CAMBRIA

March 25, 1998

Mr. Scott Seery
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

RE: Remediation System Design
Former Shell Service Station
15275 Washington Avenue
San Leandro, California
WIC #204-6852-1108

Dear Mr. Seery:

As requested in your January 12, 1998, enclosed are the design drawings for installation of the soil vapor extraction system at this site. As shown on these drawings, a King Buck catalytic oxidizer has been selected for abatement of the airstream. This equipment was chosen because data from the soil vapor extraction test show the expected flowrates and influent concentrations are within the operating parameters of the unit, and because it is readily available (Shell already owns the equipment and has it in stock ready for use).

The work plan for installation of an additional well will be submitted prior to April 12, 1998.

If you have any questions, please call me at (707) 935-4852.

Sincerely,

Cambria Environmental Technology, Inc.

Diane M. Lundquist, P.E.
Principal Engineer
C46725

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ENVIRONMENTAL
TECHNOLOGY, INC.
270 PERKINS STREET,
P.O. BOX 259
SONOMA,
CA 95476
PH: (707) 935-4850
FAX: (707) 935-6649

Attachments

Remedial Design Plans

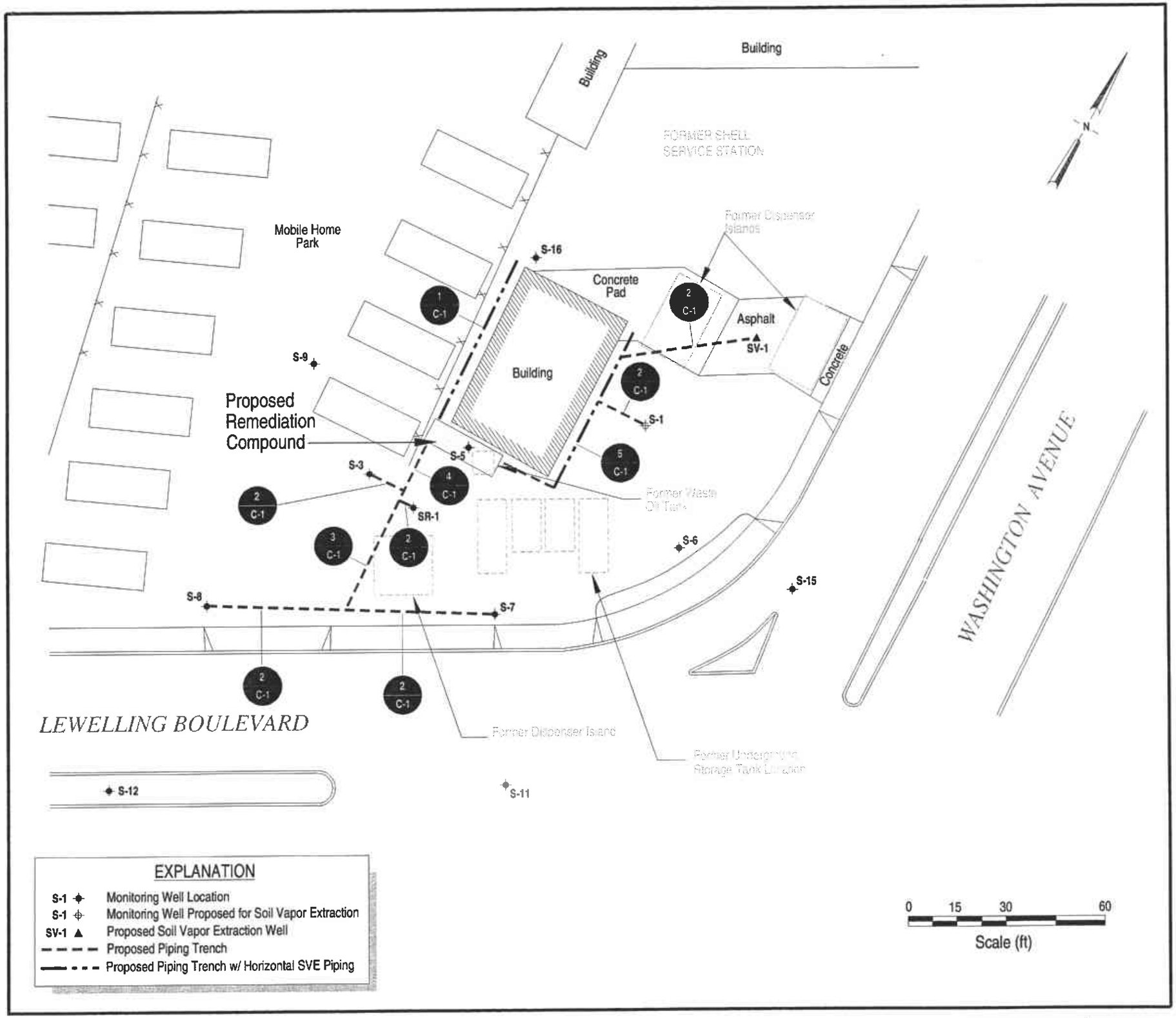
cc (no attachments):

Mr. Alex Perez, Shell Oil Products Company
Mr. John Verber, Larson and Burnham
Mr. Jonathan W. Redding, Fitzgerald, Abbott, and Beardsley
Mr. Richard P. Waxman, Wendell, Rosen, Black, and Dean

Former Shell Service Station

15275 Washington Avenue
San Leandro, California

Site Plan and System Layout



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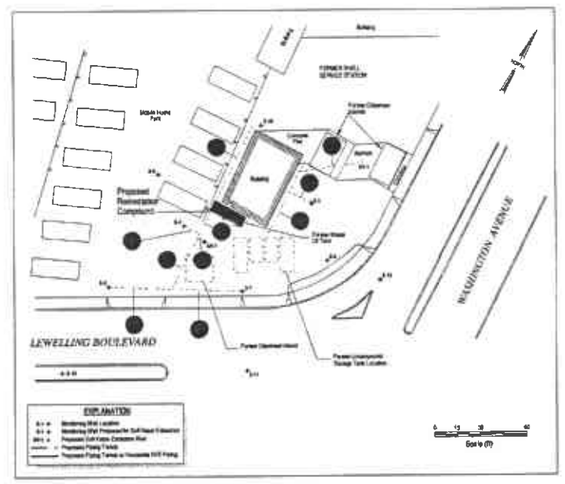


FIGURE A-1

03/09/98

F:\PROJECT\SHELL\SNL15275\FIGURES\A-1.DWG

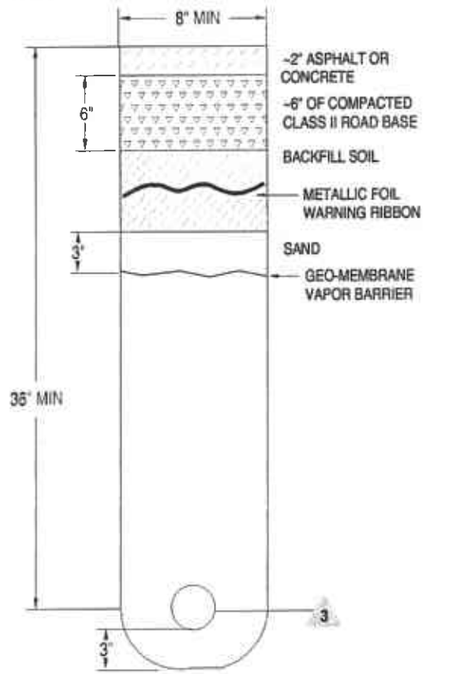
Former Shell Service Station

15275 Washington Avenue
San Leandro, California

Trench Sections

1 C-1 TRENCH SECTION - Horizontal SVE

NOT TO SCALE



2 C-1 TRENCH SECTION - SVE & BIOSP

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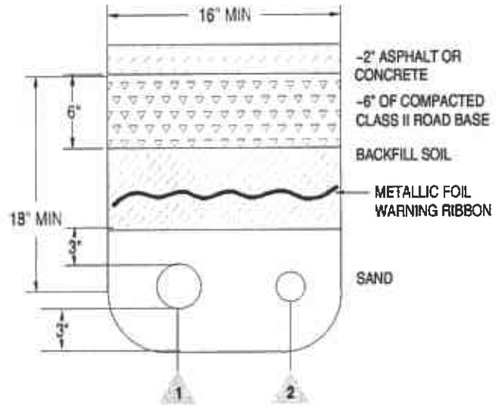

3 C-1 TRENCH SECTION - SVE & BIOSP

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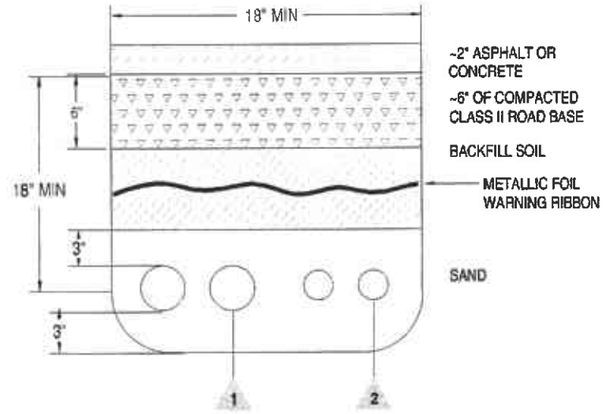

4 C-1 TRENCH SECTION - SVE & BIOSP

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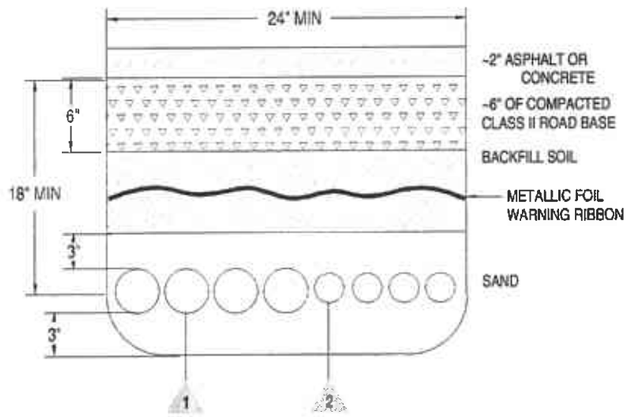

5 C-1 TRENCH SECTION - SVE & BIOSP

NOT TO SCALE

NOTES:

1. 2" DIA SCH. 40 PVC SVE PIPE
2. 1" DIA SCH. 80 PVC BIOSPARGE PIPE
3. 2" DIA SCH. 40 PVC SLOTTED.020 HORIZONTAL SVE PIPE

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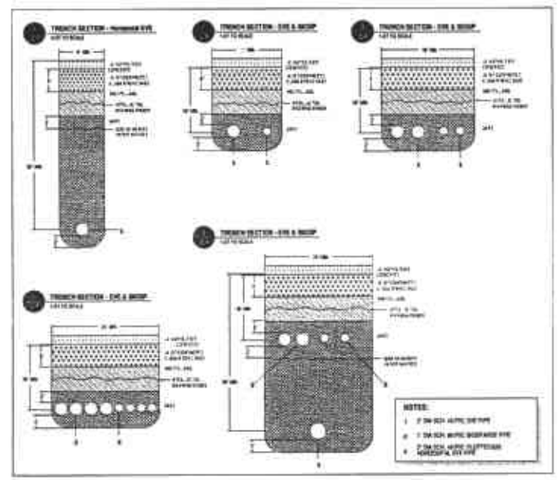

FIGURE C-1

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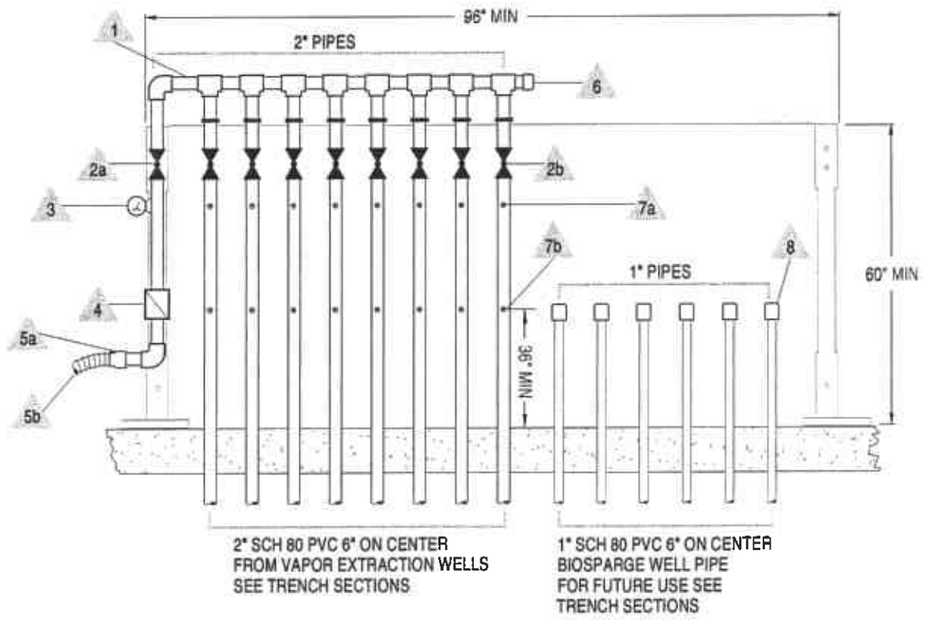
F:\PROJECT\SHELL\SNL15275\FIGURES\C-1.DWG

1 C-2

SVE / BIOSP MANIFOLD

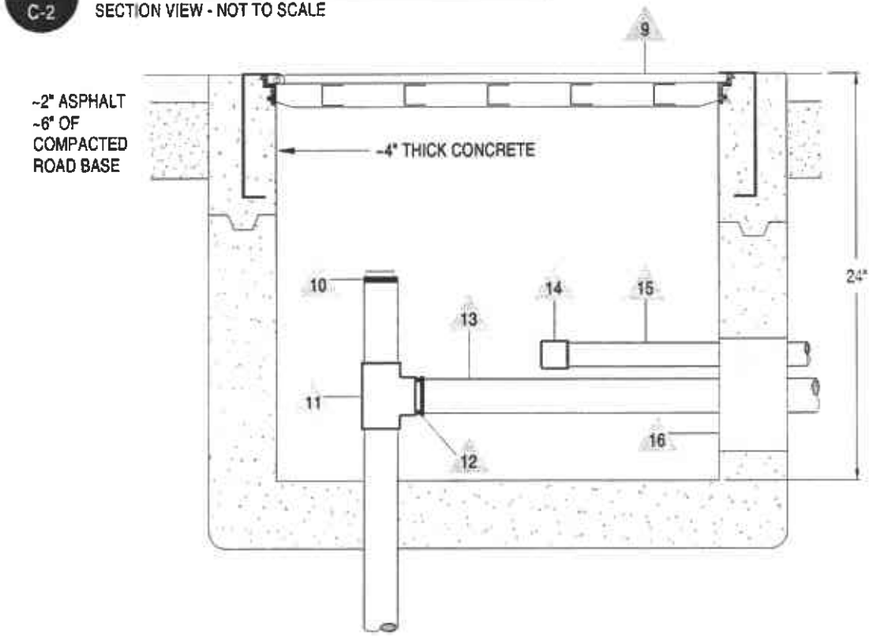
NOT TO SCALE



2 C-2

SVE / BIOSP VAULT MANIFOLD DESIGN, TYP

SECTION VIEW - NOT TO SCALE



NOTES:

1. 2" DIA SCH. 80 PVC VAPOR EXTRACTION PIPING MANIFOLD
2a. 2" DIA PVC GLOBE VALVE
2b. 2" DIA SCH. 80 PVC BALL VALVE TYPICAL OF 8
3. 0-150" H_20 VACUUM GUAGE
4. 2" MERIAM FLOW METER, CONSULTANT SUPPLIED, CONTRACTOR INSTALLED
5a. 2" CAM LOCK FITTINGS, 2" FLEXIBLE HEAVY DUTY VACUUM HOSE
5b. TO WATER KNOCKOUT DRUM, 2" CAMLOCK FITTINGS ON INLET/OUTLET OF KNOCKOUT DRUM
6. 2" DIA SCH. 80 THREADED CAP
7a. 1/4" NPT MALE x HOSE PVC LABCOCK SAMPLE PORT - TYPICAL OF 8
7b. 1/4" NPT (PLUG) - TYPICAL OF 8
8. 1" DIA SCH. 80 PVC SLIP CAP (DO NOT GLUE)
9. 24" UNIVERSAL MODEL #78-2410 TRAFFIC RATED VAULT OR EQUIVALENT
10. LOCKING "J" PLUG WELL CAP
11. 2", 3" OR 4" DIA SCH. 40 PVC TEE AS REQUIRED
12. SCH. 40 PVC REDUCER BUSHING TO 2" DIA
13. BLANK 2" DIA SCH. 40 PVC SVE PIPE
14. 1" DIA SCH. 80 PVC SLIP CAP (DO NOT GLUE)
15. BLANK 1" DIA SCH. 80 PVC BIOSP PIPE
16. GROUTED VAULT PENETRATION

Former Shell Service Station

15275 Washington Avenue
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Manifold System - Soil Vapor Extraction / Biosparge Well Piping

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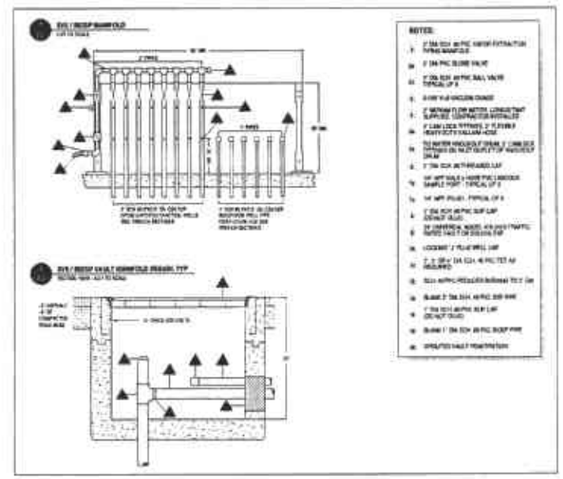

FIGURE C-2

03/09/98

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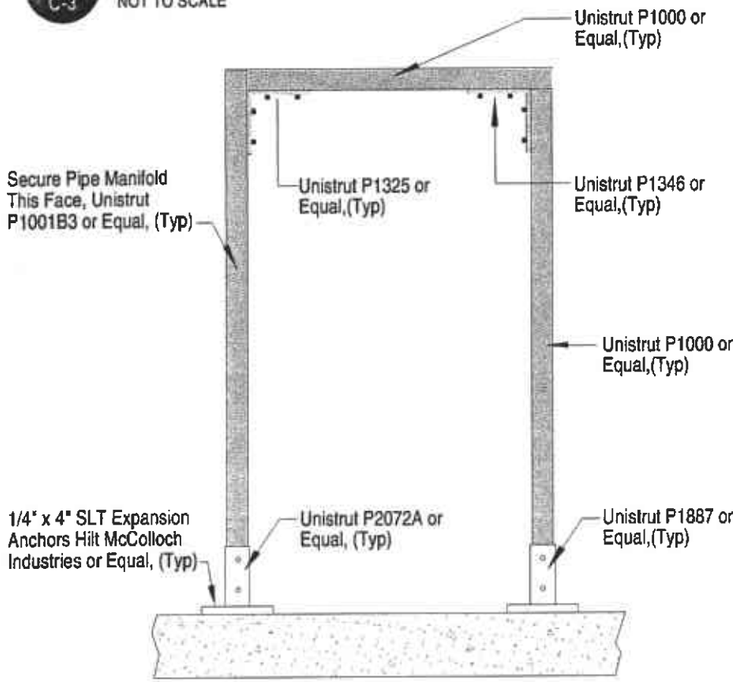
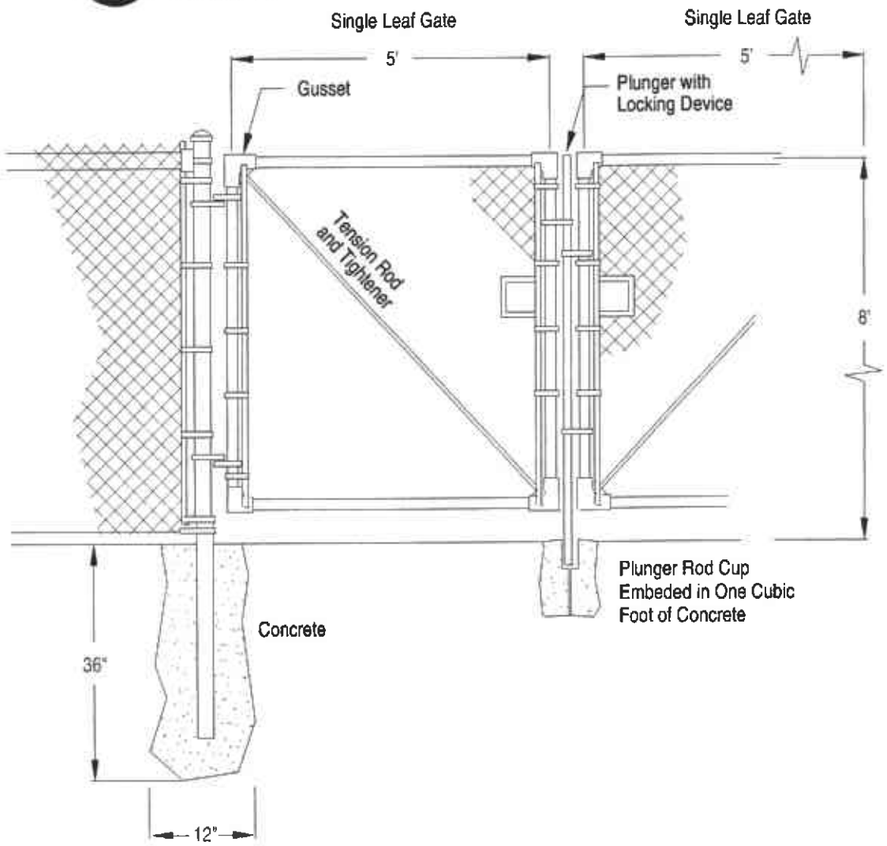
1 C-3 MANIFOLD SUPPORT & ANCHORS

NOT TO SCALE



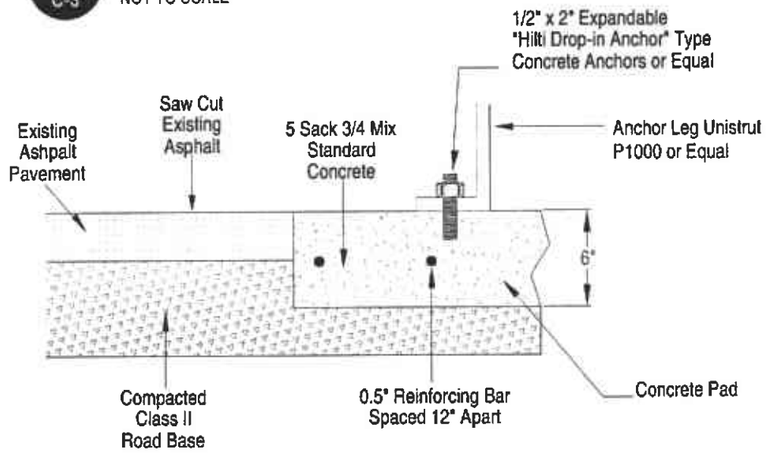
2 C-3 FENCE DETAIL

NOT TO SCALE



3 C-3 CONCRETE PAD AND ANCHOR DETAIL

NOT TO SCALE



NOTES:

1. Fence Post Specifications:

Terminals:	2 7/8" OD, 5.79 lb/ft SCH 40 Steel
Line Posts:	2 3/8" OD, 2.8 lb/ft SCH 40 Steel
Top Posts:	1 5/8" SCH 40
Fence Fabric:	10 Gauge, Galvanized Steel

2. New fence post fabric shall be chain link with plastic slat inserts.

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Manifold Support, Fence, Concrete Pad and Anchor Details

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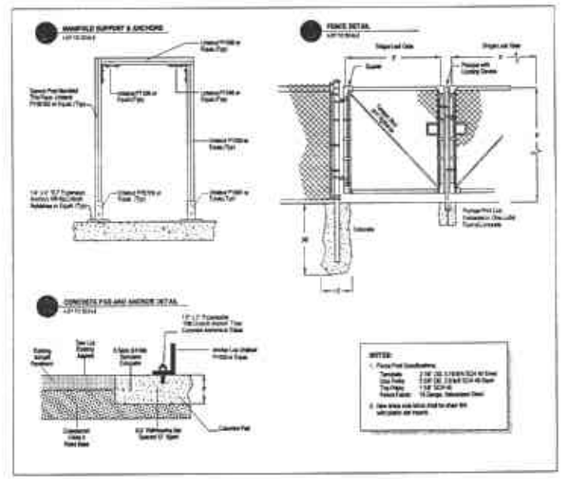

FIGURE C-3

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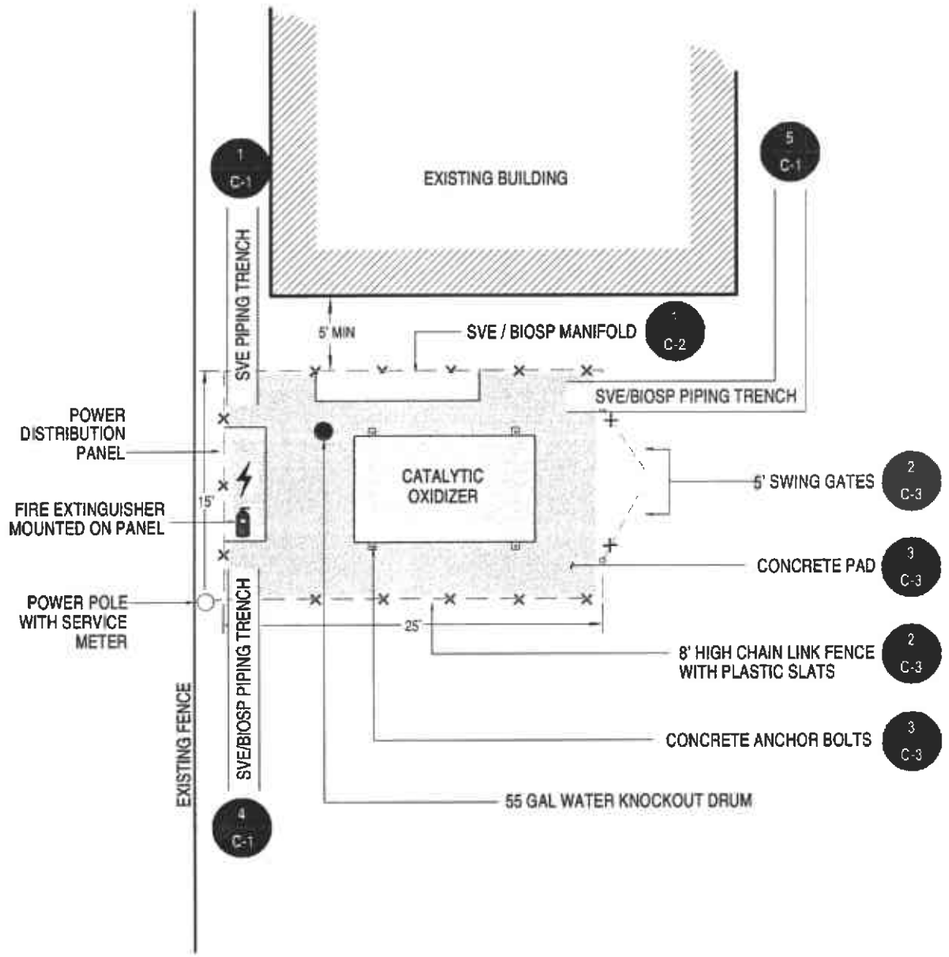
Former Shell Service Station

15275 Washington Avenue
San Leandro, California

Remediation Compound Layout



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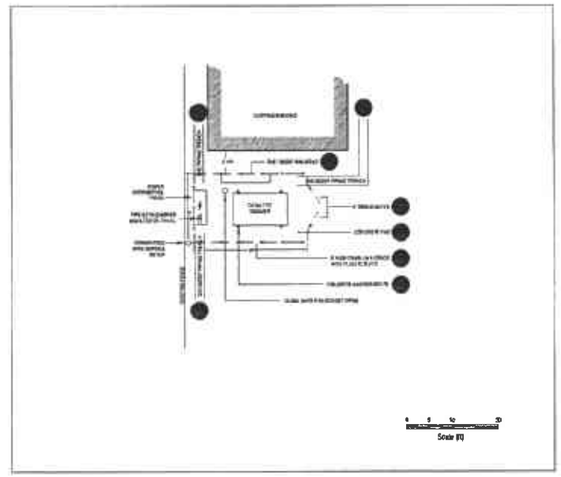

FIGURE C-4

03/10/98

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REMEDIAL DESIGN PLANS

FORMER SHELL SERVICE STATION
15275 Washington Avenue
San Leandro, California

SOIL VAPOR EXTRACTION SYSTEM

Prepared for:
SHELL OIL PRODUCTS COMPANY

Prepared by:
CAMBRIA ENVIRONMENTAL TECHNOLOGY, INC.

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F:\PROJECT\SHELL\SNL15275\FIGURES\G-1.DWG

Former Shell Service Station
15275 Washington Avenue
San Leandro, California

Title Page

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FIGURE G-1

SCHEDULE OF DRAWINGS

FIGURE	FIGURE NUMBER	DRAWING TITLE
1 OF 11	G-1	TITLE PAGE
2 OF 11	G-2	SCHEDULE OF DRAWINGS
3 OF 11	G-3	VICINITY MAP
4 OF 11	A-1	SITE PLAN / SYSTEM LAYOUT
5 OF 11	C-1	TRENCH SECTIONS
6 OF 11	C-2	MANIFOLD SYSTEM - SOIL VAPOR EXTRACTION / BIOSPARGE WELL PIPING
7 OF 11	C-3	MANIFOLD SUPPORT, FENCE, CONCRETE PAD AND ANCHOR DETAILS
8 OF 11	C-4	REMEDIATION COMPOUND LAYOUT
9 OF 11	M-1	SVE PROCESS AND INSTRUMENTATION DIAGRAM
10 OF 11	E-1	ELECTRICAL SINGLE LINE DIAGRAM
11 OF 11	TS-1	TECHNICAL SPECIFICATIONS

Former Shell Service Station
15275 Washington Avenue
San Leandro, California

Schedule of Drawings

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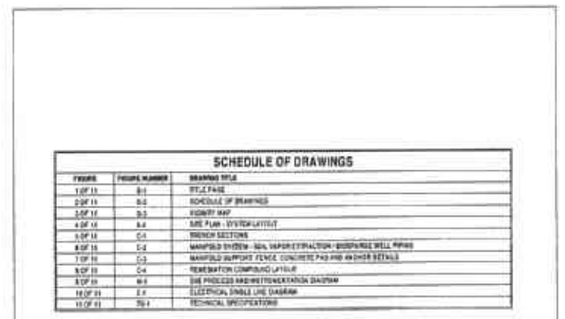

FIGURE G-2

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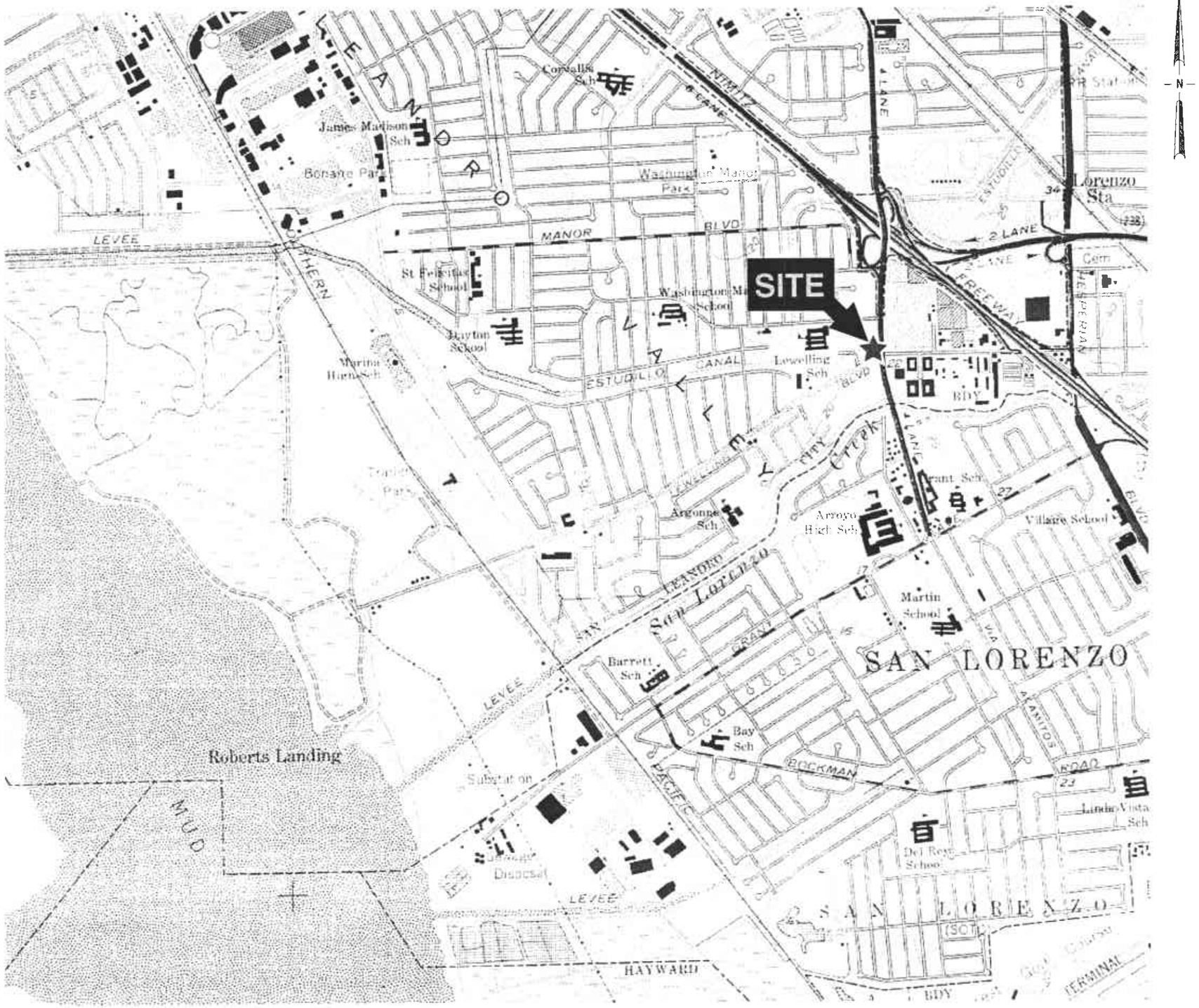
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

Vicinity Map



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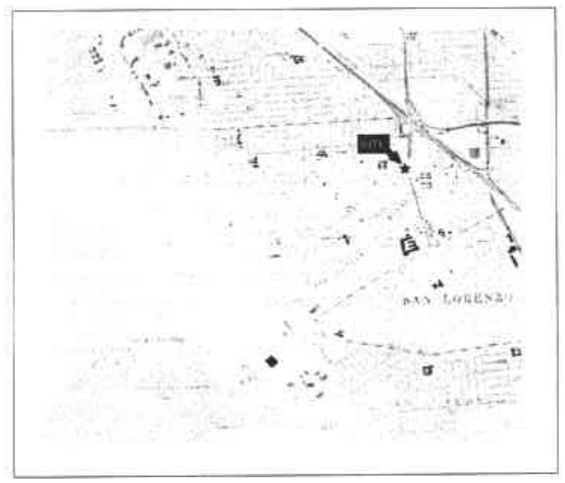

FIGURE G-3

03/09/98

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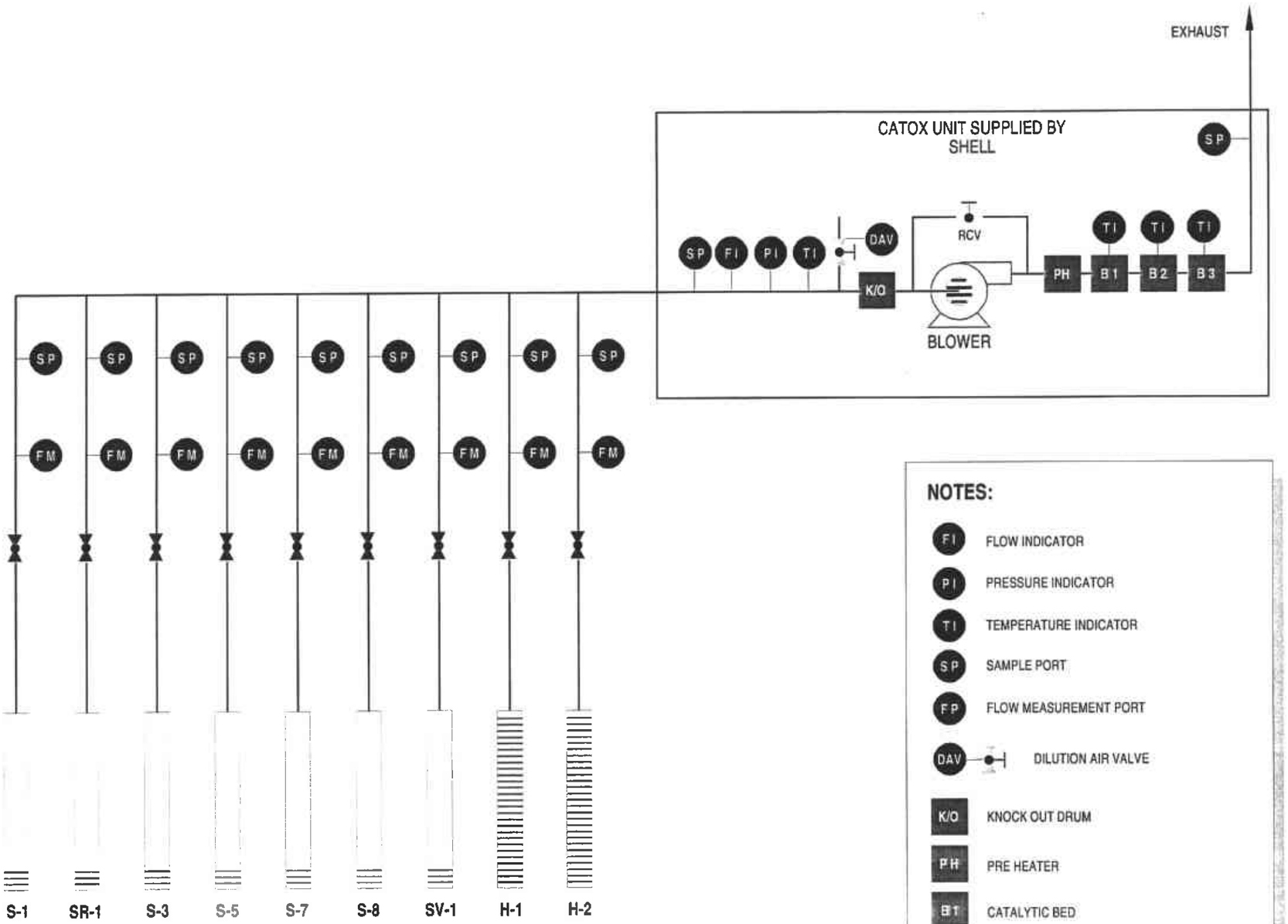

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F:\PROJECT\SHELL\SNL15275\FIGURES\M-1.DWG

Former Shell Service Station
15275 Washington Avenue
San Leandro, California

SVE Process and Instrumentation Diagram

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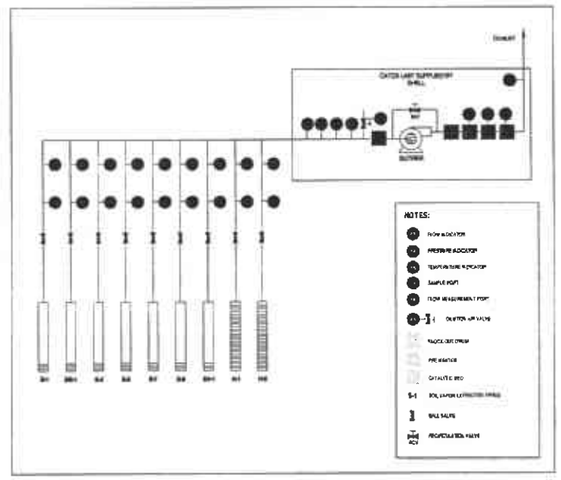
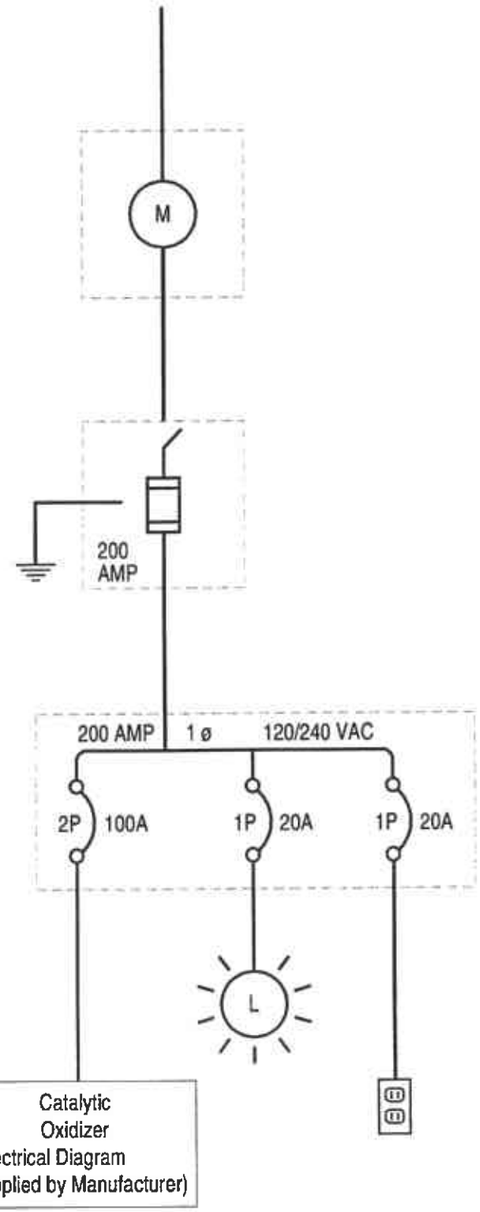


FIGURE **M-1**

Former Shell Service Station
15275 Washington Avenue
San Leandro, California

Single Line Diagram



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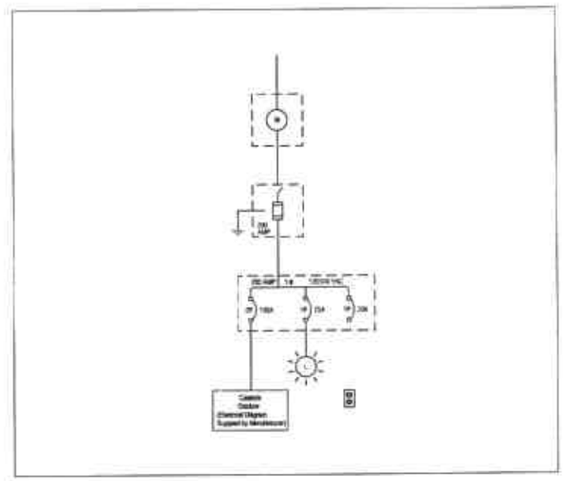

FIGURE E-1

03/11/98

F:\PROJECT\SHELL\SNL15275\FIGURES\E-1.DWG

TECHNICAL SPECIFICATIONS

1 GENERAL

SUMMARY: Shell Oil Company is soliciting bids to install a Soil Vapor Extraction (SVE) system at this site. Installing the system will require:

- Installing an SVE piping array which includes two horizontal vapor extraction wells (H-1, H-2) five monitoring wells to be converted to vapor extraction wells (S-1, S-3, S-5, S-7, S-8) and one vapor extraction well (SV-1);

- Connecting to wells and piping arrays as shown on Drawing A-1;

- Constructing a reinforced concrete pad (15' x 25' x 6") using 0.5-inch rebar with 12-inch spacing as shown on Drawing C-3;

- Installing a fenced treatment system enclosure as shown on Drawing C-3;

- Trenching from the wells and piping arrays to the treatment system enclosure;

- Constructing piping manifold within treatment system enclosure as shown on Drawing C-2;

- Supplying Phase 1, 120/240 V, 200 A electrical service, which includes installation of one power pole and construction of electrical distribution load center;

- Installing and anchoring SVE system including 55 gallon knock-out drum assembly; and

- Completing electrical connection to SVE system

The SVE design drawings and technical specifications were prepared by Cambria Environmental Technology, Inc. (Cambria). Cambria will be the point of contact with the contractor. Contractor shall visit the site to verify the presence and condition of the existing structures.

SCOPE OF WORK: The contractor shall provide the labor, supervision, quality assurance, materials (unless otherwise specified), equipment and tools required to complete this scope of work. The contractor shall comply with all applicable local, state, and federal requirements. The contractor will secure all permits necessary for construction including building, electrical, and plumbing.

CONTRACTOR SHALL:

1.1 Upon request, attend a pre-bid and/or pre-construction site meeting with the Cambria project manager.

1.2 Provide a health and safety plan for workers and public safety. Plan should include, but not be limited to, use of barricades, cones, caution tape or trench plates to effectively screen work area for routing traffic and public while work is in progress. Contractor shall be responsible for all construction-related safety.

1.3 Ensure the least possible obstruction to traffic and inconvenience to the general public and ensure protection of persons and property.

1.4 Estimate completion time and provide a written schedule of completion to the Cambria project manager. Notify Cambria immediately of schedule changes.

1.5 Coordinate and schedule all construction inspections as required by the City of San Leandro Building Department and all other appropriate agencies.

1.6 Scope of work will not be considered complete until final inspections are signed off by the City of San Leandro Building Department and all other appropriate agencies.

1.7 Maintain general cleanup practices to keep the site, all streets, and paved areas free from material debris as the character of work will permit. Upon work completion, remove all surplus material and debris and leave the site in clean condition.

1.8 Notify Underground Service Alert (USA) at 1-800-642-2444 at least two working days prior to commencing any work. Contractor will, at its sole expense, coordinate an underground line location contractor to locate all underground utilities in the vicinity of the work described in the plans.

1.9 Contractor shall repair or replace, at sole expense, any facilities damaged as a result of performing this work to the satisfaction of the Shell project engineer or Cambria representative.

2 UNDERGROUND PIPE INSTALLATION
CONTRACTOR SHALL:

2.1 Layout trenches in accordance with Drawing A-1. Actual trench locations and dimensions to be field-verified with Cambria representative prior to proceeding with saw cutting and excavation.

2.2 Install below grade piping to allow for 24-inch minimum cover of electrical conduits. Slope SVE pipe in shallow trench a minimum of 2% towards the wells and piping arrays.

2.3 Stockpile all spoils onsite over plastic sheeting and cover spoils with plastic sheeting. Immediately notify the Cambria project manager if gasoline or chemical odors are detected during excavation activities. Excavated materials suspected of containing gasoline or other chemicals shall be stored onsite completely covered above and below with polyethylene plastic sheeting. Cambria will arrange for sampling and classification of soil for disposal. Shell shall dispose of all Class I and II excavated soil at its sole expense. Contractor shall provide cost per yard price in bid for Class III soil disposal.

2.4 Supply and install all PVC fittings, cement, primer, and Teflon tape. Prime and apply solvent cement to PVC fittings in accordance with pipe manufacturer's instructions.

2.5 Supply and install all valves in accordance with manufacturer's instructions.

2.6 Supply and install metallic foil warning ribbon in trenches as shown on drawings. Backfill trenches with sand to depth shown on drawings and compact sand to 95 %. Backfill remaining trench with backfill soil and/or compacted Class II base material as shown on drawings.

2.7 Provide and install vaults specified on Drawings C-2. Edge of vaults shall be raised 3/8-inch above grade, with a minimum of 4-inch concrete on all sides sloped to provide a negative grade away from the vault. Install vaults with a minimum of 4-inch concrete on bottom to provide positive sealing. Vault joints and piping penetrations shall be sealed with grout.

2.8 Clearly label all well heads, vaults and piping with well identification number.

2.9 Pressure test all piping to maximum pressure of 8 psig for 30 minutes prior to backfilling. Contractor shall furnish all temporary caps, plugs, thrust blocks and other required materials to measure and hold pressures on tested lines. Contractor shall report and repair all leaks found outside acceptable values.

2.10 Restore all surfaces to pre-existing or better condition.

2.11 Protect finished surfaces from mechanical damage until work is accepted by Cambria project manager.

2.12 Provide barricades, cones, caution tape or trench plates to effectively screen work area from traffic and public, and to protect work area from damage or accidents while work is in progress. Contractor shall be responsible for all construction-related safety.

2.13 Meet all applicable building codes and any other agency requirements during performance of the work.

2.14 Clean site of all construction debris resulting from the construction.

2.15 Warranty trench work against subsidence for one year.

3 OTHER
CONTRACTOR SHALL:

3.1 Contractor shall anchor SVE system to concrete pad using (1/2" x 2") "Hilti Drop-in Anchor" type bolts per anchor leg.

3.2 Install a fenced treatment system enclosure as shown on Drawing C-4. The fence will be chain link with plastic slats. The slat color will match the station colors and shall be approved by Shell or a Cambria representative.

3.3 Install a 3A40BC dry chemical fire extinguisher inside the treatment system fence next to the gate.

3.4 Mount three 9" x 12" (minimum) signs on the fence at the property boundary and on the equipment enclosure. One sign shall read: "DANGER - NO SMOKING"; the second sign shall read: "WARNING - Detectable amounts of chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm may be found in and around this facility. California Health and Safety Code SS25249.6"; and the third shall read: "Cambria Environmental Technology, Inc. (510) 420-0700, (510) 419-8215 - 24 hrs" (consultant supplied). Signs shall be fabricated of 1/8" acrylic, silk screened with UV-resistant ink.

4 ELECTRICAL
CONTRACTOR SHALL:

4.1 Install power pole per PG&E specifications and local codes.

4.2 Install new service meter on power pole with earth ground. Construct main power distribution electrical panel with 200 A main power disconnect, install conduit and conductors from meter to main panel.

4.3 Install conduit and conductors from main panel to new 8 circuit distribution panel installed on main panel.

4.4 Install conduit and conductors from treatment system distribution panel to catalytic oxidizer control panel (control panel supplied by others). Conduit runs shall not block or hinder access to or servicing of any equipment.

4.5 Provide a ground stake inside the equipment enclosure.

4.6 Use rigid steel or IMC conduits where conduits are exposed to potential damage. Use steel compression couplings and connectors on all EMT conduits. All junction boxes shall be NEMA type FS with at least one extra hub for possible future addition conduit connection.

4.7 Gasoline dispensing operations and vapor processing equipment have associated classified locations as defined by the National Fire Protection Association (NFPA). All electrical wiring shall comply with applicable provisions of Articles 500, 501, and 514 of the National Electrical Code (NEC).

4.8 Perform all work in compliance with City of San Leandro electrical codes.

4.9 The contractor shall include Cambria as the point of contact for the electrical service meter for the treatment system panel.

5.0 Install Compound flood light with switch on main power distribution panel.

5.1 Install 120 V GFI receptacle on main power distribution panel.

Former Shell Service Station

15275 Washington Avenue
San Leandro, California

Technical Specifications

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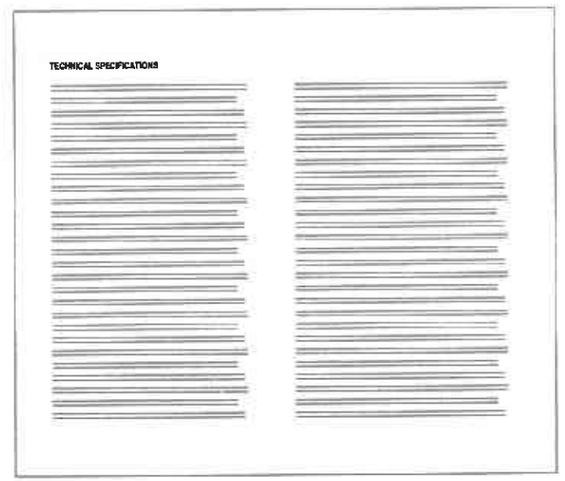

FIGURE TS-1

03/09/98

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