



California Regional Water Quality Control Board Los Angeles Region



Winston H. Hickox
Secretary for
Environmental
Protection

Over 50 Years Serving Coastal Los Angeles and Ventura Counties
Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Gray Davis
Governor

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.swrcb.ca.gov/rwqcb4>

November 13, 2003

Mr. Joseph Lopez
Praxair, Inc.
1785 Old Oakland Road
San Jose, CA 95131

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
CLAIM NO. 7000 0520 0020 1693 5527

Dear Mr. Lopez:

NOT INSURE

GENERAL WASTE DISCHARGE REQUIREMENTS FOR HRC INJECTION PILOT TEST AT PETROLEUM HYDROCARBON FUEL AND/OR VOLATILE ORGANIC COMPOUND IMPACTED SITES - FORMER MQS INSPECTION FACILITY, 6800 EAST WASHINGTON BOULEVARD, COMMERCE, CALIFORNIA (SITE ID NO. 1844000, CI-NO. 8669)

We have completed our review of your application for coverage under General Waste Discharge Requirements to inject potassium permanganate (KMnO₄) solution at the site to test its effectiveness for the remediation of the volatile organic compounds contaminated groundwater.

Praxair, Incorporated (hereinafter Discharger) has owned the property located at 6800 East Washington Boulevard in Commerce, California (Figure 1) since 1996. The site is a 2-acre parcel of land containing a 38,000-square foot building. From 1959 to 1994, the site was occupied by MQS Inspection Facility, which performed a variety of non-destructive testing and chemical analyses.

In June 1996, a plume of groundwater contamination with volatile organic compounds (VOCs) such as tetrachloroethene (PCE) was found beneath the site in the former clarifier area. In October 1998, soil vapor extraction (SVE) was performed using four dual-nested vapor extraction wells (VEW-1 through VEW-4). Results indicated that SVE was highly effective in removing PCE from shallow soil at the site. In April 1999, an air sparging pilot test was performed at well AS-1 (Figure 2). The air sparge and SVE system operated from June 8, 2000 through July 10, 2002. Total PCE removed by the air sparge/SVE system since it began operation is estimated at 725 pounds (Figure 3).

In August 2002, the Discharger submitted a "Chemical Oxidation Bench-Scale Test and Monitoring Well Replacement Report" proposing a pilot test to inject a 1% potassium permanganate (KMnO₄) solution into each of five injection points (wells MW-6R, MW-9, AS-1, AS-5, and AS-8; Figure 2) to remediate the PCE contamination in the groundwater. In April 2003, the Discharger submitted a "Chemical Oxidation Pilot Test and Monitoring Well Deepening Workplan" (Workplan) amending the previous pilot test protocol by proposing to inject KMnO₄ solution into wells OW-1R, MW-5R, AS-5, and AS-8. On August 18, 2003, Regional Water Quality Control Board staff Steven Hariri approved the Workplan with a number of conditions.

California Environmental Protection Agency

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption
For a list of simple ways to reduce demand and cut your energy costs, see the tips at: <http://www.swrcb.ca.gov/news/echallenge.html>



Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

The site is situated within the Los Angeles Coastal Plain – Central Groundwater Basin. The depth to groundwater at the site ranged from 77.51 feet to 100.32 feet below ground surface (bgs) (measured on September 9, 2003) and the hydraulic gradient across the site typically ranges from 0.005 to 0.008 feet per foot. The most recent (measured in September 2003) groundwater flow direction is to the southeast (Figure 4) and the approximate plume size for PCE is shown in the attached Figure 5.

For the pilot test, KMnO_4 solution will be injected, one location at a time, into the subsurface via existing groundwater monitoring wells MW-1, MW-2, MW-3, and OW-1R and groundwater will be extracted from monitoring well MW-5R at an estimated rate of 0.5 to 1.0 gallon per minute (gpm) to create a hydraulic barrier. After completing the injection into the peripheral wells, KMnO_4 solution will be injected in well MW-5R without creating a hydraulic barrier by extracting from another well. The injected potassium permanganate will oxidize VOCs to by-products which include hydrogen and chloride ions, carbon dioxide (CO_2), and manganese dioxide (MnO_2). Any extracted groundwater, following laboratory analyses, will be hauled off-site for disposal.

The maximum volume of KMnO_4 solution that will be injected for the pilot test is 30,000 gallons (6,000 gallons per well). The maximum injection rate of KMnO_4 solution will be 10 gpm per injection point and the solution will be injected into the uppermost water-bearing zone at each injection point (approximately 100 feet bgs) via gravity feed. To evaluate the effectiveness of the pilot test program, groundwater monitoring wells MW-6R, MW-9, MW-10, MW-11, MW-12, and MW-14 will be used to monitor and obtain relevant parameters before and after the KMnO_4 injection.

If the pilot or feasibility test is determined to be successful and a full-scale treatment system is proposed for site cleanup, then the following is required:

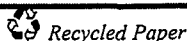
- a. A final Remedial Action Plan (RAP) is to be submitted to the Regional Board for review and approval prior to its implementation; and
- b. A revised Report of Waste Discharge (ROWD) is to be submitted for the full-scale treatment system.

Regional Board staff will review the revised ROWD to determine if it is complete or if additional information is needed. In addition, upon receipt of a complete ROWD, the Monitoring and Reporting Program will be revised to incorporate the approved full-scale treatment plan.

Any potential adverse water quality impacts that may result shall be localized, of short-term duration, and shall not impact any existing or prospective uses of groundwater. Groundwater quality shall be monitored as required in the Monitoring and Reporting Program No. CI-8669 to verify no long-term adverse impact to water quality. There may be small increases associated with soluble gases such as methane, ethane, ethene, and carbon dioxide. The site is located in the City of Commerce at Latitude: $33^\circ 59'$ and Longitude: $118^\circ 07'$. The quantities of KMnO_4 injected shall be documented per the Monitoring and Reporting Program No. CI-8669.

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Mr. Joseph Lopez
Praxair, Inc.

- 3 -

November 13, 2003

Regional Board staff have reviewed the information provided and have determined that the proposed discharge meets the conditions specified in Order No. R4-2002-0030, "General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel and/or Volatile Organic Compound Impacted Sites," adopted by this Regional Board on January 24, 2002.

Enclosed are your Waste Discharge Requirements, consisting of Regional Board Order No. R4-2002-0030 (Series No. 040) and Monitoring and Reporting Program No. CI-8669 and Standard Provisions. Please note that the discharge limits in Attachment A (Los Angeles Coastal Plain – Central Groundwater Basin) of Order No. R4-2002-0030 are applicable to your discharge.

The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of this enrollment (November 13, 2003) under Regional Board Order No. R4-2002-0030. All monitoring reports shall be sent to the Regional Board, ATTN: Information Technology Unit.

When submitting monitoring or technical reports to the Regional Board per these requirements, please include a reference to Compliance File No. CI-8669, which will assure that the reports are directed to the appropriate file and staff. Do not combine other reports with your monitoring reports. Submit each type of report as a separate document.

We are sending a copy of Order No. R4-2002-0030 only to the applicant. A copy of the Order will be furnished to anyone who requests it. If you have any questions, please contact Mr. David Koo at (213) 620-6155.

Sincerely,

for David A. Barbarash, AEO
Dennis A. Dickerson
Executive Officer


Enclosures:

1. Board Order No. R4-2002-0030
2. Monitoring and Reporting Program No. CI-8669
3. Attachment D – Priority Pollutants

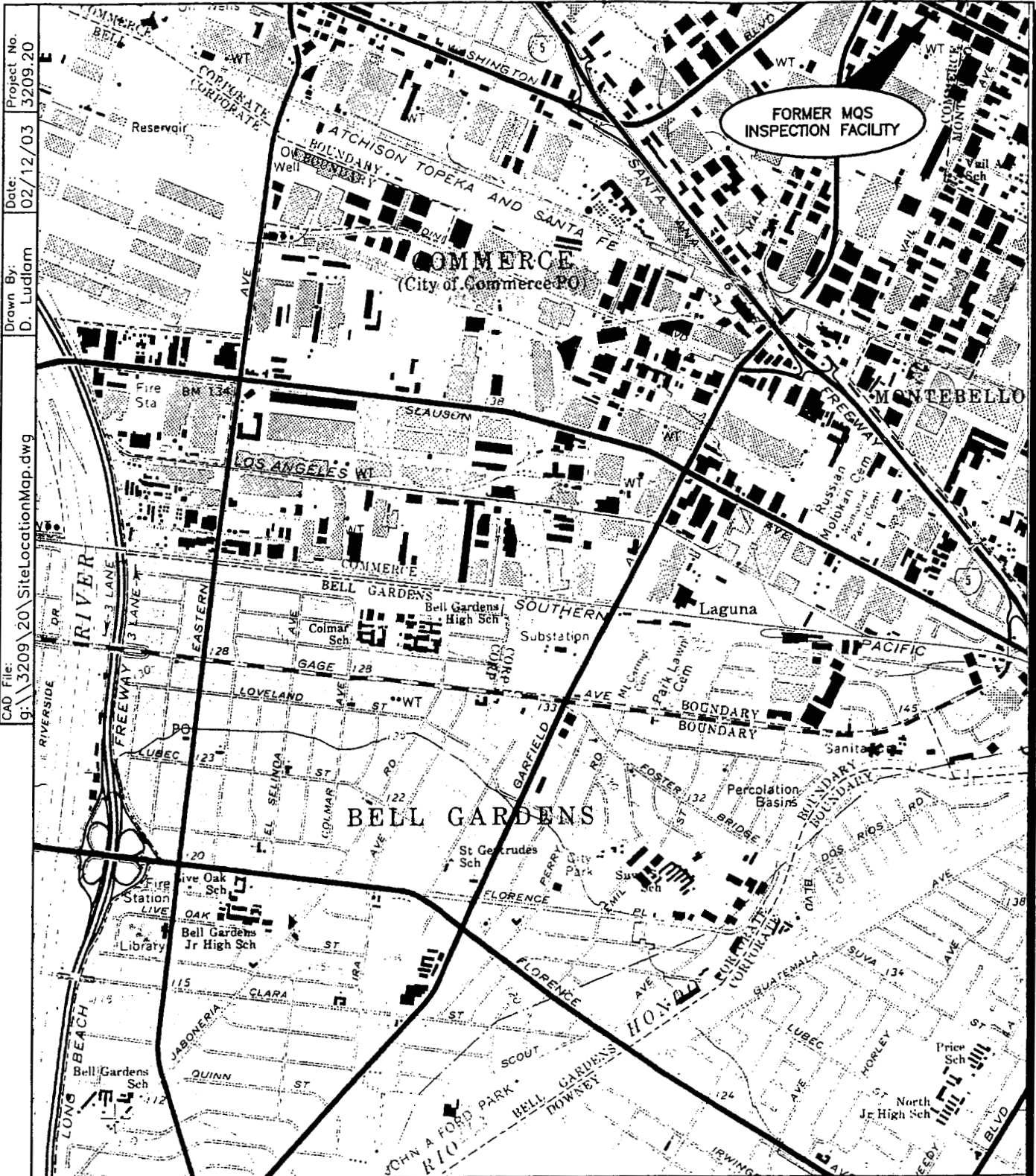
cc: Mr. Robert Sams, Office of Chief Counsel, State Water Resources Control Board
Mr. Michael Lauffer, Office of Chief Counsel, State Water Resources Control Board
Mr. Steven Hariri, Los Angeles Regional Water Quality Control Board –
Site Cleanup II Unit
Mr. Michael Quillin, Environmental Resources Management

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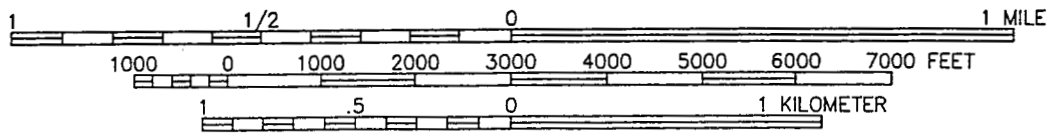
 Recycled Paper

Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.



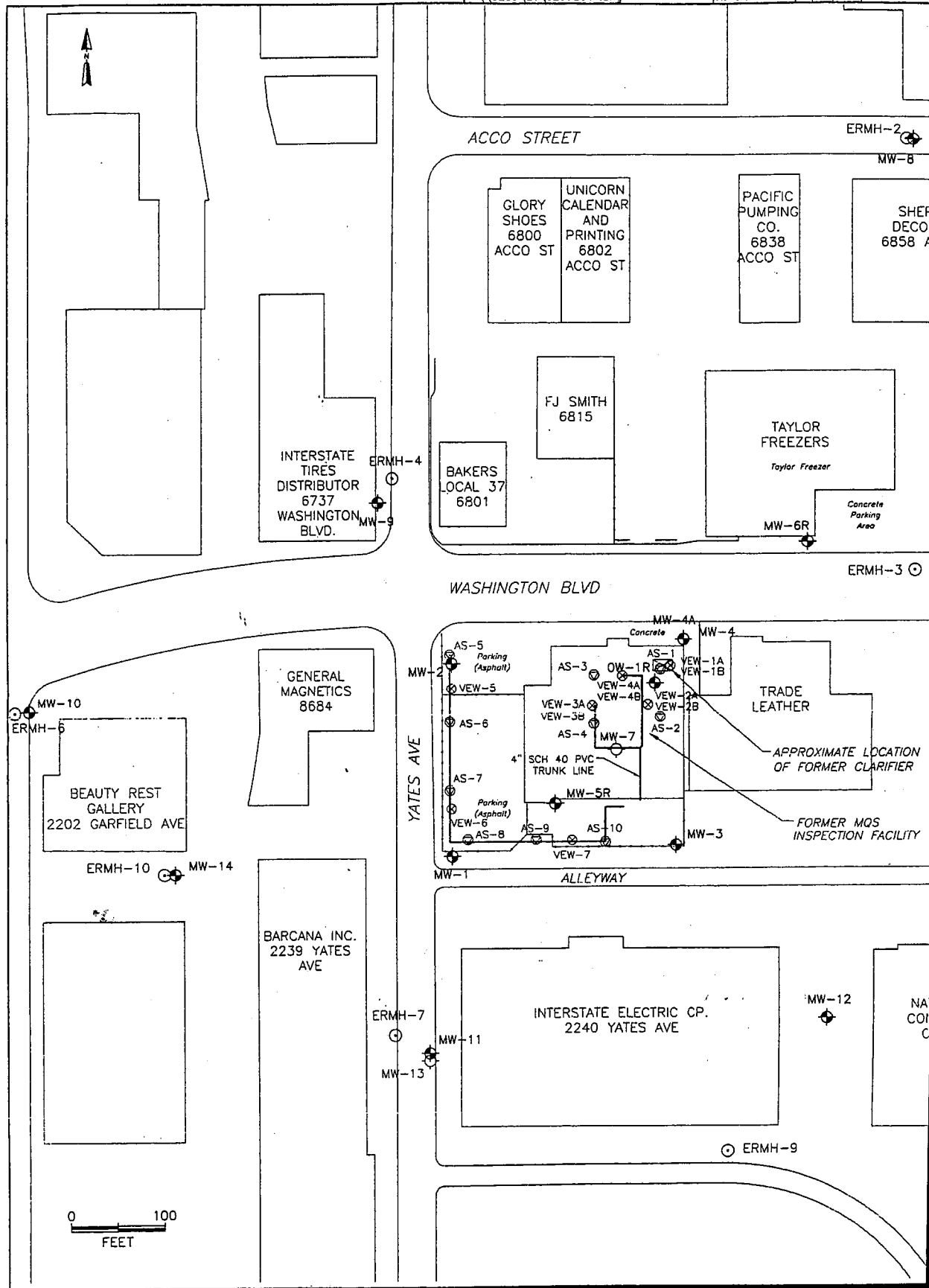
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 Date: 02/12/03
 Drawn By: D. Ludlam
 CAD File: g:\3209\20\SiteLocationMap.dwg

SCALE 1:24,000



References:
 U.S.G.S. 7.5 Minute Series (Topographic South Gate
 Quadrangle)
 Dated: 1981

Figure 1
Site Location Map
Former MQS Inspection Facility
Commerce, California



LEGEND

◆ Existing Monitoring Well	⊙ Air Sparge Well
◇ Abandoned Monitoring Well	⊗ SVE Well
⊙ Abandoned Hydropunch Boring	— Piping Layout
	— Fence

Note: ERMH-5 and ERMH-8 were not drilled due to accessibility issues and/or auger refusal.

Figure 2
Site Plan Map
Former MQS Inspection Facility
Commerce, California
 ERM 07/02

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 Date: 07/28/00
 Project No. 3209.20

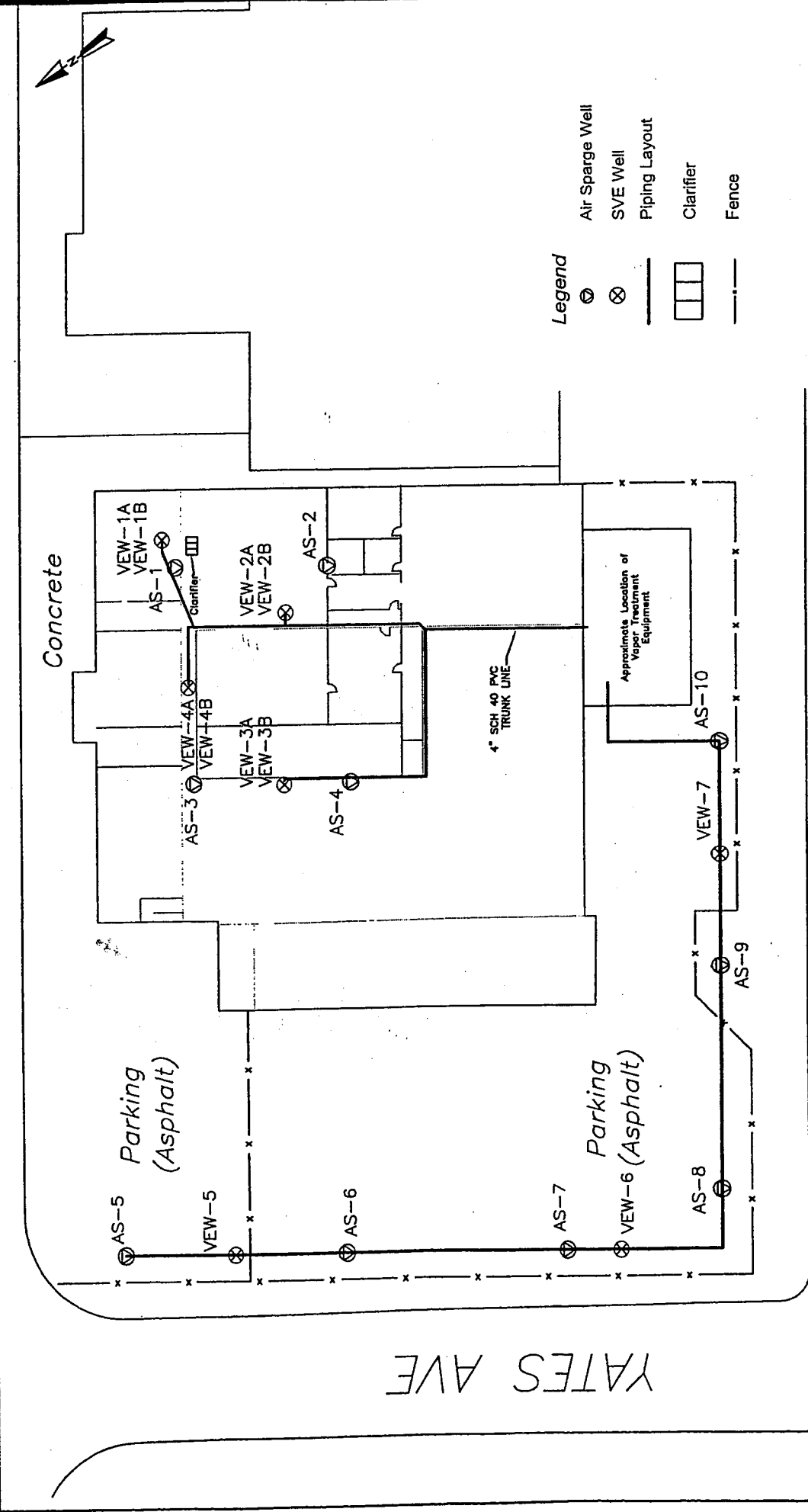


Figure 3
 Layout of SVE and
 Air Sparge Remediation System
 Former MQS Inspection Facility
 Commerce, California

ERM 0700

ALLEYWAY

YATES AVE



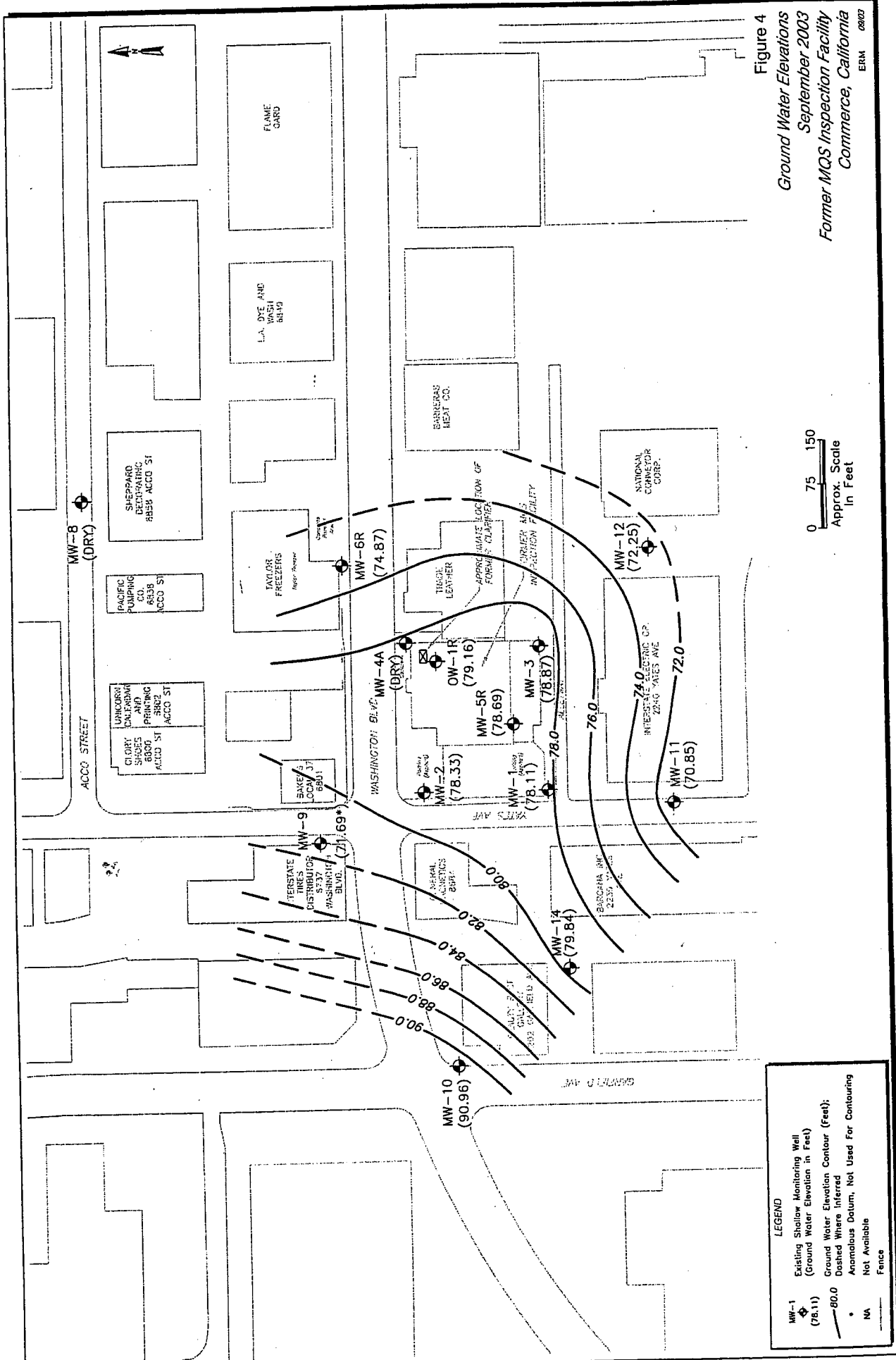


Figure 4
 Ground Water Elevations
 September 2003
 Former MOS Inspection Facility
 Commerce, California
 ERM 0903

0 75 150
 Approx. Scale
 In Feet

LEGEND

MW-1 (78.11)	Existing Shallow Monitoring Well (Ground Water Elevation in Feet)
80.0	Ground Water Elevation Contour (Feet); Dashed Where Inferred
MA	Anomalous Datum, Not Used For Contouring
---	Not Available
---	Fence

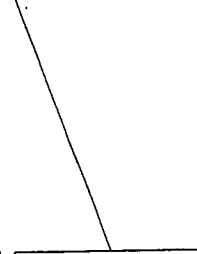
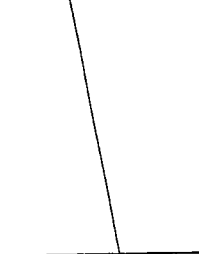
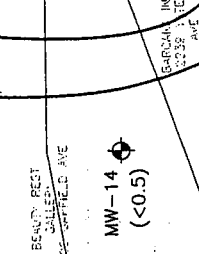
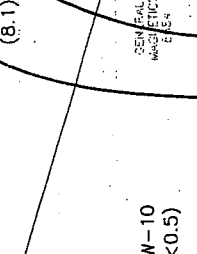
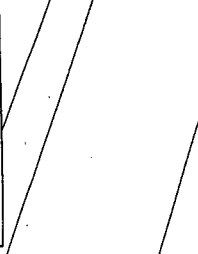
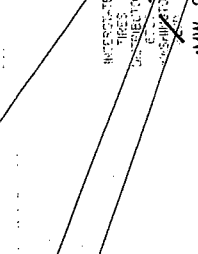
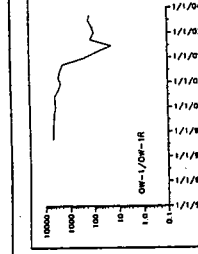
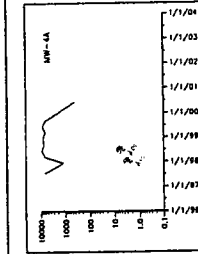
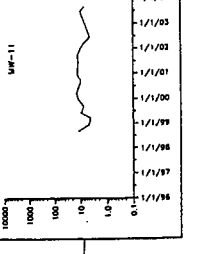
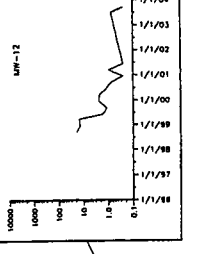
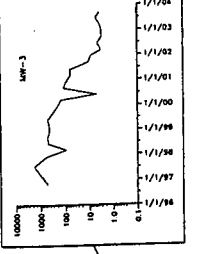
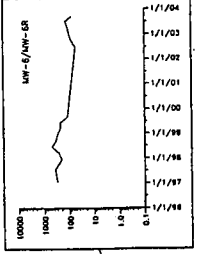
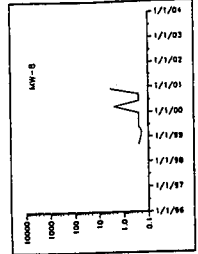
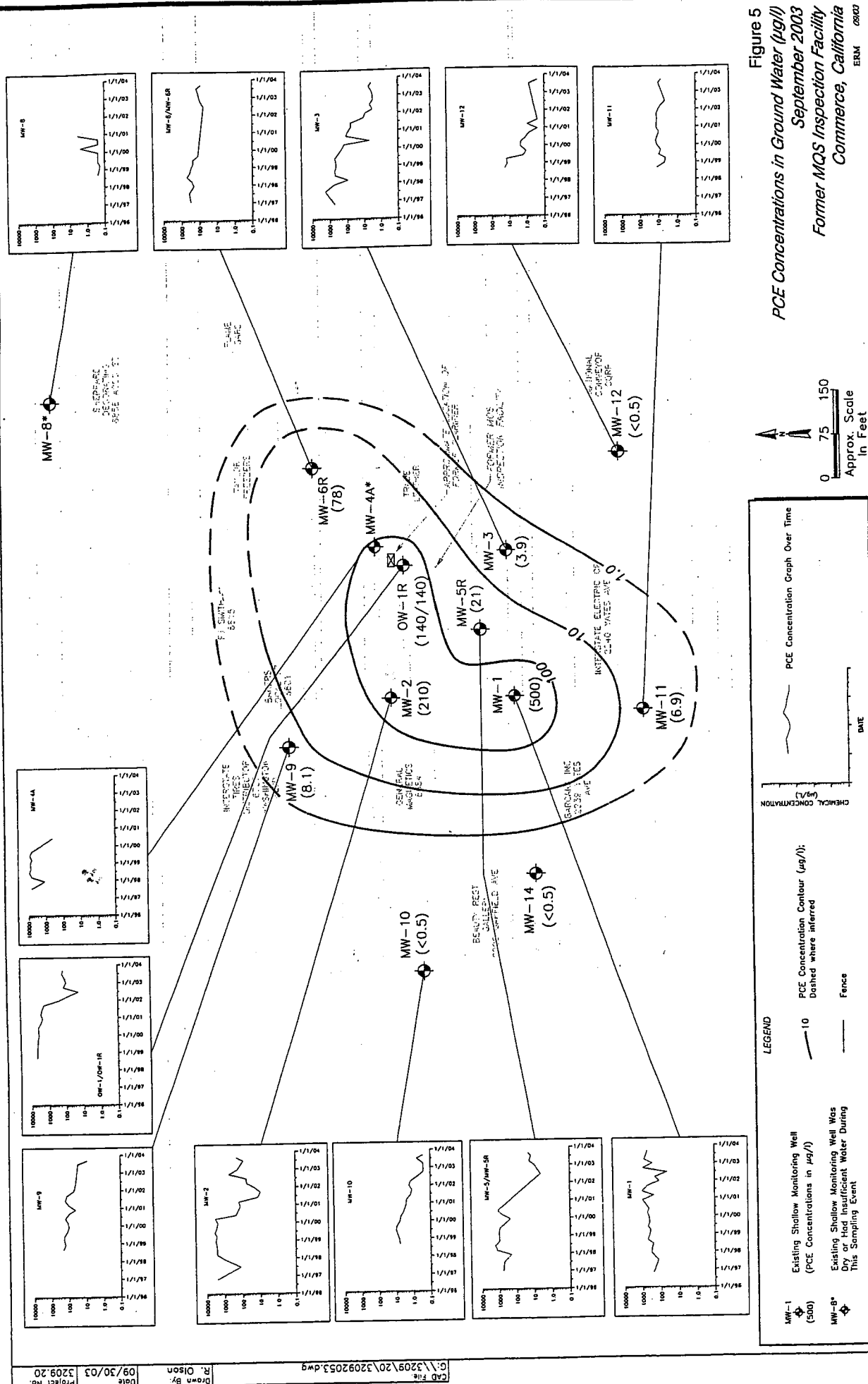
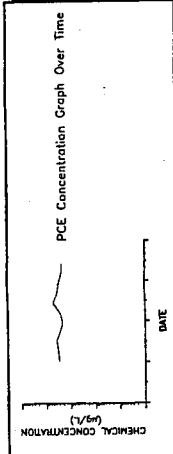


Figure 5
PCE Concentrations in Ground Water (µg/l)
 September 2003
 Former MGS Inspection Facility
 Commerce, California

0 75 150
 Approx. Scale
 In Feet



LEGEND

- Existing Shallow Monitoring Well (500)
- Existing Shallow Monitoring Well Was Dry or Had Insufficient Water During This Sampling Event
- PCE Concentration Contour (µg/l)
- PCE Concentration Graph Over Time

ATTACHMENT D

PRIORITY POLLUTANTS

Metals

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

Miscellaneous

Cyanide
Asbestos (only if
specifically
required)

Pesticides & PCBs

Aldrin
Chlordane
Dieldrin
4,4'-DDT
4,4'-DDE
4,4'-DDD
Alpha-endosulfan
Beta-endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC
Delta-BHC
Toxaphene
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260

Base/Neutral Extractibles

Acenaphthene
Benzidine
1,2,4-trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-chloronaphthalene
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis(2-chloroisopropyl) ether
Bis(2-chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-nitrosodimethylamine
N-nitrosodi-n-propylamine
N-nitrosodiphenylamine
Bis (2-ethylhexyl) phthalate
Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a) anthracene
Benzo(a) pyrene
Benzo(b) fluoranthene
Benzo(k) fluoranthene
Chrysene
Acenaphthylene
Anthracene
1,12-benzoperylene
Fluorene
Phenanthrene
1,2,5,6-dibenzanthracene
Indeno (1,2,3-cd) pyrene
Pyrene
TCDD

Acid Extractibles

2,4,6-trichlorophenol
P-chloro-m-cresol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethylphenol
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dinitro-o-cresol
Pentachlorophenol
Phenol

Volatile Organics

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Chloroform
1,1-dichloroethylene
1,2-trans-dichloroethylene
1,2-dichloropropane
1,3-dichloropropylene
Ethylbenzene
Methylene chloride
Methyl chloride
Methyl bromide
Bromoform
Dichlorobromomethane
Chlorodibromomethane
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl chloride
2-chloroethyl vinyl ether
Xylene

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-8669
FOR
PRAXAIR, INCORPORATED
(FORMER MQS INSPECTION FACILITY)

ENROLLMENT UNDER REGIONAL BOARD
ORDER NO. R4-2002-0030 (Series No. 040)
SITE ID NO. 1844000

I. REPORTING REQUIREMENTS

- A. Praxair, Incorporated (hereinafter Discharger) shall implement this monitoring program on the effective date of this enrollment (November 13, 2003) under Regional Board Order No. R4-2002-0030. The first monitoring report under this Program is due by January 15, 2004.

Monitoring reports shall be received by the dates in the following schedule:

<u>Reporting Period</u>	<u>Report Due</u>
January – March	April 15
April – June	July 15
July – September	October 15
October – December	January 15

- B. If there is no discharge or injection, during any reporting period, the report shall so state. Monitoring reports must be addressed to the Regional Board, Attention: Information Technology Unit.
- C. By March 1 of each year, the Discharger shall submit an annual summary report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements.
- D. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and the corrective actions taken or planned that may be needed to bring the discharge into full compliance with waste discharge requirements. This section shall be located at the front of the report and shall clearly list all non-compliance with discharge requirements, as well as all excursions of effluent limitations.

November 13, 2003

E. The Discharger shall comply with requirements contained in Section G. of Order No. R4-2002-0030 "Monitoring and Reporting Requirements" in addition to the aforementioned requirements.

II. POTASSIUM PERMANGANATE (KMnO₄) SOLUTION INJECTION MONITORING REQUIREMENTS

The quarterly reports shall contain the following information regarding injection activities:

1. Location Map showing the injection point(s) for KMnO₄;
2. Written summary defining:
 - Depth of injection point(s);
 - Quantity of KMnO₄ injected per injection point; and
 - Total amount of KMnO₄ injected.

III. GROUNDWATER MONITORING PROGRAM

A groundwater monitoring program shall be designed to detect and evaluate impacts to groundwater associated with the KMnO₄ injection activities surrounding the injection area. Sampling locations shall include, but not limited to, monitoring wells MW-9 and MW-10 (upgradient), MW-6R and MW-14 (source area), MW-11 and MW-12 (downgradient). These sampling locations shall not be changed and any proposed change of monitoring locations shall be identified and approved by the Regional Board Executive Officer (Executive Officer) prior to their use. The Discharger shall conduct baseline sampling prior to KMnO₄ injection and regular sampling with the required frequencies of the monitoring wells mentioned above for the following groundwater parameters:

<u>CONSTITUENT</u>	<u>UNITS*</u>	<u>TYPE OF SAMPLE</u>	<u>MINIMUM FREQUENCY OF ANALYSIS⁽¹⁾</u>
Total daily injection KMnO ₄ flow	liters/day (to indicate solution concentration)	In situ	Daily during injection
Chlorinated Volatile Organic Compounds (EPA Method 8260B)	µg/L	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Total Organic Carbon (EPA Method 9060 Modified)	µg/L	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter

Total dissolved solids	mg/L	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Specific Conductivity	µmhos/cm	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Turbidity	NTU	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
pH	pH units	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Oxidation-reduction potential	millivolts	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Temperature	°F	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Groundwater Elevation	Feet, mean sea level (msl) and below ground surface (bgs)	In situ	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Dissolved Oxygen	µg/L	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Major Anions (bromide, chloride, sulfate, nitrate, nitrite, O-phosphate, and sulfide)	µg/L	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Major Cations (barium, calcium, magnesium, manganese, potassium and sodium)	µg/L	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Permanganate	µg/L	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter

Color (EPA Method 110.2)	Color unit	Grab	<ul style="list-style-type: none"> • Weekly first month • Monthly second month through sixth month • Quarterly thereafter
Metals in Priority Pollutants scan**	µg/L	Grab	<ul style="list-style-type: none"> • Annually

* mg/L: milligrams per liter; µg/L: micrograms per liter; µmhos/cm: microohms per centimeter; °F: degree Fahrenheit

** Priority Pollutants are listed in Attachment D

All groundwater monitoring reports must include, at minimum, the following:

- a. Well identification, date and time of sampling;
- b. Sampler identification, and laboratory identification;
- c. Quarterly observation of groundwater levels, recorded to 0.01 feet mean sea level and groundwater flow direction.

III. MONITORING FREQUENCIES

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

IV. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the _____ day of _____ at _____.

_____ (Signature)

_____ (Title)"

Praxair, Incorporated
Monitoring and Reporting Program No. CI-8669

Site ID No. 1844000
Order No. R4-2002-0030

All records and reports submitted in compliance with this Order are public documents and will be made available for inspection during business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region, upon request by interested parties. Only proprietary information, and only at the request of the Discharger, will be treated as confidential.

Ordered by

David A. Bachowski, AEO
Dennis A. Dickerson
Executive Officer

Date: November 13, 2003