

FOR CONTRACT NO.: 11-281504

AADD

**INFORMATION HANDOUT
MATERIALS INFORMATION**

1. Corrective Action Plan – November 1, 2006

ROUTE: 11-SD-5703



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FINAL

CORRECTIVE ACTION PLAN ADDENDUM FOR

CALIFORNIA DEPARTMENT OF
TRANSPORTATION

Boulevard Maintenance Station
40945 Old Highway 80
Boulevard, California

November 1, 2006
OSOT, CA 164.04

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1.0 INTRODUCTION

SECOR International Incorporated (SECOR) has been retained by the California Department of Transportation (Caltrans) to prepare an addendum to the Boulevard Maintenance Station Corrective Action Plan (CAP) dated January 24, 2005. Based on the San Diego County Department of Environmental Health (DEH) correspondence dated July 31, 2006, a CAP addendum due to changes in the groundwater elevation is necessary. A copy of the letter from the DEH is included in Appendix A. This CAP Addendum is prepared in accordance with Task Order No. 11-43A0164-04 under Contract 43A0164 between Caltrans and SECOR.

1.1 SITE LOCATION AND DESCRIPTION

The site, known as the Caltrans Boulevard Maintenance Station, is located at 40945 Old Highway 80 in Boulevard, California. The location of the site and its vicinity are shown on Figure 1 (Site Location Map).

The site operates as a state highway and vehicle maintenance station. The approximately 4-acre facility consists of a garage, located in the southwestern corner of the site; a small shed and a 5,000-gallon above-ground storage tank (AST) with associated dispenser, located in the central portion of the site; a storage building along the western site boundary and a caretaker residence (currently vacant) near the northeastern corner of the site. A domestic water supply well is located in the northwestern corner of the site (Figure 2). The eastern portion of the site is also used for temporary parking of local school buses. The portion of the site used for maintenance and parking is bounded by a chain-link fence.

The site is situated in a remote rural portion of southeastern San Diego County. The site is bounded to the north by Old Highway 80; to the south by the Boulevard Limited Volume Transfer Station; to the west by the access road to the transfer station and vacant land beyond; and to the east by vacant land. Numerous ranches and residences are located around the site, but predominantly to the southwest of the facility.

The Caltrans Boulevard Maintenance Station is located in southeast San Diego County, within the southwest 1/4 of the northeast 1/4 of Section 28, Township 17 South, Range 7 East (T17S R7E S28).

The subject site is located between the United States-Mexico Border Mountains to the south, the Jacumba Mountains to the northeast and the Laguna Mountains to the northwest. The Tecate Divide is about two miles to the west of the site. The site is situated at about 3,300 feet above mean sea level (MSL). The site's paved surface has a pronounced northeasterly slope. The topography of the surrounding area is rolling hills. Old Highway 80 is an approximate topographic low for the site vicinity.

1.2 PROJECT BACKGROUND

Ongoing assessment and remediation activities have been conducted at the site since the underground storage tank (UST) removal activities in 1996. Groundwater monitoring at the site indicate the presence of hydrocarbon impact, particularly in the vicinity of MW-7. Routine

groundwater monitoring for the site has also included sampling of the on-site domestic well. Site assessment activities are summarized in the Boulevard Maintenance Station Corrective Action Plan, dated January 24, 2005, prepared by Bryan A Stirrat & Associates, Inc. (BAS).

In January 2005, the Corrective Action Plan (CAP) was submitted to DEH recommending soil vapor extraction with air sparge (AS/VE) for remediation of the soil and groundwater. The CAP was conditionally approved by DEH in August 2005. Since the CAP was submitted, groundwater elevations have increased at the site (Table 1). In September 2006, SECOR was retained to prepare a CAP addendum to incorporate into the design of the AS/VE system changes in groundwater conditions.

2.0 PROPOSED REMEDIATION METHOD

2.1 REMEDIATION METHOD PARAMETERS

Several remediation technologies were considered and evaluated in the CAP dated January 24, 2005. After screening alternatives, BAS recommended an AS/VE system for site remediation.

A feasibility test of AS/VE was conducted by BAS in November 2004. BAS observed minor influence (0.15" H₂O) in one well approximately 43 feet away from the test well. It appears the 44 feet BAS estimated as the radius of influence (ROI) is based on this single vacuum influence data point. SECOR believes this estimate of ROI may be somewhat optimistic for design purposes given the uncertainty in the test data. Rather than calculating the theoretical ROI from the one data point and the radial flow equation, SECOR recommends defining the "effective" ROI for design purposes as the distance away from the test well when the vacuum influence is equal to one percent of the applied vacuum (Buscheck and Peargin, 1991).

The sparge feasibility test performed by BAS was not performed using a sparge well. Instead a one-inch stinger with packing was placed in MW-2 and air was injected through the stinger. There was relative indication that sparge air permeated the soil based on increased dissolved oxygen (DO) readings in the observation wells. The actual oxygen increase is difficult to assess since DO measurements are reported in percentages, not concentrations.

Vapor extraction is commonly used in conjunction with air sparge to control vapor migration and minimize human health risks. The subject site is a rural location with no manned buildings in the immediate vicinity of the air sparge system. Vapor extraction is recommended at this site primarily to reduce accumulation of vapors under the asphalt surface during early stages of the remediation. In later stages, the VE operation may be able to be discontinued due to low vapor concentrations.

For design purposes SECOR has specified a 32' ROI and 25% overlap for the VE system wells. The AS wells are designed with a 15' ROI with a 25% overlap. Well construction presented in Section 2.2.2 and 2.2.3 incorporates an increase in groundwater elevation since the pilot test was conducted. Groundwater elevation data from the June 2006 monitoring event are presented with additional historic elevation data in Table 1.

2.2 AS/VE REMEDIATION SYSTEM DESIGN AND CONSTRUCTION

2.2.1 Permitting

No modifications of the permitting requirements presented in the CAP dated January 24, 2005, are necessary.

2.2.2 Air Sparge Wells and Conveyance Piping

SECOR recommends the installation of ten air sparge (AS) wells in the vicinity of the impacted soil based on previous assessment activities. Air sparge wells will be installed using 25-foot

spacing to insure overlap in oxygen penetration. Proposed well locations are presented in Figure 3. The AS wells will be installed using a 6-inch hollow stem auger to a depth of 40 feet below ground surface (bgs). Air sparge wells will be constructed from 2-inch schedule 40 PVC casing to 37.5 feet bgs with a 0.020 inch slot stainless steel wire wrapped screen from 37.5 – 40 ft bgs. Wells should be completed with 12 inch concrete vaults with traffic rated covers. AS well construction details are illustrated in Figure 4. Due to extensive past soil assessment activities and based on conversations with the DEH, SECOR recommends no soil sampling during the installation of the AS wells.

Each AS well will have dedicated conveyance piping to a manifold at the air compressor. Conveyance piping will be constructed from 1-inch Schedule 80 PVC. The valving and flow measurement for each AS well will be located at the manifold.

2.2.3 Vapor Extraction Wells and Conveyance Piping

SECOR recommends installing four VE wells (a reduction of four wells from what was originally proposed in the CAP). VE wells will be installed using 50-foot spacing to insure overlap. Proposed well locations are presented in Figure 3. The VE wells will be installed using a 6-inch hollow stem auger to a depth of 25 feet bgs. VE wells will be constructed from 2-inch schedule 40 PVC with 0.020-screened section from 15 – 25 ft bgs. Wells should be completed with 12 inch concrete vaults with traffic rated covers. VE well construction details are illustrated in Figure 5. Due to extensive past soil assessment activities and based on conversations with the DEH, SECOR recommends no soil sampling during the installation of the VE wells.

The proposed conveyance piping for the extraction system will consist of a 4-inch diameter Schedule 40 PVC header pipe and a series of 2-inch diameter PVC laterals. One end of the extraction header pipe will be connected to the inlet of the vapor treatment unit.

2.2.4 Vapor Extraction Treatment Unit and Air Compressor

The vapor extraction/treatment unit will be rented/leased from an approved vendor, and will consist of a trailer-mounted or a skid-mounted, pre-plumbed, pre-wired, catalytic oxidizer vapor extraction/treatment unit capable of handling up to a 250 SCFM flow rate. The unit will contain a TEFC motor and a positive displacement electrically powered blower sized to draw a vacuum of up to 12 inches of mercury.

The unit will include a 30-gallon (minimum capacity) entrainment separator with high liquid level shut-off and visual sight glass, a vacuum gage, flow sensors, an influent filter, soundproofing on the blower, and complete valving, instrumentation and process alarms. The system will be equipped with a strip-chart recorder that will continuously record the process gas flow, combustion temperature and lower explosive limit (LEL) percent concentration in the process gas. The selected unit will be connected to a natural gas line or to a propane tank for supplemental fuel, unless an electric model is chosen. Once the inlet VOC concentrations are consistently reduced to less than 300 parts per million volume (ppm v/v), the vapor extraction system can be shut down. At this point in the remediation, SECOR recommends operating the AS system in a pulsed fashion with out simultaneous vapor extraction (a.k.a. biosparging). Operating in this mode will require a certification of exemption from the San Diego County Air Pollution Control District.

The air-delivery unit will consist of an oil-free air compressor capable of continuous operation, supplying compressed air at pressures ranging from 40 to 50 psig and providing a flow of compressed air ranging from 40 to 80 SCFM. The air compressor will also be rented/leased or purchased from an approved vendor. The 1-inch diameter main compressed air lines for each AS well will be provided with a solenoid valve located at a manifold and connected to a timer. Initially the system would operate with all air sparge wells simultaneously. After the VE system is discontinued due to low vapor concentrations, the timers will be programmed to alternate operation of the AS wells at 2-hour intervals. Using this strategy, five wells will be operational at any given time for a period of 2 hours, then turned off for a period of two hours, resulting in each well being operated for a total of 12 hours each day. The timer programming can be modified based on groundwater monitoring data to optimize system effectiveness.

3.0 SUMMARY

Based on the data presented in the Boulevard Maintenance Station CAP, the DEH letter dated July 31, 2006, and information obtained at an October 3, 2006 meeting between Caltrans, SECOR and DEH representatives, SECOR has specified the following changes to the January 24, 2005, Boulevard Maintenance Station CAP:

- Install an AS/VE system at the site with 10 AS wells and four VE wells.
- Install the AS wells using 25-foot spacing and the VE wells using 50-foot spacing as illustrated on Figure 3.
- Do not soil sample during the installation of the VE and AS wells.
- Complete the AS and VE wells as specified by Figures 4 and 5.
- Install dedicated 1-inch piping from the air sparge manifold to each AS well.
- Install an air compressor with the capacity to supply up to 50 psig and 80 SCFM.
- Operate the AS/VE simultaneously until vapor concentrations are below 300 ppm.
- After vapor concentrations decrease, discontinue VE operation and operate the AS system in pulse mode.

4.0 REFERENCES

Buscheck, T., and Peargin, T.R., 1991. Summary of a nation-wide vapor extraction system performance study. *Proceedings: Petroleum Hydrocarbons and Organic Chemicals in Ground Water*. November 1991. NGWA/API, Dublin, OH.

Bryan A. Stirrat & Associates, Inc., January 24, 2005, *Corrective Action Plan*, Contract 43A100, Task Order No. 6, Boulevard Maintenance Station, 40945 Old Highway 80, Boulevard, California.

FIGURES

Figure 1 - Site Location Map

Figure 2 - Site Plan

Figure 3 - Proposed AS/VE System Layout

Figure 4 - AS Well Construction

Figure 5 - VE Well Construction

Corrective Action Plan Addendum

California Department of Transportation

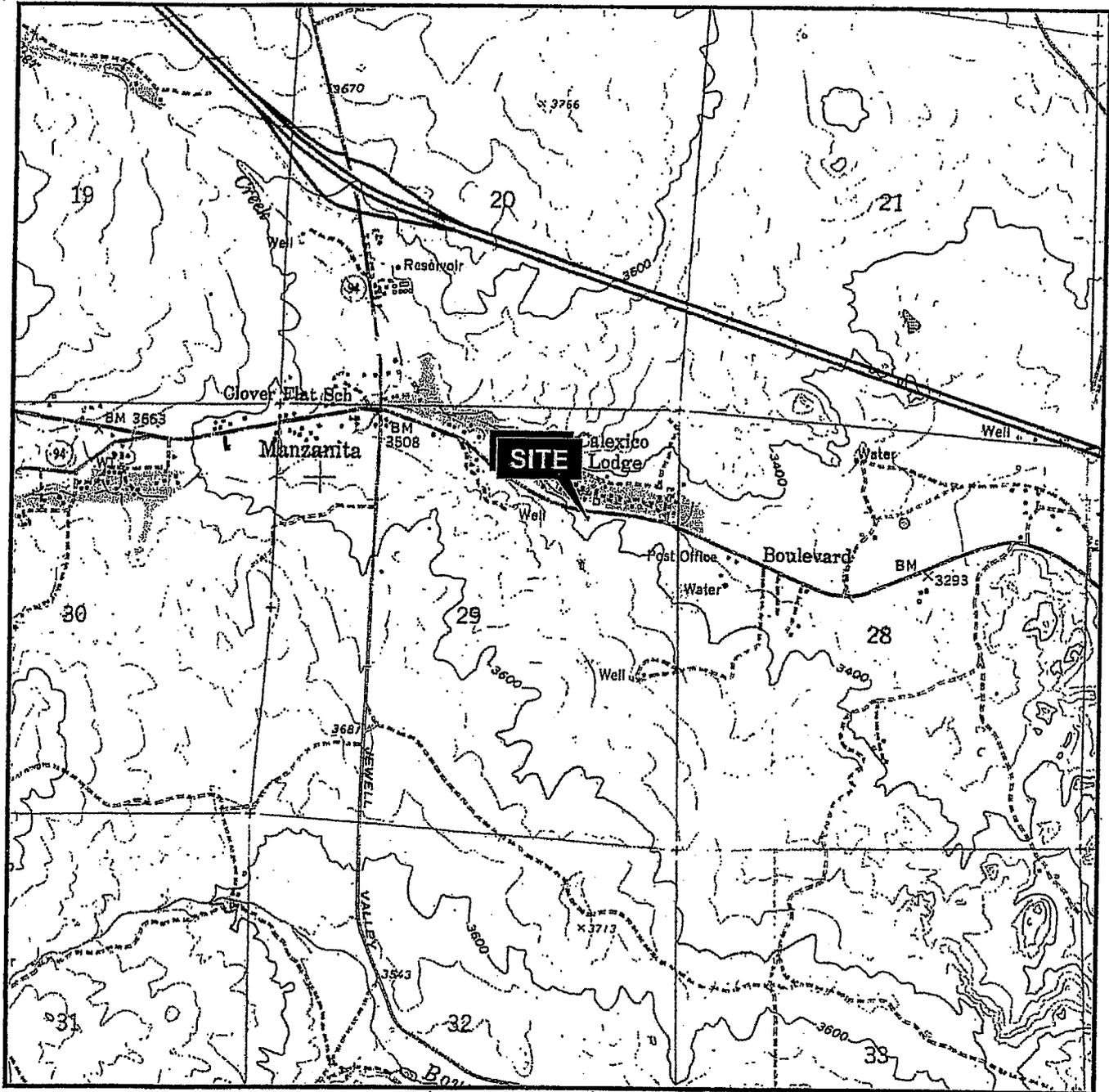
Boulevard Maintenance Station

40945 Old Highway 80

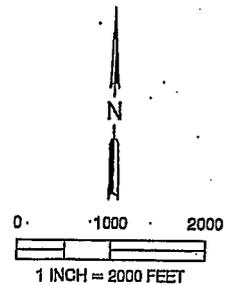
Boulevard, California

080T CA164 04

November 1, 2006

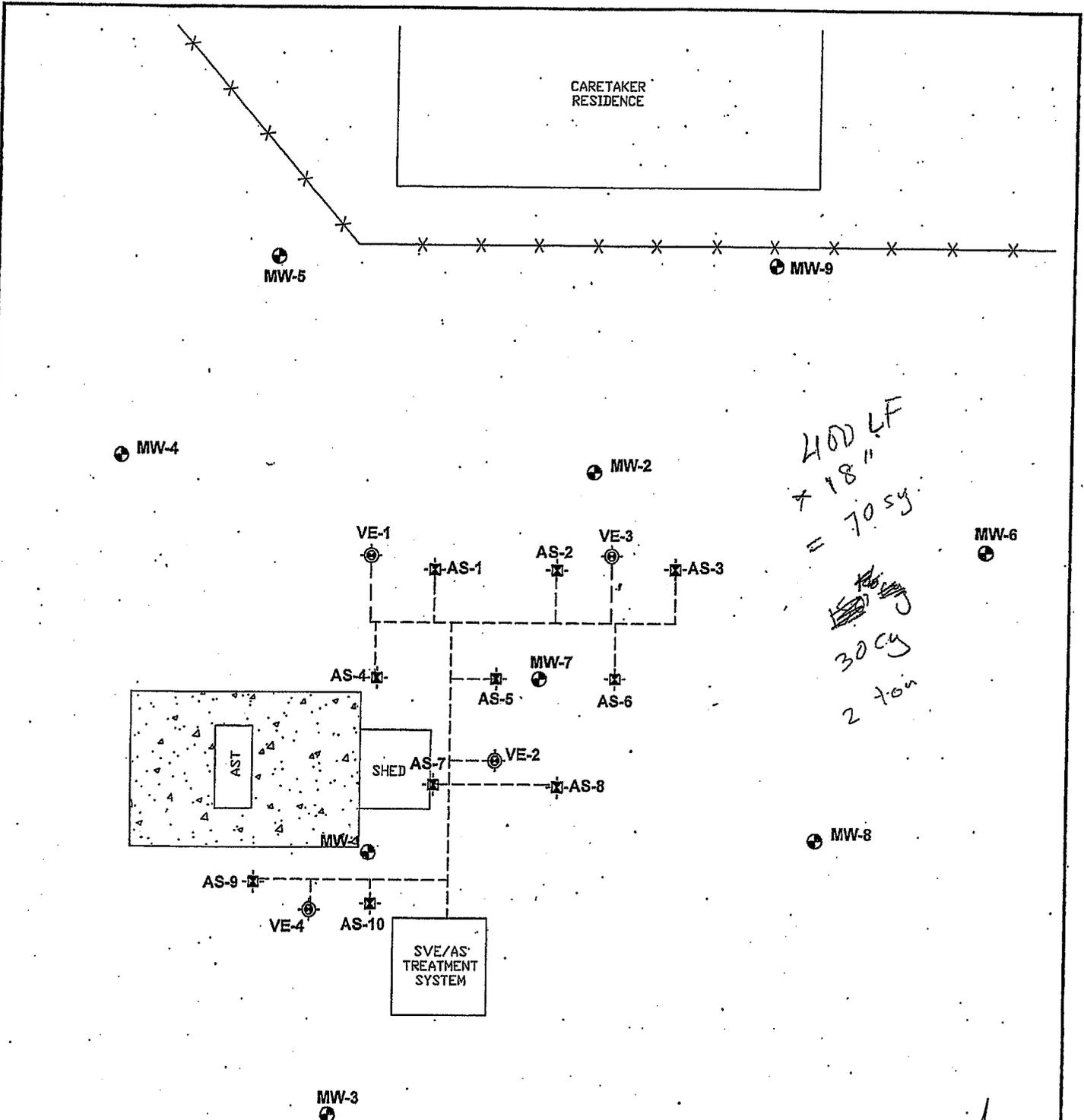


QUADRANGLE LOCATION



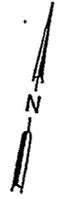
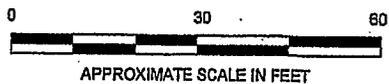
Reference: Terrain Navigator—U.S.G.S., 1959, Live Oaks Springs, California
 Quadrangle, 7.5-Minute Topographic Map. Photorevised 1975

 SECOR 2655 CAMINO DEL RIO NORTH, SUITE 802 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195 / 298-6100 (FAX)	FOR: CALTRANS BOULEVARD MAINTENANCE STATION 40945 Old Highway 80 Boulevard, California	SITE LOCATION MAP		FIGURE: 1
	JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:



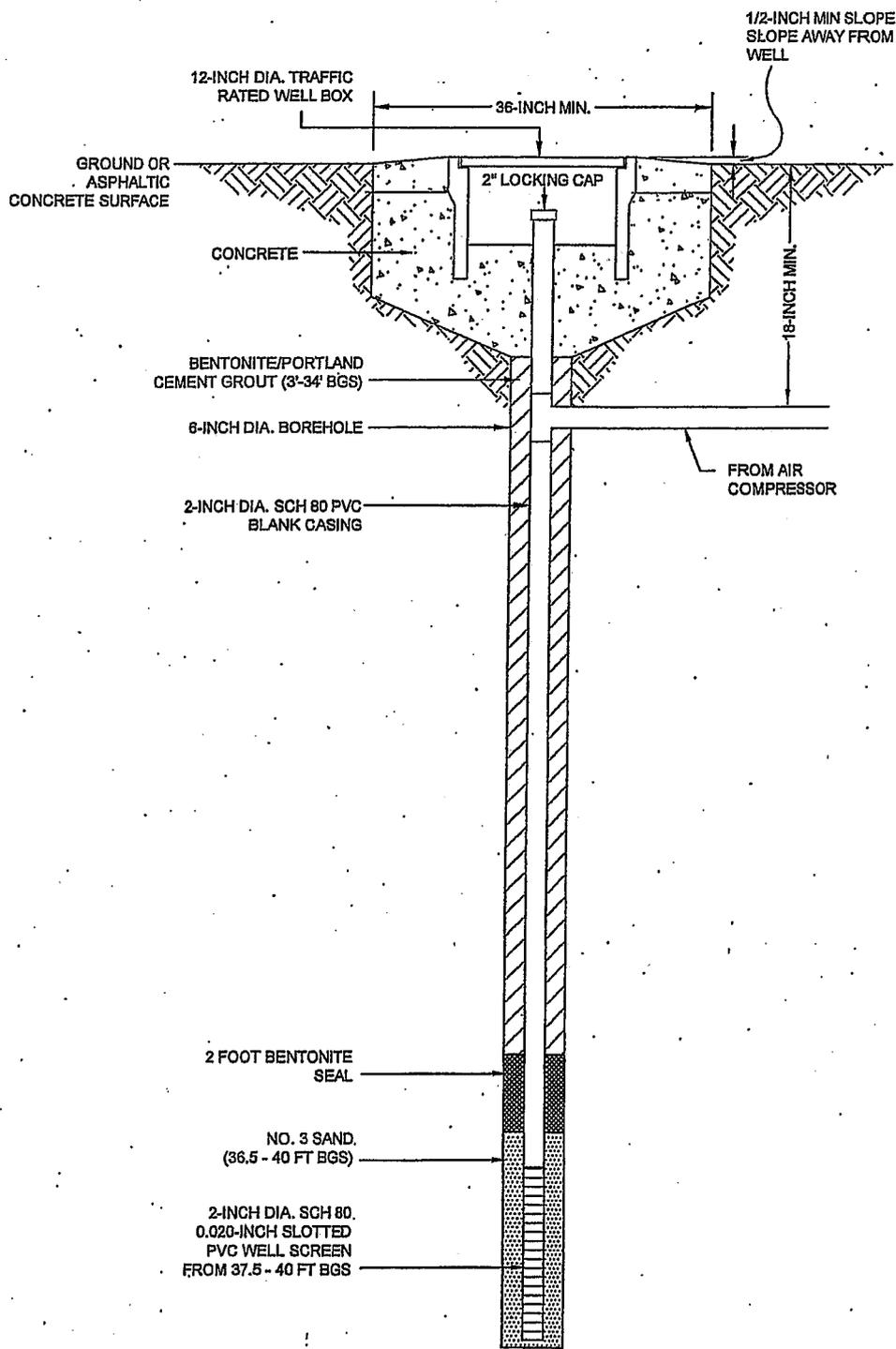
LEGEND:

- MW-3 ⊕ GROUNDWATER MONITORING WELL
- AS-1 ⊠ PROPOSED LOCATION OF AIR SPARGE WELL
- VE-1 ⊙ PROPOSED LOCATION OF VAPOR EXTRACTION WELL
- PROPOSED TRENCH



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 REFERENCE: SITE PLAN ADAPTED FROM BRYAN A. STIRRAT AND ASSOCIATES, FIGURE DATED DECEMBER, 2004. 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 298-6195/298-6199 (FAX)	FOR: CALTRANS BOULEVARD MAINTENANCE STATION 40945 Old Highway 80 Boulevard, California	PROPOSED SOIL VAPOR/AIR SPARGING SYSTEM LAYOUT	FIGURE: 3
	JOB NUMBER:	DRAWN BY:	CHECKED BY:
			DATE:



AS WELL HEAD DETAILS
NOT TO SCALE



SECOR

2855 CAMINO DEL RIO NORTH, SUITE 802
SAN DIEGO, CALIFORNIA

FOR:

CALSTRANS BOULEVARD
MAINTENANCE STATION
40945 Old Highway 80
Boulevard, California

AIR SPARGE WELL
CONSTRUCTION DIAGRAM

FIGURE:

4

JOB NUMBER:

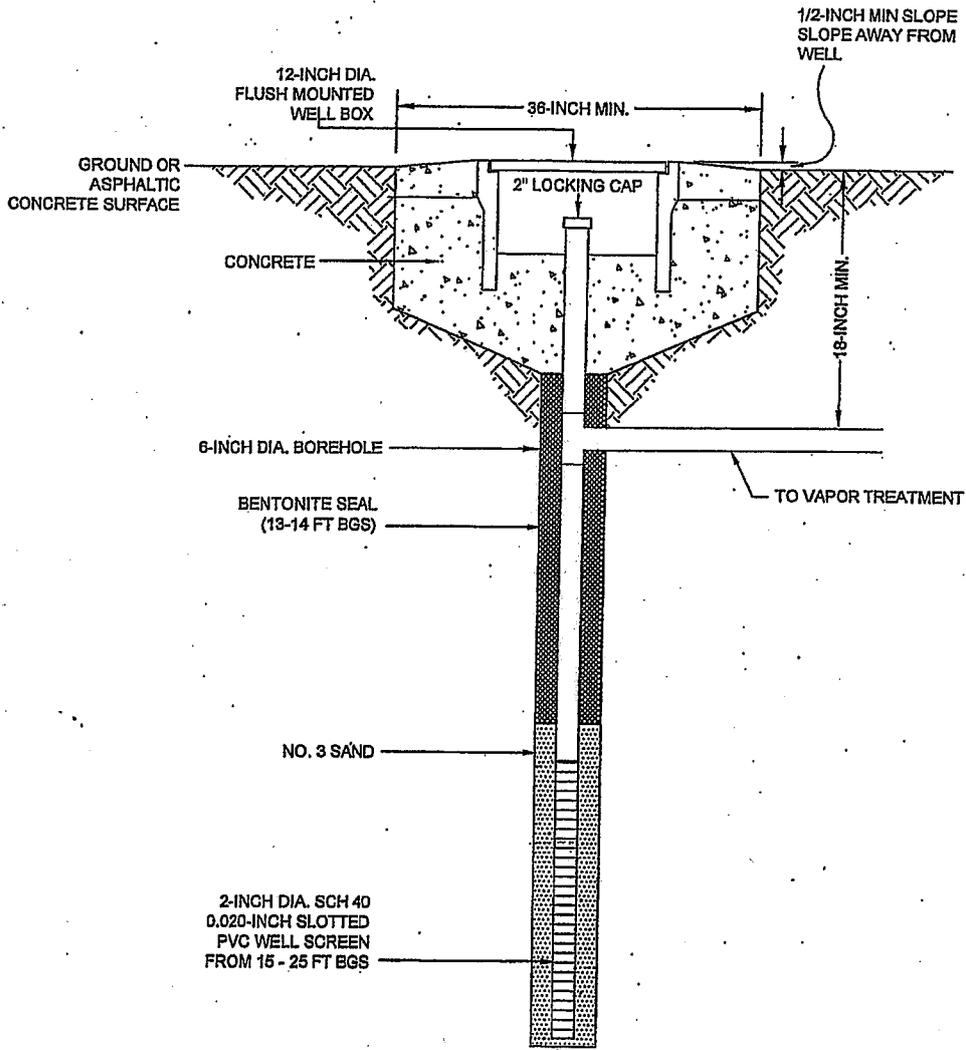
DRAWN BY:

CHECKED BY:

APPROVED BY:

DATE:

00



SVE WELL HEAD DETAILS
NOT TO SCALE

 SECOR 2855 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 288-8195/288-8199 (FAX)	FOR: CALTRANS BOULEVARD MAINTENANCE STATION 40945 Old Highway 80 Boulevard, California		VAPOR EXTRACTION WELL CONSTRUCTION DIAGRAM		FIGURE: 5
	JOB NUMBER: 080T.CA164.04	DRAWN BY: RO	CHECKED BY:	APPROVED BY:	DATE: 10/13/06

TABLES
Table 1 – Historical Groundwater Elevation Data
Corrective Action Plan Addendum
California Department of Transportation
Boulevard Maintenance Station
40945 Old Highway 80
Boulevard, California
080T.CA164.04
November 1, 2006

TABLE 1
Historical Groundwater Elevation Data
CALTRANS BOULEVARD MAINTENANCE STATION

Well ID	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	
										Well Information (1)
Installation Date										
Elevation of well ⁽²⁾ (ft. above msl):										
Well Casing Diameter (in)										
Total depth of well ⁽³⁾ (ft)										
Screen Length ⁽⁴⁾ (ft)										
Depth to Groundwater ⁽³⁾ (ft)										
7/21/1997										
9/13/2000										
8/15/2001										
4/10/2002										
7/2/2002										
10/16/2002										
1/22/2003										
4/8/2003										
8/12/2003										
1/8/2004										
5/6/2004										
11/15/2004										
6/8/2006										
Elevation of Water Surfaces (ft. above msl)										
7/21/1997										
9/13/2000										
8/15/2001										
4/10/2002										
7/2/2002										
10/16/2002										
1/22/2003										
4/8/2003										
8/12/2003										
1/8/2004										
5/6/2004										
11/15/2004										
6/8/2006										

NOTES:
 (2) Surveyed top of well casing.
 (3) Measured from top of casing.
 (4) Screen installed at the bottom of each well

**APPENDIX A
COUNTY OF SAN DIEGO DEH LETTER DATED JULY 31,
2006, REGARDING CLEANUP OF GASOLINE/DIESEL
RELEASE AT CALTRANS BOULEVARD MAINTENANCE
STATION**

Corrective Action Plan Addendum
California Department of Transportation
Boulevard Maintenance Station
40945 Old Highway 80
Boulevard, California
080T:CA164-04
November 1, 2006



County of San Diego

GARY W. ERBECK
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www.sdcountry.ca.gov/deh/lwq

OFFICIAL NOTICE

July 31, 2006

Mr. Owen Chung
California Department of Transportation
4050 Taylor Street, M.S. 242
San Diego, CA 92110

Dear Mr. Chung:

CLEANUP OF GASOLINE/DIESEL RELEASE AT CALTRANS
BOULEVARD MAINTENANCE STATION
40945 OLD HIGHWAY 80, BOULEVARD, CA 91905
UNAUTHORIZED RELEASE H00149-001

The *Second Quarter 2006 Groundwater Sampling* report from Ninyo and Moore has been reviewed. Groundwater elevations have dropped somewhat during the past year and contamination levels in groundwater have changed slightly in response to this water level change. Groundwater contamination levels in the vicinity of the leak (wells MW 1, MW2, and MW7) are much higher than they were in 2004.

Because this site is in a groundwater-dependent community which obtains its water from a fractured bedrock aquifer, the continued presence of hydrocarbons in the soil/groundwater poses a high risk. Changes in groundwater elevation, because of natural processes and/or pumping of supply wells in the vicinity, can abruptly change the distribution pattern of groundwater contamination. Caltrans will incur significant expense if the contamination impacts a water supply well.

This site (along with the Caltrans Bostonia property) is one of the most significant of the contaminated Caltrans properties in San Diego County. A Corrective Action Plan (CAP) for cleanup using soil vapor extraction with air sparging was conditionally approved in August 2005. At that time, you were asked to notify surrounding property owners and residents of the opportunity to review the CAP. In January 2006, I asked you to update the design of the cleanup system because of an increase in groundwater elevation; I have received no evidence that the design update or the public notification has been done.

By November 1, 2006, update the CAP, provide public notification, and select a contractor who can implement the cleanup plan.

Monitoring of wells MW4, MW5, and MW9 can be eliminated until further notice; monitoring frequency of the remaining wells can be reduced to semiannual.