



# 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-8566, INDIVIDUAL WASTE DISCHARGE REQUIREMENTS ORDER NO. R4-2003-0051, 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 CI-8566 Revision" (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. On April 8, 2003, an Individual WDR permit was granted to BRC to be used in conjunction with the existing General WDR, to allow bioaugmentation to remediate selected source areas. Bioaugmentation involves the addition of selected non-pathogenic (naturally derived, not engineered) chlorinated ethene-degrading *Dehalococcoides ethenogenes* culture, referred to as KB-1, in select areas to facilitate reductive dechlorination. Since the permit was issued, carbohydrate solutions with KB-1 have been delivered into the subsurface at three of the pilot test areas (Buildings 1D, 3, and 36) and monitoring and sampling have been conducted pursuant to Monitoring and Reporting Program (MRP) CI-8566. Additional groundwater sampling and a hydropunch investigation has also been completed in the Building 1D area to further delineate the areas requiring treatment.

Based upon the baseline sampling and additional groundwater investigation results, BRC recommends modify the existing MRP CI-8566 for the Building 1D area. As presented in the Letters, the proposed revisions take into consideration the recently completed hydropunch sampling and anticipated revisions to the enhanced in situ bioremediation (EISB) injection activities 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 proposed revisions recommend an additional monitoring and reporting schedule for CI-8566 for the Building 1D area and is intended to provide consistent schedules for the WDR MRPs outlined in the General and Individual WDR programs. During the EISB for the Building 1D area, additional injection volumes of KB-1 will be needed to facilitate KB-1 amendment at the additional injection wells approved in the Letter Work Plan. The increase in KB-1 at Building 1D would be offset by an equal decrease for

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Building 3 yielding no net increase in allowable KB-1 amendment for the site. BRC propose the following revisions to the General WDR for KB-1 amendment at Building 1D and Building 3.

	<b>Volume of KB-1 (Gallons, from Original WDR Permit)</b>	<b>Volume of KB-1 (Gallons, Requested Revision)</b>
<b>Building 3</b>		
Cumulative Total for Pilot Test	32	32
Maximum Allowable Quantity	60	32
<b>Building 14</b>		
Cumulative Total for Pilot Test	16.5	16.5
Maximum Allowable Quantity	55	83
<b>Building 1D and 3 Cumulative Allowable Quantity</b>	115	115

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. Modifications to the Individual WDR and MRP is also consistent with Provision C-13 and C-15 of Order No. R4-2003-0051. Regional Board staff has reviewed the information provided and concur with BRC's proposal to modify the allowable injection volumes for Building 1D and Building 3 outlined in WDR permit R4-2003-0051 and the MRP CI-8566. Attached please find Revised MRP CI-8566, 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 updated figure 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 CI-8566 and Order No. R4-2003-0051, 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.

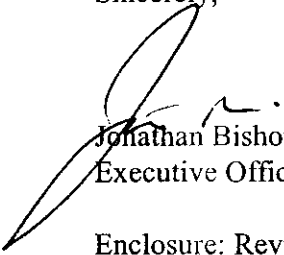
Mr. Brian Mossman  
Boeing Realty Corporation

- 3 -

October 31, 2005

**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-8566

cc: Mark Stewart, California Department of Water Resources, Watermaster, Central Basin  
Mitchell Yamada, Certified Unified Program Agency, City of Long Beach  
Steve Nakauchi, City of Long Beach, Department of Health Services  
Christopher Ross, Hargis + Associates

***California Environmental Protection Agency***



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

**REVISED MONITORING AND REPORTING PROGRAM NO. CI- 8566**  
**FOR**  
**BOEING REALTY CORPORATION - FORMER C-1 FACILITY**  
**LONG BEACH, CALIFORNIA**  
**(CLEANUP AND ABATEMENT ORDER 95-048, FILE NO. 95-034)**  
**ORDER NO. R4-2003-0051**

The Discharger shall implement this monitoring and reporting program on the effective date of this Order. This monitoring and reporting program is to be used in conjunction with the existing General Waste Discharge permit monitoring and sampling program CI-8520.

**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 include injection wells located throughout the treatment area and are selected to be representative of conditions within 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 include monitor wells located within or immediately adjacent to the treatment areas. These wells will be monitored to evaluate the effectiveness of the emplaced reactive zone. Group C wells include monitor wells 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 reactive zone.

The required constituents to be analyzed and the monitoring schedule for each well group for Building 1D are shown in the table below.

<u>CONSTITUENT</u>	<u>UNITS</u>	<u>TYPE OF SAMPLE</u>	<u>SAMPLE LOCATIONS</u>	<u>FREQUENCY</u>
<u>Volatile Fatty Acids</u> (acetate, butyrate, lactate and propionate)	mg/l	grab	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
<u>DHC Assay</u> (to determine presence of <i>Dehalococcoides ethenogenes</i> )	N/A	grab	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

- (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 (Figure 2).

Group B wells: Performance monitoring well in treatment area MW1052 (Figure 2).

Group C wells: Other Monitor wells; two existing wells MW2001 and MW1059, 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> Wells) (Figure 2).

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

<u>CONSTITUENT</u>	<u>UNITS</u>	<u>TYPE OF SAMPLE</u>	<u>SAMPLE LOCATIONS</u>	<u>FREQUENCY</u>
Volatile Fatty Acids <sup>(a)</sup>	mg/l	grab	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
DHC Assay <sup>(b)</sup>	N/A	grab	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) Volatile Fatty Acids include: acetate, butyrate, lactate and propionate.

(b) 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 modified monitoring and reporting program.

Group A wells: Monitor wells MW1069 and MW2083 to 2087 (Figure 3).

Group B wells: Monitor wells MW-1070, MW-2088 and MW-2089 (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>UNITS</u>	<u>TYPE OF SAMPLE</u>	<u>SAMPLE LOCATIONS</u>	<u>FREQUENCY</u>
Volatile Fatty Acids <sup>(a)</sup>	mg/l	grab	Group A and B	Final Event July 2005
DHC Assay <sup>(b)</sup>	N/A	grab	Group A and B	Final Event July 2005

FOOTNOTES

(a) Volatile Fatty Acids include: acetate, butyrate, lactate and propionate.

(b) 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. Quarterly observation of groundwater levels, 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.

## II. REPORTING REQUIREMENTS

The Discharger shall submit Reports detailing the results of the remediation. The reports should include an evaluation of the effectiveness of using the amendment and KB-1 solution to remediate VOC-contaminated groundwater at the Site, the impact of any by-products on the receiving groundwater quality, and any other effects the in-situ treatment may have. This monitoring and reporting program supercedes previous requirements stated in work plan approval letters. The reports will be submitted in accordance with the following schedule:

Report	Report Due Date
Building 1D Annual Progress Report	October 31, 2006
	October 31, 2007
Building 1D Final Status Report	June 30, 2008
Building 14 Annual Progress Report	April 28, 2006
	April 30, 2007
Building 14 Final Status Report	June 30, 2008
Building 36 Final Pilot Test Report	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)

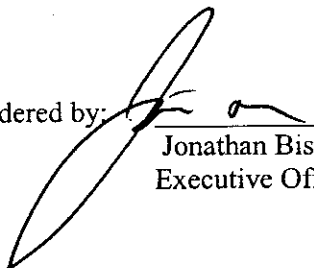
\_\_\_\_\_  
(Title)"

#### 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.

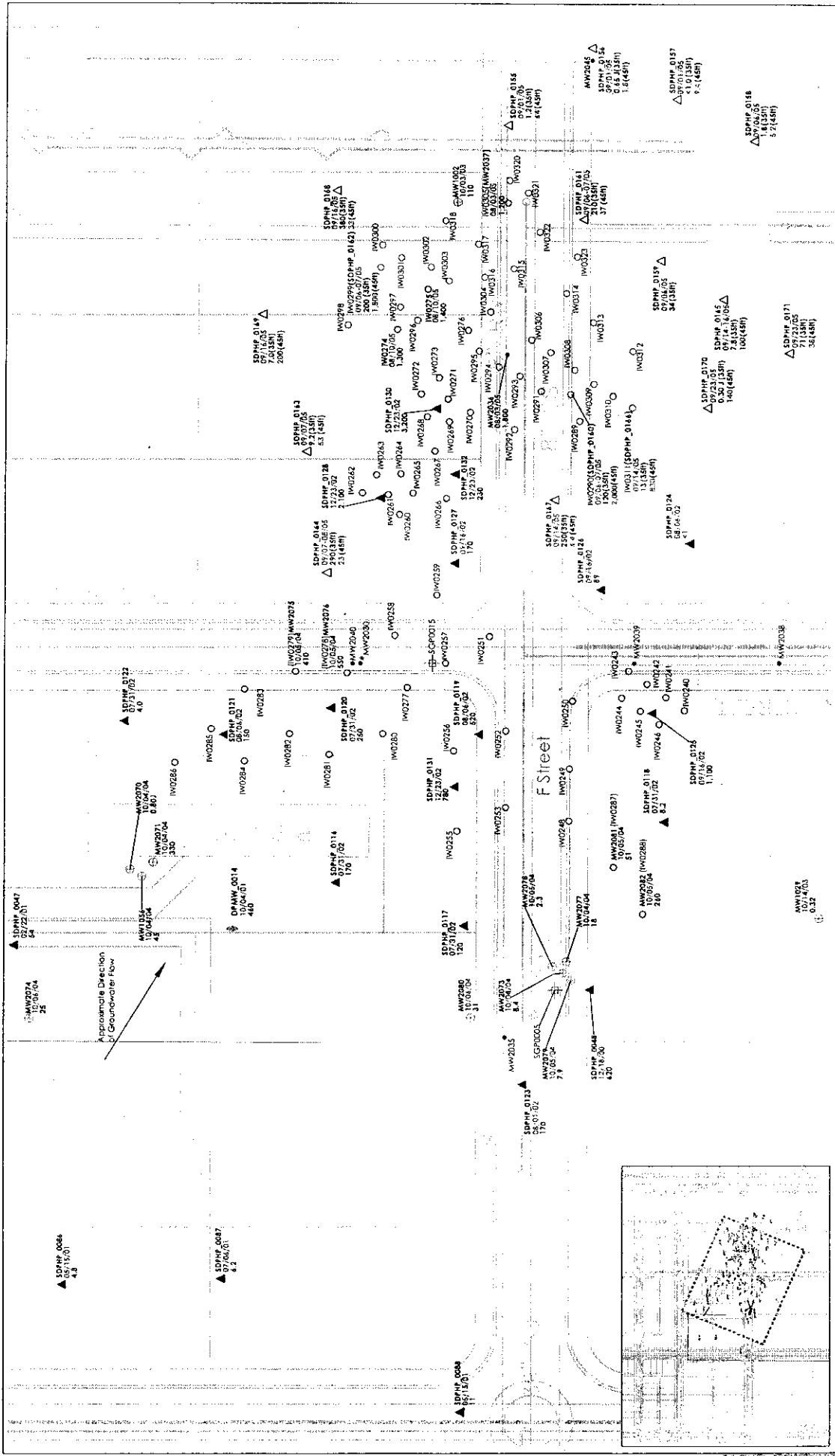
Ordered by:



Jonathan Bishop  
Executive Officer

Date: October 31, 2005





**Proposed Locations of Additional Electric Donor Injection Wells**  
 Building 1D, Former C-1 Facility, Boeing Realty Corporation,  
 Long Beach, California

Oct. 2005 **Figure: 1**

**Legend**

- Proposed well/hydrocouch
- Existing well/hydrocouch
- Well location
- Well depth
- Well diameter
- Well completion
- Well casing
- Well screen
- Well annulus
- Well head
- Well pad
- Well pad area
- Well pad perimeter
- Well pad center
- Well pad radius
- Well pad diameter
- Well pad circumference
- Well pad area (sq ft)
- Well pad area (sq in)
- Well pad area (sq yd)
- Well pad area (sq mi)
- Well pad area (sq km)
- Well pad area (sq m)
- Well pad area (sq cm)
- Well pad area (sq mm)
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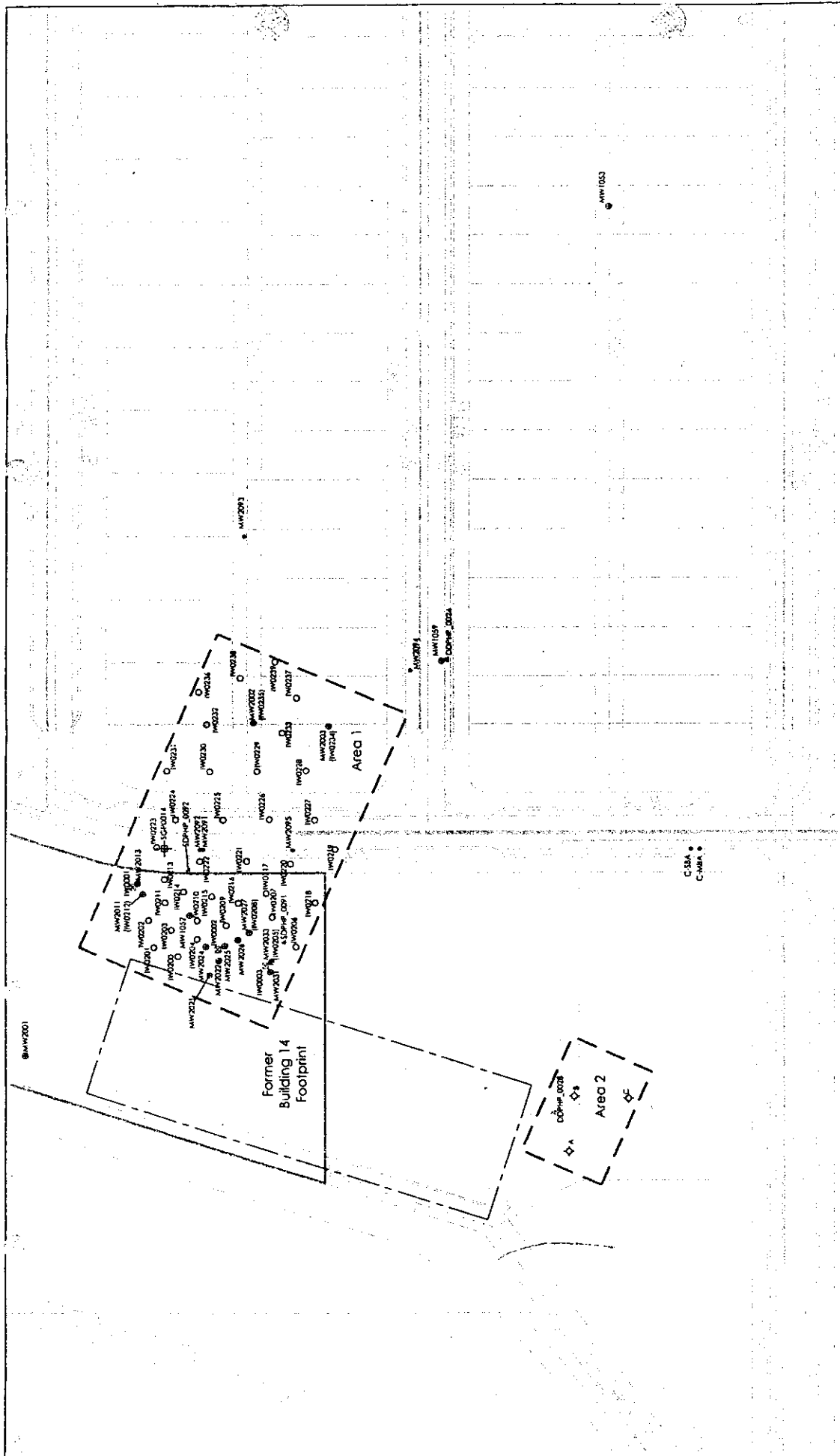
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**Legend**

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- Existing well/hydrocouch
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- Well pad area (sq mm)
- Well pad area (sq dm)



Scale 0 50 100  
Feet

Location of EISB Treatment Areas  
Building 14, Former C-1 Facility, Boeing Realty Corporation,  
Long Beach, California

Jan. 2005 Figure: 2

GEOSYNTEC  
CONSULTANTS

CSBA  
C-MBA

Proposed well/hydropunch/probe

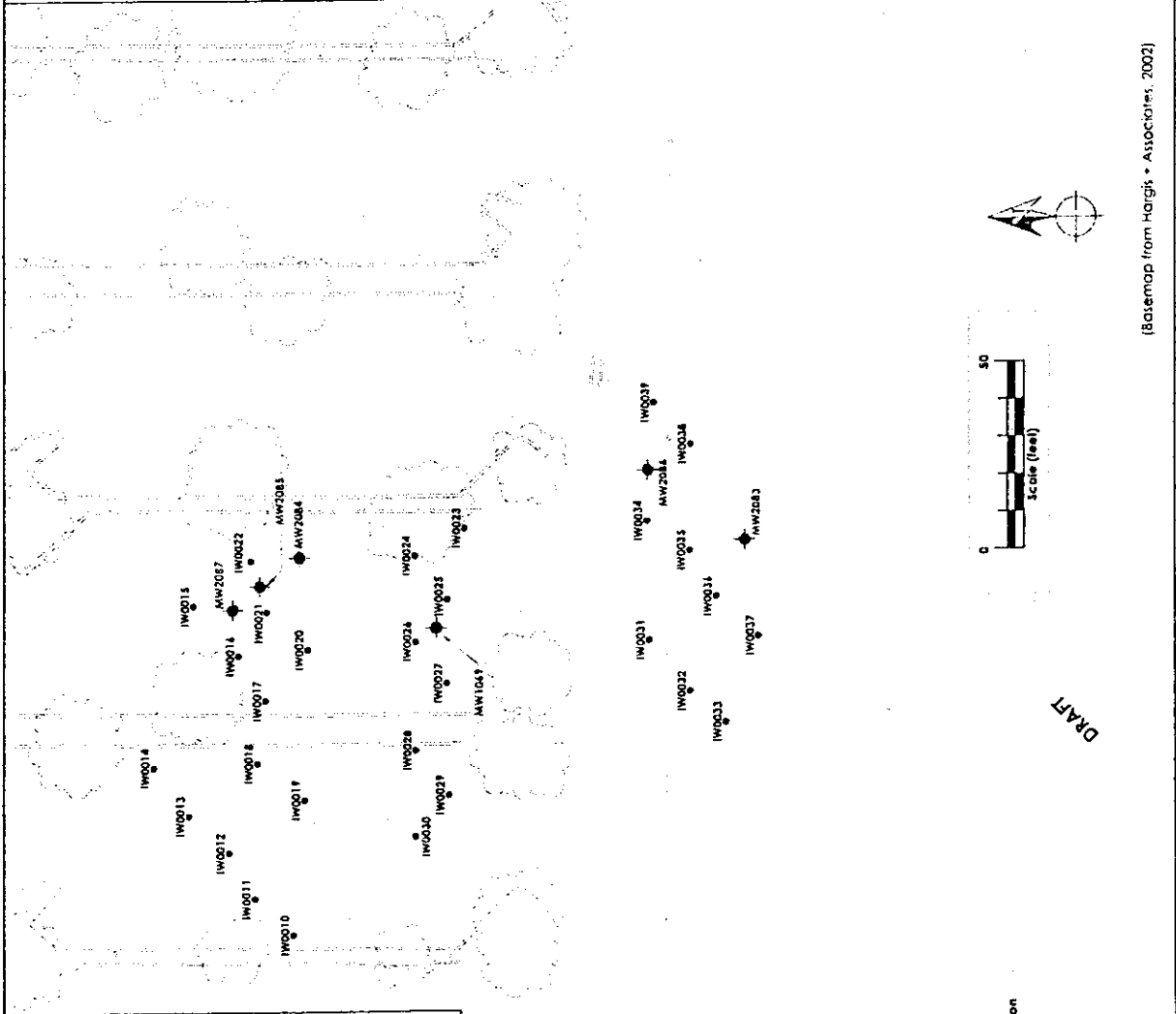
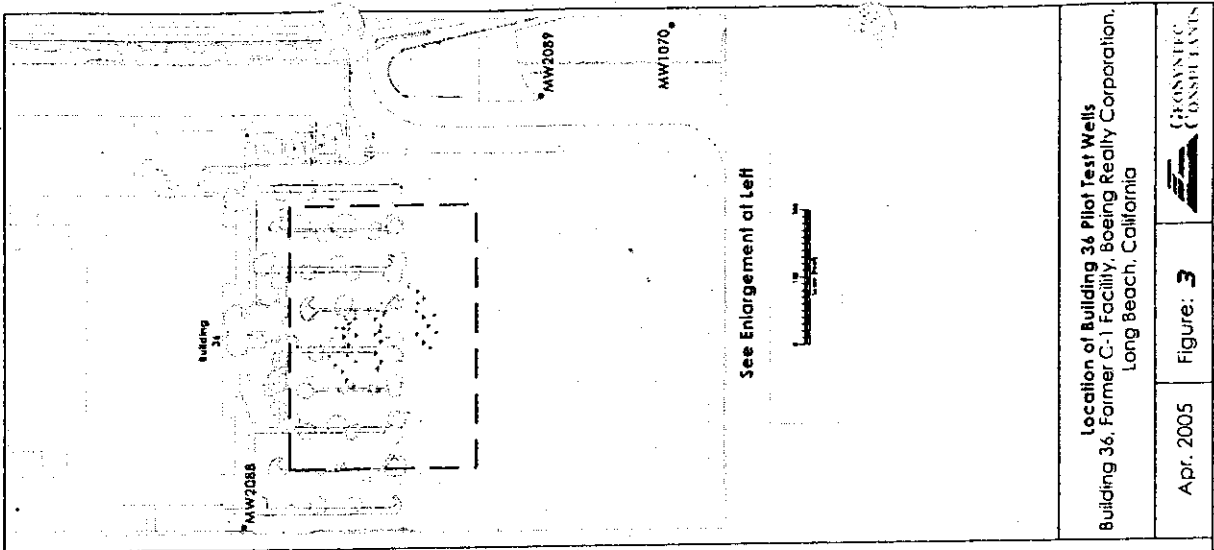
- MW2001 - MW2034 Proposed well
- ◇ MW1003 - MW1009 Proposed well
- ◇ MW1010 - MW1019 Proposed well
- ◇ MW1020 - MW1034 Proposed well
- ◇ MW1035 - MW1040 Proposed well
- ◇ MW1041 - MW1050 Proposed well
- ◇ MW1051 - MW1060 Proposed well
- ◇ MW1061 - MW1070 Proposed well
- ◇ MW1071 - MW1080 Proposed well
- ◇ MW1081 - MW1090 Proposed well
- ◇ MW1091 - MW1100 Proposed well
- ◇ MW1101 - MW1110 Proposed well
- ◇ MW1111 - MW1120 Proposed well
- ◇ MW1121 - MW1130 Proposed well
- ◇ MW1131 - MW1140 Proposed well
- ◇ MW1141 - MW1150 Proposed well
- ◇ MW1151 - MW1160 Proposed well
- ◇ MW1161 - MW1170 Proposed well
- ◇ MW1171 - MW1180 Proposed well
- ◇ MW1181 - MW1190 Proposed well
- ◇ MW1191 - MW1200 Proposed well

Existing well/hydropunch

- MW1001 - MW1002 Existing well
- ◇ MW1003 - MW1009 Existing well
- ◇ MW1010 - MW1019 Existing well
- ◇ MW1020 - MW1034 Existing well
- ◇ MW1035 - MW1040 Existing well
- ◇ MW1041 - MW1050 Existing well
- ◇ MW1051 - MW1060 Existing well
- ◇ MW1061 - MW1070 Existing well
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- ◇ MW1191 - MW1200 Existing well

Legend

- MW1001 - MW1002 Proposed well
- ◇ MW1003 - MW1009 Proposed well
- ◇ MW1010 - MW1019 Proposed well
- ◇ MW1020 - MW1034 Proposed well
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- ◇ MW1191 - MW1200 Proposed well



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-Q108
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
  - ⊗ IW0010 OH Injection Well
  - Pilot test area boundary

(Basemap from Hargis + Associates, 2002)

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

Apr. 2005

Figure: 3

