ConocoPhillips
76 Broadway
Sacramento, California 95818

December 20, 2010

Mr. Jerry Wickham
Alameda County Health Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: 76 Service Station No. 7376
4191 First Street
Pleasanton, California

RE: Remedial Action Plan

Dear Mr. Wickham,

I declare under penalty of perjury that to the best of my knowledge the information and/or recommendations contained in the attached report is/are true and correct.

If you have any questions or need additional information, please contact me at (916) 558-7612.

Sincerely,

Bill Borgh

Bill Borgh
Site Manager – Risk Management and Remediation

Attachment

REMEDIAL ACTION PLAN
76 SERVICE STATION NO. 7376
4191 FIRST STREET
PLEASANTON, CALIFORNIA
ALAMEDA COUNTY FUEL LEAK CASE NO. RO0000361

Prepared for:

ConocoPhillips Company
76 Broadway
Sacramento, CA 95818

Prepared by:

Delta Consultants
312 Piercy Road
San Jose, California 95138

December 20, 2010

CERTIFICATION

The following report was prepared under the supervision and direction of the undersigned California Certified Hydrogeologist and Professional Engineer.

DELTA CONSULTANTS

PROFESSIONAL GEOLOGIST
R. LEE DOOLEY
NO. 0183
CERTIFIED
HYDROGEOLOGIST
STATE OF CALIFORNIA

R. Lee Dooley
California Certified Hydrogeologist #0831

REGISTERED PROFESSIONAL ENGINEER
ATIR JAVED CHAK
NO. 67445
EXP. 6/30/11
CIVIL
STATE OF CALIFORNIA

Atir J. Chak, PE, REA
California Professional Civil Engineer No. C67445

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1.0 INTRODUCTION

Delta Consultants, (Delta), on behalf of ConocoPhillips (COP) has prepared this *Remedial Action Plan (RAP)* for the 76 Service Station No. 7376, located at 4191 First Street in Pleasanton, California and the adjacent properties to the north and northeast (site) (**Figures 1 and 2**). Delta has prepared this document in response to the Alameda County Health Care Services Agency (ACEH) letter dated October 19, 2010 and after consultation with other impacted stakeholders. The RAP presents the selected remedial action for the site which involves source removal activities through soil vapor extraction, extraction and disposal of separate phase hydrocarbons (SPH), and management of groundwater migration control through groundwater extraction and treatment. Monitoring of groundwater will be necessary during a post remediation phase in order to ensure the effectiveness of the remedies. Following completion of active remediation, the anticipated future use of the site is as a commercial gasoline retail station and the property to the north and northwest as a City of Pleasanton landscaped parking area.

2.0 REMEDIAL ACTION PLAN

Delta has evaluated the currently applicable remedial approaches for addressing the constituents of concern (COCs) identified beneath the site and properties to the north. Primary COCs are petroleum hydrocarbons and the fuel oxygenate methyl tert-butyl ether (MTBE) derived from the 76-branded service station and bunker fuel oil from a former under ground storage tank (UST) within the former railroad right-of-way north of the site. Based on Delta's evaluation of the site conditions, pilot testing, and remedial alternatives per the *Revised Corrective Action Plan* dated September 30, 2010 (DELTA, 2010), Delta recommends soil vapor extraction (SVE) and groundwater extraction (GWE) as the most appropriate active remedial action at the site. Any separate phase bunker oil will be removed from well sumps.

2.1 Targeted Cleanup Goals

Initial targeted cleanup goals are the California Regional Water Quality Control Board, San Francisco Bay (RWQCB) Environmental Screening Levels (ESLs). The ESLs will be re-evaluated after one year of system operation. Any identified COC's that are not listed in the RWQCB's ESL table will be evaluated and tracked with guidance from the lead regulatory

agency. The following table summarizes the published ESLs for the COCs identified in Delta's *Revised Corrective Action Plan*.

TARGETED CLEANUP GOALS

COC	Soil (mg/kg)	Groundwater (ug/L)
Benzene	0.044	1.0
MTBE	0.023	5.0
TPH-G	83	100
TPH-residual fuels (soil >3m)	5,000	100
TPH-residual fuels (soil <3m)	370	210
ethylbenzene	3.3	30
naphthalene	3.4	17
toluene	2.9	40
xylene	2.3	20
2-methylnapthalene	0.25	2.1
Fluorine	8.9	3.9
tertiary-butyl alcohol	0.075	120

mg/kg =milligram per kilogram ug/L = micrograms per Liter

MTBE = methyl tertiary butyl ether TPH-G= Total Petroleum Hydrocarbons as Gasoline

m= meters

2.2 SVE System Details

The conceptual design will consist of a network of SVE wells screened in the permeable vadose zone layers of sand and gravel. The purpose of these wells is to reduce volatile organic compound (VOC) and petroleum hydrocarbon mass from the vadose zone to minimize potential future migration into the saturated zone. The proposed network of SVE wells is designed to maximize the area of vapor extraction influence and adequately mitigate the subsurface impacts. Based on the results of the April 2010 SVE pilot test, a conservative radius of influence (ROI) of 12 feet was reported as the minimum expected ROI. To ensure adequate capture zone in the stratified site lithology, the SVE well spacing has been designed with overlapping ROI's (**Figure 2**). This overlapping along with a conservative design ROI of 12 feet, should allow maximum vapor recovery in the targeted area.

Existing wells CWB-1 and CWB-3 will be connected to the SVE system to extract vapors. Additional SVE wells will be installed and connected to the system to allow for flexibility in operation and concentration of the remediation efforts on those areas with the highest concentrations of TPH-G, benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX), compounds, and fuel oxygenates. The proposed additional SVE wells are VE-1 through VE-6, VE-7A, VE-7B, VE-8A, VE-8B, VE-9, VE-10A, VE-10B, VE-11A, VE-11B, and VE-12 through VE-23. Each SVE well will be individually connected to a manifold located on the 76 Service Station No. 7376 property in the proposed remediation compound by an appropriately sized process line. All appropriate access agreements with impacted stakeholders will be obtained prior to well installation or remedial construction activities.

The proposed SVE well locations are shown on **Figures 2 and 3**. A table with the proposed well specifications is presented below;

Well ID	Well Diameter (inches)	Total Well Depth (ft. bgs)	Screen Interval (ft. bgs)	Well Sump Interval (ft. bgs)
VE-1	4	40	22 to 37	37 to 40
VE-2	4	40	22 to 37	37 to 40
VE-3	4	40	22 to 37	37 to 40
VE-4	4	40	22 to 37	37 to 40
VE-5	4	40	22 to 37	37 to 40
VE-6	4	40	22 to 37	37 to 40
VE-7A	4	40	22 to 37	37 to 40
VE-7B	4	66	58 to 63	63 to 66
VE-8A	4	44	31 to 41	41 to 44
VE-8B	4	66	58 to 63	63 to 66
VE-9	4	44	31 to 41	41 to 44
VE-10A	4	44	31 to 41	41 to 44
VE-10B	4	68	55 to 65	65 to 68
VE-11A	4	44	31 to 41	41 to 44
VE-11B	4	68	55 to 65	65 to 68
VE-12	4	44	31 to 41	41 to 44
VE-13	4	44	31 to 41	41 to 44
VE-14	4	44	31 to 41	41 to 44
VE-15	4	44	31 to 41	41 to 44
VE-16	4	44	31 to 41	41 to 44
VE-17	4	44	31 to 41	41 to 44
VE-18	4	44	31 to 41	41 to 44
VE-19	4	44	31 to 41	41 to 44
VE-20	4	44	31 to 41	41 to 44
VE-21	4	44	31 to 41	41 to 44
VE-22	4	44	31 to 41	41 to 44
VE-23	4	44	31 to 41	41 to 44

ft. bgs = feet below ground surface

Wells will be constructed of 4-inch diameter PVC casing and well screen (0.020 inch). A #3 sand pack will be placed to two feet above the screen interval. A two-foot thick bentonite seal will be placed above the sand pack followed by a cement grout to the surface. In

addition to utilizing these proposed wells for vapor extraction, there is the possibility of recovering bunker fuel/weathered oil in these wells that has migrated from the former redwood underground storage tank (UST) area, as discovered during the groundwater pumping feasibility study in April 2010. The three foot, non-screened casing section sump at the bottom of each well will be used to house a pneumatic product pump or alternative product skimmer to pump out any collected bunker fuel oil. Due to the low anticipated volume of weathered oil that will be recovered each month, a flexible, oil grade tubing contained will be used to transport any recovered oil from the well to the top of each well. During site visits, field personnel will pump and /or transfer the recovered oil into properly labeled 55-gallon Department of Transportation rated drums for future disposal.

General industry practices for trenching installation methodologies will be utilized, including process pipe materials selection, use of sweep angles in the trench layout to minimize flow restrictions, trenching depth, sloping of the process lines, trench backfill and trench compaction. Field and engineering determinations will be made for the reuse of excavated soil in the trenching backfill, if soil is deemed clean and appropriate for compaction; it will be place back into the trench. If soil is deemed impacted or unsuitable for compaction, appropriate protocols for separating, stockpiling, classifying and disposing of clean, non-hazardous and hazardous waste will be implemented.

Recovered vapors from the SVE system will be treated using a skid mounted SVE blower equipped with a Thermal Oxidizing (Thermox) Unit. Based on the SVE system performance data collected during the April 2010 SVE Feasibility Study, a minimum 500 cubic feet per minute SVE Blower/Thermox will be needed to run all 27 wells simultaneously. However, to improve well flow rates and optimize vapor extraction, wells will be extracted from on a periodic or timed basis. A compressor installed in the remedial compound will be used to power the pneumatic product pumps in the SVE wells.

Two design items should be noted for the proposed SVE system. On the offsite property, a KinderMorgan underground petroleum pipeline is noted as running southwest to northeast. Any drilling or trenching work in this area will need to be coordinated with KinderMorgan prior to conducting any field activities. The second design item is that several offsite SVE wells and their associated process pipe trench lines are located on a third party

stakeholder's private property. Access negotiations for this well installation and remedial work will need to be completed prior to the final implementation activities.

2.3 GWE System Details

Two proposed groundwater extraction wells, GWE-1 and GWE-2, will be connected to the groundwater pump and treat system. GWE-1 is proposed near the location of existing well MW-5 for removal of separate phase hydrocarbons (SPH) and associated dissolved constituents. The well will be designed to accept a SPH skimmer and with a bottom sump for collection and removal of heavy fuels.

GWE-2 is proposed down-gradient and off-site to provide migration control of the existing groundwater plume. The well will be constructed of 4-inch diameter PVC casing to a total depth of approximately 85 feet below ground surface (bgs). Depths to groundwater in adjacent wells MW-8 and MW-9 in September 2010 were 68.73 and 65.90 feet respectively. The well will be screened from approximately 65 to 85 feet bgs in order to be able to extract groundwater from the saturated sand and gravel layers currently contaminated with petroleum hydrocarbons and MTBE. SPH is not anticipated at this downgradient location.

Based on previous pumping test, the groundwater extraction flow rate is anticipated to be approximately 1.0 gallon per minute (gpm). The sustained yield and area of influence will be determined by a 24-hour pumping test at both GWE-1 and GWE-2. Extracted groundwater will be conveyed by underground piping to a treatment area in the northern portion of the service station property. The extracted groundwater will be treated by granular activated carbon (GAC) and then discharged in accordance with applicable permit.

2.4 Conceptual Remedial System Design

The SVE system design will generally consist of a vacuum pump with an effluent air treatment system. Vapor extracted from the vadose zone will be treated by a thermal catalytic oxidizer (TCAT). Initially, all SVE wells will be connected to the system to extract vapors, and as remediation progresses, Delta will evaluate the need to add additional SVE wells or disconnect SVE wells from the system. The design of the proposed groundwater pump and treat system will consist of a dedicated pneumatic pump in each well for GWE.

Groundwater will be pumped to a surge/storage tank, through a sediment filter bag assembly, then pumped through a minimum two (2) 2,000-gallon liquid activated carbon vessels prior to discharge to the sewer or storm drain connection. System design drawings are included as **Appendix A**.

Treatment of Waste streams

The waste stream generated by SVE is soil vapors. The vapors will be treated by a TCAT. The SVE system will be designed to meet Bay Area Air Quality Management District (BAAQMD) discharge requirements obtained for this specific site. Extracted groundwater will be treated by carbon adsorption and discharged to the sewer or storm drain under a Publicly Owned Treatment Works (POTW) or National Pollutant Discharge Elimination System (NPDES) permit.

Progress Monitoring and Sampling

Progress of the SVE remediation system will be monitored by sampling the system influent streams of soil vapors and groundwater. All sampling will be based on site specific permit driven requirements of the BAAQMD, POTW, or NPDES. Each permit is unique in regards to analysis required, frequency of sampling and measurements, analytical methods, and reporting requirements. Delta will comply with all BAAQMD startup and monthly monitoring requirements.

Generally BAAQMD permits require a three day startup event where air samples are collected daily from influent, post dilution and effluent air points and analyzed for COCs. Continuous monitoring of the air stream temperature and flow rates is also conducted during the startup to ensure the permit conditions are satisfied and the remedial equipment is operating properly. Additional system parameter data, both permit required and non-specific permit required, will also be collected to monitor system performance. This includes, but is not limited to collecting pressure, flow and hydrocarbon concentration of the individual SVE wells influent process lines. A baseline ROI for the SVE system will be established during the first quarter of operation. Other extraction wells can be used as observation points to verify ROI by closing the well at the vapor manifold. ROI evaluation will continue on a monthly basis to track performance.

The groundwater discharge permit will also dictate monitoring and sampling requirements and procedures. Optimization of the system will be based on these permit required sampling results. Drawdown of the water table will be monitored in adjacent monitoring points to determine an effective ROI for the recovery wells.

Progress Evaluation

Progress of the SVE and GWE system will be evaluated based on influent analytical data. In addition, influent hydrocarbon concentrations readings will be recorded from individual extraction wells on a monthly basis using a photo-ionization detector (PID). These PID measurements will be used to monitor the performance of each extraction well. Recovery rates for system COC and groundwater recovery rates will also be monitored monthly. Monthly trend analysis of all field data and quarterly trend analysis of all lab data will be used to optimize the system and ensure proper and efficient system operation. Continued operation of the SVE system will be evaluated after one year of operation or earlier if COC recovery rates reach asymptotic levels.

After the influent soil vapor concentrations have approached an asymptotic reduction the system will be tested for rebound of concentrations. Rebound testing will consist of collecting baseline laboratory vapor samples followed by a 3-month period of shutdown. During the shutdown period, PID air samples from each SVE well head will be collected on a monthly basis to monitor for rebound. Additionally, during this shutdown period one sample for laboratory analysis will be collected from up to three SVE wells exhibiting the highest COC concentrations (based on PID samples). At the completion of the shutdown period the SVE system will be restarted and laboratory analytical vapor samples will be collected. Analytical data will be compared to baseline samples at shutdown to evaluate for rebound of COC concentrations. If rebound occurs, the analytical results and magnitude will be discussed with the regulatory agency a recommendation may be made to restart the system or continue monitoring. Prior to restarting the system, the appropriate stakeholders will be notified. If it is determined that rebound has not occurred, a work plan for confirmation soil borings will be prepared.

Specific Bunker C clean up will be evaluated after one year of operation of in-well pumping. Product recovery and optimization will be conducted monthly for the first year . After one

year of operation, Delta recommends the following: a review of the SPH recovery rates and SPH volumes to identify the impacted areas remaining on all properties, a comparison of this data against the remedial system layout, evaluate the need for additional wells and a possible expansion of system or development of a risk assessment model to address potential unrecovered bunker fuel as it relates to human health and environmental impacts.

Progress Reports

Quarterly progress reports of the remediation system will be submitted. At a minimum, this report will include the following items:

- The percentage of time the system has operated;
- A summary of the flow rate, temperature and pressure of recovered vapors;
- A comparison of calculated ROIs for the SVE wells
- The extraction rate of groundwater;
- The volume of weather oil/SPH recovered and disposed of;
- The mass of hydrocarbons removed as soil vapor;
- The mass of hydrocarbons removed by the extracted groundwater;
- The percentage of reduction in hydrocarbon concentration in the vapor phase;
- The percentage of reduction in hydrocarbons concentrations in groundwater;
- A summary of the remedial system optimization efforts; and
- A summary of compliance and permitting issues for both the air and groundwater discharge permits.

Confirmation Sampling

Once asymptotic reduction of hydrocarbon concentrations has been confirmed in the vapor phase samples, soil confirmation samples will be collected. A work plan describing confirmation sampling activities will be prepared for submittal to the ACEH.

Implementation Schedule

Implementation of the activities discussed in this report will be initiated upon receipt of approval from the ACEH. Delta anticipates the following implementation schedule:

Milestone	Approximate Time Frame
RAP review and commenting period	3 months
Permitting, well installation, and construction activities	9 months
Active remediation	3 years (with annual system performance reviews)
Post monitoring	2 years
Closure activities	3 months

3.0 REMARKS

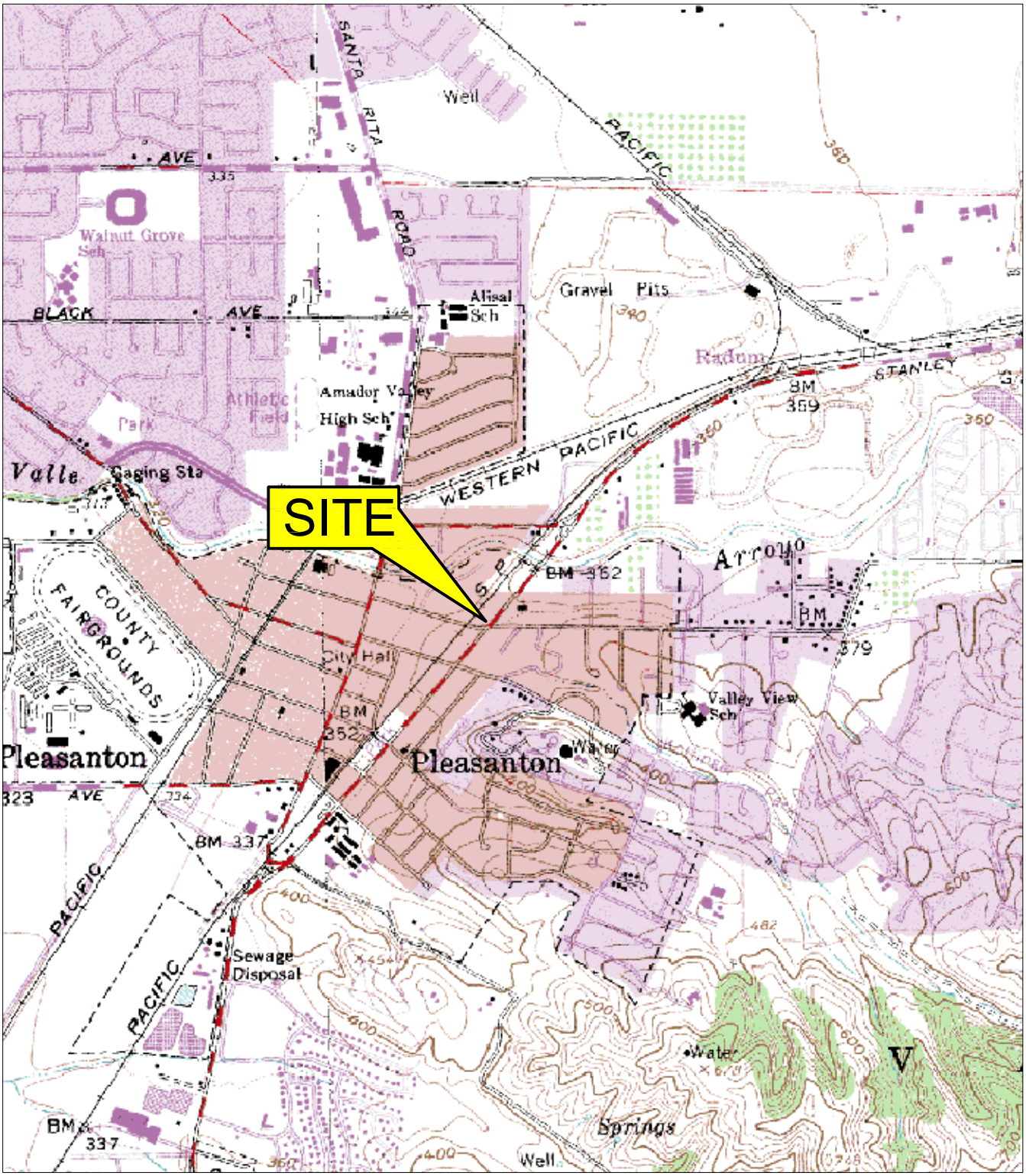
The descriptions, conclusions, and recommendations contained in this report represent Delta's professional opinions based upon the currently available information and are arrived at in accordance with currently acceptable professional standards. For any reports cited that were not generated by Delta, the data from those reports is used "as is" and is assumed to be accurate. Delta does not guarantee the accuracy of this data for the referenced work performed nor the inferences or conclusions stated in these reports. This report is based upon a specific scope of work requested by the client. The Contract between Delta and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were conducted. This report is intended only for the use of Delta's Client and anyone else specifically listed on this report. Delta will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Delta makes no express or implied warranty as to the contents of this report.

4.0 REFERENCES

California Regional Water Quality Control Board (RWQCB), *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater,* November 2007, Revised May 2008.

Delta Consultants (2010), *Revised Corrective Action Plan*, *76 Station N0. 7376, 4191 First Street, Pleasanton, California*, September 30, 2010.

FIGURES



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, LIVERMORE QUADRANGLE (1978)

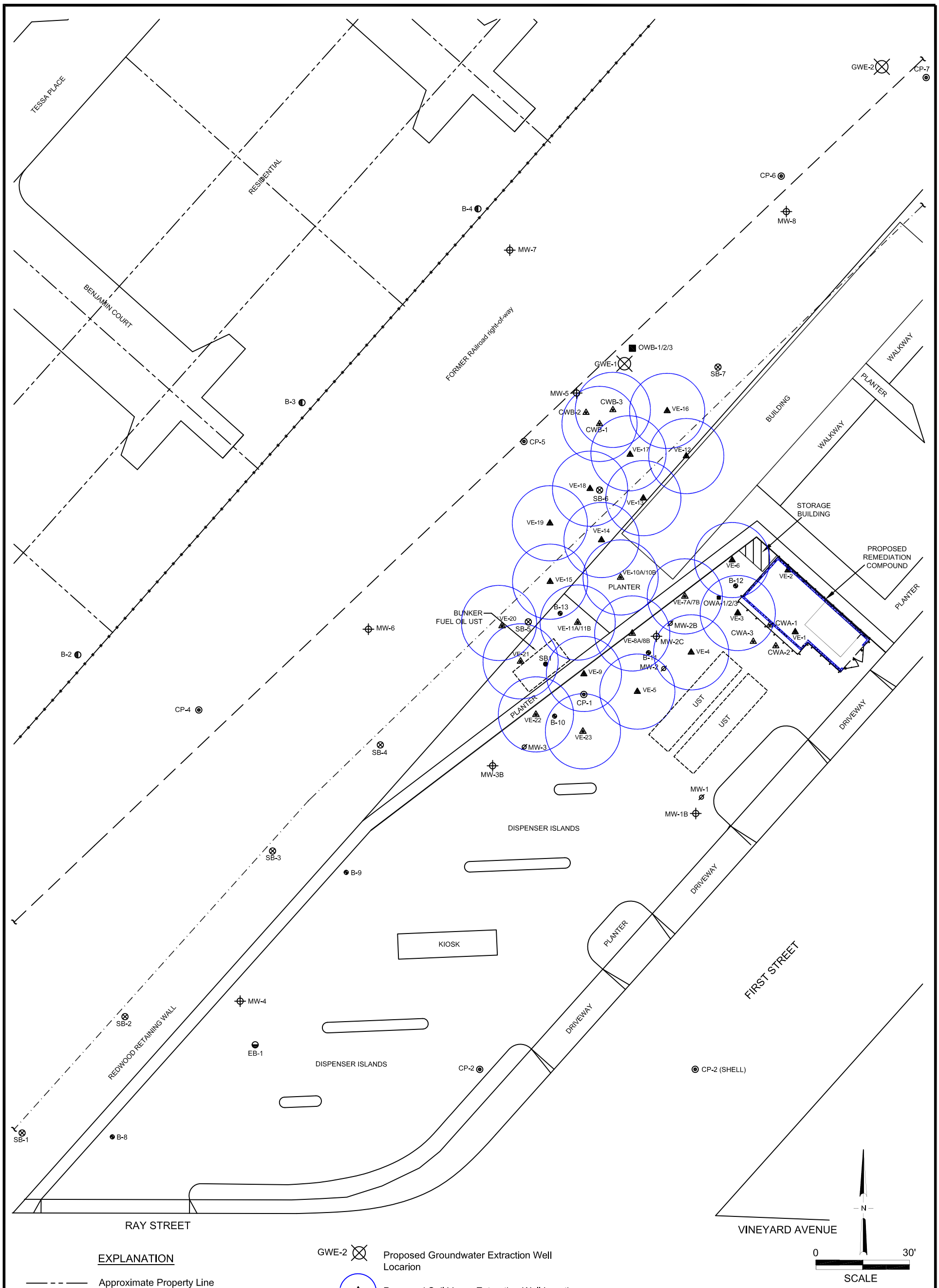
FIGURE 1

SITE LOCATION MAP

76 STATION NO. 7376
4191 FIRST STREET
PLEASANTON, CALIFORNIA

PROJECT NO. C107376	DRAWN BY JH 03/28/08
FILE NO. 7376-SiteLocator	PREPARED BY LS
REVISION NO.	REVIEWED BY DD

DELTA



EXPLANATION

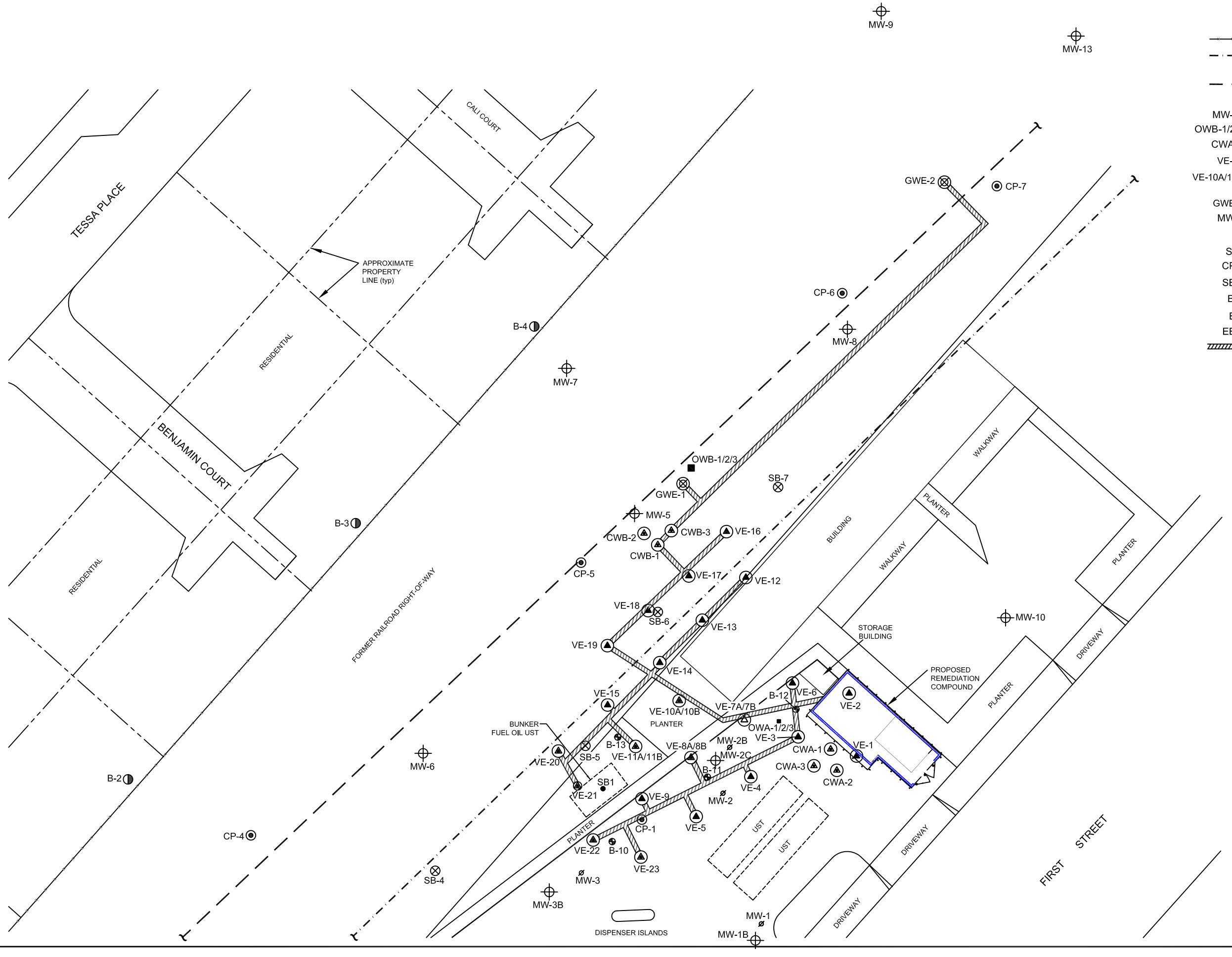
- Approximate Property Line
- Fence
- Approximate Location of Underground Petroleum Pipeline (KinderMorgan)
- Approximate location of Fiber Optic Utility Line
- MW-12 — Groundwater monitoring well Locaton
- OWB-1/2/3 — Observation Well Location (Delta, 2010)
- CWA-1 — Soil Vapor Extraction Well Location (Delta, 2010)
- MW-2 — Abandoned Well Location
- GWE-2 — Proposed Groundwater Extraction Well Locarion
- VE-19 — Proposed Soil Vapor Extraction Well Location with Radii
- VE 7A/7B — Proposed Nested Soil Vapor Extraction Well Location with Radii
- SB1 — Soil boring Location (Delta, June 2009)
- CP-1 — CPT boring Location (Delta, February 2008)
- SB-1 — Soil Boring Location (BSU, 2007)
- B-8 — Soil Boring Location (Gettler-Ryan, 1998-1999)
- B-1 — Soil Boring Location (ENGEO, 1997)
- EB-1 — Soil Boring (KEI, 1995)

FIGURE 2
SITE MAP WITH PROPOSED WELL LOCATIONS

76 STATION NO. 7376
4191 FIRST STREET
PLEASANTON, CALIFORNIA

PROJECT NO. C107376330	DRAWN BY K. MARTIN	
FILE NO. 7376-SM1	PREPARED BY G. CERNA	
DATE 10 DEC 10	REV. 1	LAYER SM \ROI

DELTA



EXPLANATION

- Fence
- Approximate Location of Underground Petroleum Pipeline (KinderMorgan)
- Approximate Location of Fiber Optic Utility Line

MW-12	Groundwater monitoring well Locaton
OWB-1/2/3	Observation Well Location (Delta, 2010)
CWA-3	Soil Vapor Extraction Well Location (Delta, 2010)
VE-19	Proposed Soil Vapor Extraction Well Location
VE-10A/10B	Proposed Nested Soil Vapor Extraction Well Location
GWE-2	Proposed Groundwater Extraction Well Location
MW-2	Abandoned Well Location
SB1	Soil boring Location (Delta, June 2009)
CP-1	CPT boring Location (Delta, February 2008)
SB-1	Soil Boring Location (BSU, 2007)
B-8	Soil Boring Location (Gettler-Ryan, 1998-1999)
B-1	Soil Boring Location (ENGEO, 1997)
EB-1	Soil Boring (KEI, 1995)
	Proposed SVE Trenching Location

N

0 15' 30'

Date	Revision	Drawn	Review
-	1 -	-	-
	2		
	3		
	4		
	5		

Prepared by	Reviewed by	Drawn by	Date
LD	-	KYM	12/10/2010

SITE MAP WITH PROPOSED TRENCH LOCATIONS
SOIL VAPOR EXTRACTION AND GROUNDWATER EXTRACTION SYSTEM

76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

Project No.
C107376330

Filename
7376-SM2

Figure
3

APPENDIX A

System Design Drawings

CONSTRUCTION NOTES:

PERFORM ALL WORK IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, STANDARDS AND CODES INCLUDING OSHA AND CALOSHA.

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY BUILDING PERMITS AND CONDUCTING AGENCY NOTIFICATIONS.

EXECUTE WORK SO AS TO MINIMIZE ANY DISRUPTIONS TO THE FUELING FACILITY OPERATIONS. PROVIDE AND MAINTAIN ACCESS FOR FACILITY OPERATIONS AS DIRECTED. IT IS THE CONSULTANT'S/CONTRACTOR'S RESPONSIBILITY TO ISSUE MDI NOTIFICATIONS.

CONTRACTOR TO VERIFY THE LOCATION OF TANKS, PIPING, APPURTENANCES AND UTILITIES. CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS WHICH EFFECT THE WORK PRIOR TO BEGINNING CONSTRUCTION. NOTIFY UNDERGROUND SERVICE ALERT (USA) PRIOR TO ANY SUBSURFACE WORK.

PROTECT EXISTING ITEMS WHICH ARE TO REMAIN IN PLACE, BE REUSED OR REMAIN PROPERTY OF THE STATION OWNER OR COP. REPAIR ITEMS WHICH ARE TO REMAIN AND WHICH ARE DAMAGED DURING THE PERFORMANCE OF THE WORK TO THEIR ORIGINAL CONDITION OR REPLACE WITH NEW. DO NOT EXCEED LOADING CAPACITIES OF SITE PAVEMENT.

UNSHORED EXCAVATIONS GREATER THAN 4 FEET DEEP SHALL NOT HAVE A SLOPE GREATER THAN 1:1.

STOCKPILED SOIL SHALL BE PROTECTED FROM WEATHER. CONTAMINATED SOIL SHALL BE COVERED IN ACCORDANCE WITH BAAQMD REQUIREMENTS. PROVIDE STORMWATER RUN-ON AND RUN-OFF CONTROLS FOR TEMPORARY SOIL STOCKPILES AND OPEN EXCAVATIONS. PREVENT CONSTRUCTION OR DEMOLITION MATERIALS FROM ENTERING STORM DRAINS AND SEWER SYSTEMS.

ALL SOIL AND WATER SAMPLING SHALL BE DONE IN ACCORDANCE WITH LOCAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE CHARACTERIZATION, TRANSPORTATION AND DISPOSAL OF MATERIALS AND WASHWATERS ASSOCIATED TRENCH EXCAVATION AND DECONTAMINATION WITH COP FOR PROPER HANDLING. CONCRETE AND ASPHALT DEBRIS SHALL BE RECYCLED WHERE POSSIBLE.

RESTORE OR PROVIDE ARCHITECTURAL FINISHES IN AREAS AFFECTED BY DEMOLITION TO MATCH PRE-CONSTRUCTION CONDITIONS. WORK TO INCLUDE BUT NOT LIMITED TO PAVEMENT RESTRIPING, CURB PAINTING, LANDSCAPING AND PATCHING SURFACE IRREGULARITIES. ALL LEFT BEHIND SAW CUTS SHOULD BE KEEP TO AN ABSOLUTE MINIMUM.

THE CONVEYANCE PIPING LAYOUT OF THE SITE SHALL BE IN SUCH A MANNER AS TO MINIMIZE THE AMOUNT PRODUCT LINE OR TANK SLAB CROSSINGS.

ALL PROCESS LINES AND CONDUITS SHALL BE FREE OF DIRT AND DEBRIS AFTER INSTALLATION. THE GW SECONDARY CONTAINMENT LINES SHALL BE CLEANED PRIOR TO THE INSTALLATION OF THE PRIMARY LINE.

PRESSURE TEST ALL SVE AND GW SECONDARY LINES TO 5PSI PRIOR TO BACKFILL. PRESSURE TEST GW PRIMARY, COMPRESSED AIR AND AIR SPARGE LINES TO 75% OF THE PROCESS LINE PRESSURE. THERE SHALL BE NO NOTICEABLE CHANGE AFTER 1 HOUR OR ANY VISIBLE LEAK INDICATIONS.

MATERIAL REFERENCE

ITEM No.	PART	LOCATION	MATERIAL SPECIFICATION	PREF. MANU. OR SUPPLIER	MANU. PART #	EQV
1	WELL SUMP	WELLHEAD	30 GAL. SUMP W/COVER	HARRINGTON PLASTICS	WPSUMP-2	X
7	PROCESS LINE	TRENCHES	HDPE W304 100 PSI UTILITY POLYETHYLENE- 3/4" OR 1"	HARRINGTON PLASTICS	3/4": SL-I00190404B 1": SL-I00190305B	X
8	PNEUMATIC PUMP	WELL	SUBMERSIBLE PNEUMATIC PUMP AP-SERIES (TYPE FOR REQUIRED FLOW RATE)	TESTAMERICA	VARIES WITH SIZE PHONE (800-800-8094)	X
10	WELL CAP	WELLHEAD	WELLHEAD CAP SEAL SIZED FOR WELL CASING DIAMETER AND NUMBER AND SIZE OF OPENINGS(VAPOR AND WATER EXTRACTION)	TESTAMERICA	VARIES WITH SIZE PHONE (800-800-8094)	X
11	PUMP HOSES	WELL	WATER, AIR, VENT SIZED FOR FLOW RATE PLUS PUMP SUPPORT CABLE	TESTAMERICA	VARIES WITH SIZE PHONE (800-800-8094)	X
12	PULSE COUNTER	WELLHEAD	1/4" NPT PULSE COUNTER (AIR PUMPS ONLY)	TESTAMERICA	VARIES WITH SIZE PHONE (800-800-8094)	X
19	LEVELS	TANKS	FLOAT SWITCHES, ETC.	CAMPBELL		X
25	CLAMPS	HDPE TUBING	HEAVY DUTY T-BOLT HOSE CLAMP	McMASTER-CARR	3/4": 5443K14 1": 5443K16	X
26	HOSE BARBS	HDPE TUBING	MALE ADAPTER (REDUCING MALE ADAPTERS MAY BE SUBSTITUTED AS REQUIRED)	HARRINGTON PLASTICS	3/4": 1436-007 1": 1436-010	X
27	PENETRATION BOOTS	PIPE & SUMP	PENETRATION FITTING (SPECIFY SIZES REQUIRED)	ENVIRON PRODUCTS	3/4" OR 1": FEB-3157 2": FEB-6200 3": FEB-6300 4": FEB-7400 6": FEB-8600	X
29	SWEEPS	DUAL EXTRACTION PIPING	X" SCH 40 PBX 90X36 RIGID NONMETALLIC ELECTRICAL CONDUIT SWEEPS FOR DOUBLE CONTAINMENT.		VARIES WITH SIZE	X
32	GRATING	SUMP	MINIMUM 24"x24" NON-TRAFFIC RATED GRATE AND FRAME	REGIONAL		X
40	TERMINATION BOOT	WELLHEAD	TERMINATION BOOT	BLUELINE	3"x1": PER3.5X1.4A 3"x2": PER3.5X2.4A 1.4"X1" INSERT: SI 1.4X1.0 2.4"X1.9" INSERT: SI 2.4X1.9	X

EQV - AN "X" IN THIS COLUMN DENOTES THAT AN EQUIVALENT MANUFACTURER/PART CAN BE USED IN PLACE OF THE PREFFERED MANUFACTURER LISTED IN COLUMN FIVE AS LONG AS THE THE EQUIVALENT PART MEETS THE SPECS PROVIDED IN COLUMN FOUR - MATERIALS SPECIFICATION..

ABBREVIATIONS

A.C.	ASPHALTIC CONCRETE	MAX.	MAXIMUM
BLDG.	BUILDING	MIN.	MINIMUM
BLVD.	BOULEVARD	N	NEW
B.W.	BOTH WAYS	NO(S).	NUMBER(S)
CONC.	CONCRETE	ø	NOMINAL DIAMETER
CONTR.	CONTROL	O.C.	ON CENTER
DIA.	DIAMETER	OWS	OIL WATER SEPARATOR
DBL.	DOUBLE	PSI	POUNDS PER SQUARE INCH
E	EXISTING	R.R.	RAILROAD
EA.	EACH	SS	SANITARY SEWER
EL.	ELEVATION	SCH.	SCHEDULE
FIN.	FINISH	STL.	STEEL
FRP	FIBERGLASS REINFORCED PLASTIC	SD	STORM DRAIN
B.G.S.	BELOW GROUND SURFACE	TC	TOP OF CURB
GAL(S).	GALLON(S)	TYP.	TYPICAL
HPFS	HIGH POINT OF FINISHED SURFACE	U.G	UNDERGROUND
OWS	OIL WATER SEPARATOR	UST(s)	UNDERGROUND STORAGE TANK(s)
		WC	INCHES WATER COL PRESS

LEGEND

- VACUUM BREAKER
- CHECK VALVE
- BALL VALVE
- PRESSURE REG.
- GLOBE VALVE
- FLOW ELEMENT
- FILTER
- FLOW DIRECTION
- PUMP W/UNIONS
- SUMP PUMP
- SAMPLE PORT
- FQ FLOW TOTALZING INDICATOR
- LSH LEVEL SW HIGH HIGH
- LSH LEVEL SW HIGH
- LSL LEVEL SW LOW
- PI PRESSURE INDICATOR
- PSH PRESSURE SW HIGH
- FI FLOW INDICATOR
- PR PRESSURE REGULATOR
- PRV PRESSURE RELIEF VALVE
- U.G. PIPE AND CONDUIT
- FENCE/K-RAIL
- U.G. UST ELECTRICAL CONDUIT
- CONCRETE
- ASPHALTIC CONCRETE
- EARTH
- FILL AND BACKFILL
- COARSE AGGREGATE
- PEA GRAVEL
- SAND AND TOPSOIL

Date	Revision	Drawn	Review
-	1 -	-	-
	2		
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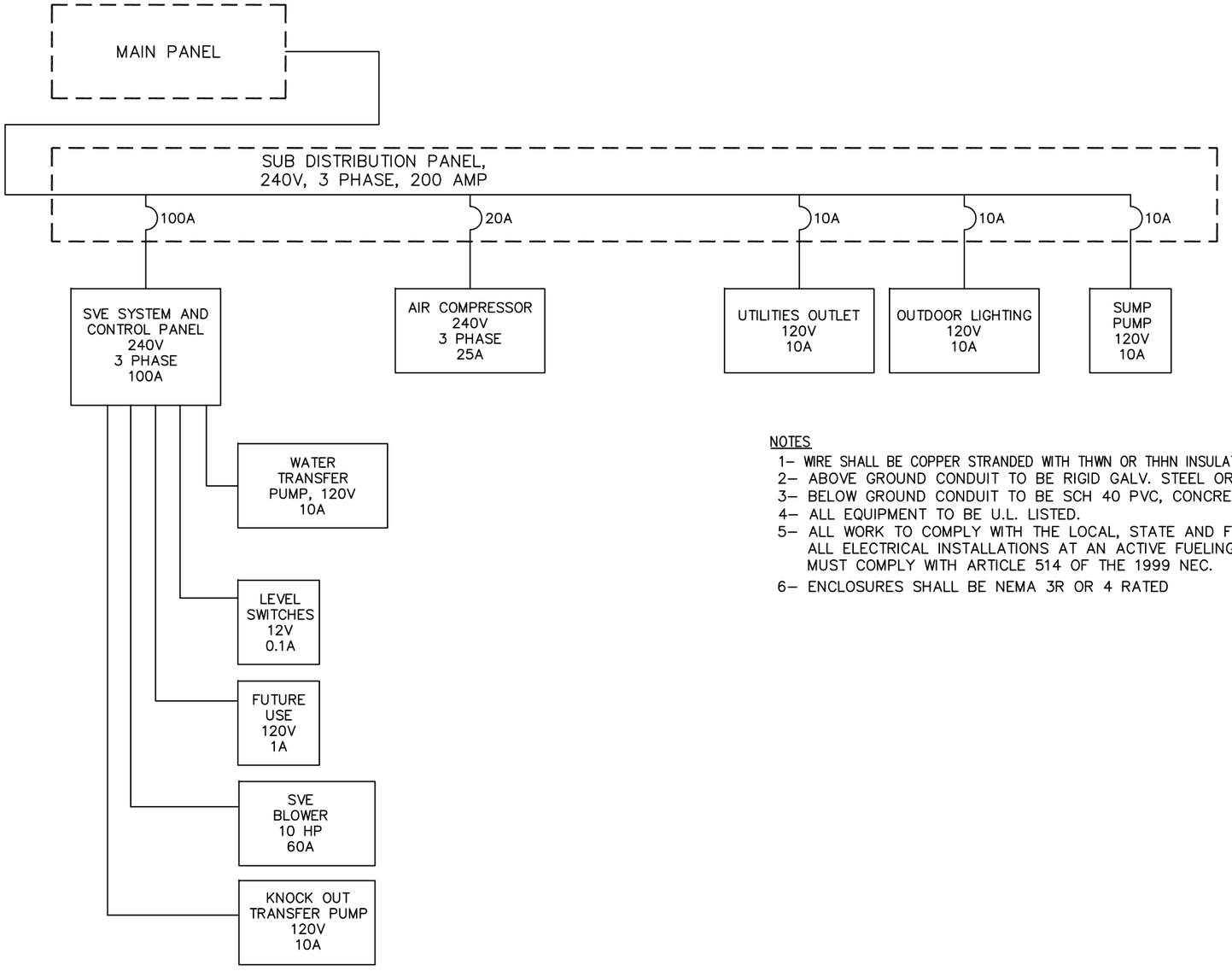
Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/06/2010

SPECIFICATIONS
SOIL VAPOR EXTRACTION AND GROUNDWATER EXTRACTION SYSTEM

76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

Project No.	C107376330
Filename	7376-SPEC
Drawing No.	10



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 1999 NEC.
6– ENCLOSURES SHALL BE NEMA 3R OR 4 RATED

SINGLE LINE ELECTRICAL DIAGRAM

DETAIL A/7

N.T.S.

Date	Revision	Drawn	Review
-	1 -	-	-
	2		
	3		
	4		
	5		

Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/07/2010

ELECTRICAL LINE DIAGRAM
SOIL VAPOR EXTRACTION AND
GROUNDWATER EXTRACTION SYSTEM

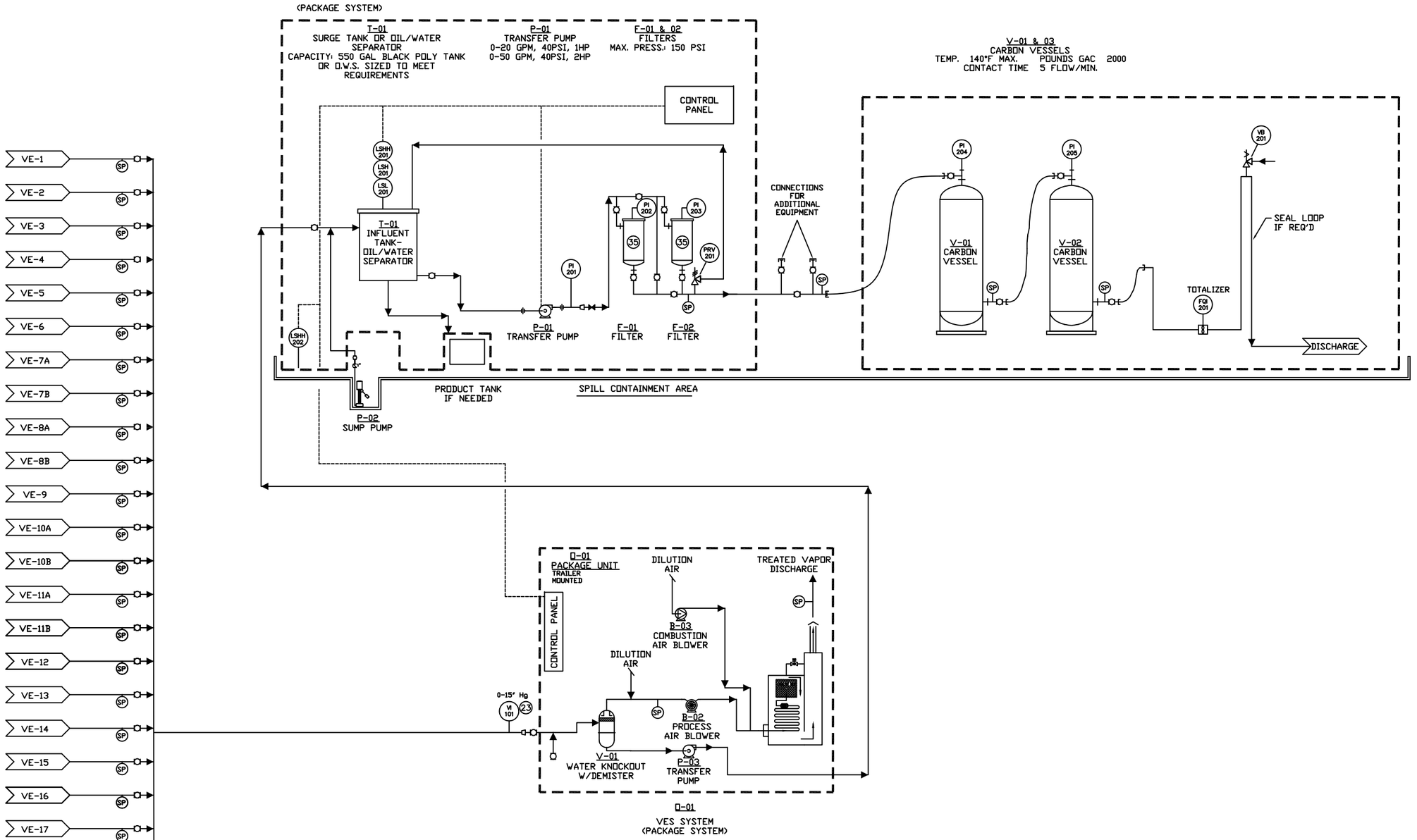
76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

Project No.
C107376330

Filename
7376-ELEC

Drawing No.
9



NOTES:

1. THE SYSTEM SHOWN IS A BASIC GROUNDWATER TREATMENT SYSTEM UTILIZING GRANULAR ACTIVATED CARBON (GAC) AS THE PRIMARY TECHNOLOGY AND PNEUMATIC PUMPS. THE SITE SPECIFIC REQUIREMENTS AND SPECIFICATIONS ARE TO BE DETERMINED AND VERIFIED BY THE CONSULTING ENGINEER. I.E. AIR STRIPPERS, ADDITIONAL CARBON VESSELS, RESIN BEDS, FILTRATION, ETC.
2. A TYPICAL SKID MOUNTED PRE-ENGINEERED OWS UNIT IS SHOWN ON THE DIAGRAM. A FUNCTIONALLY EQUIVALENT SYSTEM MAY BE CONSTRUCTED UTILIZING SEVERAL DIFFERENT CONFIGURATIONS. FOR SOME REMEDIATION INSTALLATIONS, A LOW DENSITY POLYETHYLENE (LDPE) SURGE TANK MAY REPLACE THE OWS UNIT. THE CONSULTING ENGINEER SHALL DETERMINE THE NECESSARY TANK SIZE AND GEOMETRY (TYPICALLY 500 TO 1,000 GALLONS). VERIFY THE SEISMIC ENGINEERING REQUIREMENTS WITH THE LOCAL BUILDING AUTHORITY. THE SAME CONTROL METHODOLOGY SHOWN FOR THE OWS UNIT SHALL BE USED WITH THE SURGE TANK INSTALLATION (LESS THE PRODUCT TANK). THE PUMP, FILTERS AND ASSOCIATED ITEMS MAY BE EITHER PREASSEMBLED OR FABRICATED ON SITE.
3. THE GAC FOR THE TREATMENT SYSTEM MAY BE SUPPLIED FROM THE MANUFACTURER AS INDIVIDUAL VESSELS OR AS PRE-PACKAGED SYSTEM. THE VESSELS SHOWN ON THIS DIAGRAM ARE HOSE CONNECTED. THE PRESSURE RELIEF VALVE IS NOT REQUIRED IF THE DEADHEAD PRESSURE OF THE PUMP IS LESS THAN THE MAXIMUM RATING OF THE CARBON VESSELS.
4. THE SIZING OF THE AIR COMPRESSOR IS BASED ON PNEUMATIC PUMP DEMAND. PISTON TYPE AIR COMPRESSORS NOT TO EXCEED 25% DUTY CYCLE - ROTARY SCREW TYPE COMPRESSORS MAY BE OPERATED UP TO 100% DUTY CYCLE.

Date	Revision	Drawn	Review
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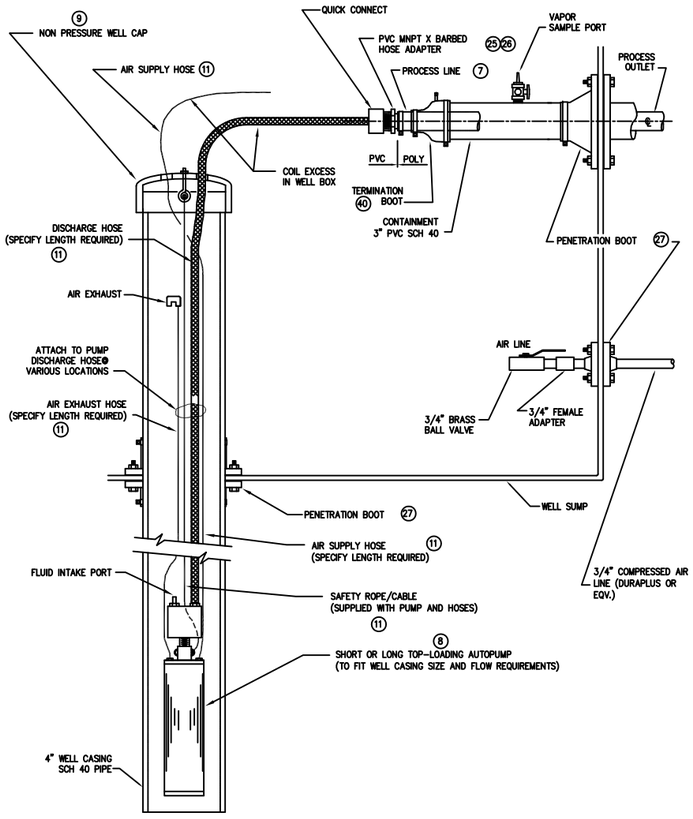
Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/08/10

PIPING AND INSTRUMENTATION DIAGRAM
SOIL VAPOR EXTRACTION AND
GROUNDWATER EXTRACTION SYSTEM

76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

Project No.	C107376330
Filename	7376-PID
Drawing No.	8



NOTES:

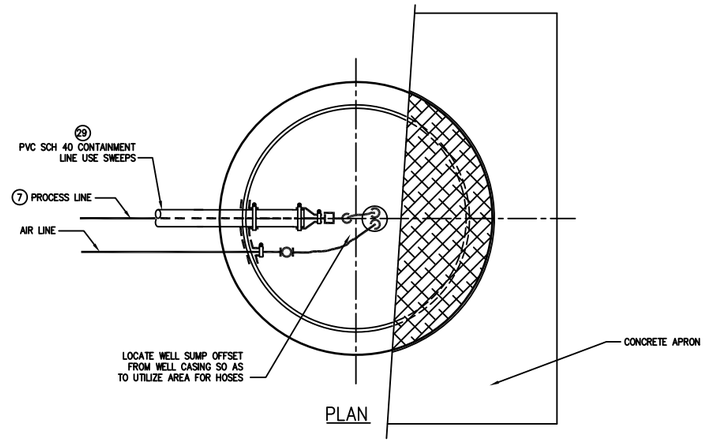
SHOWN IS A DIAGRAMMATIC LAYOUT OF A PNEUMATIC GROUNDWATER PUMP INSTALLATION WITH THE PROVISIONS FOR VAPOR CONNECTIONS.

THE ACTUAL FITTING AND PIPING ARRANGEMENT WILL BE DETERMINED BY SITE CONDITIONS AND LOCATION OF SUMP PENETRATION FITTINGS.

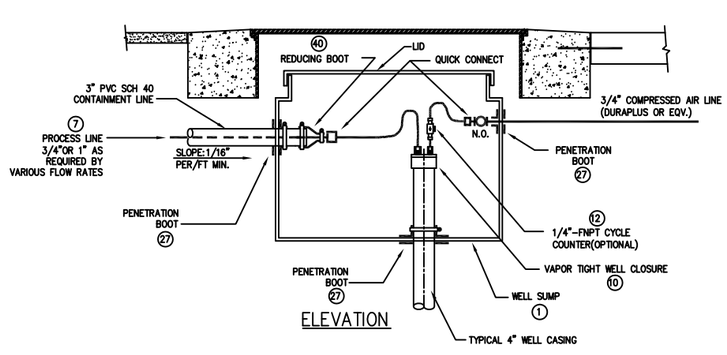
GWE PNEUMATIC PUMPS REMEDIATION STANDARD

DETAILS A/7

N.T.S.



PLAN



ELEVATION

NOTES:

SHOWN IS A TYPICAL GROUNDWATER EXTRACTION WELLHEAD CONNECTION. WITH THIS CONFIGURATION, ONLY ONE CONVEYANCE LINE IS RUN TO EACH WELL CONNECTION POINT. A SINGLE BRANCHED PNEUMATIC LINE IS CONNECTED TO EACH WELL.

THE CONFIGURATION SHOWN USES A SUBMERSIBLE PNEUMATIC PUMP FOR GROUNDWATER EXTRACTION. REFER TO THE PNEUMATIC PUMP MANUFACTURERS' INSTALLATION MANUAL FOR CONNECTION DETAILS.

GWE WELL HEAD CONSTRUCTION

DETAILS B/7

N.T.S.

Date	Revision	Drawn	Review
-	1 -	-	-
	2		
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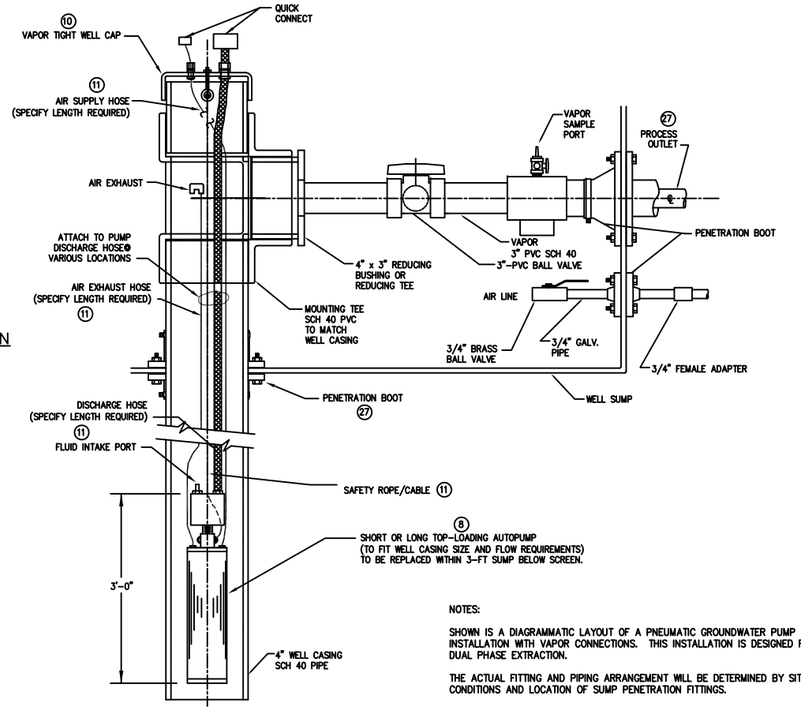
Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/08/2010

WELLHEAD & PUMP DETAILS
SOIL VAPOR EXTRACTION AND
GROUNDWATER EXTRACTION SYSTEM

76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

Project No.	C107376330
Filename	7376-WELLHEAD2
Drawing No.	7

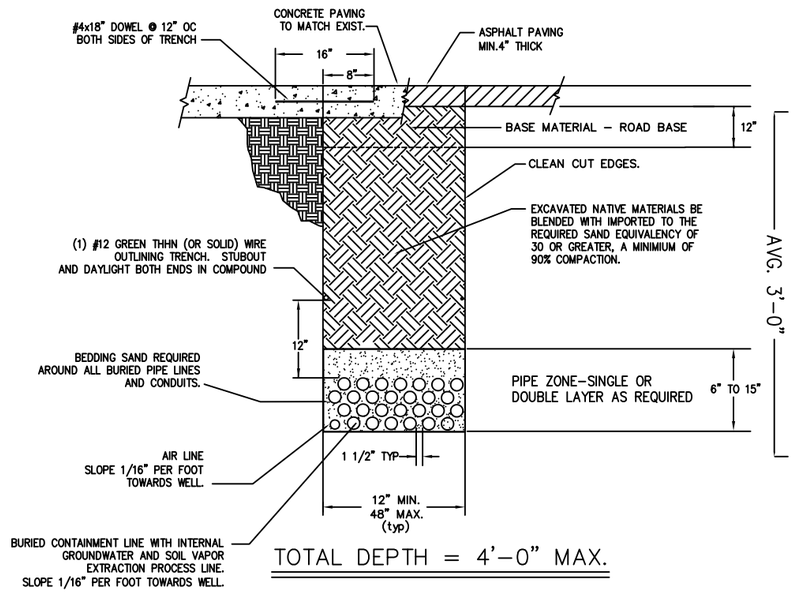


SVE WELL CONSTRUCTION DETAILS (A/6) N.T.S.

NOTES:

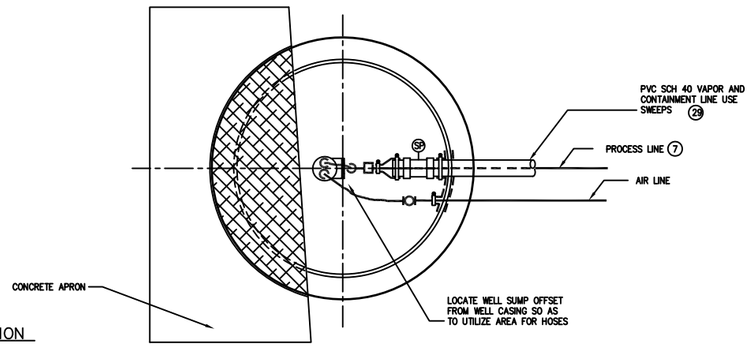
SHOWN IS A DIAGRAMMATIC LAYOUT OF A PNEUMATIC GROUNDWATER PUMP INSTALLATION WITH VAPOR CONNECTIONS. THIS INSTALLATION IS DESIGNED FOR DUAL PHASE EXTRACTION.

THE ACTUAL FITTING AND PIPING ARRANGEMENT WILL BE DETERMINED BY SITE CONDITIONS AND LOCATION OF SUMP PENETRATION FITTINGS.

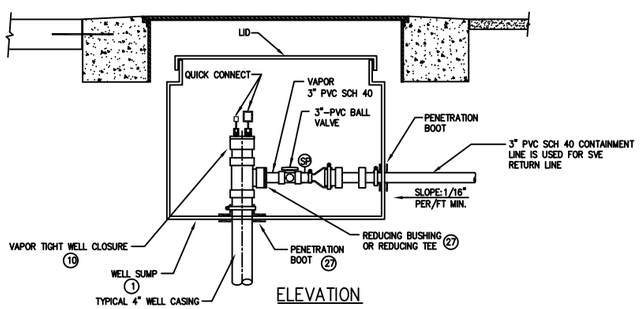


TOTAL DEPTH = 4'–0" MAX.

ELEVATION
(SHOWING BACK FILL)
TRENCH CONNECTION LAYOUT
A – A' SECTION (C/6) N.T.S.



PLAN

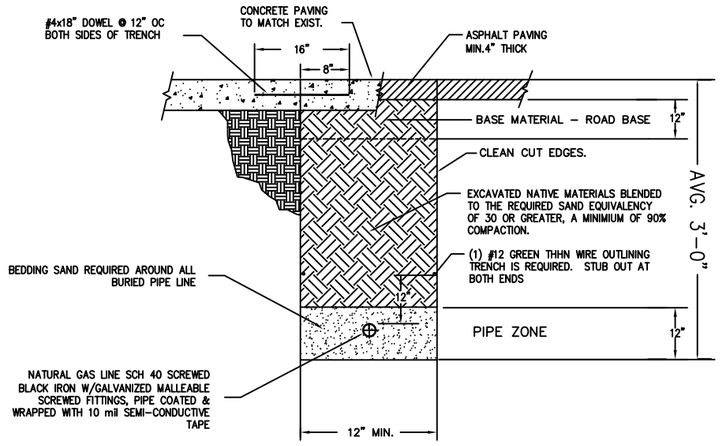


ELEVATION

SVE WELL HEAD CONSTRUCTION DETAILS (B/6) N.T.S.

NOTES:

THE CONFIGURATION SHOWN USES A SUBMERSIBLE PNEUMATIC PUMP FOR POSSIBLE BUNKER FUEL REMOVAL. REFER TO THE PNEUMATIC PUMP MANUFACTURERS' INSTALLATION MANUAL FOR CONNECTION DETAILS.



TOTAL DEPTH = 3'–0" MAX.

ELEVATION
(SHOWING COMPACTED FILL)
NATURAL GAS TRENCH LAYOUT
SECTION (D/6) N.T.S.

Date	Revision	Drawn	Review
-	1 -	-	-
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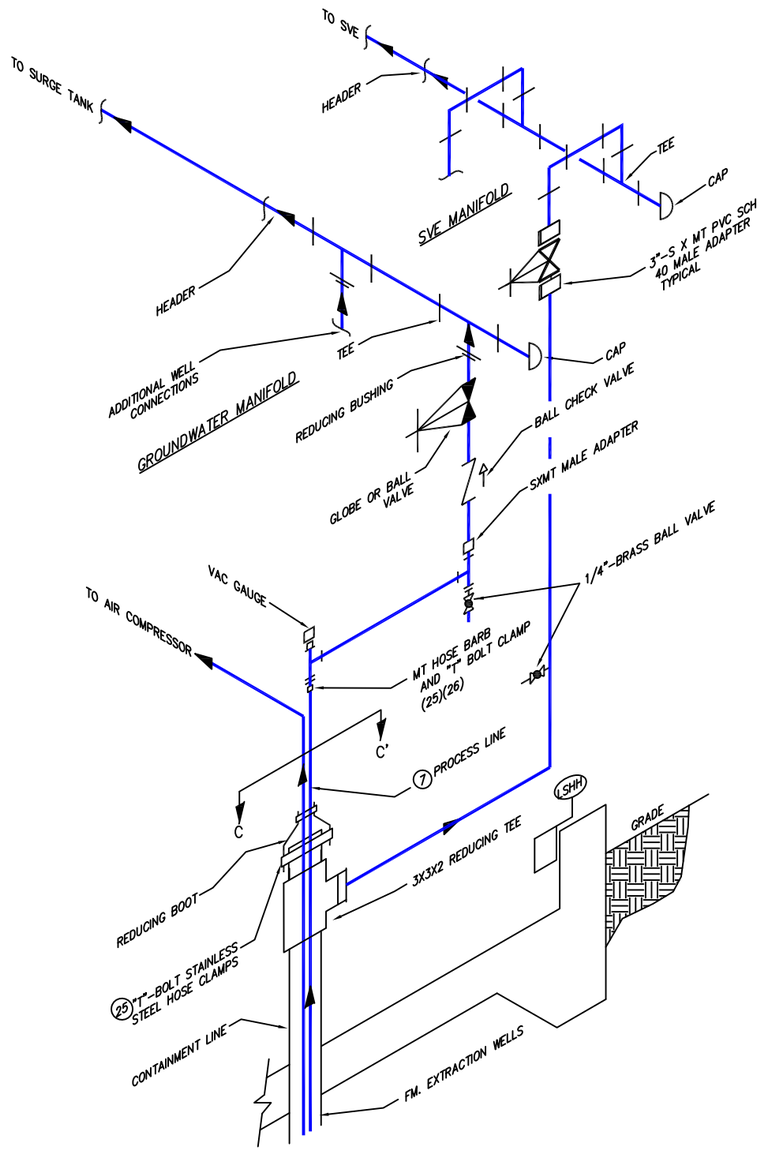
Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/10/2010

WELLHEAD, TRENCH & PUMP DETAILS
SOIL VAPOR EXTRACTION AND
GROUNDWATER EXTRACTION SYSTEM

76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

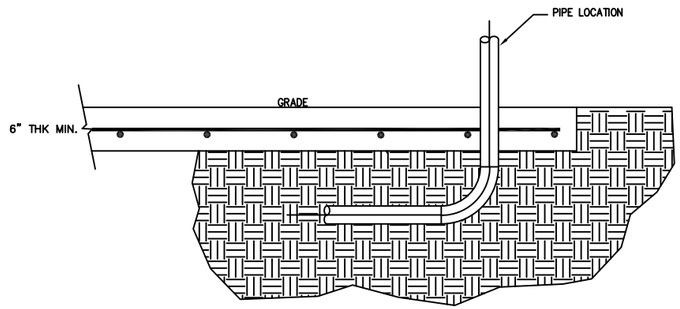
Project No.	C107376330
Filename	7376-WELLHEAD
Drawing No.	6



GROUNDWATER AND VAPOR EXTRACTION MANIFOLD

LAYOUT N.T.S. A/5

NOTE: 1 – FOR MATERIAL REFERENCE LIST SEE SHEET 10

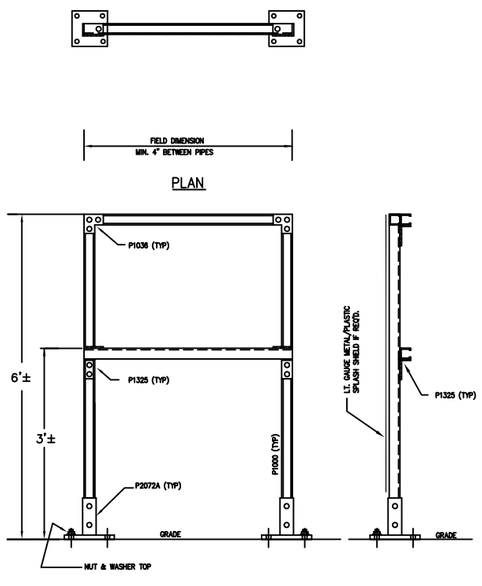


SECTION C–C'

(@ INLET MANIFOLD)

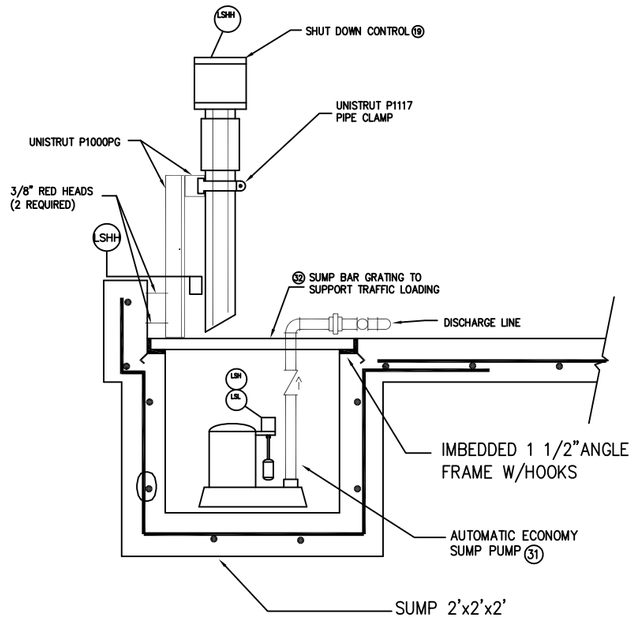
MANIFOLD STUB UP DETAIL N.T.S. C/5

NOTE: 1 – FOR MATERIAL REFERENCE LIST SEE SHEET 10



MANIFOLD SUPPORT DETAIL N.T.S. D/5

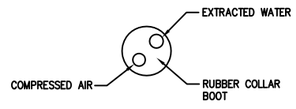
NOTE: 1 – ALL MATERIAL CALL OUTS ARE AND/OR APPROVED EQUAL.



SECTION B–B'

NOTE: 1 – FOR MATERIAL REFERENCE LIST SEE SHEET 10

SUMP AND LEVEL CONTROL DETAIL N.T.S. E/5



REDUCING BOOT DETAIL DETAIL N.T.S. B/5

Date	Revision	Drawn	Review
-	1 -	-	-
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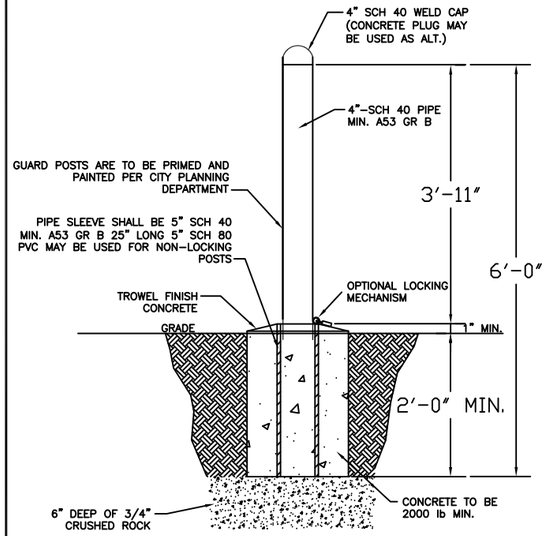
Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/06/2010

REMEDIATION COMPOUND DETAILS
SOIL VAPOR EXTRACTION AND
GROUNDWATER EXTRACTION SYSTEM

76 Service Station No. 2707376
4191 First Street
Pleasanton, California

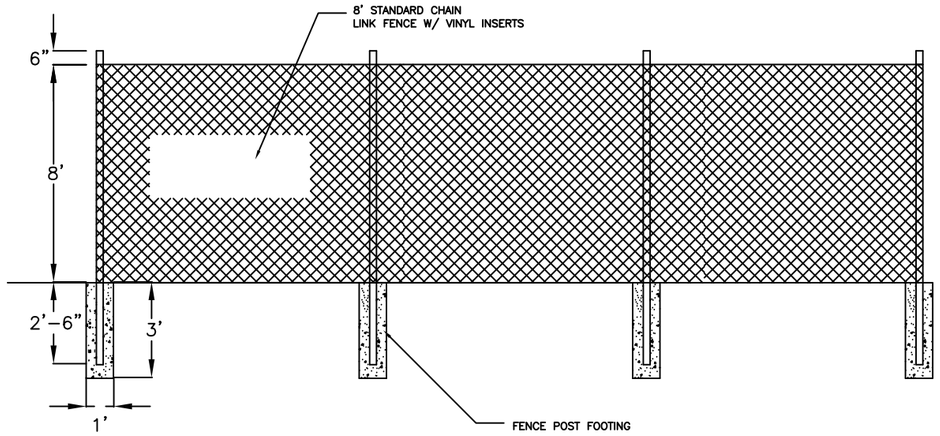
DELTA

Project No.	C107376330
Filename	7376-COMPDET
Drawing No.	5



REMOVABLE BUMPER POST CONSTRUCTION (typ)

DETAIL A/4 N.T.S.



CHAIN LINK COMPOUND PERIMETER FENCE

DETAIL B/4

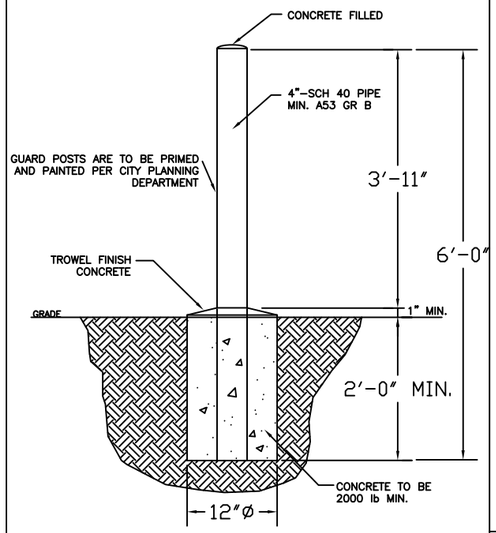
NOTES:

FENCE SHALL BE TYPICAL 11 GAUGE 2" MESH GAW CHAIN LINK FABRIC

FENCE POSTS SHALL BE 2-7/8" OD STRUCTURAL GRADE GALVANIZED STEEL

BOTTOM AND TOP RAIL SHALL BE 1-5/8" OD 16 GAUGE GALVANIZED STEEL

GATE POSTS FOR GATES WIDER THAN 6' SHALL BE 2-7/8" OD SCH40 STEEL



BUMPER POST CONSTRUCTION (typ)

DETAIL C/4 N.T.S.

Date	Revision	Drawn	Review
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Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/07/2010

REMEDIATION CONPOUND DETAILS
SOIL VAPOR EXTRACTION AND
GROUNDWATER EXTRACTION SYSTEM

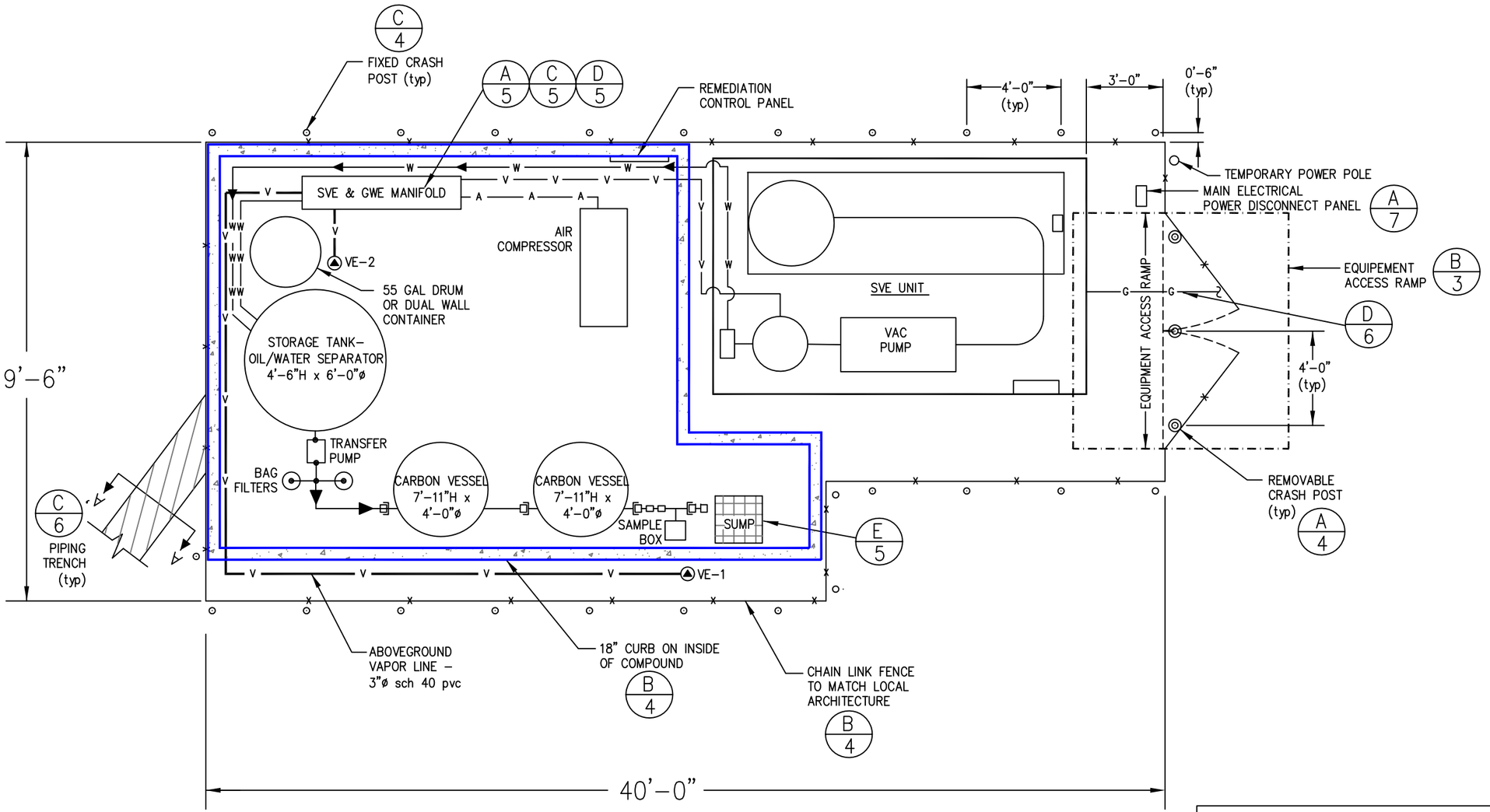
76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

Project No.
C107376330

Filename
7376-BUMPER

Drawing No.
4

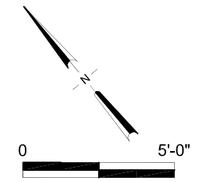


NOTES:

SHOWN IS A DIAGRAMMATIC COMPOUND LAYOUT. THE ACTUAL COMPOUND CONFIGURATION SHALL BE DETERMINED BY THE EQUIPMENT LAYOUT AND THE SITE SPECIFIC CONDITIONS.

THE GROUNDWATER TREATMENT AREA IS CURBED FOR CONTAINMENT. SURFACE IS SLOPED SUCH THAT WATER IS DRAINED INTO THE SUMP.

— V — = SOIL VAPOR LINE
— W — = GROUNDWATER LINE
— A — = AIR LINE
— G — = NATURAL GAS LINE
▲ = PROPOSED SOIL VAPOR EXTRACTION WELL



APPROX. SCALE

Date	Revision	Drawn	Review
-	1 -	-	-
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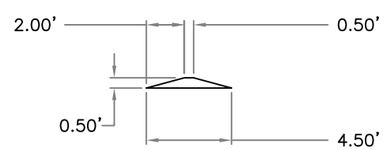
Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/08/2010



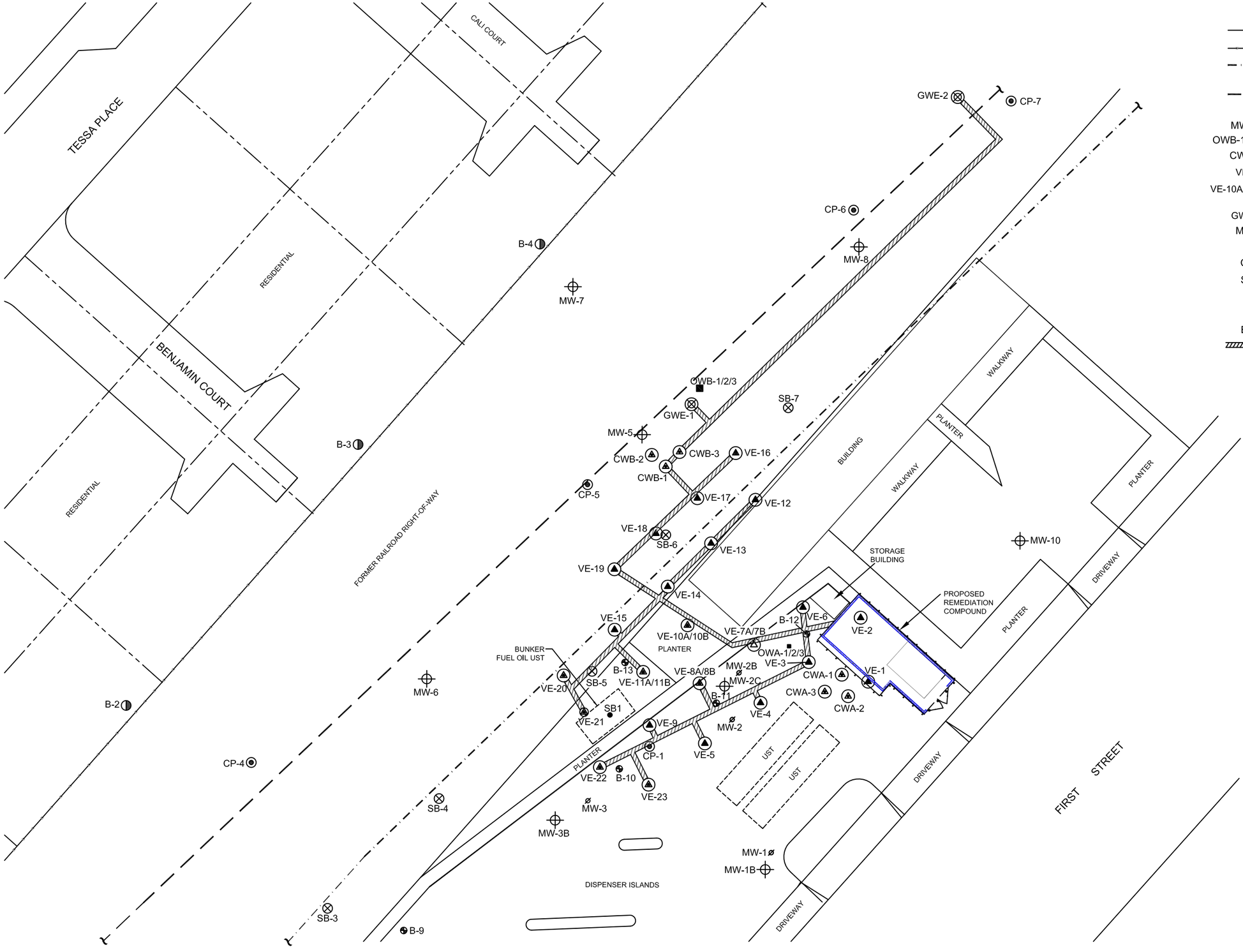
EQUIPMENT ACCESS RAMP DETAIL N.T.S. B/3

EQUIPMENT LAYOUT
SOIL VAPOR EXTRACTION AND
GROUNDWATER EXTRACTION SYSTEM

76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

Project No.
C107376330
Filename
7376-EQUIP
Drawing No.
3



EXPLANATION

- Approximate Property Line
- Fence
- Approximate Location of Underground Petroleum Pipeline (KinderMorgan)
- Approximate Location of Fiber Optic Utility Line

MW-12	Groundwater monitoring well Locaton
OWB-1/2/3	Observation Well Location (Delta, 2010)
CWA-3	Soil Vapor Extraction Well Location (Delta, 2010)
VE-19	Proposed Soil Vapor Extraction Well Location
VE-10A/10B	Proposed Nested Soil Vapor Extraction Well Location
GWE-2	Proposed Groundwater Extraction Well Location
MW-2	Abandoned Well Location
SB1	Soil boring Location (Delta, June 2009)
CP-1	CPT boring Location (Delta, February 2008)
SB-1	Soil Boring Location (BSU, 2007)
B-8	Soil Boring Location (Gettler-Ryan, 1998-1999)
B-1	Soil Boring Location (ENGEO, 1997)
EB-1	Soil Boring (KEI, 1995)
	Proposed SVE Trenching Location

N

0 15' 30'

Date	Revision	Drawn	Review
-	1 -	-	-
	2		
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Prepared by	Reviewed by	Drawn by	Date
GC	-	KYM	12/10/2010

SITE MAP WITH PROPOSED TRENCH LOCATIONS
SOIL VAPOR EXTRACTION AND GROUNDWATER EXTRACTION SYSTEM

76 Service Station No. 2707376
4191 First Street
Pleasanton, California

DELTA

Project No.	C107376330
Filename	7376-SITEMAP
Drawing No.	2