



# California Regional Water Quality Control Board

## Los Angeles Region



Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Alan C. Lloyd, Ph.D.  
Agency Secretary

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Arnold Schwarzenegger  
Governor

October 31, 2005

Mr. Brian Mossman  
Boeing Realty Corporation  
4900 East Conant Street, Building 1  
Long Beach, CA 90808

**REVISED MONITORING AND REPORTING PROGRAM CI-8520, GENERAL WASTE DISCHARGE REQUIREMENTS ORDER NO. R4-2002-0030 (SERIES NO. 8), BOEING REALTY CORPORATION, FORMER C-1 FACILITY, LONG BEACH (CLEAN UP AND ABATEMENT ORDER 95-048, FILE NO. 95-034, SLIC NO. 0399)**

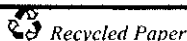
Dear Mr. Mossman:

We have received the "Proposed Monitoring and Reporting Program Revision, Building 1D, CI-8520" (Letters) dated September 30, 2005, and October 17, 2005, prepared by Hargis + Associates. On January 15, 2003, a General Waste Discharge Requirement (WDR) permit was granted to Boeing Realty Corporation (BRC) to inject carbohydrate solutions to groundwater for use in in-situ bioremediation to remediate volatile organic compounds (VOCs) in groundwater. Since the permit was issued, carbohydrate solutions have been delivered into the subsurface at four pilot test areas (Buildings 1D, 3, 14, and 36) and monitoring and sampling have been conducted pursuant to Monitoring and Reporting Program CI-8520. Additional groundwater sampling and a hydropunch investigation have also been completed in the Building 1D area to further delineate the areas requiring treatment.

Based upon the results of the additional hydropunch sampling activities, BRC recommends modifications to the existing Monitoring and Reporting Program CI-8520, primarily for the Building 1D area. As presented in the Letters, the proposed revisions adjust the sampling frequency and schedules to take into consideration of the recently completed hydropunch sampling and anticipated revisions to the enhanced in-situ bioremediation (EISB) for groundwater in the Building 1D area, as outlined in the "*Work Plan Addendum #2: Results of Additional Hydropunch Investigation at Building 1D, Former C-1 Facility, Boeing Realty Corporation*" (Letter Work Plan) dated September 30, 2005, prepared by GeoSyntec Consultants and approved by this Regional Board in a letter dated October 14, 2005. The EISB activities are covered under the Individual WDR (WDR Order No. R4-2003-0051, CI-8566). The General WDR allows for a total of 1,607,000 gallons of carbohydrate solutions to be injected into the groundwater for the Building 1D area. The additional injection activities as outlined in the approved Letter Work Plan will not exceed the allowable injection volumes in the General WDR, therefore, no modifications to volumes are being requested at this time.

Section 13263 (e) of the California Water Code provides that all Requirements shall be reviewed periodically and, upon such review, may be revised by the Regional Board. Regional Board staff has reviewed the information provided and concur with BRC's proposal to modify the Monitoring and Reporting Program. Attached please find Revised Monitoring and Reporting Program CI-8520, which supersedes the Revised Monitoring and Reporting Program dated June 22, 2005. This revised monitoring and reporting program includes a modified sampling schedule, reporting frequency and an updated figure

**California Environmental Protection Agency**



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

Mr. Brian Mossman  
Boeing Realty Corporation

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October 31, 2005

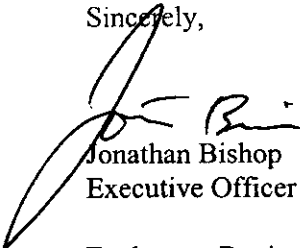
for the Building 1D area. The monitoring and reporting requirements for the Building 14 and 36 areas have not been modified, however the existing schedules have been carried over into this revised program. All monitoring and reporting requirements related to the injection activities for the Building 3 area have been completed. No additional monitoring and reporting related to this permit is required. However, groundwater monitoring will continue to be conducted under the site remediation program.

The Revised Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of this Order. All monitoring reports should 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-8520 and Order No. R4-2002-0030, which will assure that the reports are directed to the appropriate file and staff. Please do not combine your discharge monitoring reports with other reports. Submit each type of report as a separate document.

**Please call Ms. Ana Townsend at (213) 576-6738, or Dr. Rebecca Chou at (213) 576-6733 if you have any questions.**

Sincerely,




Jonathan Bishop  
Executive Officer

Enclosure: Revised Monitoring and Reporting Program No. CI-8520

cc: Mark Stewart, California Department of Water Resources, Watermaster, Central Basin  
Mitchell Yamada, Certified Unified Program Agency, City of Long Beach  
Cherly Ross, West Basin Municipal Water District  
Steve Nakauchi, City of Long Beach, Department of Health Services  
Robert Scott, Boeing Realty Corporation  
Christopher Ross, Hargis + Associates

***California Environmental Protection Agency***

 Recycled Paper

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

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

**REVISED MONITORING AND REPORTING PROGRAM NO. CI 8520  
FOR  
BOEING REALTY CORPORATION - FORMER C-1 FACILITY  
LONG BEACH, CALIFORNIA  
(CLEANUP AND ABATEMENT ORDER 95-048, FILE NO. 95-034)  
ORDER NO. R4-2002-0030 (SERIES NO. 8)**

The Discharger shall implement this monitoring and reporting program on the effective date of this Order.

**I. GROUNDWATER MONITORING PROGRAM**

**A. BUILDING 1D**

In the Building 1D area, the following three categories of wells will be included in the revised monitoring and reporting program.

Group A wells: Injection wells IW0257 and IW0305 (Figure 1).

Group B wells: Monitor wells MW2036, MW2039, and MW2040 (Figure 1).

Group C wells: Monitor wells MW2030, MW2035, MW2038, and MW2045 (Figure 1).

Group A wells are located in the treatment area and wells are selected to be representative of conditions within the treatment areas in the Shallow Bellflower aquitard at locations that are compatible with future development. These wells will be monitored to evaluate the rate of emulsified oil consumption. Group B wells are located within or immediately adjacent to the treatment areas and will be monitored to evaluate the effectiveness of the emplaced reactive zone. Group C wells are located upgradient or downgradient, below, or otherwise outside of the treatment area. These wells located outside the treatment area have been selected to monitor water quality outside the anticipated reactive zone.

The required constituent to be analyzed and the monitoring schedule for each well are shown in the table below.

<b>CONSTITUENT</b>	<b>SAMPLE LOCATIONS</b>	<b>FREQUENCY</b>
Field Parameters <sup>(a)</sup>	Group A, B and C Wells	Baseline <sup>1</sup>
	Group A and B Wells	Post Injection <sup>2</sup>
	Group A Wells	Annually
	Group B Wells	Semiannually
Volatile Organic Compounds (EPA Method 8260B)	Group A, B and C Wells	Baseline <sup>1</sup>
	Group A and B Wells	Post Injection <sup>2</sup>
	Group A and C Wells	Annually
	Group B Wells	Semiannually
Dissolved Hydrocarbon Gasses <sup>(b)</sup>	Group A, B and C Wells	Baseline <sup>1</sup>
	Group A and B Wells	Post Injection <sup>2</sup>
	Group A Wells	Annually
	Group B Wells	Semiannually
	Group C Wells	Biannually
Anions <sup>(c)</sup>	Group A, B and C Wells	Baseline <sup>1</sup>
	Group A and B Wells	Post Injection <sup>2</sup>
	Group B Wells	Annually
	Group A and C Wells	Biannually
Volatile Fatty Acids <sup>(d)</sup>	Group B and C Wells	Baseline <sup>1</sup>
	Group A and B Wells	Post Injection <sup>2</sup>
	Group A and B Wells	Annually
	Group C Wells	Biannually
Total Organic Carbon (EPA Method 9060 Modified)	Group A, B and C Wells	Baseline <sup>1</sup>
	Group A and B Wells	Post Injection <sup>2</sup>
	Group A Wells	Annually
	Group B Wells	Semiannually
	Group C Wells	Biannually
Sulfide	Group B and C Wells	Baseline <sup>1</sup>
	Group B Wells	Post Injection <sup>2</sup>
	Group B Wells	Annually
	Group C Wells	Biannually
Dissolved Metals <sup>(e)</sup>	Group A, B and C Wells	Baseline <sup>1</sup>
	Group B Wells	Post Injection <sup>2</sup>
	Group B Wells	Annually
	Group A and C Wells	Biannually
DHC Assay <sup>(f)</sup>	Group A, B and C Wells	Baseline <sup>1</sup>
	Group B Wells	Post Injection <sup>2</sup>
	Group B Wells	Annually
	Group A and C Wells	Biannually

FOOTNOTES

- (a) Field Parameters include: pH, dissolved oxygen, specific conductance, redox potential, depth to water and temperature.
  - (b) Dissolved Hydrocarbon Gasses include: ethene, ethane and methane.
  - (c) Anions include: chloride, sulfate and nitrate.
  - (d) Volatile Fatty Acids include: acetate, butyrate, lactate and propionate.
  - (e) Dissolved Metals include: iron, manganese and arsenic.
  - (f) DHC Assay to determine presence of Dehalococoides Ethenogenes (DHE).
- 
- 1) Baseline sampling for Group B wells will only include MW2036 as MW2039 and MW2040 will not be installed until after injection has been completed. Baseline sampling will occur after wells installed prior to amendment injection.
  - 2) Post injection sampling will also include MW2030, a Group C well that will not be installed at the time of baseline sampling. The post injection sampling will occur not less than 2 or more than 4 weeks post amendment injection.

**B. BUILDING 3**

All monitoring and reporting requirements related to the injection activities for the Building 3 area have been completed. No additional monitoring and reporting related to this permit is required.

**C. BUILDING 14**

In the Building 14 area, the following three categories of wells will be included in the modified monitoring and reporting program.

Group A wells: Injection wells IW0219 and IW0223.

Group B wells: Performance monitoring well in treatment area MW1052.

Group C wells: Other Monitor wells; two existing wells, MW2001 and MW1059, and two wells installed pre-injection, MW2093 and MW2094 (C<sup>1</sup> Wells), and one well installed to the Middle Bellflower Aquitard (MBA) post injection, MW2092 (C<sup>2</sup> Well).

Group D wells: Monitor wells (installed post injection) MW2095 and MW2091.

All Group A, B, C and D wells will be sampled for selected analytes during pre-injection (baseline) and post-injection monitoring. Groundwater well locations are shown in attached Figure 2.

The required constituents to be analyzed and the monitoring schedule for each well group for Building 14 are shown in the table below.

<b>CONSTITUENT</b>	<b>SAMPLE LOCATIONS</b>	<b>FREQUENCY</b>
Field Parameters <sup>(a)</sup>	Group A, B and C <sup>1</sup> Wells	Baseline
	Group A, B, C <sup>2</sup> and D Wells	Post Injection
	Group A Wells	Annually
	Group B and D Wells	Semiannually
	Group C Wells	Annually
Volatile Organic Compounds	Group A, B and C <sup>1</sup> Wells	Baseline
	Group A, B, C <sup>2</sup> and D Wells	Post Injection
	Group A Wells	Annually
	Group B and D Wells	Semiannually
	Group C Wells	Annually
Dissolved Hydrocarbon Gasses <sup>(b)</sup>	Group A, B and C <sup>1</sup> Wells	Baseline
	Group C <sup>2</sup> and D Wells	Post Injection
	Group A Wells	Annually
	Group B and D Wells	Semiannually
	Group C Wells	Biannually
Anions <sup>(c)</sup>	Group A, B and C <sup>1</sup> Wells	Baseline
	Group C <sup>2</sup> and D Wells	Post Injection
	Group B and D Wells	Annually
	Group C Wells	Biannually
Volatile Fatty Acids <sup>(d)</sup>	Group B and C <sup>1</sup> Wells	Baseline
	Group A, B, C <sup>2</sup> and D Wells	Post Injection
	Group A, B and D Wells	Annually
	Group C Wells	Biannually
Total Organic Carbon	Group A, B and C <sup>1</sup> Wells	Baseline
	Group A, B, C <sup>2</sup> and D Wells	Post Injection
	Group B and D Wells	Semiannually
	Group C Wells	Biannually
Sulfide	Group B and C <sup>1</sup> Wells	Baseline
	Group C <sup>2</sup> and D Wells	Post Injection
	Group B and D Wells	Annually
	Group C Wells	Biannually
Dissolved Metals <sup>(e)</sup>	Group A, B and C <sup>1</sup> Wells	Baseline
	Group C <sup>2</sup> and D Wells	Post Injection
	Group B and D Wells	Annually
	Group A and C Wells	Biannually
DHC Assay <sup>(f)</sup>	Group A, B and C <sup>1</sup> Wells	Baseline
	Group C <sup>2</sup> and D Wells	Post Injection
	Group B and D Wells	Annually
	Group A and C Wells	Biannually

FOOTNOTES

- (a) Field Parameters include: pH, dissolved oxygen, specific conductance, redox potential, depth to water and temperature.
- (b) Dissolved Hydrocarbon Gasses include: ethene, ethane and methane.
- (c) Anions include: chloride, sulfate and nitrate.
- (d) Volatile Fatty Acids include: acetate, butyrate, lactate and propionate.
- (e) Dissolved Metals include: iron, manganese and arsenic.
- (f) DHC Assay to determine presence of Dehalococcoides Ethenogenes (DHE).

**D. BUILDING 36**

In the Building 36 area, the following two groups of groundwater wells will be included in the revised monitoring and reporting program. One more round of sampling is required under this monitoring and reporting program.

Group A: MW2083, MW2084, MW2085, MW2086, MW2087, and MW1069 (six wells total).

Group B: MW2088, MW2089, and MW1070 (three wells total).

Groundwater well locations are shown in attached Figure 3.

The required constituents to be analyzed and the monitoring schedule for each well group for Building 36 are shown in the table below.

<u>CONSTITUENT</u>	<u>SAMPLE LOCATIONS</u>	<u>FREQUENCY</u>
Field Parameters <sup>(a)</sup>	Group A and B Wells	Semiannually
Volatile Organic Compounds (EPA Method 8260B)	Group A and B Wells	Semiannually
Dissolved Hydrocarbon Gasses <sup>(b)</sup>	Group A and B Wells	Semiannually
Anions <sup>(c)</sup>	Group A and B Wells	Semiannually
Volatile Fatty Acids <sup>(d)</sup>	Group A and B Wells	Semiannually
Total Organic Carbon (EPA Method 9060 Modified)	Group A and B Wells	Semiannually
Sulfide	Group A and B Wells	Semiannually
Dissolved Metals <sup>(e)</sup>	Group A and B Wells	Semiannually
DHC Assay <sup>(f)</sup>	Group A and B Wells	Semiannually

FOOTNOTES

- (a) Field Parameters include: pH, dissolved oxygen, specific conductance, redox potential, depth to water and temperature.
- (b) Dissolved Hydrocarbon Gasses include: ethene, ethane and methane.
- (c) Anions include: chloride, sulfate and nitrate.
- (d) Volatile Fatty Acids include: acetate, butyrate, lactate and propionate.
- (e) Dissolved Metals include: iron, manganese and arsenic.
- (f) DHC Assay to determine presence of Dehalococcoides Ethenogenes (DHE).



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. Periodic observation of groundwater levels per respective monitoring schedule, recorded to 0.01 feet mean sea level and groundwater flow direction.

#### AMENDMENT INJECTION MONITORING REQUIREMENTS

The reports shall contain the following information regarding injection activities:

1. Depth of injection points;
2. Quantity, type, and concentration of amendment injected and dates injected;
3. Total amount of amendment injected;
4. Verification of amendment injected: and
5. Analytical data wells from each injection test area.

## II. REPORTING REQUIREMENTS

### A. BUILDING 1D

Monitoring reports shall be received by the dates in the following schedule. This monitoring and reporting program supersedes all previous requirements for the Building 1D area. The first monitoring report under this Program is due by April 30, 2006.

Reporting Period	Sampling Month	Report Due Date
Baseline and Post Injection Monitoring	Baseline: After wells installed prior to amendment injection. Post injection: Not less than 2 or more than 4 weeks post amendment injection	April 30, 2006
Installation Report	Not Applicable	March 30, 2006
April – September 2006	July	October 31, 2006
October 2006 – March 2007	January	April 30, 2007
April – September 2007	July	October 31, 2007
October 2007 – March 2008	January	April 30, 2008
Final Status Report	Not applicable	June 30, 2008

**B. BUILDING 3**

All monitoring and reporting requirements related to the injection activities for the Building 3 area have been completed. No additional monitoring and reporting related to this permit is required to be completed.

**C. BUILDING 14**

Monitoring reports shall be received by the dates in the following schedule. This monitoring and reporting program supersedes all previous requirements. The first monitoring report under this Program is due by July 29, 2005.

Reporting Period	Sampling Month	Report Due Date
January – June 2005	April (Pilot Test)	July 29, 2005
Final Pilot Test Report	Not Applicable	September 30, 2005
Baseline and Post Injection Monitoring	Baseline: After wells installed prior to amendment injection Post injection: not less than 2 or more than 4 weeks post amendment injection	October 31, 2005
Installation Report	Not Applicable	January 31, 2006
October 2005 – March 2006	October	April 28, 2006
April – September 2006	April	October 31, 2006
October 2006 – March 2007	October	April 30, 2007
April – September 2007	April	October 31, 2007
October 2007 – March 2008	October	April 30, 2008
Final Status Report	Not Applicable	June 30, 2008

**D. BUILDING 36**

Monitoring reports shall be received by the dates in the following schedule. This monitoring and reporting program supersedes all previous requirements. The Discharger is required to submit the following reports by its due date:

Reporting Period	Sampling Month	Report Due Date
April – September 2005	July	October 31, 2005
Final Report	Not Applicable	January 31, 2006

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.

### III. 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)"

### IV. 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.

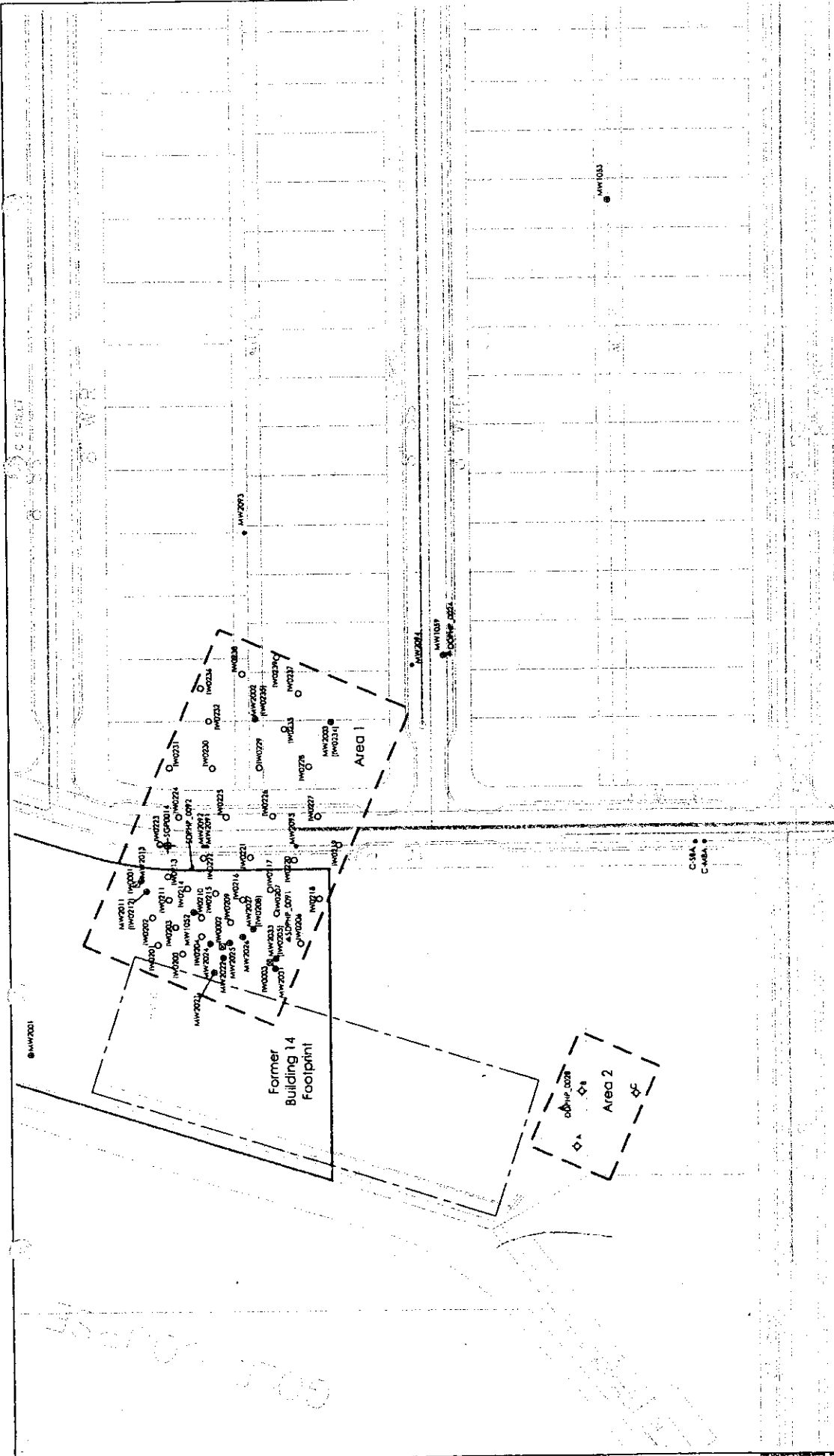
These records and reports are public documents and shall be made available for inspection during normal business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region.

Ordered by:

  
\_\_\_\_\_  
Jonathan Bishop  
Executive Officer

Date: October 31, 2005





**Legend**

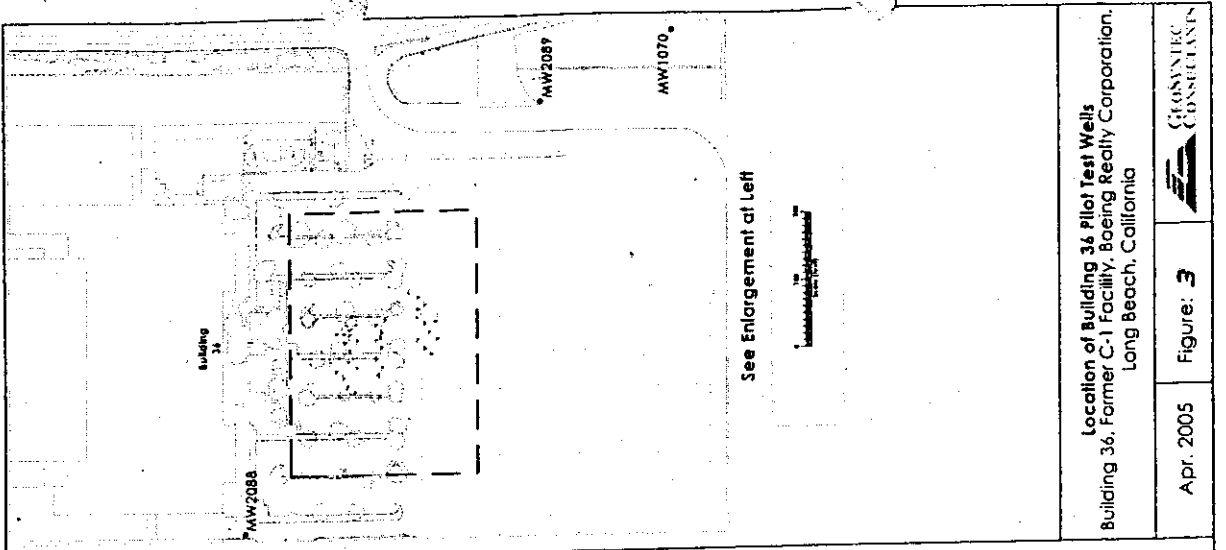
- Monitoring Well (circle)
- Monitoring Well (diamond)
- Proposed Well/Hydropunch/Probe (circle with dot)
- Proposed Well/Hydropunch/Probe (diamond with dot)
- Proposed Well/Hydropunch/Probe (square with dot)
- Proposed Well/Hydropunch/Probe (triangle with dot)
- Proposed Well/Hydropunch/Probe (star with dot)
- Proposed Well/Hydropunch/Probe (circle with cross)
- Proposed Well/Hydropunch/Probe (diamond with cross)
- Proposed Well/Hydropunch/Probe (square with cross)
- Proposed Well/Hydropunch/Probe (triangle with cross)
- Proposed Well/Hydropunch/Probe (star with cross)
- Proposed Well/Hydropunch/Probe (circle with dot and cross)
- Proposed Well/Hydropunch/Probe (diamond with dot and cross)
- Proposed Well/Hydropunch/Probe (square with dot and cross)
- Proposed Well/Hydropunch/Probe (triangle with dot and cross)
- Proposed Well/Hydropunch/Probe (star with dot and cross)

**Existing Well/Hydropunch**

- Existing Well/Hydropunch (circle)
- Existing Well/Hydropunch (diamond)
- Existing Well/Hydropunch (square)
- Existing Well/Hydropunch (triangle)
- Existing Well/Hydropunch (star)
- Existing Well/Hydropunch (circle with cross)
- Existing Well/Hydropunch (diamond with cross)
- Existing Well/Hydropunch (square with cross)
- Existing Well/Hydropunch (triangle with cross)
- Existing Well/Hydropunch (star with cross)

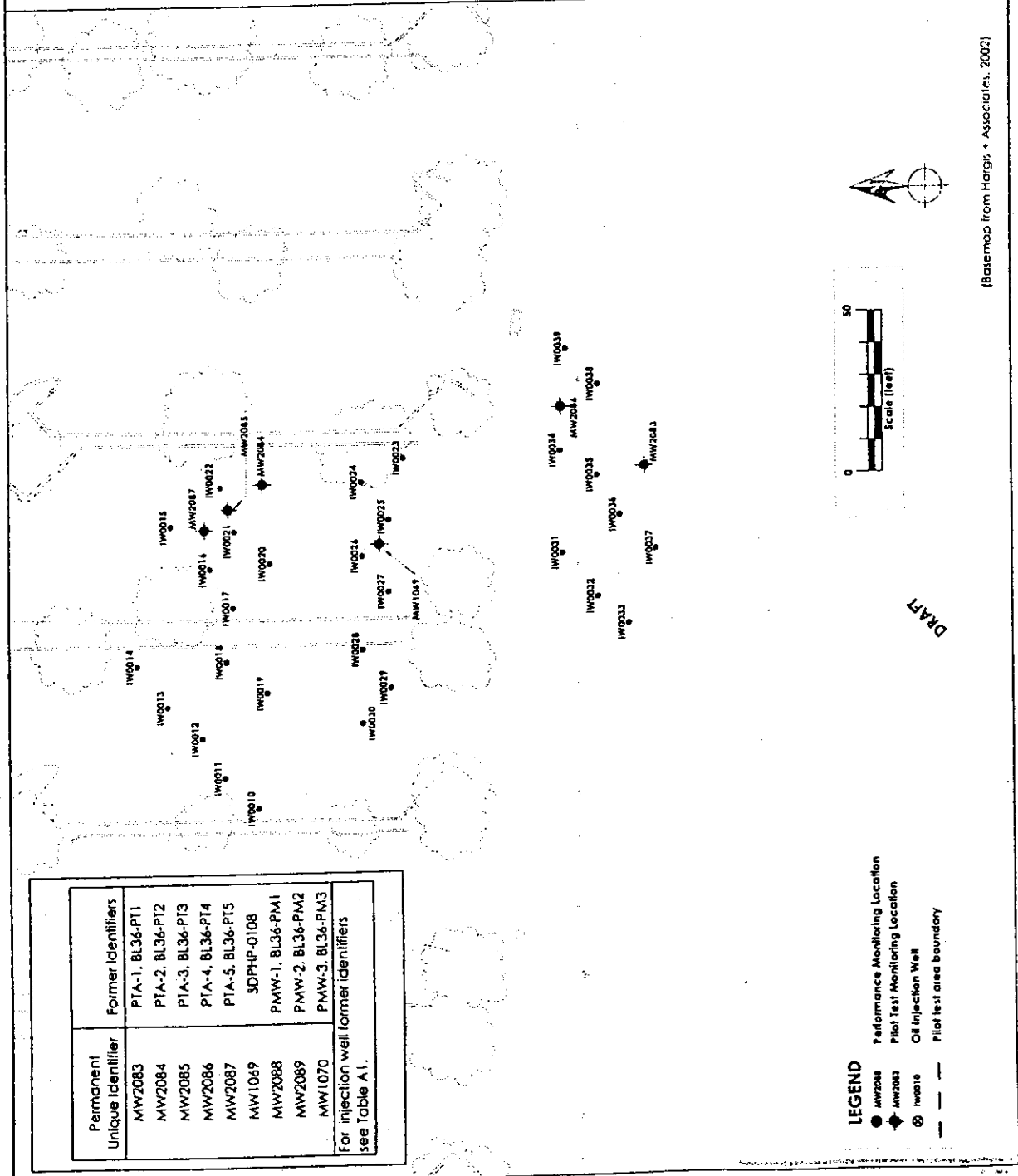
**Proposed Well/Hydropunch/Probe**

- Proposed Well/Hydropunch/Probe (circle)
- Proposed Well/Hydropunch/Probe (diamond)
- Proposed Well/Hydropunch/Probe (square)
- Proposed Well/Hydropunch/Probe (triangle)
- Proposed Well/Hydropunch/Probe (star)
- Proposed Well/Hydropunch/Probe (circle with cross)
- Proposed Well/Hydropunch/Probe (diamond with cross)
- Proposed Well/Hydropunch/Probe (square with cross)
- Proposed Well/Hydropunch/Probe (triangle with cross)
- Proposed Well/Hydropunch/Probe (star with cross)



Location of Building 36 Pilot Test Wells  
 Building 36, Former C-1 Facility, Boeing Realty Corporation,  
 Long Beach, California

Apr. 2005 Figure: 3  
 GEOSYNTEC CONSULTANTS



(Basemap from Hargis + Associates, 2002)

Permanent Unique Identifier	Former Identifiers
MW2083	PTA-1, BL36-PT1
MW2084	PTA-2, BL36-PT2
MW2085	PTA-3, BL36-PT3
MW2086	PTA-4, BL36-PT4
MW2087	PTA-5, BL36-PT5
MW1069	SDPHP-0108
MW2088	PMW-1, BL36-PM1
MW2089	PMW-2, BL36-PM2
MW1070	PMW-3, BL36-PM3

For injection well former identifiers see Table A.1.

- LEGEND**
- Performance Monitoring Location
  - MW2083 Pilot Test Monitoring Location
  - IW0018 Oil Injection Well
  - Pilot test area boundary