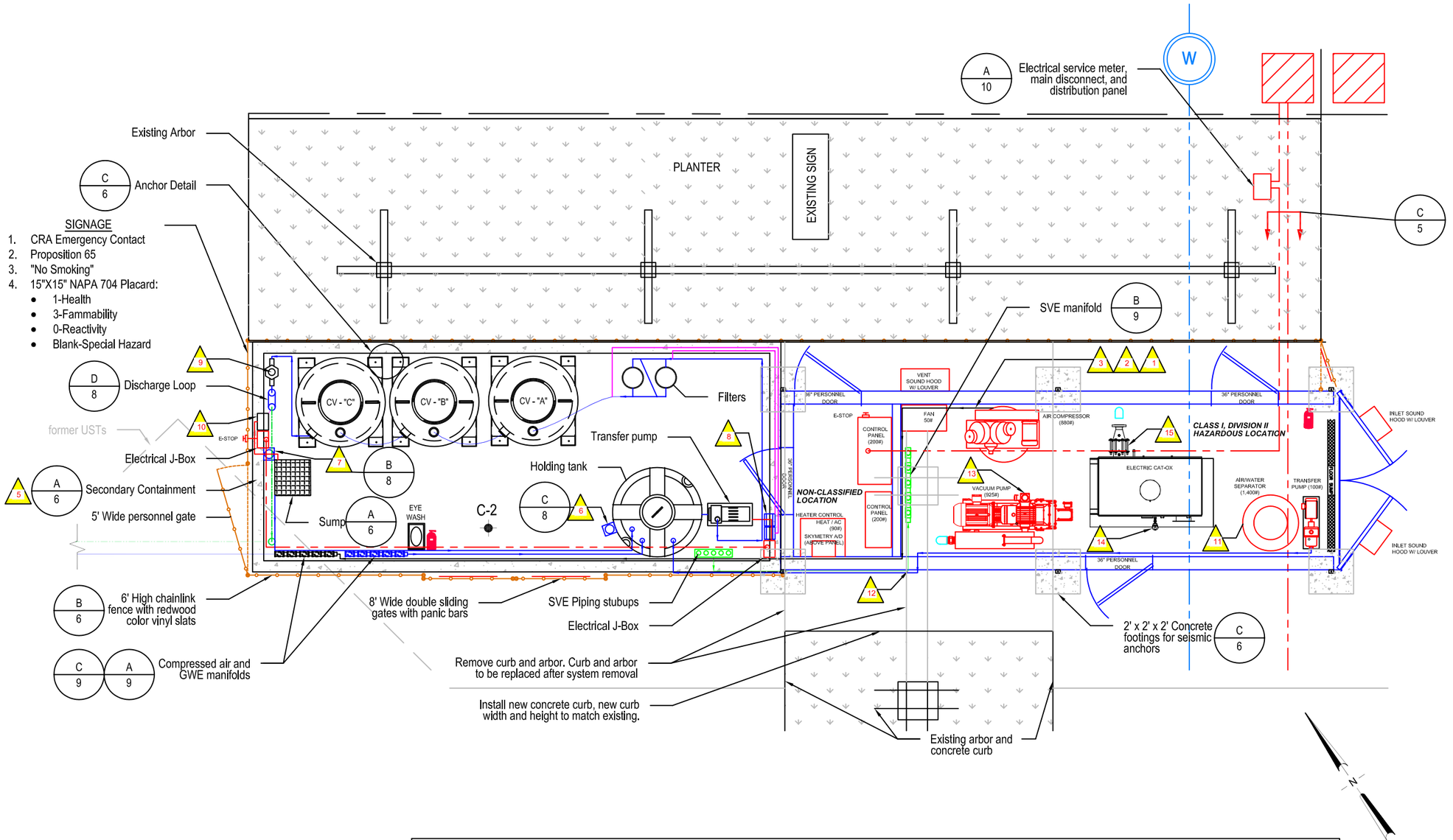

Legend

- Underground Electrical Conduit
- Underground Waterline
- SVE Piping (3" Ø SCH 80 PVC PIPE)
- Groundwater Pipe (2" Ø SCH 80 PVC PIPE)
- Compressed Air Line (1/2" Galvanized Pipe)
- Electrical Conduit
- Control/instrument connections
- Proposed Remediation Compound Fence
- Min. 20# ABC Dry Chem. Fire Extiguisher Mount 3 to 5 Feet above Floor

CHEVRON CRITICAL DEVICES:

1. HIGH PRESSURE SWITCH ON COMPRESSED AIR TANK PROVIDED BY AIR COMPRESSOR MANUFACTURER
2. HIGH PRESSURE RELIEF VALVE ON COMPRESSED AIR TANK PROVIDED BY AIR COMPRESSOR MANUFACTURER
3. ASCO 3-WAY AIR SOLENOID VALVE MODEL # 8321G2
4. O'KEEFE PNEUMATIC FLOAT VALVE PART # OKC-2250-2
5. SECONDARY CONTAINMENT PER DETAIL A OF DRAWING 6
6. HIGH LEVEL SWITCH ON TRANSFER TANK WARRICK CONTROLS - MULTI-PROBE FTG (MODEL# 3G4E1)
7. HIGH LEVEL SWITCH ON SECONDARY CONTAINMENT BERM WARRICK CONTROLS - MULTI-PROBE FTG (MODEL# 3G2E1)
8. HIGH PRESSURE SWITCH UNITED ELECTRIC PRESSURE SWITCH (TYPE H100)
9. FLOW TOTALIZER HAYS PULSE FLOW METER (MODEL #5P301)
10. LOWER EXPLOSIVE LIMIT METER GASTECH SAFETNET 100
11. HIGH HIGH LEVEL SWITCH ON KNOCK-OUT TANK PROVIDED BY OXIDIZER VENDOR
12. MOTOR-ACTUATED WELL FIELD/DILUTION AIR VALVE (LINKED) PROVIDED BY OXIDIZER VENDOR
13. VACUUM RELIEF VALVE PROVIDED BY EXTRACTION BLOWER MANUFACTURER
14. HIGH HIGH TEMPERATURE SENSOR PROVIDED BY OXIDIZER VENDOR
15. FLAME ARRESTOR PROVIDED BY OXIDIZER VENDOR

CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT

FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL PHASE EXTRACTION SYSTEM EQUIPMENT COMPOUND LAYOUT

DRAFT

DRAWING STATUS

No	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

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Drafted By: JS	Date: 10/12/08	
Reviewed By: DNL	Date:	
Scale: 1" = 5'		

10/12/08

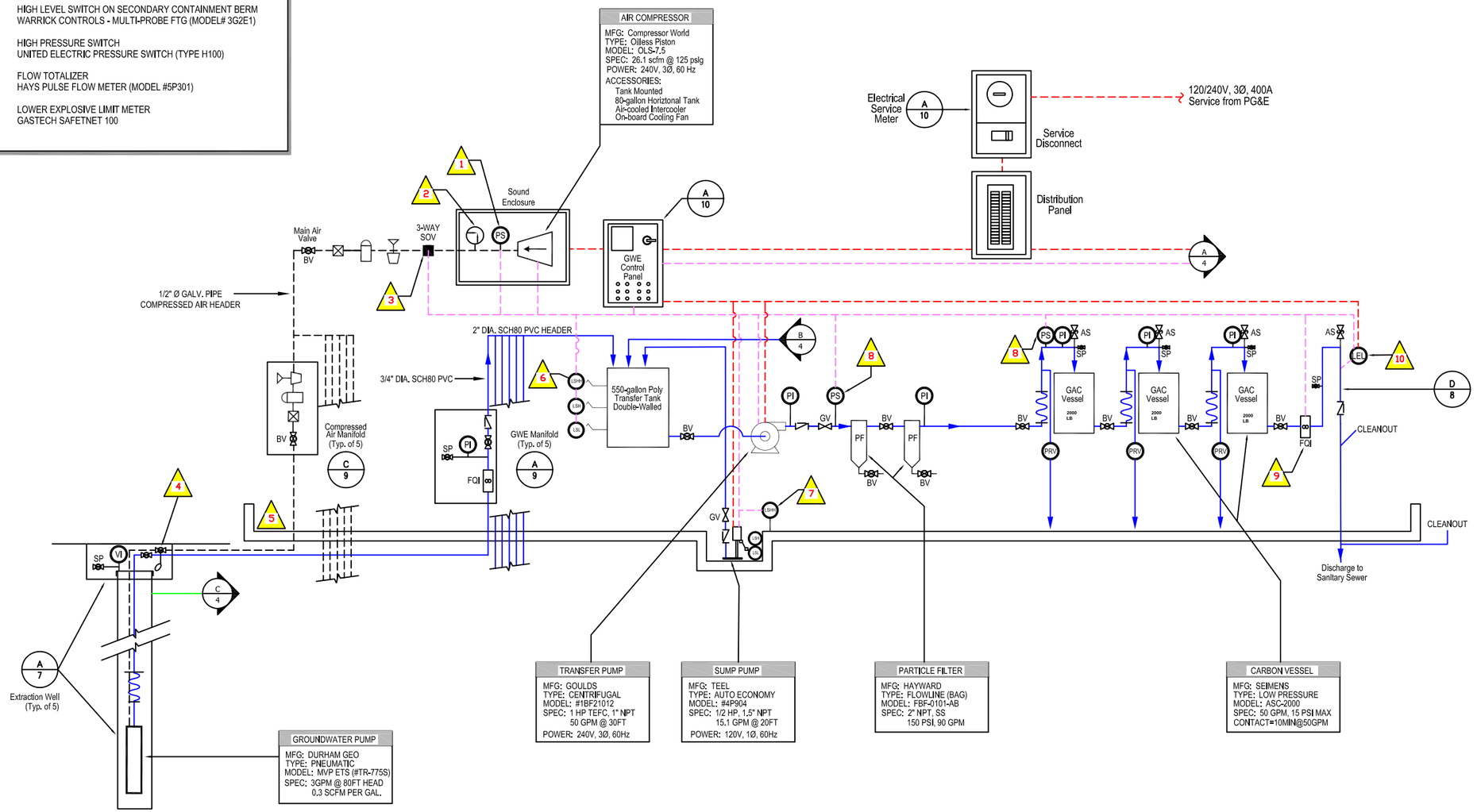
CRITICAL DEVICES:

1. HIGH PRESSURE SWITCH ON COMPRESSED AIR TANK
   PROVIDED BY AIR COMPRESSOR MANUFACTURER
2. HIGH PRESSURE RELIEF VALVE ON COMPRESSED AIR TANK
   PROVIDED BY AIR COMPRESSOR MANUFACTURER
3. ASCO 3-WAY AIR SOLENOID VALVE
   MODEL # 8321G2
4. O'KEEFE PNEUMATIC FLOAT VALVE
   PART # OKC-2250-2
5. SECONDARY CONTAINMENT
   PER DETAIL A OF DRAWING 6
6. HIGH LEVEL SWITCH ON TRANSFER TANK
   WARRICK CONTROLS - MULTI-PROBE FTG (MODEL# 3G4E1)
7. HIGH LEVEL SWITCH ON SECONDARY CONTAINMENT BERM
   WARRICK CONTROLS - MULTI-PROBE FTG (MODEL# 3G2E1)
8. HIGH PRESSURE SWITCH
   UNITED ELECTRIC PRESSURE SWITCH (TYPE H100)
9. FLOW TOTALIZER
   HAYS PULSE FLOW METER (MODEL #5P301)
10. LOWER EXPLOSIVE LIMIT METER
    GASTECH SAFETNET 100

EXPLANATION

- FQI — Flowmeter/Indicator
- BV = Ball Valve
- GV = Gate Valve
- SP — Sample Port
- Flexible Hose
- TS — Temperature Sensor
- LSHH — Level Switch - Hi Hi
- LSH — Level Switch - Hi
- LSL — Level Switch - Low
- PS — Pressure Transmitting Switch
- FI — Flow Indicator
- PRV — Pressure Relief Valve
- PI — Pressure Indicator
- VI — Vacuum Indicator
- Water Trap
- Air Filter
- Air Pressure Regulator
- AS — Vacuum Breaker
- Quick Disconnect
- Check Valve
- Solenoid Valve
- SOV — Vacuum/Pressure relief valve
- M — Motor
- SVE Piping
- Electrical Control Wiring
- Electrical Power Wiring
- Compressed Air Line
- Groundwater Piping
- CHEVRON CRITICAL DEVICE

NOTE: AS PER CHEVRON REQUIREMENTS, BOSS GROUND JOINT COUPLERS WILL BE USED IN PLACE OF CAM LOCKS



CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT

FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL PHASE EXTRACTION SYSTEM
PROCESS FLOW DIAGRAM - 1

DRAWING STATUS

NO	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

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Drafted By: JS	Date: 10/08/08	
Reviewed By: DNL	Date:	
Scale: Not To Scale		

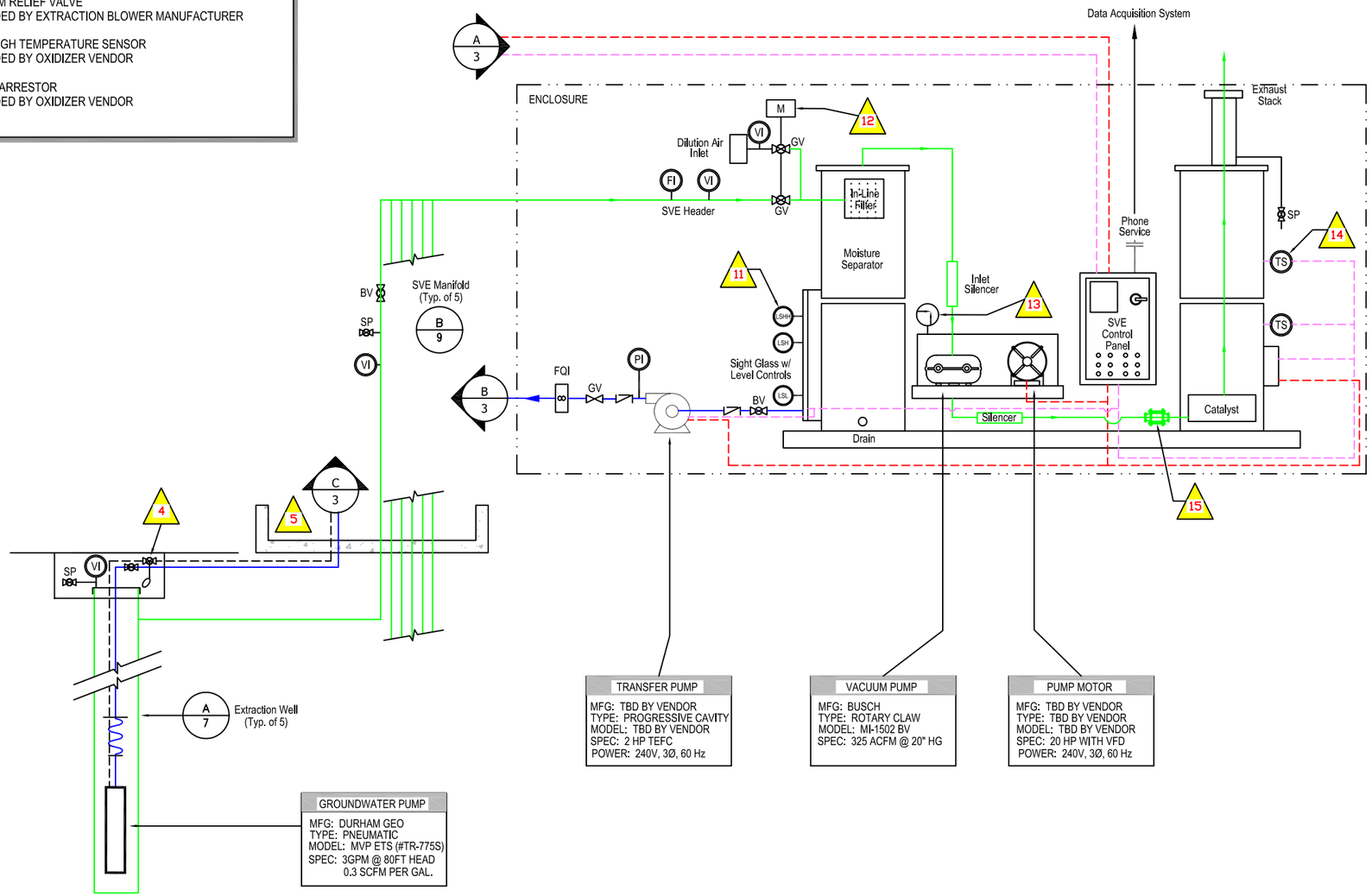
10/08/08

CRITICAL DEVICES:

- 4 — O'KEEFE PNEUMATIC FLOAT VALVE PART # OKC-2250-2
- 5 — SECONDARY CONTAINMENT PER DETAIL A OF DRAWING 6
- 11 — HIGH HIGH LEVEL SWITCH ON KNOCK-OUT TANK PROVIDED BY OXIDIZER VENDOR
- 12 — MOTOR-ACTUATED WELL FIELD/DILUTION AIR VALVE (LINKED) PROVIDED BY OXIDIZER VENDOR
- 13 — VACUUM RELIEF VALVE PROVIDED BY EXTRACTION BLOWER MANUFACTURER
- 14 — HIGH HIGH TEMPERATURE SENSOR PROVIDED BY OXIDIZER VENDOR
- 15 — FLAME ARRESTOR PROVIDED BY OXIDIZER VENDOR

EXPLANATION

- 8 FQI — Flowmeter/Indicator
- BV = Ball Valve
- GV = Gate Valve
- SP — Sample Port
- Flexible Hose
- TS — Temperature Sensor
- LSHH — Level Switch - Hi Hi
- LSH — Level Switch - Hi
- LSL — Level Switch - Low
- PS — Pressure Transmitting Switch
- FI — Flow Indicator
- PI — Pressure Indicator
- VI — Vacuum Indicator
- Water Trap
- Air Filter
- Air Pressure Regulator
- AS — Vacuum Breaker
- Quick Disconnect
- Check Valve
- Solenoid Valve
- SOV — Vacuum/Pressure relief valve
- M — Motor
- SVE Piping
- Electrical Control Wiring
- Electrical Power Wiring
- Compressed Air Line
- Groundwater Piping
- 1 — CHEVRON CRITICAL DEVICE



TRANSFER PUMP
MFG: TBD BY VENDOR
TYPE: PROGRESSIVE CAVITY
MODEL: TBD BY VENDOR
SPEC: 2 HP TEFC
POWER: 240V, 3Ø, 60 Hz

VACUUM PUMP
MFG: BUSCH
TYPE: ROTARY CLAW
MODEL: MI-1502 BV
SPEC: 325 ACFM @ 20" HG

PUMP MOTOR
MFG: TBD BY VENDOR
TYPE: TBD BY VENDOR
MODEL: TBD BY VENDOR
SPEC: 20 HP WITH VFD
POWER: 240V, 3Ø, 60 Hz

GROUNDWATER PUMP
MFG: DURHAM GEO
TYPE: PNEUMATIC
MODEL: MVP ETS (#TR-775S)
SPEC: 3GPM @ 80FT HEAD
0.3 SCFM PER GAL.

CLIENT
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT
FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA
CRA PROJECT # 311950

TITLE
DUAL PHASE EXTRACTION SYSTEM
PROCESS FLOW DIAGRAM - 2

DRAWING STATUS

NO	Revision	Date	Initial

SCALE VERIFICATION
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

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Source Reference:

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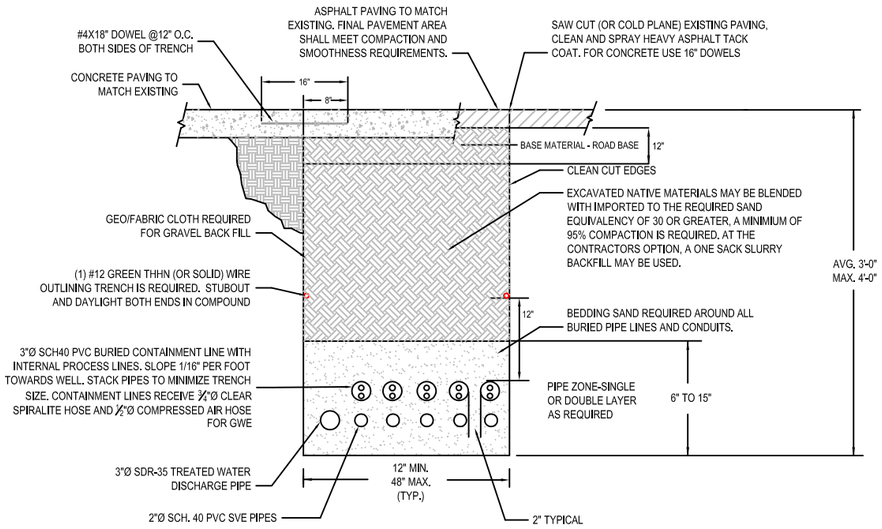
Drafted By: JS	Date: 10/08/08	
Reviewed By: DNL	Date:	
Scale: Not To Scale		

10/08/08

A/5 Combined Trench Cross-Section

SCALE: **Not to Scale**



B/5 Piping Trench Cross-Section

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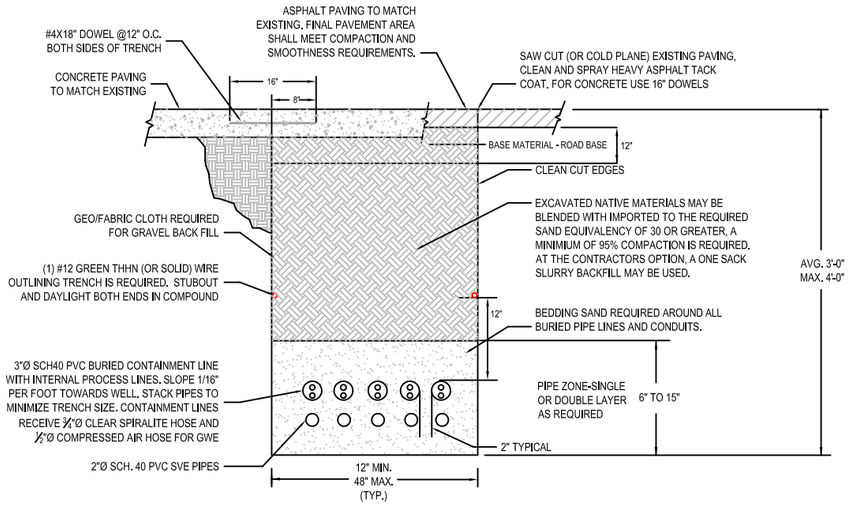

C/5 Utility Trench Cross-Section

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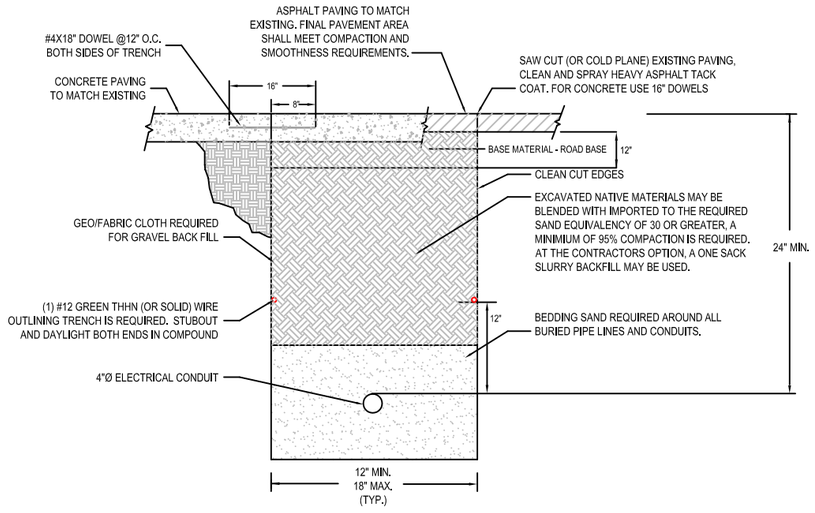

D/5 Aboveground Piping Cross-Section

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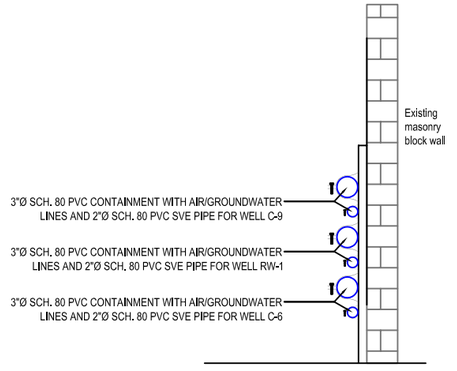

CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT

FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL PHASE EXTRACTION SYSTEM
CIVIL DETAILS - 1

DRAWING STATUS

No.	Revision	Date	Initial

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THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

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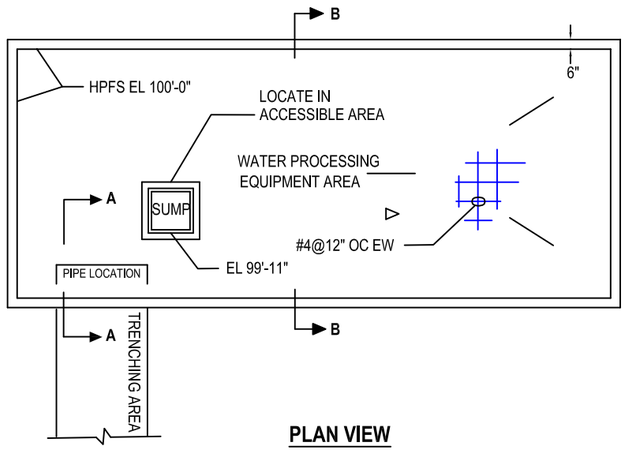
Scale: Not To Scale		

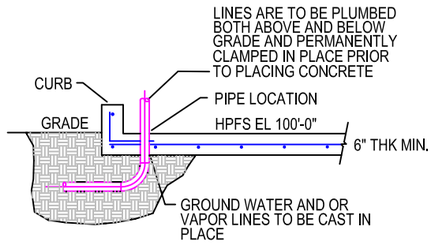
10/08/08

A/6 Concrete Foundation Details

SCALE: Not to Scale

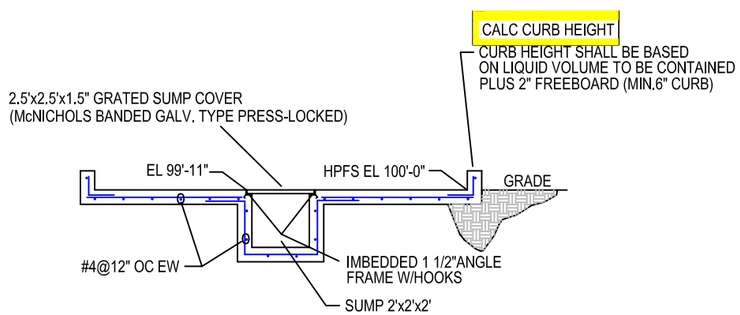


PLAN VIEW



SECTION A-A

(@ INLET MANIFOLD)



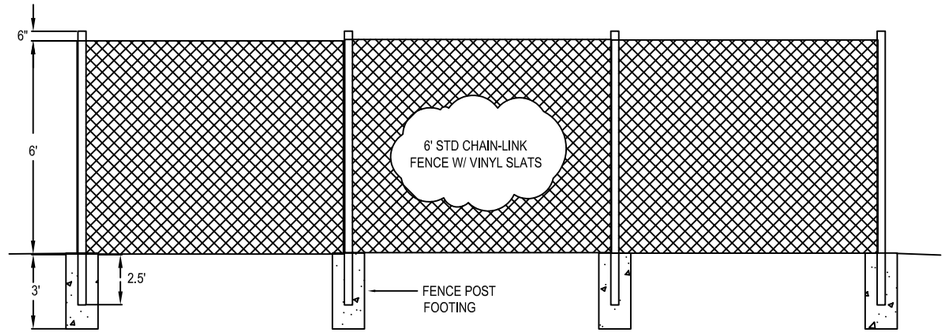
SECTION B-B

NOTES:

SHOWN IS A DIAGRAMMATIC COMPOUND FOUNDATION. THE ACTUAL COMPOUND CONFIGURATION IS PRESENTED ON FIGURE 2 AND HAS BEEN SIZED BASED ON THE EQUIPMENT LAYOUT AND SITE-SPECIFIC CONDITIONS.

B/6 Fence Detail

SCALE: Not to Scale

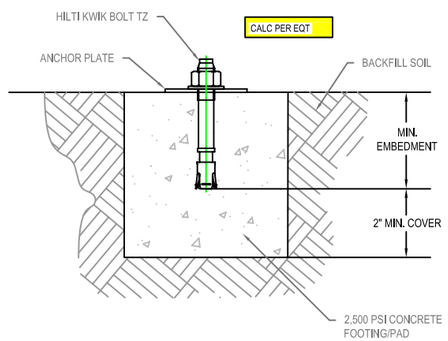


NOTES:

FENCE SHALL BE TYPICAL 11 GAUGE 2" MESH GAW CHAIN LINK FABRIC
FENCE POSTS SHALL BE 2-7/8" OD STRUCT GRADE GALV STEEL
TOP RAIL SHALL BE 1-5/8" OF 16 GAUGE GALV STEEL
BOTTOM TENSION WIRE SHALL BE A MINIMUM OF 9 GAUGE GALV WIRE
GATE POSTS FOR GATES WIDER THAN 6' SHALL BE 2-7/8" OD SCH40 STEEL

C/6 Seismic Anchoring Detail

SCALE: Not to Scale



Anchor Dimensions				
EQUIPMENT	BOLT SIZE	QTY. OF BOLTS	MIN. EMBEDMENT	ANCHORED TO
Equipment Container	TBD	TBD	TBD	2' x 2' x 2' Concrete footings per attached calculations
Carbon vessels	TBD	4	TBD	Concrete containment pad
Holding tank	TBD	4	TBD	Concrete containment pad

CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT

FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL PHASE EXTRACTION SYSTEM
CIVIL DETAILS - 2

DRAWING STATUS

No	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

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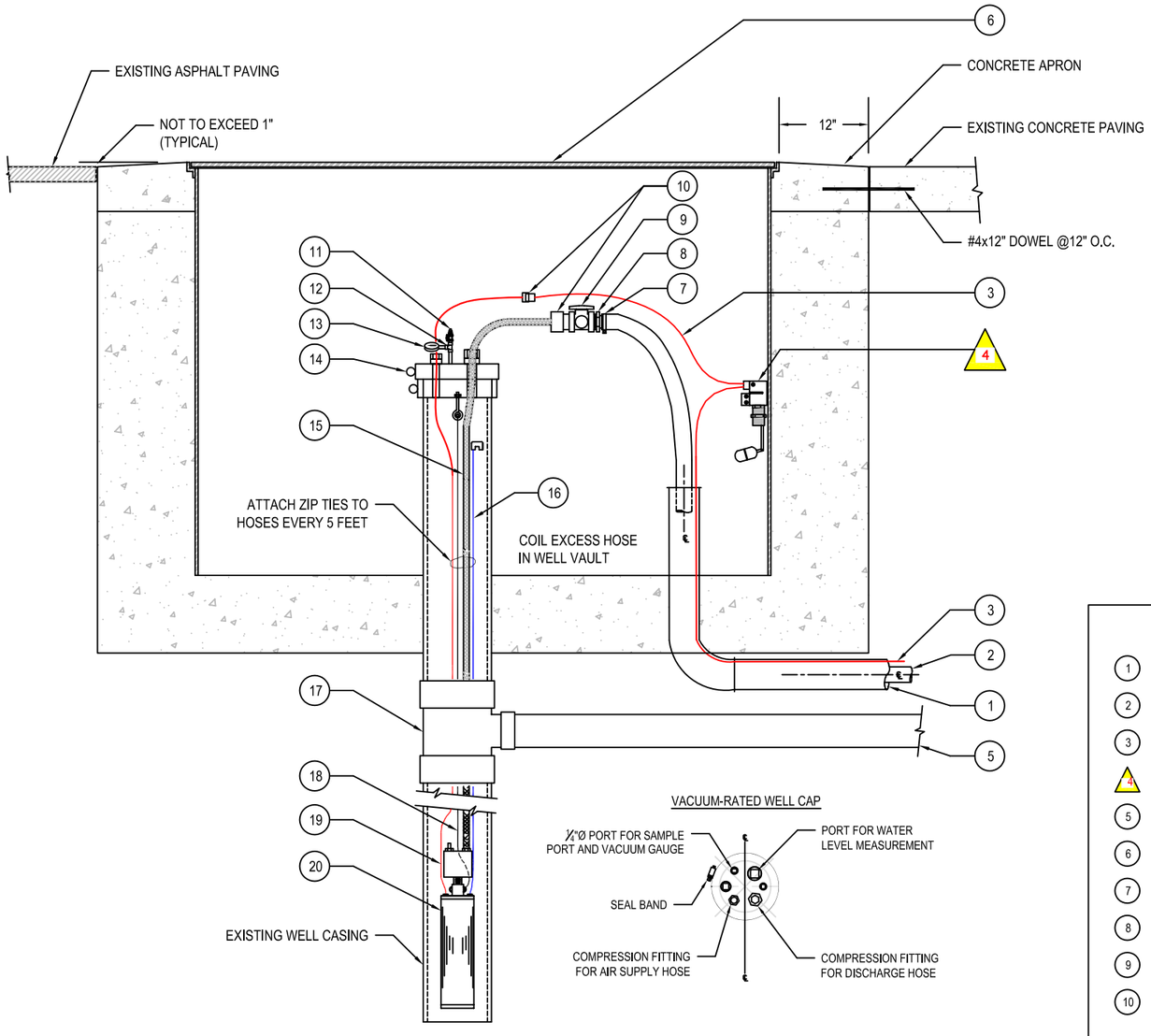
10/08/08

A/7 Well Vault & Wellhead Detail

SCALE: Not to Scale



Well Construction Details

WELL ID (EW-#)	DIAMETER (INCHES)	DEPTH (FBG)	SCREEN INTERVAL (FBG TO FBG)	PUMP DEPTH * (FBG)
C-1	4	55	25 - 55	54
C-3	4	55	25 - 55	54
C-6	4	35	10 - 35	34
C-9	4	30	5 - 30	29
RW-1	10	35	10 - 35	34

* PUMP DEPTH SPECIFIED TO THE BOTTOM OF PUMP IN THE EXTRACTION WELL.

PARTS LIST

1. 3"Ø SCH. 40 PVC CONTAINMENT PIPE FOR GROUNDWATER AND AIR SUPPLY HOSES
2. 3/4"Ø WESTFLEX HDPE TUBING W304 SILVER LABEL, 100 PSI
3. 1/2"Ø SPEEDAIRE COMPRESSED AIR HOSE MAXIMUM PRESSURE RATING - 250 PSI
4. O'KEEFE PNEUMATIC FLOAT VALVE (PART# OKC-2250-2) CHEVRON CRITICAL DEVICE
5. 2"Ø SCH. 40 PVC PIPE FOR VAPOR EXTRACTION
6. TRAFFIC RATED WELL VAULT (MINIMUM 24"Ø VAULT)
7. HEAVY DUTY T-BOLT OR ROLL-OVER HOSE CLAMP (MIKALOR OR EQUIVALENT)
8. 3/4"Ø MNPT X HDPE TUBING ADAPTOR FOR GROUNDWATER TUBING
9. 3/4"Ø BRASS BALL VALVE
10. DURHAM GEO QUICK CONNECT FITTINGS (3/4"Ø FOR GROUNDWATER AND 1/2"Ø FOR COMP. AIR)
11. 1/4"Ø MNPT SAMPLE PORT
12. 1/4"Ø THREADED TEE FITTING AND PIPE NIPPLE(S)
13. LIQUID-FILLED VACUUM GAUGE STAINLESS STEEL CASING, 0-30 IN. HG
14. DURHAM GEO 4"Ø MVP WELL CLINCHER (INCLUDED WITH PUMP ORDER, #TR-773)
15. 3/4"Ø BUNA-N WATER DISCHARGE HOSE DURHAM GEO PART # 777
16. 3/4"Ø BUNA-N AIR EXHAUST LINE DURHAM GEO PART # 777
17. 4" x 2" SCH. 40 PVC REDUCING TEE (USE PROPER REDUCING FITTING FOR RW-1)
18. NYLON-COATED STAINLESS STEEL CABLE DURHAM GEO PART # 918702
19. 1/2"Ø BUNA-N AIR SUPPLY HOSE DURHAM GEO PART # 777
20. PNEUMATIC GROUNDWATER PUMP DURHAM GEO MVP ETS (#TR-775S)

CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

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FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL PHASE EXTRACTION SYSTEM
CIVIL DETAILS - 3

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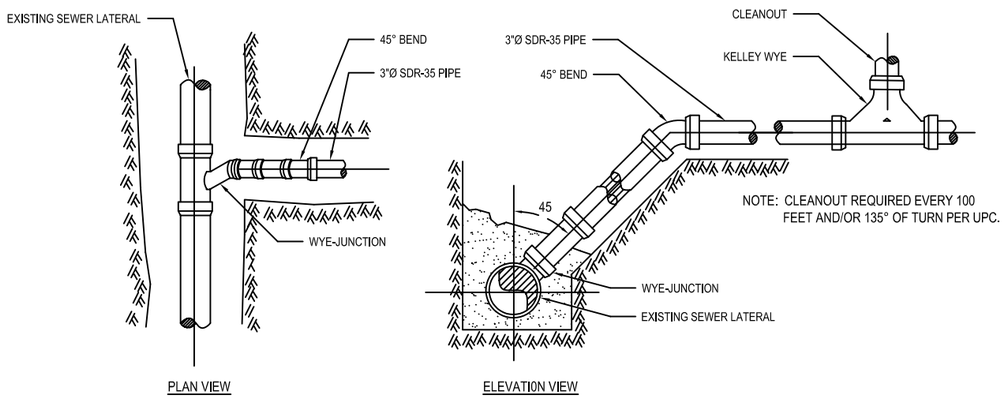
10/11/08

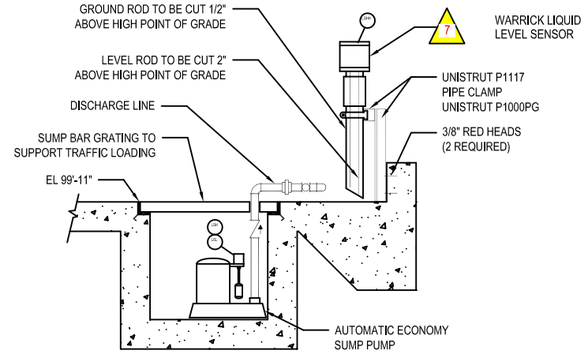
A/8 Existing Sanitary Sewer Connection

SCALE: **Not to Scale**



B/8 Sump & Level Control Detail

SCALE: **Not to Scale**



C/8 Level Control Detail

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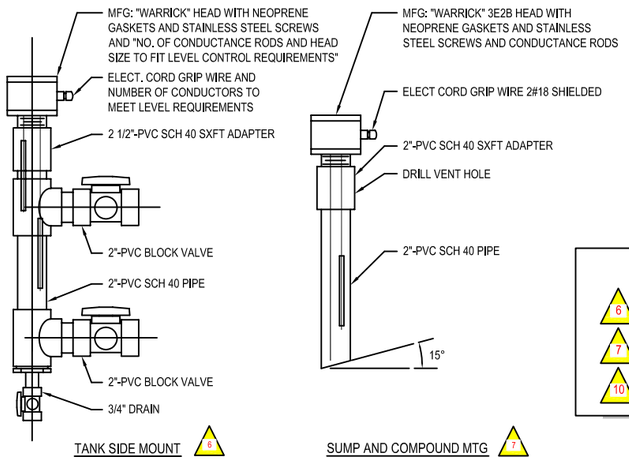


CHEVRON CRITICAL DEVICES

6 HIGH LEVEL SWITCH ON TRANSFER TANK
WARRICK CONTROLS - MULTI-PROBE FTG (MODEL# 3G4E1)

7 HIGH LEVEL SWITCH ON SECONDARY CONTAINMENT BERM
WARRICK CONTROLS - MULTI-PROBE FTG (MODEL# 3G2E1)

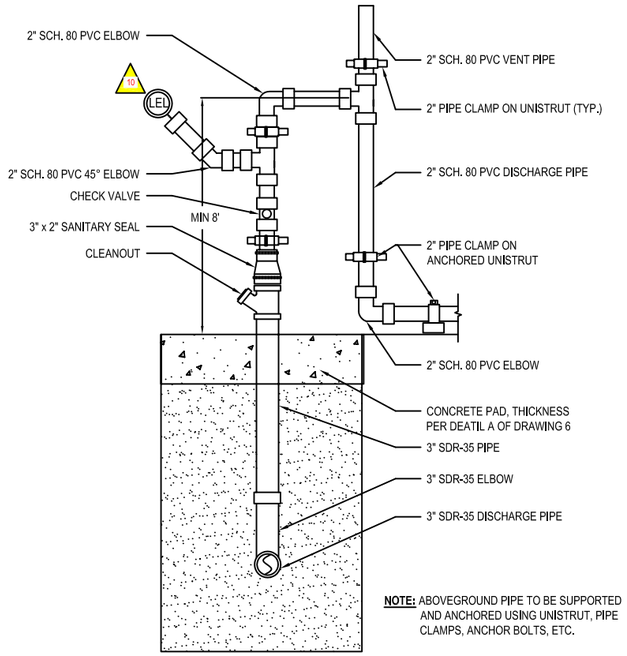
10 LOWER EXPLOSIVE LIMIT METER
GASTECH SAFETNET 100

NOTES:

- SHOWN ARE TWO INSTALLATIONS OF THE WARRICK 3E STYLE CONDUCTANCE PROBE ASSEMBLIES FOR POINT LIQUID LEVEL DETECTION. THEY ARE USED IN CONJUNCTION WITH WARRICK 27, 47 OR 67 SERIES CONTROLLERS.
- THE SIDE MOUNT INSTALLATION UTILIZES 4 ROD HEADS FOR TANK LOW, HIGH, HIGH/ALARM LEVELS AND REFERENCE GROUND. THE WARRICK CONTROLLER IS TYPICALLY CONFIGURED TO USE THESE LEVEL POINTS FOR PUMP OFF, PUMP ON AND HIGH LEVEL ALARM. THESE CAN BE USED FOR INFLUENT SURGE TANKS AND OWS UNITS.
- THE SUMP AND CONTAINMENT COMPOUND INSTALLATIONS UTILIZE THE 2 ROD HEAD FOR SINGLE POINT LEVEL CONTROL. THESE ARE CONFIGURED TO ACT AS SWITCH FOR A HIGH LEVEL ALARM SIGNAL.
- ON ALL THE CONDUCTANCE PROBE INSTALLATIONS, THE BOTTOM OF THE ROD ACTS AS THE SPECIFIC LEVEL ACTUATION POINT.

D/8 Discharge Pipe Detail

SCALE: **Not to Scale**



NOTE: ABOVEGROUND PIPE TO BE SUPPORTED AND ANCHORED USING UNISTRUT, PIPE CLAMPS, ANCHOR BOLTS, ETC.

CLIENT

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PROJECT

FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL PHASE EXTRACTION SYSTEM
MECHANICAL DETAILS - 1

DRAWING STATUS

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Drafted By: JS	Date: 10/11/08	
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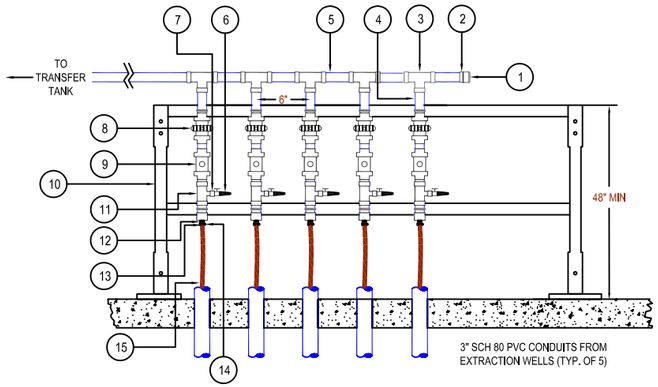
10/11/08

SPECIFICATIONS

1. 2" SCH. 80 PVC PLUG
2. 2" SCH. 80 PVC SOC x FTP ADAPTER
3. 2" x 3/4" SCH 80 PVC REDUCING TEE
4. 3/4" SCH 80 PVC PIPE
5. 2" SCH 80 PVC PIPE
6. 1/4" LABCOCK VALVE
7. 3/4" x 1/4" REDUCING BUSHING, SLIPx FPT
8. 3/4" DUO-BLOCK BALL VALVE HARRINGTON P/N 1001007
9. 3/4" BALL CHECK VALVE HARRINGTON P/N TC10075STE
10. UNISTRUT FRAME FOR MANIFOLD SUPPORT
11. 3/4" SCH 80 PVC TEE
12. 3/4" SCH 80 FEMALE ADAPTOR
13. 3/4" MPT x 3/4" HOSE ADAPTOR
14. MIKALOR (OR EQUIVALENT) HEAVY DUTY ROLL-OVER OR T-BAR HOSE CLAMP
15. 3/4" DIA. HDPE TUBING WESTFLEX W304 SILVER LABEL
16. AIR SUPPLY FROM COMPRESSOR
17. 1/2" GALVANIZED TEE
18. 1/2" GALVANIZED PIPE
19. 1/2" BALL VALVE, BRASS BODY, LOCKABLE McMASTER-CARR P/N 4629K13
20. POP-SAFETY AIR VALVE, SET FOR 125PSI McMASTER-CARR P/N 9889K39
21. PARTICLE FILTER / PRESSURE REGULATOR WITH PRESSURE GAUGE (0-125 PSI) & STROKE COUNTER DURHAM GEO #TR77803 & #TR-77804
22. FLOW PORT W/PLUG
23. 1/2" GALVANIZED THREADED COUPLING
24. 1/2" MPT x 1/2" HOSE ADAPTOR
25. 1/2" DIA. SPEEDAIRE AIR SUPPLY HOSE GRAINGER P/N 5W021
26. SVE HEADER 3" DIA. SCH80 PVC PIPE
27. 3" GATE VALVE
28. 3" FEMALE ADAPTOR HARRINGTON P/N 835-040
29. SPEARS COMBO. WYE AND 1/8 BEND, REDUCING (SPEARS P/N P502-420)
30. 2" GREY PVC LONG RADIUS 90°
31. 0-30" Hg VACUUM GAUGE
32. 2" DIA SCH. 80 PVC BALL VALVE (TYP. OF 6), HARRINGTON P/N 1070020 OR EQUIVALENT
33. VACUUM GAUGE AND ROTAMETER ASSEMBLY
34. 1/4" NPT MALE x HOSE PVC LABCOCK SAMPLE PORT - TYPICAL OF 5

A/9 Groundwater Extraction Manifold

SCALE: Not to Scale



C/9 Compressed Air Manifold

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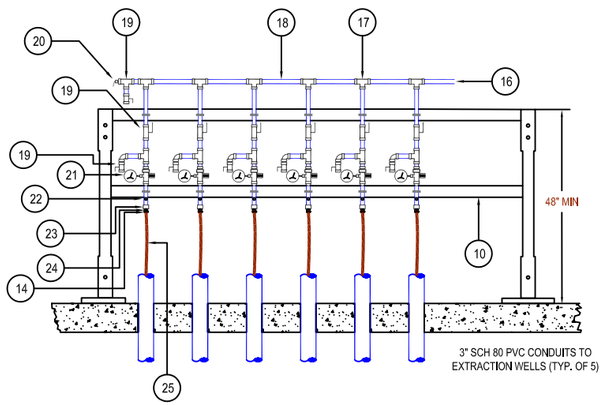
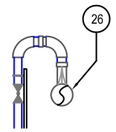


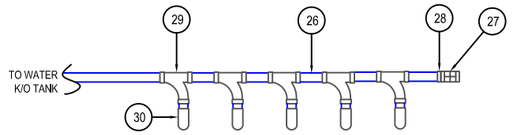
B/9 Soil Vapor Extraction Manifold

SCALE: Not to Scale

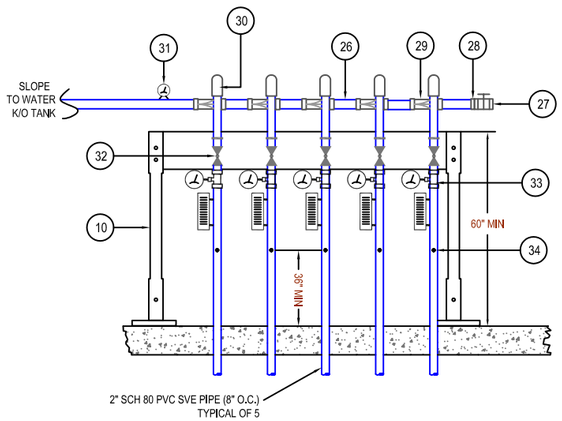
SIDE VIEW



TOP VIEW



FRONT VIEW



CLIENT

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

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FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

CRA PROJECT # 311950

TITLE

DUAL PHASE EXTRACTION SYSTEM
MECHANICAL DETAILS - 2

DRAWING STATUS

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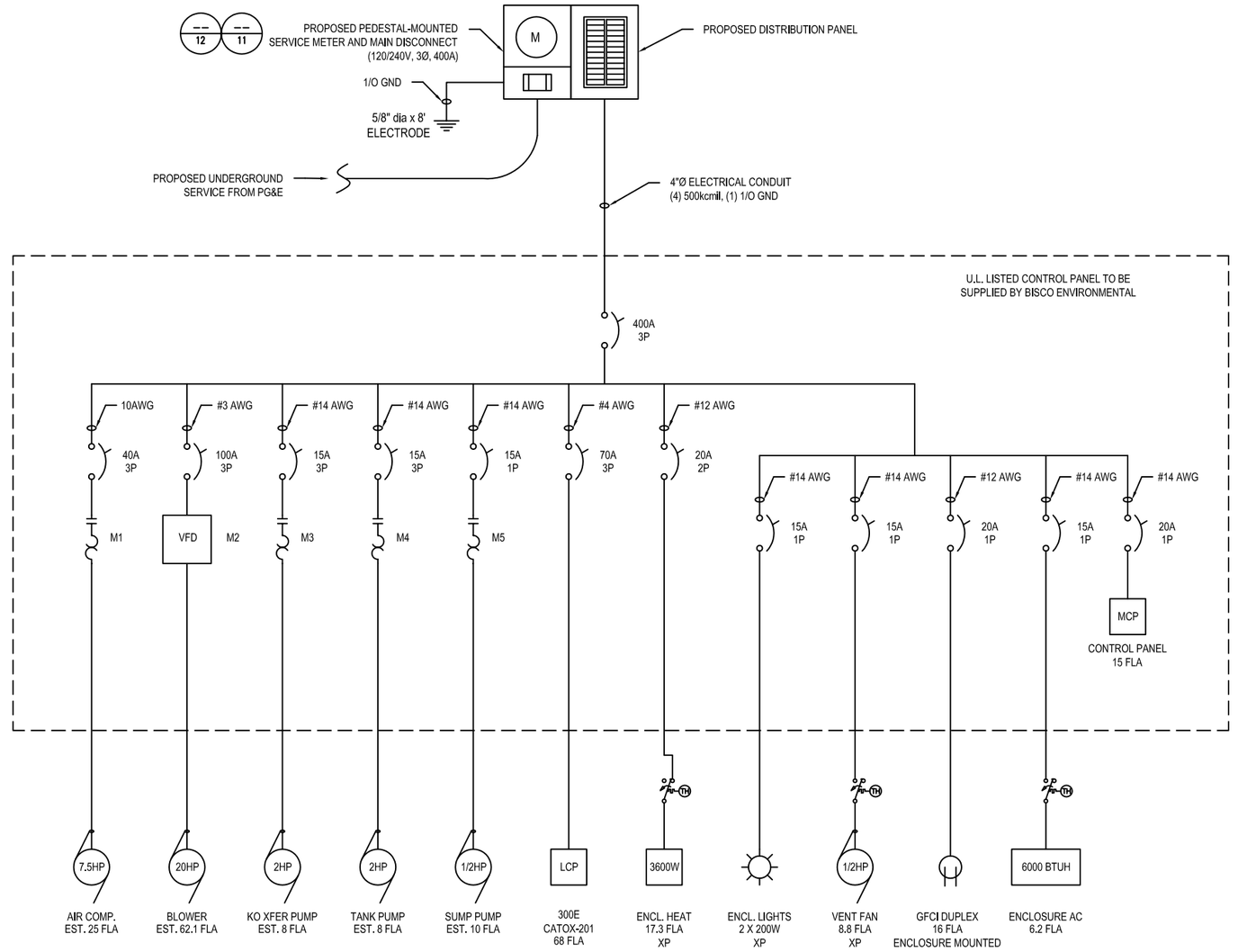

LEGEND

AWG	AMERICAN WIRE GAUGE (COPPER)
TEFC	TOTALLY ENCLOSED FAN COOLED
XP	EXPLOSION PROOF - IMPLIES NEMA 7
VFD	VARIABLE FREQUENCY DRIVE (INVERTER)
MCP	MASTER CONTROL PANEL
TH	THERMOSTAT - FORM C CONTACT TEMPERATURE RISE OR FALL

XXHP — HORSEPOWER RATING: ELECTRIC MOTOR - INTERLOCKED PER PROVIDED SCHEDULE & PROCESS DIAGRAM

M1 — MOTOR NUMBER: FULL-VOLTAGE, NON-REVERSING (FVNR) MAGNETIC MOTOR STARTER W/ ADJUSTABLE OVERLOAD

90A 3P — AMPERAGE RATING; NUMBER OF POLES: MOLDED CASE CIRCUIT BREAKER

Notes:

1. Wire shall be copper stranded with THWN or THHN insulation.
2. Above ground conduit to be rigid galv. steel or EMT.
3. Below ground conduit to be sch 40 PVC, concrete encased if required.
4. All equipment to be U.L. listed.
5. All work to comply with the local, state and federal codes. All electrical installations at an active fueling facility must comply with article 514 of the 2005 NEC.
6. Enclosures shall be NEMA 3R or 4 rated.
7. All panels shall have a minimum 3-foot clearance per NEC art 110-16(a)
8. All wire methods shall comply with NEC article 501, Class 1, Division 2 environment requirement

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FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA

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TITLE

DUAL PHASE EXTRACTION SYSTEM
ELECTRICAL SINGLE LINE DRAWING

DRAWING STATUS

No.	Revision	Date	Initial

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Prepared by: J8B1

PERMANENT WOOD POST INSTALLATION UNDERGROUND ELECTRIC SERVICE

054712

Asset Type: Electric Distribution **Function:** Construction and Design

Issued by: Alex Yan (APY1) **Date:** 07-15-08

Rev. #06: This document replaces PG&E Document 054712, Rev. #05. For a description of the changes, see Page 4.

This document is also included in the following manual:

- *Electric and Gas Service Requirements Manual* (Greenbook)

Purpose and Scope

This document shows the minimum requirements for a customer-installed wood post for permanent installation of underground electric service. The service installations shown on this document are intended to serve individual customers (not mobile home parks) where PG&E-approved manufactured pedestals are not readily available. (Manufactured pedestals are preferred because they provide easier service installations and better protection of conduit, ground wire and customer's connection facilities.)

General Information

1. The customer shall install service conduit in accordance with this document. The customer shall install load side conduit and suitable conductors as required by local or state codes.
2. Local ordinances may include requirements in addition to those shown in this document. Consult local inspection authorities for these requirements. In areas where local ordinances require permits and inspection, these must be obtained before PG&E can establish service. Meters will be installed and energized by PG&E after the customer's metering equipment has been properly installed and after an inspection clearance has been given to PG&E by the appropriate electrical inspection authority.
3. When a service larger than 200 amps is desired, consult PG&E.
4. Service Post Installation
   A. A permanent service installation is one which will remain for a period longer than one year, as estimated by PG&E (for temporary installations, refer to Document 036670).
   B. Wood posts used for permanent service shall be pressure-treated for the full length. Any other process which will provide equivalent penetration and retention must be approved by PG&E. Acceptable wood preservatives are water-borne salts and pentachlorophenol. Brush application of wood preservative is ineffective for permanent posts and therefore unacceptable. Minimum dimensions of posts shall be 4" x 6" x 8'-0" long or 6" diameter x 8'-0" long. Depth of setting shall be 3' 0" minimum. A 4-inch-thick concrete pad shall be poured around the post as shown in Figure 1 on Page 3 and Figure 3 on Page 4.
   C. Post installations shall be in protected locations, out of the way of vehicular traffic or other hazardous conditions.
5. Service Conduit and Termination
   A. PG&E will install the underground service in accordance with Electric Rule 16. The underground service lateral will be installed, owned, and maintained by PG&E from PG&E's distribution line to the termination facility, which is normally the meter enclosure.
   B. The customer shall provide trenching and backfill in accordance with PG&E specifications and pay any costs provided for in Electric Rule 16.
   C. Residential service will normally be installed in conduit as shown in Figure 1 on Page 3.
   D. Non-residential service will normally be installed in conduit furnished and installed by the customer as shown in Figure 3 on Page 4.

6. Grounding

   The customer shall be responsible for bonding and grounding all exposed non-current-carrying metal parts. Grounding shall be in accordance with the National Electric Code and local ordinances except that the grounding wire shall be protected against mechanical damage by rigid steel conduit, or armored copper ground wire may be used.
7. Metering Requirements
   A. Meters will be furnished by PG&E.
   B. For residential installations, a PG&E-approved combination service termination and meter socket panel without circuit closing devices as shown on Page 3, shall be furnished, installed, and wired by the customer.
   C. For non-residential applications, a PG&E-approved combination service termination and bused-safety-socket meter box with test bypass facilities and service main disconnect, as shown on Page 4, shall be furnished, installed, and wired by the customer.

References	Location	Document
Underground Conduit Without Concrete Encasement	FRO: UG- Conduit	031793A
Temporary Underground Electric Service Single-Phase, 120/240 Volt, 100 Amps Maximum	UG-1: Services	036670
Minimum Requirements for the Design and Installation of Conduit and Insulated Cable	UG-1: Cable	038193
Guide for the Design of Underground Residential Secondary Systems	ELS	041543
Terminating Underground Electric Services 0–600 Volts in Customer-Owned Facilities	UG-1: Services	058817

Table 1 List of Materials to be Furnished and Installed by the Customer (see Figure 1 on Page 3 and Figure 3 on Page 4)

Item	Description
1	Service Termination Enclosure, Combination Meter Socket Panel (see Figure 2 on Page 3 or Figure 4 on Page 4 for details)
2	Post, 4" x 6" x 8'-0" Long or 6" in Diameter x 8-0" Long, Fully Treated (see Note 4 on Page 1)
3	Conduit (load side), Size and Material as Required by Building Code (typically rigid galvanized steel or Schedule 80 PVC plastic)
4	Conduit, Service Riser, Rigid Steel, Galvanized or Schedule 80 PVC Plastic, 3" Minimum I.D. for #1/0 Aluminum Service Cable (see Note 6 on Page 3)
5	Conduit, Rigid Steel, Galvanized, With Pipe Strap (for bare ground wire, omit if armor clad wire is used)
6	Hub and Clamp, Grounding, to Suit Item 5
7	Ground Rod (see Note 6 on Page 2)
8	Ground Wire, Copper, Bare or Armor Clad (size in accordance with applicable electrical codes and local requirements)
9	Conduit, Plastic or Rigid Steel, for Underground Service (size as shown in Document 031793A)

CLIENT

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ELECTRICAL DETAILS - 1

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10/10/08

Residential Service Only, 0–200 Amp

Notes

1. Poured concrete pad shall be approximately 4 inches thick. Provide 1/2-inch slope away from post to allow for drainage.
2. Install bend in direction of service trench. To facilitate cable installation, only one 90° bend is permitted in the service riser installation. If trench is shared with gas or other utilities, consult PG&E for required increased trench depth.
3. Meter socket enclosures for residential service (Figure 2) shall not be equipped with any circuit closing device.
4. For services larger than 200 amps, consult PG&E for requirements.
5. Approved meter socket enclosures for non-residential service (Figure 4 on Page 4) shall be equipped with test bypass facilities.
6. Whenever it is necessary to install a service longer than 75 feet, the applicant must contact PG&E before ordering the service riser, conduit or, termination facilities. If the service riser and conduit called for in Table 2 on Page 4 will not accept the cable required to meet the voltage and/or flicker drop requirements, or will cause cable pulling problems, the next larger PG&E standard conduit size must be installed. This may also require a larger service termination enclosure, which must also be installed. (Refer to Document 041543 for flicker and voltage drop requirements and Document 038193 for cable pulling limitations.)

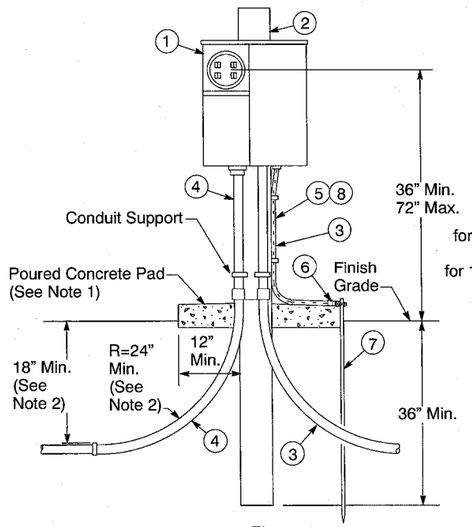


Figure 1
Residential Service

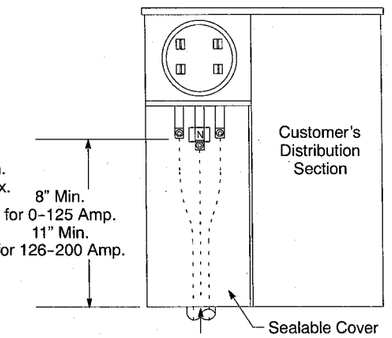


Figure 2
Typical Residential Combination Service Termination Enclosure and Meter Socket Panel, 200 Amp Max., 120/240 V

Residential and Non-Residential Service 0–200 Amp Installed in Conduit

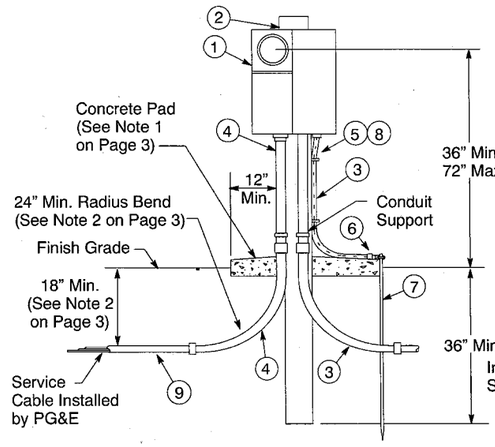


Figure 3
Non-Residential Service
(or residential service installed in conduit)

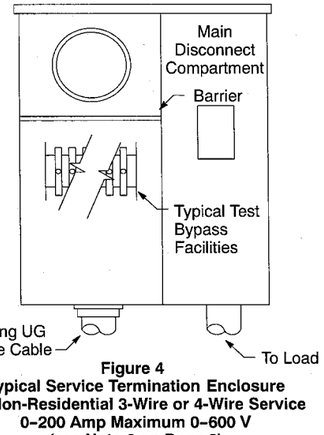


Figure 4
Typical Service Termination Enclosure for Non-Residential 3-Wire or 4-Wire Service 0–200 Amp Maximum 0–600 V (see Note 6 on Page 3) (see Figure 2 on Page 3 for typical residential enclosure)

Table 2 Cable and Conduit Requirements

Main Service Switch Rating – Amps	Conduit Number and Size (see Note 6 on Page 3)		Aluminum Cable Number and Size AWG or kcmil	
	3-Wire	4-Wire	Per Phase	Neutral
0–125	1–2"	1–2"	1–1/0	1–1/0
126–200	1–3"	1–3"	1–4/0	1–1/0

Revision Notes

Revision 06 has the following changes:

1. Revised meter maximum height in Figure 1 on Page 3 and Figure 3 on Page 4.

CLIENT
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

PROJECT
FORMER CHEVRON STATION # 9-5607
5269 CROW CANYON ROAD
CASTRO VALLEY, CA
CRA PROJECT # 311950

TITLE
DUAL PHASE EXTRACTION SYSTEM
ELECTRICAL DETAILS - 2

DRAWING STATUS

NO	Revision	Date	Initial

SCALE VERIFICATION
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

CONESTOGA–ROVERS & ASSOCIATES
5900 HOLLIS STREET, SUITE A
EMERYVILLE, CA 94608
PHONE: 510.420.0700
FAX: 510.420.9170
WWW.CRAWORLD.COM

Source Reference:
PG&E DOCUMENT #054712, REV. #06: 07-15-08

Designed By:	Date:	Drawing No.
SVN	10/10/08	12
Drafted By: JS	Date: 10/10/08	
Reviewed By: DNL	Date:	
Scale: Not to Scale		

10/10/08

ATTACHMENT B

STANDARD OPERATIONS AND MAINTENANCE PLAN

SYSTEM PERFORMANCE MONITORING PLAN

Former Chevron Station 95607
5269 Crow Canyon Road
Castro Valley, California

INTRODUCTION

The following sections present a performance monitoring plan (PMP) for the proposed multi-phase extraction (MPE) and treatment system at the former Chevron Station 95607 located at 5269 Crow Canyon Road, in Castro Valley, California.

This PMP has been prepared in accordance with Chevron's MPE Standard Operating Procedures (Version 1.1) Guidance Documents dated October 24, 2005.

Operation & Maintenance Field Data Sheets and Data Summary Tables are attached following this text.

KEY PERFORMANCE MONITORING CRITERIA

1. Soil Vapor Extraction (SVE) System

1.1. SVE Data Collection Frequency.

- 1.1.1. Daily for 3 days during startup-includes testing and all permit-specified sample collection for air discharge permit
- 1.1.2. Weekly after MPE system startup (first six weeks)
- 1.1.3. Bi-weekly thereafter

1.2. SVE Data Collection Requirements.

- 1.2.1. Data that will be collected and recorded at arrival and departure during each visit is outlined below. A copy of the proposed site-specific blank field data sheets are included in Attachment A.
- 1.2.2. Extracted vapor from the system's pre-dilution influent (INF1), post-dilution influent (INF2; located on the pressure side of the extraction blower(s)), and each manifold leg will be monitored by collecting the following data:
  - 1.2.2.1. Vacuum/pressure: using quick connects and a dedicated hand held pressure device connected to each SVE line at the manifold, at INF1, and at INF2.
  - 1.2.2.2. Temperature: measured for each SVE line at the manifold, at INF1, and at INF2 using an anemometer or thermocouple. If using an anemometer (on the manifold), the port will be located at least three pipe diameters from the nearest sample port.

1.2.2.3. Flow rate: measured for each operating SVE line at the manifold, at INF1, and at INF2 using an anemometer or pitot tube.

1.2.2.4. VOC concentrations: measured in the field with a FID and/or LEL (during each visit) at dedicated sample ports for each operating SVE line at the manifold, at INF1, and at INF2

1.2.2.5. System influent vapor samples will be collected for laboratory analysis at least once per month in Tedlar bags and analyzed using U.S. EPA Method TO-14 or TO-15, or equivalent, from the INF2 sample port (located on the positive pressure side of the blower before the oxidizer) identified in 1.2.2.4. Additional field concentration data will be collected using an FID and/or LEL for well field optimization.

1.2.2.6. O2/CO2/CH4 (field measured using multi-gas meter or sampled by a laboratory) from the sample ports identified in 1.2.2.4.

1.2.3. System inlet temperature

1.2.3.1. Temperature indicator mounted at/near blower inlet.

1.2.4. Blower exhaust temperature

1.2.4.1. Temperature indicator mounted on blower exhaust line (upstream of heat exchanger and vapor treatment).

1.2.5. System/blower flow rate

1.2.5.1. Measured on pressure side of blower (upstream of heat exchanger or vapor treatment) utilizing an anemometer; access through dedicated port.

1.3. SVE Mass Removal Calculations

1.3.1. Data sets

1.3.1.1. The project team will use laboratory analytical concentration data to calculate mass removal to provide the most accurate and consistent quantification of mass removed.

1.3.2. Mass removal calculations:

1.3.2.1. The mass removal rate will be calculated using the average of two successive measured VOC concentrations and recovered vapor flow rates. The governing equations used to calculate mass removal rate are included in the master O&M data summary tables (copy provided in Attachment A).

1.4. SVE System Optimization Plans

1.4.1. Baseline FID and background well manifold ("wellhead") vacuum readings will be collected from all sampling points prior to and during initial system startup. Influent VOC concentrations will be recorded for the system and individual SVE wells during semi-monthly O&M events using a FID or LEL and confirmed using laboratory analysis. System

flow will be we applied to the wellfield as necessary to optimize cleanup efforts and to operate the ECAT efficiently.

1.4.2. CRA will begin extraction from one well (the "hottest" well, C-3) to determine its optimum extracted flow and corresponding applied vacuum. Additional wells will be added for extraction as long as the optimum flow and vacuum are maintained at the well already undergoing MPE.

1.4.3. A minimum system mass removal rate of 10 pounds per day of vapor phase TPHg must be achieved to justify continued operation of the MPE system. If mass removal rates drop below this threshold, and no optimization is able to increase the mass removal rate, the system will be evaluated for shut down.

1.4.4. Wellhead vacuum and FID readings will be collected from system performance monitoring points to evaluate individual SVE well influence and mass removal estimates. MPE wells will be "closed" based on field VOC measurements and removal rates.

2. Groundwater Extraction (GWE) system

2.1. GWE system data collection frequency

2.1.1. Daily for 2 days during startup to collect all samples required for water discharge permit during startup

2.1.2. Weekly after MPE system startup (first six weeks);

2.1.3. Monthly thereafter.

2.2. GWE System Data Collection Requirements

2.2.1. Data that will be collected and recorded at arrival and departure during each visit is outlined below. A copy of blank field data sheets are included in Attachment A.

2.2.2. Individual flow rates of the operating pneumatic pumps, (operating to effectively dewater the formation) will be measured. Individual flow meters or pulse counters will be used to gauge flow from each well. The system flow meter will be used to monitor and record total flows and flow rates from the system discharge location after the carbon vessels and prior to discharge into the Site's sanitary sewer connection.

2.3. Wellfield drawdown

2.3.1. Effective well drawdown will be monitored with HDPE tubing placed down-well and terminated just above the inlet of the bottom loading pneumatic pump. Dewatering during MPE operation will be confirmed if the HDPE tubing at the manifold side shows vacuum influence from SVE operation. The system is designed to allow electric submersible pumps to replace the pneumatic pumps if they cannot adequately dewater the wells. Nearby monitoring wells C-2 and RW-1 will be gauged at least once a month to determine the potential drawdown radius of influence of the dewatering system. The pneumatic pumps will be bottom loading and placed as close to the bottom of the well as feasible.

2.4. Carbon monitoring and change-outs:

2.4.1. Influent, midfluent, and effluent samples will be monitored for breakthrough of TPHg and BTEX compounds pursuant to the following schedule, or as required by the Castro Valley Sanitary District per the issued discharge permit:

2.4.1.1. Weekly for the first month

2.4.1.2. Monthly thereafter

2.4.2. If breakthrough of TPHg/BTEX occurs in the first vessel, a carbon change-out shall be scheduled as soon as possible (within a month). If breakthrough occurs in the second vessel, the system shall be turned off until the carbon is changed out.

3. MPE System Shutdown Criteria

3.1. After the influent soil vapor concentrations have demonstrated TPHg mass removal rates decrease below 10 pounds per day, CRA will propose shutting down the system to the regulatory agency.

OPERATION & MAINTENANCE FIELD DATA SHEETS AND DATA SUMMARY TABLES

Quality Control List
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

Compliance Items:	Dec-13		Jan-14		Feb-14		Mar-14		Apr-14		May-14		Jun-14		Jul-14		Aug-14		Sep-14		Oct-14		Nov-14	
	DM	PM	DM	PM	DM	PM	DM	PM	DM	PM	DM	PM	DM	PM	DM	PM	DM	PM	DM	DM	PM	PM	DM	PM
GWE- 1st visit																								
Monthly Inf, Mid1, Mid2, Mid3 and Eff samples collected																								
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
SVE- 1st visit																								
Monthly Inf-1, Inf-2, and Eff samples collected																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
Benzene shall not exceed <0.102 ppd during sampling																								
VOC abatement >98.5%																								
GWE- 2nd visit																								
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
Critical devices checklist complete for visit																								
Discharge rate compliant (<20 gpm)																								
pH >6 and <9.5																								
DTW readings in extraction wells																								
SVE- 2nd visit																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
Critical devices checklist complete for visit																								
VOC abatement >98.5%																								
GWE- 3rd visit																								
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
Discharge <10 gpm																								
pH >6 and <9.5																								
SVE- 3rd visit																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
VOC abatement >98.5%																								
GWE- 4th visit																								
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
Discharge <10 gpm																								
pH >6 and <9.5																								
SVE- 4th visit																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
VOC abatement >98.5%																								
SVE- 5th visit																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
VOC abatement >98.5%																								
GWE- 5th visit																								
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
Discharge <10 gpm																								
pH >6 and <9.5																								
SVE- 6th visit																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
VOC abatement >98.5%																								
GWE- 6th visit																								
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
Discharge <10 gpm																								
pH >6 and <9.5																								
SVE- 7th visit																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
VOC abatement >98.5%																								
GWE- 7th visit																								

Quality Control List
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

Compliance Items:	**Dec-13**		**Jan-14**		**Feb-14**		**Mar-14**		**Apr-14**		**May-14**		**Jun-14**		**Jul-14**		**Aug-14**		**Sep-14**		**Oct-14**		**Nov-14**	
	DM	**PM**	**DM**	**PM**	**DM**	**PM**	**DM**	**PM**	**DM**	**PM**	**DM**	**PM**	**DM**	**PM**	**DM**	**PM**	**DM**	**PM**	**DM**	**DM**	**PM**	**PM**	**DM**	**PM**
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
Discharge <10 gpm																								
pH >6 and <9.5																								
SVE- 8th visit																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
VOC abatement >98.5%																								
GWE- 8th visit																								
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
Discharge <10 gpm																								
pH >6 and <9.5																								
SVE- 9th visit																								
Oxidizer temp >1,400 Degrees F																								
Effluent flow rate <250 scfm																								
VOC abatement >98.5%																								
GWE- 9th visit																								
Totalizer readings collected (monthly requirement)																								
Maintenance log maintained																								
Change silt filter bags																								
Discharge <10 gpm																								
pH >6 and <9.5																								
Quarterly effluent samples collected (January, April, July, October)																								
Quarterly sample results compliant																								
Quarterly SMR (1/30, 4/30, 7/30, 10/30)																								
All critical devices have been checked (January, April, July, October)																								
Annual																								
GW report (TBD after permit receipt)																								
GW sampling for quarterly metals taken																								

Abbreviations:
S - Scheduled
C - Completed

Notes:
Monthly sampling includes TPHg, BTEX, and 5 Oxygenates

Permits:
Bay Area Air Quality Management District
San Francisco Public Utility District

Table 1A
Groundwater Extraction and Treatment System
Influent and Effluent Hydrocarbon Concentration Data
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

	Influent						Midfluent 1						Midfluent 2						Midfluent 3						Effluent						
Sample Date (mm/dd/yy)	TPHg Conc. (ug/L)	Benzene Conc. (ug/L)	Toluene Conc. (ug/L)	Ethylbenzene Conc. (ug/L)	Xylenes Conc. (ug/L)	MTBE Conc. (ug/L)	TPHg Conc. (ug/L)	Benzene Conc. (ug/L)	Toluene Conc. (ug/L)	Ethylbenzene Conc. (ug/L)	Xylenes Conc. (ug/L)	MTBE Conc. (ug/L)	TPHg Conc. (ug/L)	Benzene Conc. (ug/L)	Toluene Conc. (ug/L)	Ethylbenzene Conc. (ug/L)	Xylenes Conc. (ug/L)	MTBE Conc. (ug/L)	TPHg Conc. (ug/L)	Benzene Conc. (ug/L)	Toluene Conc. (ug/L)	Ethylbenzene Conc. (ug/L)	Xylenes Conc. (ug/L)	MTBE Conc. (ug/L)	TPHg Conc. (ug/L)	Benzene Conc. (ug/L)	Toluene Conc. (ug/L)	Ethylbenzene Conc. (ug/L)	Xylenes Conc. (ug/L)	MTBE Conc. (ug/L)	pH[a]

mm/dd/yy = month month/day day/ year year
Conc. = Concentration
ug/L = micrograms per liter
TPHg = total petroleum hydrocarbons quantified as gasoline
MTBE = methyl tert-butyl ether
<X.X = Not detected at or below the detection limit indicated
a = pH measured in the field
b = waiting for field data

BTEX analyzed by EPA method 8260B
TPHg analyzed by EPA method 8015M
MTBE analyzed by EPA method 8260B

Table 1B
Groundwater Extraction and Treatment System
Quarterly Hydrocarbon Concentration Data
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

	Effluent																	
Sample Date (mm/dd/yy)	TPHg Conc. (ug/L)	Benzene Conc. (ug/L)	Toluene Conc. (ug/L)	Ethylbenzene Conc. (ug/L)	Xylenes Conc. (ug/L)	MTBE Conc. (ug/L)	Arsenic Conc. (ug/L)	Cadmium Conc. (ug/L)	Chromium Conc. (ug/L)	Copper Conc. (ug/L)	Lead Conc. (ug/L)	Nickel Conc. (ug/L)	Silver Conc. (ug/L)	Zinc Conc. (ug/L)	Mercury Conc. (ug/L)	Chemical Oxygen Demand (ug/L)	Total Suspended Solids (ug/L)	pH[a]
Agency limits																		

Notes and Abbreviations:

mm/dd/yy = month month/day day/ year year
Conc. = Concentration
ug/L = micrograms per liter
TPHg = total petroleum hydrocarbons quantified as gasoline
MTBE = methyl tert-butyl ether
<X.X = Not detected at or below the detection limit indicated
a = pH measured in the field

BTEX analyzed by EPA method 8260B
TPHg analyzed by EPA method 8015M
MTBE analyzed by EPA method 8260B

Table 2
Groundwater Extraction and Treatment System
Operational Data and Dissolved Phase Hydrocarbons Mass Removal Data
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

Date (mm/dd/yy)	Well IDs	Hour Meter[1] (hours)	Totalizer Reading (gallons)	Period Volume (gallons)	Period Operational Flow Rate (gpm)	Cumulative Volume (gallons)	TPHg Concentration (µg/L)	TPHg Period Removal[2] (pounds)	TPHg Cumulative Removal (pounds)	Benzene Concentration (µg/L)	Benzene Period Removal[2] (pounds)	Benzene Cumulative Removal (pounds)	MTBE Concentration (µg/L)	MTBE Period Removal[2] (pounds)	MTBE Cumulative Removal (pounds)	Notes
Agency Limits																
			Total Extracted Volume (gal):				Pounds Removed:			Pounds Removed:			Pounds Removed:			
			Average Operational Flow Rate (gpm)[3]:				Gallons Removed[4]:			Gallons Removed[4]:			Gallons Removed[4]:			

Reporting Period: First Quarter 2013	Cumulative Results Since Start-up:
Number of Days during Reporting Period	Number Days since Startup
Gallons of Extracted Ground Water	Cumulative Total Gallons Extracted
Average Flow Rate	Average Flow Rate[5]
Pounds of TPHg Removed	Cumulative Pounds of TPHg Removed
TPHg Removal Rate	TPHg Removal Rate
Pounds of Benzene Removed	Cumulative Pounds of Benzene Removed
Benzene Removal Rate	Benzene Removal Rate
Pounds of MTBE Removed	Cumulative Pounds of MTBE Removed
MtBE Removal Rate	MtBE Removal Rate

Table 3
Dual Phase Extraction System
Operational Data
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

Date (mm/dd/yy)	**Operating Time (hours)**	**Hour Meter (hours)**	**System Uptime (percent)**	**Period Operation (hours)**	**Blower Vacuum (inHg)**	**INF-1 Vacuum (inHg)**	**INF-1 Vacuum (in H_2O)**	**INF-1 Temperature (°F)**	**INF-1 Measured Flow (acfm)**	**INF-1 Calculated Flow (scfm)**	**INF-2 Pressure[1] (in H_2O)**	**INF-2 Temperature (°F)**	**INF-2 Measured Flow[1] (acfm)**	**INF-2 Calculated Flow (scfm)**	**Effluent Flow Rate (scfm)**	**Dilution Air (% open)**	**Pre-Oxidizer Temp (°F)**	**Post-Oxidizer Temp (°F)**	**Influent 1 PID (ppmv)**	**Influent 1 LEL (%LEL)**	**Influent 2 PID (ppmv)**	**Influent 2 LEL (%LEL)**	**Effluent LEL (%LEL)**	**Effluent PID (ppmv)**	**Mass Removal based on PID (ppd)**	**Destruction Efficiency (%)**	**Notes**	**Wells**
Permit Conditions:																												
Since Startup:																												
Year to Date:																												
Month to Date:																												

Cumulative Results Since Startup:
Number Days Since Startup
Number of Hours Operated Since Startup

Abbreviations and Notes:

1. = INF-2 flow read from chart recorder. INF-2 pressure used to convert acfm to scfm.
2. = Changed hour meter
3. = water in pipe; unable to measure accurate concentration/ LEL readings

acfm = actual cubic feet per minute
scfm = standard cubic feet per minute (flow in scfm = flow in acfm * [operating pressure{abs} / standard pressure {abs}] * [standard temperature {abs} / operating temperature {abs}])
°F = Degrees Fahrenheit
% = Percentage
INF-1 = pre-dilution system influent
INF-2 = post-dilution system influent
in H_2O = Inches of water
in Hg = Inches of mercury
NM = Not measured
LEL = Lower Explosive Limit
ppmv = parts per million by volume
a = Hour meter non-functional due to improper wiring; hour meter values estimated based upon continuous runtime

Compliance:
BAAQMD Requirements:
Flow Rate < 250 scfm
Oxidizer Temperature > 600 deg Fahrenheit in electric catalytic mode and > 1400 degrees in thermal catalytic mode
Benzene Emission Limit < 0.102 ppd
Destruction efficiency (measured as hexane)

98.50%	VOC >2,000 ppmv
97.00%	VOC >200 and <2,000 ppmv
90.00%	VOC < 200 ppmv
	Note: If outlet VOC < 10 ppmv, destruction efficiency requirement is waived

Table 4
Dual Phase Extraction System
Analytical Data
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

Date (mm/dd/yy)	Concentrations[1]												Well ID	TPHg			Benzene			MTBE			VOC			Note
	INF-1				INF-2				Effluent																	
	TPHg (ppmv)	Benzene (ppmv)	MTBE (ppmv)	VOC (ppmv)	TPHg (ppmv)	Benzene (ppmv)	MTBE (ppmv)	VOC (ppmv)	TPHg (ppmv)	Benzene (ppmv)	MTBE (ppmv)	VOC (ppmv)		Removal Rate[2, 6] (ppd)	Cumulative Removed[7] (pounds)	Emission Rate[2, 6] (ppd)	Removal Rate[3, 6] (ppd)	Cumulative Removed[7] (pounds)	Emission Rate[3, 6] (ppd)	Removal Rate[4, 6] (ppd)	Cumulative Removed[7] (pounds)	Emission Rate[4, 6] (ppd)	Removal Rate[5, 6] (ppd)	Emission Rate[5, 6] (ppd)	Destruction Efficiency (%)	
Total Pounds Removed:														TPHg =			Benzene =			MTBE =						

Reporting Period:March 2013

Number Days in Reporting Period
Pounds of TPHg Removed during Reporting Period
Average TPHg Removal Rate (lb/day)
Pounds of Benzene Removed during Reporting Period
Average Benzene Removal Rate (lb/day)
Pounds of MtBE Removed during Reporting Period
Average MtBE Removal Rate (lb/day)

Cumulative Results Since Startup: 11/26/2012 through 4/1/2013

Number Days in Since Startup
Cumulative Pounds of TPHg Removed Since Startup
Average TPHg Removal Rate (lb/day) Since Startup
Cumulative Pounds of Benzene Removed Since Startup
Average Benzene Removal Rate (lb/day) Since Startup
Cumulative pounds of MtBE Removed Since Startup
Average MtBE Removal Rate (lb/day) Since Startup

Table 5
Dual Phase Extraction System
Individual Well Performance Data Table
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

Date (mm/dd/yy)	INF 1 Vacuum (inHg)	Well ID												Well ID										Well ID							Well ID												Well ID											
		Manifold Vacuum (inHg)	Casing Vacuum (inWC)	Stroke Counter	Groundwater Flow (gpm)	Flow (acfm)	Flow (scfm)	Conc w/ LEL (% LEL)	Conc w/ PID (ppmv)	Lab concentrations (ppmv)	Mass removal based on LEL (ppd)	Tygon tubing vac (in H2O)	DTW (fbg)	Manifold Vacuum (inHg)	Casing Vacuum (inWC)	Flow (acfm)	Flow (scfm)	Conc w/ LEL (% LEL)	Conc w/ PID (ppmv)	Lab Concentrations (ppmv)	Mass removal based on LEL (ppd)	Tygon tubing vac (in H2O)	DTW (fbg)	Manifold Vacuum (inHg)	Casing Vacuum (inWC)	Flow (acfm)	Conc w/ LEL (% LEL)	Conc w/ PID (ppmv)	Tygon tubing vac (in H2O)	DTW (fbg)	Manifold Vacuum (inHg)	Casing Vacuum (inWC)	Stroke Counter	Groundwater Flow (gpm)	Flow (acfm)	Flow (scfm)	Conc w/ LEL (% LEL)	Conc w/ PID (ppmv)	Lab Concentration (ppmv)	Mass removal based on LEL (ppd)	Tygon tubing vac (in H2O)	DTW (fbg)	Manifold Vacuum (inHg)	Casing Vacuum (inWC)	Stroke Counter	Groundwater Flow (gpm)	Flow (acfm)	Flow (scfm)	Conc w/ LEL (% LEL)	Conc w/ PID (ppmv)	Lab Concentration (ppmv)	Mass removal based on LEL (ppd)	Tygon tubing vac (in H2O)	DTW (fbg)
																																										44												45

Abbreviations:

in WC = Inches of water column

acfm = actual cubic feet per minute

LEL = lower explosive limit

PID = photo ionization detector

Conc = Concentration

ppmv = Parts per million by volume

DTW = Depth to Water

fbg = Feet below ground surface

NM = Not Measured

off = Well and/or system off during this time

ppd = pounds per day

flow in scfm = flow in acfm * [operating pressure(abs) / standard pressure (abs)] * [standard temperature (abs) / operating temperature (abs)]

pounds per day removed = C (ppmv) x Q (scfm) x (1lb-mole/386ft3) x MW (lb/lb-mole) x 60 min/hr x 24 hr/day x 10-6

C = concentration
Q = flow
MW = molecular weight

LEL assumed to be that of hexane (11,000 ppmv)

LEL percentage to ppm conversion = (LEL%/100)*(11,000 ppm/LEL %)

Gallons in 1 cubic foot = 7.48

Groundwater Flow = (strokes per minute*((PI*(radius of well (ft.)^2)*(well depth (ft)-length of pump (ft)))/7.48)

Temperature for calculating scfm is assumed to be INF-1 temperature

a = While pumps operational, tygon tubing showed vacuum, indicating dewatering success. Manual DTW collects while individual pump is off for 10 minutes.

b = Vacuum too high to get PID and LEL readings

c = water in flow stream; sum of other flows subtracted from total influent flow to estimate flow

Table 6
OM Field Notes
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

Date (dd/mm/yy)	SVE Arrival (on/off)	SVE Departure (on/off)	GWE Arrival (on/off)	GWE Departure (on/off)	GW hour meter	SVE hour meter	uptime %	Comments

Table 7
Compliance Sampling Scope of Work
Former Chevron Station 95607
5269 Crow Canyon Road, Castro Valley, California

Site	5269 Crow Canyon Road
Client	Chevron
System	Dual Phase Extraction System
PM	Judy Gilbert
PL	Darrell Smolko 925.334.8617
DM	Darrell Smolko 925.334.8617
Project#	311950
Revised Date	7/15/2013

TECHNICIAN:

WORK TASKS TO BE COMPLETED

- ☐ Review and sign HASP
- ☐ Walk site and report any unusual situations (ie drums)
- ☐ Collect Effluent Vapor Sample for Analysis
- ☐ Collect arrival data per data form.
- ☐ Contact Field Services Manager if ESOW arises.
- ☐ Record operational data (including well data) to optimize system per worksheet.
- ☐ Collect Compliance Samples

Monthly Vapor Samples

Tedlar	☐	INF-1**	TPHG (EPA 25), BTEX & MTBE (TO-15)
Tedlar	☐	INF-2	TPHG (EPA 25), BTEX & MTBE (TO-15)
Tedlar	☐	EFF	TPHG (EPA 25), BTEX & MTBE (TO-15)
VOA	☐	INF-1	TPHG (EPA 8015M), BTEX & MTBE (8260)
VOA	☐	MID-1	TPHG (EPA 8015M), BTEX & MTBE (8260)
VOA	☐	MID-2	TPHG (EPA 8015M), BTEX & MTBE (8260)
VOA	☐	MID-3	TPHG (EPA 8015M), BTEX & MTBE (8260)
VOA	☐	EFF	use start up COC that includes all 5 constituents. Exclude TSS & COD unless directed otherwise

- ☐ Contact Data Manager
- ☐ Collect departure data per data form
- ☐ Collect Chart Recorder Data to send to DM
- ☐ Sign out HASP
- ☐ Need more duplicate field sheets for binder

Check which wells are operational

☐ MW-1R	☐ EX-1
☐ MW-2R	☐ EX-2
☐ MW-3	

DATA FORM

GENERAL

DATA PT	ARRIVAL	DEPARTURE	
Date			(mm/dd/yy)
Time			(hh:mm)
Op Status			(on/off)
Alarm			(ie PS1)
Elect Svc Meter			(kwh)

SVE/BISCO DATA

DATA PT	ARRIVAL	DEPARTURE	
Hour Meter			(hours)
Chart Time			(hh:mm)
Chart Recorder			(% full)
Throttle Valve			(% open)
Man. Dilution Valve			(% open)
INF-1** Vac			
Flow			(cfm)
Temp			(F)
Conc			(ppmv)
LEL			(%LEL)
INF-2 Pressure			(in WC)
Flow (vac side)			(cfm)
Temp (vac side)			(F)
Temp (pres side)			(F)
Concentration			(ppm)
LEL			(%LEL)
Blower Vac			(in Hg)
System Vac			(in WC)
Pre-Ox Temp			(F)
Post-Ox Temp			(F)
EFF Conc			(ppmv)
EFF LEL			(% LEL)
Manifold vacuum			(in WC)

GWE DATA

Op status			(on/off)
Alarm			(ie PS1)
Hour meter			(hours)
Main totalizer			(gal)
Flow			(gpm)
T pump pressure			(psi)
LEL			(%LEL)
AC pressure			(psi)
pH (meter reading)			(6.0-9.5)
Main regulator			(psi)
C1 Pressure			(psi)
C2 Pressure			(psi)
C3 Pressure			(psi)
C4 Pressure			(psi)
SF1 Pressure			(psi)
SF2 Pressure			(psi)

Table 8
Maintainance Scope of Work
Former Chevron Station # 9-5607
5269 Crow Canyon Road, Castro Valley, California

Site	5269 Crow Canyon Road	
Client	Chevron	
System	Dual Phase Extraction System	
PM	Judy Gilbert	
PL	Darrell Smolko	925.334.8617
DM	Darrell Smolko	925.334.8617
Project#	311950	
Revised Date	7/15/2013	

TECHNICIAN:

WORK TASKS TO BE COMPLETED

- ☐ Review and sign HASP
- ☐ Walk site and report any unusual situations (ie drums)
- ☐ Collect arrival data per data form.
- ☐ Contact Field Services Manager if ESOW arises.
- ☐ Record operational data (including well data) to optimize system per worksheet.
- ☐ Check that security cameras are there and motion lights work
- ☐ Newterra Unit Maintenance (consult manual)
  - ☐ Check RC Pump
  - ☐ Check RC Pump Oil Level
  - ☐ Replace RC Pump Oil as needed
  - ☐ Grease motor fittings
  - ☐ Check panel wire connections
  - ☐ Check entrainment separator
  - ☐ Clean entrainment separator
  - ☐ Clean level rods and site glass
  - ☐ Check level rod operation
  - ☐ Check water pump operation
  - ☐ Check flow transmitter operation
  - ☐ Check thermocouple wiring
  - ☐ Check drive motor linkage on valves
  - ☐ Lubricate butterfly valves
  - ☐ Check for leaks
  - ☐ Check vacuum/pressure gauges
- ☐ Groundwater Treatment System
  - ☐ Check for leaks
  - ☐ Check pressure gauges
  - ☐ Inspect/test AST level switch
  - ☐ Inspect/test OWS level switch
  - ☐ Inspect/test transfer tank level switch
  - ☐ Inspect/test silt filter pressure switch
  - ☐ Inspect/test carbon filter pressure switches
  - ☐ Inspect/test LEL meter
  - ☐ Inspect/test sump pump
  - ☐ Inspect/call autodialer
  - ☐ Replace bag filters (per visit)
  - ☐ Check vaults, wellheads, pumps
  - ☐ Clean active pumps (1st visit of month)
  - ☐ AC maintenance per vendor manual
  - ☐ Drain AC tank condensate
  - ☐ Drain pressure regulators/filters
  - ☐ Clean compound
- ☐ Contact Data Manager
- ☐ Collect departure data per data form
- ☐ Collect Chart Recorder Data to send to DM
- ☐ Sign out HASP

Check which wells are operational

☐ MW-1R ☐ EX-1
☐ MW-2R ☐ EX-2
☐ MW-3

DATA FORM

GENERAL

DATA PT	ARRIVAL	DEPARTURE	
Date			(mm/dd/yy)
Time			(hh:mm)
Op Status			(on/off)
Alarm			(ie PS1)
Elect Svc Meter			(kwh)

SVE/BISCO DATA

DATA PT	ARRIVAL	DEPARTURE	
Hour Meter			(hours)
Chart Time			(hh:mm)
Chart Recorder			(% full)
Throttle Valve			(% open)
Man. Dilution Valve			(% open)
INF-1** Vac			(in WC)
Flow			(cfm)
Temp			(F)
Conc			(ppmv)
LEL			(%LEL)
INF-2 Pressure			(in WC)
Flow			
Temp			(cfm)
Conc			(ppmv)
LEL			(%LEL)
Blower Vac			(in Hg)
System Vac			(in WC)
Cat Temp			(F)
EFF Conc			(ppmv)
EFF LEL			(% LEL
Manifold vacuum			(in WC)

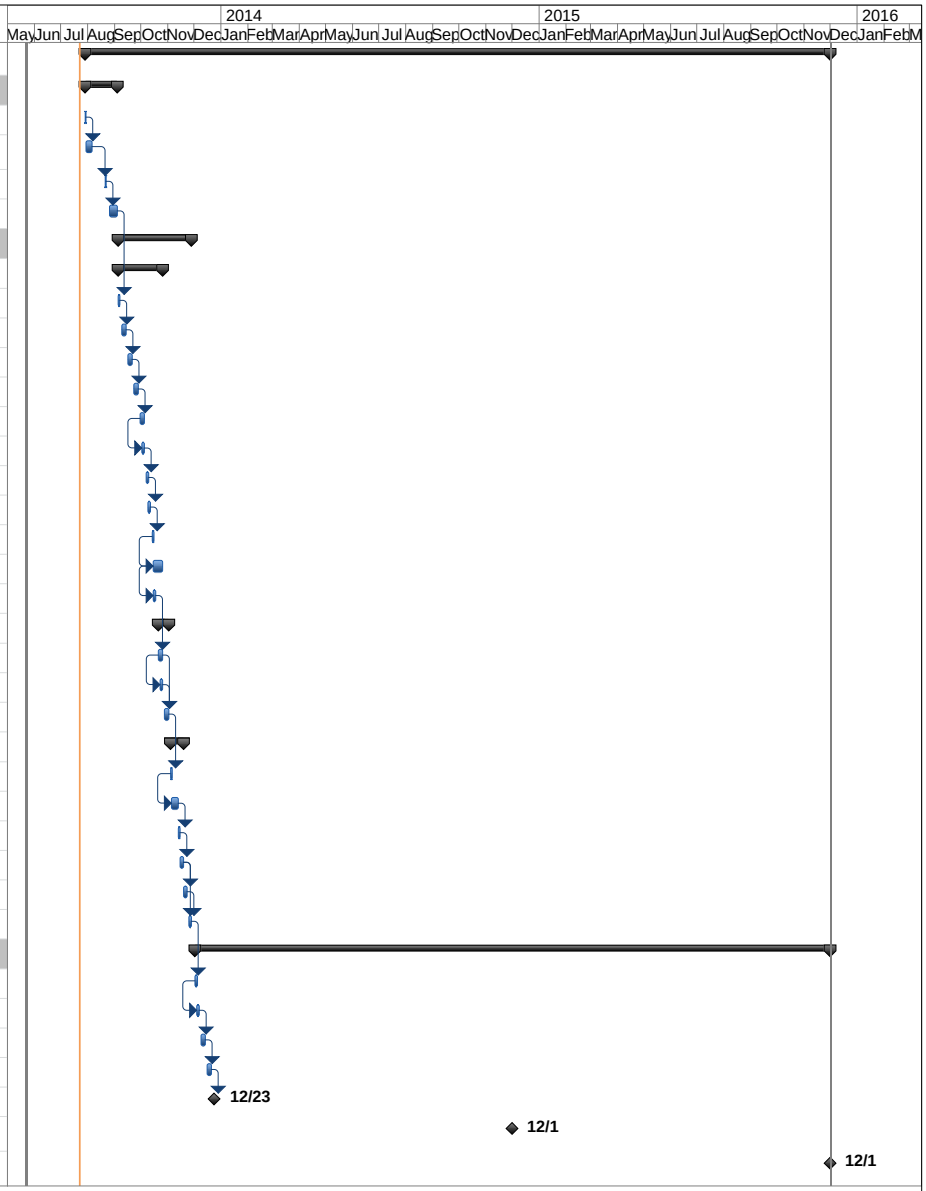
GWE DATA

Op status			(on/off)
Alarm			(ie PS1)
Hour meter			(hours)
Main totalizer			(gal)
Flow			(gpm)
Effluent LEL			(%LEL)
AC pressure			(psi)
pH (meter reading)			(6.0-9.5)
Main regulator			(psi)
C1 Pressure			(psi)
C2 Pressure			(psi)
C3 Pressure			(psi)
C4 Pressure			(psi)
SF1 Pressure			(psi)
SF2 Pressure			(psi)

ATTACHMENT C

IMPLEMENTATION SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**95607 Castro Valley Implementation Schedule**	**594 days**	**Mon 7/29/13**	**Tue 12/1/15**
2	**WELL INSTALLATIONS**	**26 days**	**Mon 7/29/13**	**Tue 9/3/13**
3	USA/Private Utility Locate	1 day	Mon 7/29/13	Mon 7/29/13
4	Almeda County Drilling Permit	5 days	Tue 7/30/13	Mon 8/5/13
5	Pre-field Meeting	1 day	Wed 8/21/13	Wed 8/21/13
6	Drilling (3 Extraction Wells, 2 Monitoring Wells)	6 days	Mon 8/26/13	Tue 9/3/13
7	**CONSTRUCTION**	**60 days**	**Thu 9/5/13**	**Wed 11/27/13**
8	**WEST SIDE SITE WORK**	**37 days**	**Thu 9/5/13**	**Fri 10/25/13**
9	Asphalt Saw Cutting	2 days	Thu 9/5/13	Fri 9/6/13
10	Surface Removal/Trash Enclosure Demo	5 days	Mon 9/9/13	Fri 9/13/13
11	Pier Drilling	5 days	Mon 9/16/13	Fri 9/20/13
12	Place Steel and Pour Concrete for Piers	5 days	Mon 9/23/13	Fri 9/27/13
13	Grading/Trenching/Soil Off-Haul	5 days	Mon 9/30/13	Fri 10/4/13
14	Underground Piping / Well Vaults / Backfill	3 days	Wed 10/2/13	Fri 10/4/13
15	Steel and Form Work	3 days	Mon 10/7/13	Wed 10/9/13
16	Pour Concrete / Shotcrete	3 days	Wed 10/9/13	Fri 10/11/13
17	Asphalt Resurfacing	2 days	Mon 10/14/13	Tue 10/15/13
18	Install Abovegrade Pipe/Conduit	9 days	Tue 10/15/13	Fri 10/25/13
19	Re-Build Trash Enclosure	3 days	Tue 10/15/13	Thu 10/17/13
20	**EAST SIDE SITE WORK**	**10 days**	**Mon 10/21/13**	**Fri 11/1/13**
21	PG & E Underground and Transformer	5 days	Mon 10/21/13	Fri 10/25/13
22	Switch Gear and Underground Conduit	3 days	Wed 10/23/13	Fri 10/25/13
23	GWE Container Footing	5 days	Mon 10/28/13	Fri 11/1/13
24	**FINAL WORK BOTH AREAS**	**11 days**	**Mon 11/4/13**	**Mon 11/18/13**
25	Place and Anchor Equipment Containers	2 days	Mon 11/4/13	Tue 11/5/13
26	Pipe and Electrical Connections	6 days	Tue 11/5/13	Tue 11/12/13
27	Install SVE Compound Fence	2 days	Wed 11/13/13	Thu 11/14/13
28	Signage, Lights, Locks, Cleanup	2 days	Fri 11/15/13	Mon 11/18/13
29	Contingency	4 days	Tue 11/19/13	Fri 11/22/13
30	Final Inspection	3 days	Mon 11/25/13	Wed 11/27/13
31	**POST-CONSTRUCTION**	**507 days**	**Mon 12/2/13**	**Tue 12/1/15**
32	PG & E Meter Release	3 days	Mon 12/2/13	Wed 12/4/13
33	CRA Dry/Wet Test	3 days	Wed 12/4/13	Fri 12/6/13
34	GWE Startup	5 days	Mon 12/9/13	Fri 12/13/13
35	SVE Startup	5 days	Mon 12/16/13	Fri 12/20/13
36	Start Continuous Operation	0 days	Mon 12/23/13	Mon 12/23/13
37	Start Post Remediation Groundwater Monitoring	0 days	Mon 12/1/14	Mon 12/1/14
38	Evaluate the Site for Low Threat Case Closure / Well Destruction	0 days	Tue 12/1/15	Tue 12/1/15



Project: 95607_Castro Valley_Imp
Date: Tue 7/23/13

Task	External Tasks	Manual Task	Finish-only
Split	External Milestone	Duration-only	Deadline
Milestone	Inactive Task	Manual Summary Rollup	Progress
Summary	Inactive Milestone	Manual Summary	
Project Summary	Inactive Summary	Start-only	