CDM Camp Dresser & McKee

#72715

Report

Final Draft
Baldwin Park Operable Unit
Pre-Remedial Design
Groundwater Monitoring Program

Pre-Remedial Design Report

San Gabriel Valley
Los Angeles County, California

SFUND RECORDS CTR
72715

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Baldwin Park Operable Unit
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San Gabriel Valley
Los Angeles County, California

September 4, 1997

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Prepared for:

San Gabriel Basin Water Quality Authority
861 Village Oaks Drive, Suite 105
Covina, CA 91724

Prepared by:

Camp Dresser & McKee Inc.
18881 Von Karman, Suite 650
Irvine, California 92612

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CDM Camp Dresser & McKee Inc.

consulting
engineering
construction
operations

18881 Von Karman Avenue, Suite 650
Irvine, California 92715
Tel: 714 752-5452 Fax: 714 752-1307

50th 1947-1997 Anniversary

September 5, 1997

Baldwin Park Operable Unit Steering Committee
c/o Mr. Donald E. Vanderkar, Chairman
Aerojet General Corporation
Highway 50 and Hazel Avenue
Building 2019, Dept. 0330
Rancho Cordova, California 95670

Subject: Submittal of Final Draft Pre-Remedial Design Report
Baldwin Park Operable Unit
Pre-Remedial Design Groundwater Monitoring Program
CDM Project No.: 2581-11658-112.T4.FNLRPT
Document Control No.: 2581-112-7.2.4

Dear Mr. Vanderkar,

Enclosed please find one copy of the *Final Draft Pre-Remedial Design Report*, dated September 4, 1997, in support of the Baldwin Park Operable Unit (BPOU) Pre-Remedial Design Groundwater Monitoring Program. Camp Dresser & McKee Inc. (CDM) has incorporated, when appropriate, EPA's comments specified in their May 23, 1997 letter to the BPOUSC. In addition, an EPA comment and response summary has been included at the beginning of the report.

Please note that Appendices A through E were submitted previously with the Draft Report, dated December 1996, and have not changed. Therefore, these appendices have not been included with this submittal. In addition, Plates 1 through 3, located at the end of the Draft Report, have not been included with the Final Draft report. Two small changes were made to these plates, however, the edits were insignificant. Copies of the edited plates will be provided upon your request.

As you are aware, only data collected through October 1996 were used to prepare this report. Results from subsequent rounds of sampling performed in 1997, including perchlorate results, have not been included. Please provide any comments to the enclosed report. CDM will finalize the document at BPOUSC's direction.

DRAFT

CDM Camp Dresser & McKee Inc.

If you have any questions or require clarification regarding this report, please feel free to call me at (714) 752-5452.

Sincerely,

CAMP DRESSER & McKEE INC.

Suzanne M Rowe

Suzanne M. Rowe, R.G.
Project Manager

Enclosures

cc:	Kirby Brill,	WQA
	Grant Ohland,	Harding Lawson Associates
	Peter Quinlan,	Dudek & Associates
	Steve Richtel,	Waste Management Inc.
	Peter Taft	Munger, Toles & Olson
	Bruce Jernigan	Browning-Ferris Industries
	Kelly McTigue, Esq.	McClintock, Weston, Benshoff
	Barry Vaughan, Esq.	Gibbs, Giden, et. al.
	B. Michael Hodge	The Fairchild Corporation
	David Giannotti, Esq.	Christensen, Miller, et. al.
	Arnold Mitchell	J.H. Mitchell & Sons Distributors, Inc.
	Zane Bolen	Mobil Oil Corporation
	Roy Millender, Esq.	Rubber/Urethanes Inc.
	Jeff Clow	Screwmatic, Inc.
	Barry Goode, Esq.	McCutchen, Doyle, Brown & Enersen
	Greg Gibbons, Esq.	Wynn Oil Company
		Astro Cam

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BALDWIN PARK OPERABLE UNIT
DRAFT PRE-REMEDIAL DESIGN REPORT

USEPA Comments (May 23, 1997) and Response Summary

EPA provided comments to the December 1996 *Draft Baldwin Park Operable Unit Pre-Remedial Design Report* in a May 23, 1997 letter to the Baldwin Park Operable Unit Steering Committee (BPOUSC). Responses to these comments are summarized in the following text. Supplemental responses to earlier EPA questions and comments (dated January 15, 1997, February 27, 1997, and March 4, 1997) were submitted previously and are included for reference in Appendix F.

Section-Page, Paragraph

1-1, 3	We suggest that you mention that the documents listed in the text summarize sampling efforts in the Baldwin Park area, but not in other portions of the San Gabriel Basin.
Response:	The text has been revised.
1-4, 1	The text states that the Duarte and Cucamonga faults generally impede groundwater flow from the Raymond Basin into the San Gabriel Basin. The Raymond Fault impedes flow from the Raymond Basin into the San Gabriel Basin.
Response:	The text has been revised.
1-5, 3	We suggest that the reference to EPA, 1994 be moved up a sentence to make it clear that the discussion of specific hydraulic characteristics is provided in this document, not EPA, 1994.
Response:	The text has been revised.
1-5, 5	TCE and PCE have been measured at concentrations "greater than' 200 times MCLs, not "up to" 200 times MCLs.
Response:	The text has been revised.
1-6, last bullet	Some of the wells installed as part of the predesign program may be used to evaluate project effectiveness, but additional wells and date collection may be needed as part of RD and RA to meet this objective.
Response:	The text has been revised.
2-1, 1st bullet	A cancer risk of 5 x 10-5 is not "well below" EPA's threshold for acceptable risk. The statement that the cancer risk is well below the acceptable risk threshold should be corrected.
Response:	The text has been revised.

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Comments and Response Summary

2-1, 2nd bullet — The noncancer risk for drinking untreated water is incorrectly stated. According to the ROD: "EPA estimates the non-cancer Hazard Index from reasonable maximum exposure to groundwater in the Baldwin Park OU area is 1.8..." (Section 7.4.2). The statement that the non-cancer risk is well below the acceptable risk threshold of 1.0 is incorrect and should be corrected.

Response: According to the ROD, EPA estimates the non-cancer HI from reasonable maximum exposure to groundwater in the Baldwin Park OU as 1.8, assuming that contaminated groundwater will be served to consumers without treatment (Section 7.4.2). This reported HI is the overall, or cumulative, HI for all contaminants of concern in the untreated water. In the next paragraph of the ROD, HIs for non-cancer effects associated with each contaminant of concern are discussed. The individual HI for TCE, or hazard quotient, assuming reasonable maximum ingestion and inhalation exposures, is estimated at 0.8.

The text in the 2nd bullet will be revised to state that ..."The highest non-carcinogenic risk associated with any individual contaminant of concern, is 0.8 for TCE, which is below the acceptable risk threshold of 1.0."

2-1, 2 — The first sentence does not accurately express EPA's conclusions on risk or the basis for remedial action at the site. EPA believes, and the ROD states, that the risks attributable to PCE, TCE, CTC, and other groundwater contaminants <u>are unacceptable</u>. Contaminant concentrations at Baldwin Park area water supply wells are, as noted elsewhere in the report, more than 200 times Maximum Contaminant Levels; contaminant concentrations at Baldwin Park area monitoring wells have been more than 6,000 times Maximum Contaminant Levels. We suggest that you delete the first sentence.

Response: The first sentence will be modified to state ..."Even though the carcinogenic risk levels do not exceed EPA's threshold for acceptable risk, EPA believes that remedial action is necessary in the Baldwin Park area."

Fig. 3-2 — Table 3-2 indicates that the conductor casing is 14-inch diameter, but Figure 3-2 indicates 16-inch diameter.

Response: The figure has been revised.

3-19, 3 — The text states that limited sample volume prevented field filtration of the metals samples. Why? EPA and its contractors have not had any problems filtering metals samples from MP wells.

Response: It is true that filtering metals in samples collected from MP wells is possible while in the field; however, additional sample volume is required to rinse the filtering apparatus and to flush the filter prior to use, which is at a minimum when sampling MP wells. Efforts were made at the time of sample collection by field personnel to minimize the number of times each MP zone was accessed. By collecting metals samples in unfiltered, unpreserved sample containers, both general minerals and metals samples could be collected in the same container,

thereby minimizing sample volumes. The laboratory immediately filtered and preserved the required volume for metals analysis as soon as the samples were received, which was generally the same day as sample collection. This method was the most practical and cost effective method for this project. Furthermore, a comparison was made between historical metals results where the samples were filtered in the field versus metals results where the laboratory filtered the samples, which indicated no significant differences in the metals concentrations. The time delay in filtering the metals samples does not adversely affected the end uses of the data.

3.26, 3 — The first several minutes of drawdown are often impacted by borehole effects and not used anyway. The initial variability would not necessarily render the pumping data unusable.

Response: Agreed, however during the step drawdown tests at Big Dalton, it was determined that the pump is configured in such a way that the desired pumping rate is not achieved immediately. Rather, the pump starts up in stages. Initially, the engine warms up for approximately 5 minutes, during which no water is pumped. For the first 30 seconds of actual pumping, water is pumped "to waste", bypassing the flow meters and any opportunity to monitor the flow rate. Following the initial stages, the pump ramps up to the target rate.

As determined during the step drawdown test, maximum drawdown is achieved very rapidly because of the quick response of the aquifer, thereby increasing the significance of the first several minutes of drawdown. The water levels stabilized during the first few minutes of each step and remained essentially constant during each of the two hour "steps".

3-31, 4 — The first sentence seems to indicate that VOC analyses are not used for treatment system design. We assume this is not the intended meaning.

Response: The text has been revised.

Section 4 — We appreciate the comprehensive presentation of the results, but prefer that large numbers of figures and tables be grouped together at the end of the section or in a separate section to make them easier to locate.

Response: Tables and figures have been grouped together at the end of Section 4. In addition, tables and figures presented in Section 5 have been grouped together at the end of that section also.

4-55,1 — It would be helpful to show the MCL contours on the cross section to help illustrate the vertical extent of contamination.

Response: The BPOUSC believes that estimation of the location of MCL contours would be subject to unacceptable uncertainty, and hence they have not been included on the figures.

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Comments and Response Summary

Fig. 4-14	Why is MW5-18 missing from this figure?
Response:	MW5-18 will be added to Figure 4-14.
Figs. 4-18 to 4-21	To reduce the risk of misinterpretation, we recommend that the figures prominently indicate that the contours are a snapshot of conditions that vary temporally, and include the date or date range of data considered in their preparation.
Response:	Figures have been revised.
Fig. 4-22	Why are MW5-15 and Paddy Lane left off of this figure?
Response:	The figure illustrates average nitrate concentrations in March/April 1996. Construction of well MW5-15 was not complete until June 1996; access to Paddy Lane was not granted until July 1996. Therefore, samples were not collected from these two wells in March/April 1996 and nitrate concentrations can not be illustrated on Figure 4-22.
Fig. 4-23	Why are MW5-08 and MW5-15 left off of this figure?
Response:	The figure illustrates average nitrate levels in March/April 1996. Construction of well MW5-08 was not complete until July 1996; well MW5-15 construction was complete in June 1996.
4-85, 3	The discussion of RPDs for metals first lists iron, manganese, and zinc as constituents with high RPDs, but later lists iron and manganese.
Response:	The text has been revised.
4-88, 3	We disagree with the statement that the data illustrate little seasonal flow variation. The figures (4-24 to 4-26) shows significant changes in flow direction in the northern portion of the contaminated area between June-July and September-October 1996.
Response:	The text has been revised.
4-116, 3	There is a discrepancy between the first and third sentences regarding the number of data packages validated.
Response:	Eight data packages were validated. The text has been revised.
4-117, 5	We do not believe that it is reasonable to assume that the entire 1,100 foot thickness of the aquifer is contributing flow to the well. A partial penetration calculation needs to be incorporated into the evaluation. At a minimum, you should provide a range of aquifer thicknesses ranging from the screened interval

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(about 300 feet) up to the full thickness (1,110 feet). This would provide a reasonable range of hydraulic conductivity estimates for this test of between 300 and 1,100 feet per day.

This same modification should be incorporated into the evaluation of recovery data. The resulting range in hydraulic conductivity would be from 270 to 2,000 feet/day.

Response: Hydraulic conductivity calculations based upon the drawdown and recovery data have been modified to include both the screened interval length and the aquifer thickness.

4-122, 3 Again, this range should be adjusted to account for the range in possible aquifer thicknesses. The last sentence should indicate a possible hydraulic conductivity range of between 270 and 2,200 feet/day.

Response: Hydraulic conductivity calculations have been modified to include both the screened interval length and the aquifer thickness.

4-122, 6 As with the Arrow/Lante test, a partial penetration calculation should be performed. Alternatively, a range of thicknesses should be used to estimate hydraulic conductivity. The resulting hydraulic conductivity range would be between 180 and 1,200 feet/day.

Response: Hydraulic conductivity calculations have been modified to include both the screened interval length and the aquifer thickness.

4-131, 3 We do not see the "odd behavior" discussed in the text in Pumping Test 1.

Response: The shift in the slope of the drawdown curve is less obvious for Pump Test 1 (Figure 4-59), however a small shift does occur after approximately 350 minutes of the test.

4-131, 4 Same comment as the other tests. Incorporating a broader range of possible aquifer thicknesses would result in a hydraulic conductivity range of 590 to 1,950 feet/day.

Response: Hydraulic conductivity calculations have been modified to include both the screened interval length and the aquifer thickness.

4-141, 2 The assumed aquifer thickness of 1,600 feet is unreasonable. Again, a partial penetration calculation is necessary. Alternatively, present a range of hydraulic conductivity estimate of 60 to 330 feet/day.

Response: Hydraulic conductivity calculations have been modified to include both the screened interval length and the aquifer thickness.

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Comments and Response Summary

4-141, 4	The overall hydraulic conductivity range should be changed to between 200 and 2,200 feet/day.
Response:	The overall hydraulic conductivity range has been adjusted to reflect modified calculations.
5-3, 2	The governing equation shown at the top of page 5-3 appears to have one or more typographical errors. The sentence following the equation also appears to have one or more typographical errors ("...where the state variable + represents...").
Response:	The typographical errors in the governing equation have been corrected.
5-3. 6	The text states that: "The source of data of the bedrock elevation is the CH2M Hill/EPA San Gabriel Basin GIS." It would be more useful to state that the bedrock elevation is based on the lines of equal elevation of the effective base of the aquifer as shown in the California Department of Water Resources Bulletin 104-2 (CDWR, 1966). These lines of equal elevation have been digitized and are contained in the EPA San Gabriel Basin GIS.
Response:	Text has been modified to reflect the source of the bedrock elevation.
5-9	The boundary conditions at the "Morris Dam Boundary Nodes: and "Rising/Dry" nodes described in Table 5-5 should also be described in Section 5.2.3.
Response:	Text has been modified to describe these boundary conditions.
Fig. 5-8	What does the green shading represent?
Response:	The green areas represent landfills. The figure has been revised to reflect this.
5-22, 2	This paragraphs states that "Areas which are known to accept large volumes of applied recharge at spreading facilities are modeled with a ratio of 10." The text should explain the basis for this statement, citing appropriate geologic, water level, and other hydrogeologic data.
Response:	Text has been modified.
5-22, 4	Were only the horizontal hydraulic conductivity and vertical anisotropy varied during steady-state calibration?
Response:	Yes, only horizontal hydraulic conductivity and the vertical anisotropy ratio were varied during the steady-state calibration.
Fig. 5-21	Is the source of these data really the EPA GIS database?

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Comments and Response Summary

Response: Head data used in the study came from the EPA San Gabriel Basin GIS, the Main San Gabriel Basin Watermaster, and the LA County Department of Public Works. Figure 5-21 has been revised to reflect this.

5-31, 2 For the steady state calibration simulation, the report states that head differences are generally no more than 5 feet at any well in the central portion of the basin, and that this 5 foot difference is relatively small compared to annual head fluctuations of up to 70 feet. For a steady state simulation, the comparison to annual (transient) head variations has little, if any, meaning. A more appropriate reference or bench mark is the head change across a specific area.

Response: Text has been modified to incorporate a more appropriate reference to head variations within the basin.

Tab. 5-4 The steady state simulated water balance does not show fluxes through Morris Dam Boundary nodes or rising/dry nodes as do the transient simulated water balance (Table 5-5). Please explain.

Response: Table has been modified to reflect these fluxes.

5-40, 2 The report states: "Importantly, the model preserves the 150 to 200 foot head difference observed across the Duarte Fault, indicating that the fundamental hydraulic characteristics of the Duarte Fault are well represented in the model.' We do not believe that this statement is adequately justified. The report provides evidence that the proper head gradient may be simulated, but does not present direct evidence for the model structure assumed for the fault or that the proper flux is simulated by the model. To show that the "fundamental hydraulic characteristics" of the Duarte Fault are well represented in the model would require evidence that the proper head gradient and groundwater flux across the fault are reproduced by the model.

Response: Table has been modified.

Table 5-5 Why is the 1992-93 simulated flux through the Morris Dam Boundary nodes a relatively large negative number compared to all the other years (1992-93 has flux of negative 12,994 acre-feet, and the other 10 water years all have a positive flux).

Response: The boundary flux generated at the Morris Dam boundary nodes for the 1992-93 Water Year is -12,335 Ac-Ft, which is an outward flux from the model. This indicates that the head at those nodes is fixed at a level lower than it would likely reach if allowed to equilibrate freely. (The Morris Dam boundary nodes are fixed at the same head throughout the transient simulation.) This is not surprising since this time period represents a peak of a wet cycle in the San Gabriel Basin. The amount of water recharged at the spreading basins is very high for both the 91-92 WY and the 92-93 WY. As indicated by the time history of head at the Key Well, plotted in Figure 5-19, heads are high in the central portion of the basin at this time. A time-varying head at that boundary would reduce or eliminate that model-generated outward flux.

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Comments and Response Summary

5-71, Case 1 — The total pumping rate in Case 1 of 19,000 gpm equals the rate simulated by EPA during the RI/FS, but the distribution of pumping in Case 1 differs and should not be described as the "ROD defined extraction" scenario.

Response: All references to Case 1 have been changed to describe it as a modified ROD extraction alternative.

6,2 1st bullet — The remedial objectives are not correctly stated. As originally stated in the ROD and restated in our January 15, 1997 letter: "...the remedial objective in Subarea 1 is to establish a capture zone for all known or suspected surface or subsurface sources of contaminants that are acting as continuing sources of dissolved-phase groundwater contamination. The remedial objective in Subarea 3 is to establish capture zones that "include all significant depth intervals where contaminant concentrations exceed MCLs..."

Response: We understand and acknowledge EPA's interpretation of the ROD, as included in EPA's January 15, 1997 letter. The interpretation on this letter, however, is clearly not the same as the remedial action objectives which are specified in the ROD. The Pre-Remedial Design Groundwater Monitoring Report has been prepared to meet the explicit requirements on the ROD. Nevertheless, the text on page 6-2 has been revised.

6-3, 1 — As discussed in the cover letter, we believe that the 5,500 gpm assumed in the Case 5 extraction scenario does not effectively meet ROD requirements. The requirements include containment of known or suspected surface or subsurface sources in Subarea 1 and all significant depth intervals where contaminant concentrations exceed MCLs in Subarea 3. The performance standard described in the text (containment of TCE at concentrations greater than 50 µg/l) is inadequate.

Response: The text has been revised to emphasize that Case 5 best meets the remedial action objectives specified in the ROD. We acknowledge that higher pumping rates may be necessary to meet the requirements described in EPA's January 15, 1997 letter.

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Section 1
Introduction

1.1 Background

The overall objective of the pre-remedial design groundwater monitoring program described herein is to collect the additional data necessary to evaluate and design a treatment system for volatile organic compound (VOC) contaminated groundwater and to develop scenarios for extraction well configurations and pumping rates. This report presents the results from data that were collected between August 1995 and October 1996. Results from subsequent rounds of sampling are not included in this report. Specifically, this report has been prepared independent of investigations for perchlorate.

VOC contamination of the groundwater in the San Gabriel Valley was first detected in 1979 as part of environmental monitoring activities in Azusa. VOCs were used in large quantities at industrial facilities within San Gabriel Valley starting in the 1940s and their use continues to the present day. During the past twelve years, more than two-thirds of the 366 water supply wells within the San Gabriel Basin for which VOC data are available have shown detectable concentrations of VOCs; about one-quarter of the 366 wells have shown concentrations exceeding federal or state drinking water standards. In May 1984, the United States Environmental Protection Agency (EPA) named four areas of contamination (San Gabriel Areas 1-4) to the National Priorities List under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or Superfund program. The Baldwin Park Operable Unit (BPOU) is one of seven operable units in the San Gabriel Valley. The other operable units are Richmond, Whittier Narrows, Suburban Water Systems Bartolo Well Field, Puente Valley, El Monte, and South El Monte.

EPA's Remedial Investigation of the San Gabriel Basin began in 1985 with a basinwide groundwater sampling program known as the Supplemental Sampling Program. In subsequent years, EPA completed additional field sampling efforts, which have included sampling of inactive water supply wells, depth-specific sampling of water supply wells, and monitoring well installation and sampling. The results of EPA's sampling efforts in the Baldwin Park area are summarized in several EPA documents:

Draft Technical Memorandum, Well Logging and Depth-Specific Sampling, San Gabriel Area 5 Remedial Investigation. May 22, 1990.

Technical Memorandum, Sampling of Existing Wells, San Gabriel Area 5 Remedial Investigation. June 25, 1991.

Technical Memorandum, Well Logging and Depth-Specific Sampling, San Gabriel Area 5 Remedial Investigation. December 2, 1991.

Interim Report of Remedial Investigations, San Gabriel Basin. July 1992. (This report summarizes sampling activities from inception through 1989.)

Technical Memorandum, Sampling of Existing Wells—Second Round, San Gabriel Area 5 Remedial Investigation. July 1992.

Technical Memorandum, Area 5 Monitoring Well Installation and Sampling, San Gabriel Area 5 Remedial Investigation. October 26, 1992.

EPA's Remedial Investigation has included the compilation and analysis of data collected by individual water purveyors, business and property owners, and the Main San Gabriel Basin Watermaster. Individual water purveyors regularly sample more than 50 water supply wells in the Baldwin Park area in accordance with federal and state drinking water requirements. Individual businesses and property owners have installed and sampled more than 25 groundwater monitoring wells in facility-specific investigations in the Baldwin Park area, most of which are overseen by the Los Angeles Regional Water Quality Control Board (LARWQCB). EPA works cooperatively with the LARWQCB to set investigation priorities and provide assistance at individual sites as needed. The Main San Gabriel Basin Watermaster has also sampled several inactive water supply wells in the Baldwin Park area.

EPA has summarized and analyzed the results of the Remedial Investigation, making use of data collected by EPA and others, in the Baldwin Park Operable Unit Feasibility Study Report, dated April 2, 1993. In March 1994, EPA issued the Record of Decision (ROD) for the BPOU. The ROD is summarized in Section 2.

1.2 Site Description

1.2.1 San Gabriel Basin

The San Gabriel Basin is located in the eastern portion of Los Angeles County (Figure 1-1). The groundwater bearing area of the main basin is a piedmont plain covering an area of approximately 167 square miles (CDWR, 1966). To the north, the San Gabriel Basin is bounded by the San Gabriel Mountains. The basin is bounded to the southwest, south and southeast by a crescent-shaped system of low hills, separating it from the Coastal Plain. The hills making up the system, from west to east, are the Repetto, Merced, Puente, and San Jose Hills. The northwest boundary of the valley is formed by the Raymond Fault. A bedrock high starting at the San Gabriel Mountains passes south between San Dimas and La Verne, forming the northeastern boundary.

The primary surface water streams in the San Gabriel Valley are the San Gabriel River and the Rio Hondo. Both of these streams have their headwaters in the San Gabriel Mountains, from which they receive a major portion of their runoff. These streams exit the valley at Whittier Narrows, which is a narrow gap in the hills at the southern portion of the basin.

The principal water-bearing formations in the San Gabriel Basin are unconsolidated and semi-consolidated non-marine sediments. These sediments vary in composition depending on their location within the valley, but generally range in size from coarse gravel and boulders near the San Figure 1-1Gabriel Mountain front, to fine and medium grained sand, which may contain larger amounts of silt and clay, as the distance from the mountain front increases. The alluvial deposits reach a maximum depth of over 4,000 feet in the southwestern portion of the San Gabriel Basin

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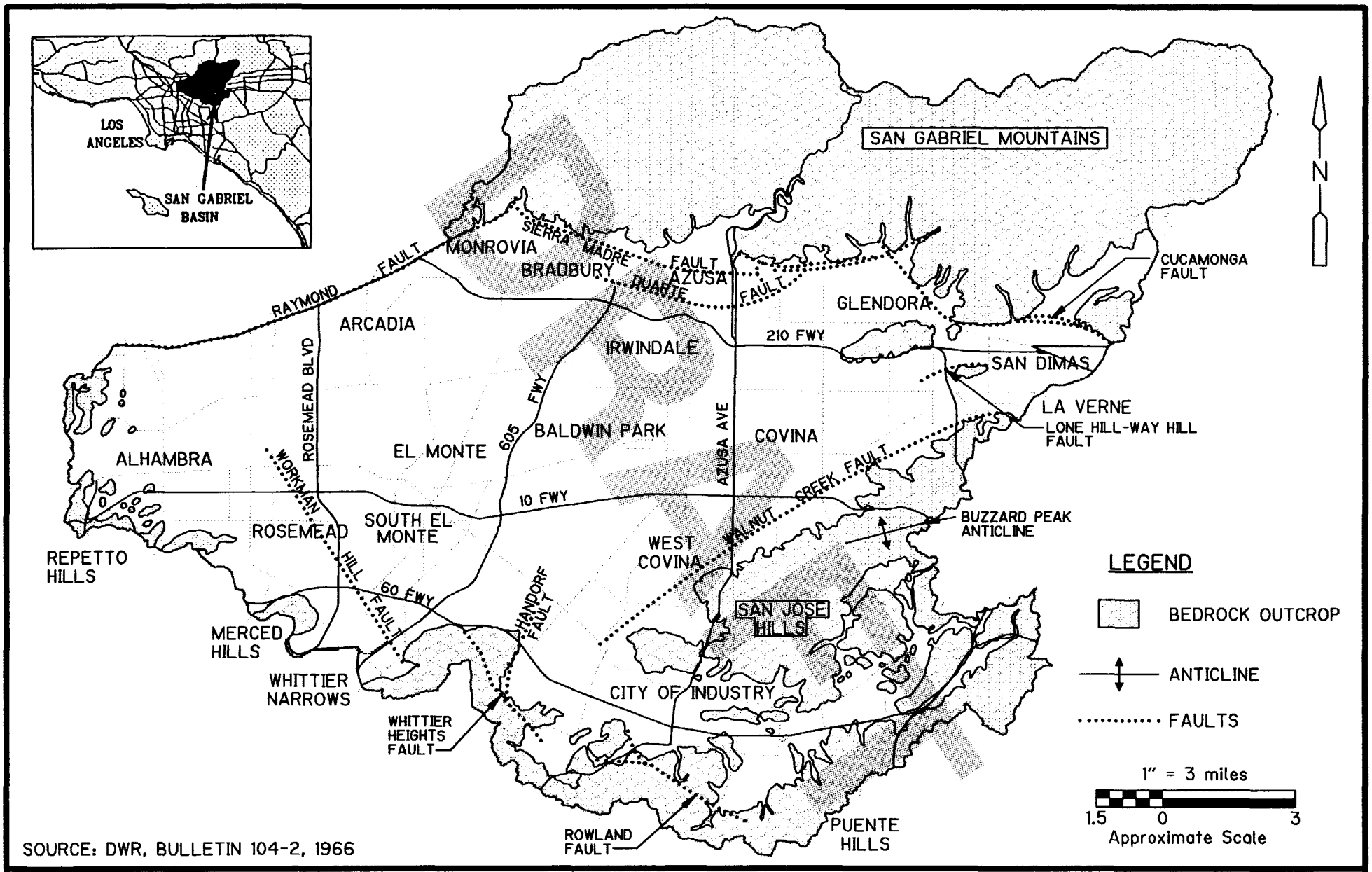

BALDWIN PARK OPERABLE UNIT PRE-REMEDIAL DESIGN

CDM
environmental engineers, scientists, planners, & management consultants

SAN GABRIEL BASIN STRUCTURE MAP

Figure 1-1

(EPA, 1992); at the edges of the basin, they are only a few hundred feet thick. Of less importance with respect to the aquifer water-bearing capacity are marine sediments located in the Whittier Narrows area, and at the mouth of the Puente Valley. The basin is underlain by, and surrounded by, relatively impermeable bedrock.

Within the San Gabriel Basin, several faults influence groundwater movement. Along the northern edge of the basin is the Sierra Madre Fault System, which generally trends east to west. The Duarte and Cucamonga Faults, which belong to this system, generally impede subsurface flow into the central portion of the basin. The Raymond Fault, which forms the northwestern boundary of the basin, also impedes groundwater flow from the Raymond Basin into the San Gabriel Basin. The impact of both of these fault systems is evidenced by the significant changes in water level elevation across the faults. Faults located in the eastern and southern sections of the basin include the Lone Hill-Way Hill Fault, the Workman Hill Fault and the Walnut Creek Fault. These faults also appear to impact groundwater movement to varying, but lesser degrees (CDWR, 1966).

There are both surface and subsurface inflows to the basin. Surface inflow is generated by precipitation on the tributary areas and enters the basin as either streamflow or overland flow. The primary area contributing to the surface inflow is the San Gabriel Mountains.

Subsurface inflow occurs across the Raymond Fault from the Raymond Basin, and from the Chino Basin to the east in the vicinity of San Dimas. Subsurface inflow also enters the main San Gabriel Basin from the Puente Basin. The only subsurface outlet from the basin is at Whittier Narrows.

A source of water to the groundwater system in the basin is natural and imported water which is recharged along reaches of the San Gabriel River, and at spreading grounds located throughout the San Gabriel Basin and in the San Gabriel Canyon. This recharged water is a significant source of water to the basin.

Groundwater flow in the central area of the basin generally flows to the south and southwest toward Whittier Narrows. This flow system is significantly influenced by the large municipal production wells and the recharge operations which are located in the central area of the basin. Groundwater in the eastern portion of the basin typically flows to the west and southwest toward the Whittier Narrows outlet. West of the Rio Hondo, groundwater flow is toward the large production wells in Alhambra and Monterey Park.

1.2.2 Baldwin Park Area

The general geology, hydrogeology and water quality of the BPOU, as discussed in the ROD (EPA, 1994), are summarized in the following paragraphs.

Nearly all of the Baldwin Park area is fully developed for residential, commercial, and industrial use. The largest parcels of open land are active and inactive gravel pits and the Santa Fe Flood Control Basin.

The Sierra Madre Fault system passes through the northern portion of the Baldwin Park area, generally east/west, near the base of the San Gabriel Mountains. The system presents a low-permeability barrier that limits groundwater movement southward from the San Gabriel

Mountains. In the BPOU area, groundwater levels north of the fault system are substantially higher than those to the south.

The surficial geology of the Baldwin Park area is composed of alluvial materials deposited by the San Gabriel River and its tributaries. Braided stream deposits occur along river channels; outcrops of stream channel deposits also occur along river channels and major tributaries. Floodplain deposits and undifferentiated alluvium cover the area between the stream channels. The underlying sediments are derived from the dominantly crystalline San Gabriel Mountains and are typically coarse-grained (e.g., sand, gravel, and boulders). These sediments are unconsolidated to partially consolidated nonmarine sediments of Recent and Pleistocene Age. They were deposited by fluvial and geomorphic processes associated with the San Gabriel River and its tributaries. Marine sediments, probably of Pleistocene and Pliocene Age, underlie some of the nonmarine sediments and are included within the groundwater system.

The northern and central portions of the Baldwin Park area consist almost entirely of massive gravel deposits. Lithologic evaluations of well logs indicate gravel deposits greater than 500 feet in thickness in the northern portions of the Baldwin Park area. These thicker layers tend to be mixed with 10- to 30-foot thick layers of clay and gravelly clay further south. The thickness of alluvial sediments is believed to range from a few hundred feet in the north to over 2,000 feet in the south in the Baldwin Park area (EPA, 1994).

Hydraulic conductivity estimates in the Baldwin Park area are some of the highest in the San Gabriel Basin. Aquifer test results from seven locations have provided hydraulic conductivity estimates between about 270 and 5,000 feet/day. These high hydraulic conductivity estimates indicate that very large extraction volumes are required to create significant changes in the flow of groundwater. Estimates of specific yield are 0.1 to 0.2, reflecting the coarse-grained materials in the area (EPA, 1994). Further discussion of specific hydraulic characteristics of the BPOU is provided in Section 5 of this document.

The groundwater flow in the BPOU area is generally towards the Whittier Narrows to the southwest. The direction of flow can vary significantly, particularly in the vicinity of the Santa Fe Spreading Grounds during periods of high recharge. Local variations in groundwater flow are also observed in areas near pumping wells and geologic faults.

The most prevalent contaminants in the Baldwin Park area are the VOCs trichloroethene (TCE), tetrachloroethene (PCE), and carbon tetrachloride (CTC). Two broad subareas of groundwater contamination have been identified in the BPOU: in the lower area of the BPOU (generally south of Arrow Avenue), TCE, PCE, CTC, and other VOCs have been detected; in both the upper and lower BPOU area, TCE and PCE have been measured at concentrations greater than 200 times drinking water standards.

Other VOCs detected above California and/or federal standards in the BPOU area include: 1,2-dichloroethane (1,2-DCA); 1,1-dichloroethene (1,1-DCE); 1,1-dichloroethane (1,1-DCA); cis-1,2-dichloroethene (cis-1,2-DCE); trans-1,2-dichloroethene (trans-1,2-DCE); 1,1,1-trichloroethane (1,1,1-TCA); and chloroform. In addition, nitrate, an inorganic contaminant, has been detected in groundwater at or near the proposed extraction areas.

1.3 Objectives

The program described in the Sampling and Analysis Plan (SAP) addresses data collection and analysis activities required to complete the conceptual remedial design. Data collected during this program were combined with existing data and then used to determine optimal extraction locations and pumping rates to allow for final design. The objectives of the monitoring program during the pre-remedial design stage were as follows:

- Collect sufficient data to determine the location, the depth and the pumping rate of the proposed extraction wells for implementation of the remedial action.
- Ensure that sufficient information is gathered for all parameters necessary to allow for detailed design and construction of the extraction wells.
- Collect sufficient data to allow development, calibration, and use of a 3-dimensional flow and transport model, using the data both to assist in the design process, as well as to evaluate the performance of various pumping scenarios.

The monitoring program included the installation and sampling of multi-port groundwater monitoring wells, the sampling of existing monitoring wells, measurement of groundwater elevations at monitoring and production wells, and the measurement of other aquifer properties to:

- Verify or refine the boundaries of upper and lower areas to help determine final pumping configurations.
- Verify or refine the efficiency of EPA's recommended pumping configurations.
- Verify or revise contaminant influent concentration estimates that will be used in the design of the OU treatment facilities.
- Provide a monitoring network so that changes in the groundwater flow regime or contaminant concentrations that may require modifications in extraction rates, well locations, or treatment methods are identified.
- Evaluate the effectiveness of the proposed remedy in satisfying the remedial objectives of preventing future increases in, and begin to reduce, concentrations of VOCs in groundwater in BPOU. The evaluation included plotting and interpreting temporal trends in water quality, analysis of changes in groundwater flow induced by the extraction wells, and computer simulations of groundwater flow, including the estimation and evaluation of capture zones. It is possible that additional wells and data collection may be needed as part of RD and RA to meet this objective. The need for additional wells will be determined during the performance assessment phase of the project.

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1.4 Project Approach

The requirements for this project were initially established by the March 31 Record of Decision. Subsequent to the issuance of the rod, EPA and the BPOUSC agreed the scope of work for the predesign groundwater monitoring program. The agreed upon scope of work was documented in the SAP, and forms the framework for the project approach described herein. There are seven components of the scope of work for the pre-remedial design groundwater monitoring program. Each element and its relationship to the objectives stated in Section 1.3 are summarized in this section.

Task 1 - Project Planning Documents

The SAP, which included the statement of work, field sampling and analysis plan, quality assurance project plan (QAPP), project organization/communication plan, and health and safety plan (HSP), was completed as the first task of the scope of work for the Phase 1 BPOU activities (June 13, 1995).

Task 2 - Site Acquisition

The principal objective of this task was to identify accessible areas for installing monitoring wells and to formally acquire written permission from the appropriate land owner for the installation and subsequent sampling of the wells.

Task 3 - Drilling Contractor Procurement

This task included the preparation of plans and specifications for the monitoring well installation using multi-port (MP) type completions, coupled with other bid document requirements, coordination of preconstruction drilling activities, and assistance to the San Gabriel Basin Water Quality Authority (WQA) in selecting a drilling subcontractor.

Task 4 - Phase I Well Construction

This task included borehole drilling, well design, construction, and development. Based on the sampling results from the first wells installed, MW5-03 and MW5-05, the ROD-proposed locations for extraction were evaluated for appropriateness, and the number and location of the remaining monitoring wells was determined.

Task 5 - Aquifer Testing

Three aquifer tests were performed. The aquifer tests provided hydraulic conductivity data that were used to refine the 3-dimensional DYN groundwater model.

Task 6 - Data Evaluation

The data evaluation task included monitoring and production well sampling, preparation of reports and groundwater modeling. Data from the monitoring wells were used to determine the location, the depths, and the pumping rate of proposed extraction wells for implementation of the remedial action. Monitoring well data were also used to develop, calibrate, and use a 3-dimensional groundwater flow (DYNFLOW) model. Particle tracking and simulated flow velocity vectors were used to select flow rates and determine final extraction well sites.

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Task 7 - Project Management

Project management support was provided to the WQA for the duration of the project, including planning, organizing and directing staff; scheduling work; budget review and financial statement preparation; and coordinating the project with other project participants.

1.5 Report Organization

A brief description of the organization and contents of the sections contained in this report is presented in this section:

- Section 2 provides the regulatory requirements which are detailed in the Record of Decision (ROD). The summary of the ROD is presented.
- Section 3 provides a summary of field activities performed during the pre-remedial design investigation and variations from the requirements of the project planning documents.
- Section 4 provides a summary and evaluation of field and analytical data collected during the pre-remedial design investigation.
- Section 5 presents the CDM DYN model and modeling results. The basis for project extraction well siting is detailed, including the locations, depth, and proposed pumping rates of each extraction well.
- Section 6 provides a summary and conclusions.
- Section 7 provides a listing of references cited in the document.
- Appendices. A separate volume of appendices contains well construction details, quarterly groundwater laboratory data sheets, field parameter data sheets, aquifer test data, and data validation reports.

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Section 2
Project Requirements

2.1 ROD Requirements

On March 31, 1994, EPA signed the Record of Decision (ROD) for the Baldwin Park Operable Unit. The ROD specifies, as the selected remedy, the extraction and treatment of approximately 19,000 gpm as an interim action. This pumpage constitutes Alternative 1, evaluated in the April 1993 OUFS and summarized in the ROD. The ROD also summarizes site risks which lead to EPA's selection of Alternative 1. The conclusions of the preliminary risk assessment, based on the assumption that groundwater is used in an untreated state, were as follows:

- The carcinogenic risk, expressed as excess lifetime cancer risk for reasonable maximum exposure, is 5×10^{-5}; this value is below EPA's threshold for acceptable risk.
- The highest non-carcinogenic risk associated with any individual contaminant of concern, expressed as the Hazard Index, is 0.8 for TCE, which is below the acceptable risk threshold of 1.0.
- In the aquifer, concentrations of several VOC constituents exceed drinking water MCL standards. However, there are no known exceedences of MCLs for groundwater provided by purveyors/suppliers to their customers, owing to well head treatment units installed on numerous production wells.

The ROD states that remedial action is necessary even though the carcinogenic risk levels do not exceed EPA's threshold for acceptable risk. Specifically, the selected remedy is intended to:

"...prevent future increases in, and begin to reduce, concentrations of all VOCs in groundwater in the Baldwin Park area....by limiting further migration of contaminated groundwater into clean and less contaminated areas or depths that would benefit most from additional protection and by removing contaminants from the aquifer."

With regard to this objective of containment, the ROD further states "extraction in both the upper and lower areas would significantly reduce contaminant concentrations throughout the Baldwin Park area, although the rate and magnitude of the reduction are difficult to predict." Such potential reductions in rate and magnitude have not been further evaluated since the issuance of the ROD, and are not addressed in this document.

As described in the ROD, in order to achieve containment, "EPA's analyses indicate that approximately 10,500 gpm of groundwater must be extracted more or less continuously in the lower area; approximately 8,500 gpm of groundwater must be extracted in the upper area. These extraction rates would limit contaminant migration out of the upper and lower areas of contamination (i.e., to capture or contain the areas of contamination).

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2.2 Water Delivery Requirements

As described above, a primary objective of this project is to meet the objectives of the March 1994 CERCLA ROD. Accordingly, the modeling analyses presented in Section 5 of this document focus on identifying the most effective means to achieve such CERCLA objectives. In other words, the modeling focussed exclusively on the pumping component of the CERCLA project - the extraction of groundwater for subsequent treatment. As a result, the modeling analyses do not include an evaluation of the feasibility of the proposed pumping relative to the requirements and constraints of the water supply aspects of this project. As specific but not exclusive, examples:

- The CEQA EIR and supporting documents (CDM 1996) analyzes the impacts of recharging water to replace the 15,000 to 19,000 gpm planned to be pumped and exported from the basin. The modeling analyses in Section 5 herein do not reevaluate the recharge capacity constraints and other impacts associated with more than 19,000 gpm needs to be recharged.

- The ability to utilize 15,000 to 19,000 gpm of exported water is based in part, on the demands of MWD's customers. The modeling analyses in Section 5 herein do not evaluate the feasibility of providing greater than 19,000 gpm during some periods of a given year.

Therefore, the feasibility of the water delivery aspects of the project are critical to the overall success of the project. Although this document does not specifically address such water supply requirements, it is critical that eventual selection of the most effective CERCLA pumpage also be consistent with all such water delivery constraints.

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Section 3
Field Activities Performed

To meet the objectives of the BPOU pre-remedial design groundwater monitoring program, which were detailed in Section 1 of this report, the following field activities were performed: (1) monitoring well installation; (2) groundwater monitoring of newly-installed monitoring wells, existing water supply wells, and existing site assessment wells; and (3) aquifer testing of water supply wells. This section summarizes the details of these field activities. Field activities detailed in this document were completed in general accordance with the Sampling and Analysis Plan (SAP) for the BPOU Pre-Remedial Design Groundwater Monitoring Program (CDM, 1995).

To date, seven well completion reports have been produced that describe field activities associated with the installation of eight Westbay multiport (MP) wells. The following sections summarize the details of the field activities discussed in the well completion reports listed below, as well as additional field activities that were conducted as part of the monitoring program. Submittal dates and field activities that were discussed in each well completion report are outlined below.

- Well Completion Report for Wells MW5-03 and MW5-05, dated March 1996, presents data collected during installation of these two wells and groundwater analytical results from the initial and 30-day sampling events. Also included are analytical results from one supplemental sampling event of well MW5-05.

- Well Completion Report for Well MW5-11, dated September 1996, presents data collected during well installation activities and groundwater analytical results from the initial and 30-day sampling events.

- Well Completion Report for Well MW5-17, dated October 1996, presents data collected during well installation activities and groundwater analytical results from the initial and 30-day sampling events.

- Well Completion Report for Well MW5-13, dated October 1996, presents data collected during well installation activities and groundwater analytical results from the initial and 30-day sampling events.

- Well Completion Report for Well MW5-18, dated November 1996, presents data collected during well installation activities and groundwater analytical results from the initial and 30-day sampling events.

- Well Completion Report for Well MW5-15, dated November 1996, presents data collected during well installation activities and groundwater analytical results from the initial and 30-day sampling events.

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- Well Completion Report for Well MW5-08, dated December 1996, presents data collected during well installation activities and groundwater analytical results from the initial and 30-day sampling events.

3.1 Pre-Remedial Design Groundwater Investigation

The following sections detail drilling, installation, development and sampling of the newly-installed Westbay MP wells. Also discussed is the collection of well elevation survey data from the MP wells, and monthly water levels from the MP wells, existing water supply and site assessment wells. Aquifer test data from step drawdown and constant discharge pumping tests were collected from four existing water supply wells. Also discussed is the collection of water quality samples from the MP wells, active and inactive water supply wells, and site assessment wells. Analytical results and field measurement data are tabulated and discussed in Section 4 of this document.

Beylik Drilling, Inc., of La Habra, California was subcontracted by WQA to drill and install the MP wells. Beylik also provided the equipment necessary to sample several of the inactive water supply wells.

3.1.1 Multiport Well Drilling, Installation, Development and Sampling

Eight MP monitoring wells were installed during the BPOU pre-remedial design groundwater monitoring program (i.e., MW5-3, MW5-5, MW5-8, MW5-11, MW5-13, MW5-15, MW5-17 and MW5-18). The Westbay MP monitoring well is a multipoint monitoring and sampling well system which includes several discrete sampling ports in one monitoring well. The total number of sampling ports installed per MP well ranged from three to ten. The first digit of the well identification number indicates that the well is located within RI Study Area 5 (i.e., MW5-). The number following the hyphen indicates the individual multiport well location number. Sampling ports within each MP well were numbered sequentially, from the deepest (e.g., MW5-03 [Zone 1]) to the shallowest (e.g., MW5-03 [Zone 10]) port.

Table 3-1 provides a listing of the monitoring wells and includes a summary of the purpose of each monitoring well. A map showing the locations of the MP wells, as well as existing wells in the BPOU area, has been included as Figure 3-1. Well locations are also illustrated on Plate 1, which is located at the end of this document.

Generally, the new multiport wells are located in areas with little or no existing water quality information at the approximate locations proposed in the SAP. The proposed locations specified in the SAP were provided by EPA during development of the SAP. The actual locations varied slightly from EPA's proposed locations due to access constraints and land availability. The locations were approved by EPA prior to initiating drilling activities at each well location.

Table 3-1
Monitoring Well Rationale

Phase	*Subarea*	*Well Number*[1]	*Monitoring Well Rationale*[2]
1A	1	MW5-03	Monitoring across the entire aquifer down gradient of Subarea 1 to fill a data gap for remedial design and tomonitor remedial effectiveness.
1A	3	MW5-05	Monitoring at cluster 5 to provide contaminant data for remedial design prior to installation of the extraction well.
1B	1	MW5-11	Monitoring at cluster 13 to provide contaminant data for remedial design prior to installation of the extraction well.
1B	1	MW5-13	Fill data gap for remedial design and provide up gradient monitoring for clusters 10 and 13 during implementation.
1B	1	MW5-17	Provide additional data on the lateral and vertical extent of contamination away from facilities in Subarea 1.
1B	1	MW5-18	Monitoring at cluster 10 to provide deeper contaminant data for remedial design prior to installation of the extraction wells.
1B	3	MW5-08	Fill data gap for remedial design and provide up gradient monitoring for cluster 5 during implementation.
1B	3	MW5-15	Fill data gap for remedial design and provide up gradient monitoring for cluster 6 during implementation.

Notes:
[1] Only wells installed for this sampling program are listed.
[2] Based on EPA's Record of Decision (ROD), March 1994.

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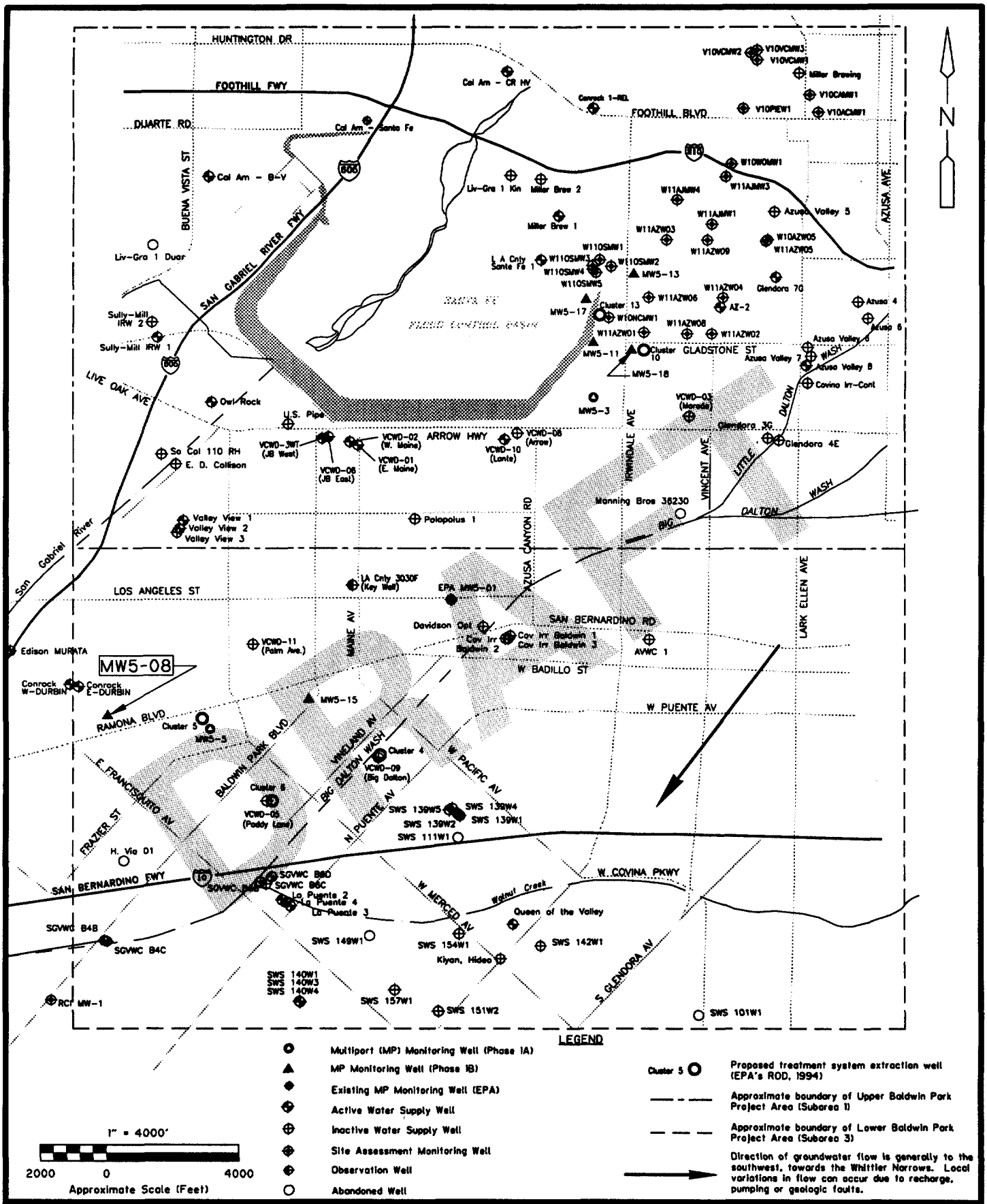

BALDWIN PARK OPERABLE UNIT PRE-REMEDIAL DESIGN

WELL LOCATION MAP

CDM
environmental engineers, scientists, planners, & management consultants

Figure 3-1

Well construction was conducted in two phases: Phase 1A and Phase 1B. During Phase 1A, monitoring wells MW5-03 (located in Subarea 1) and MW5-05 (located in Subarea 3) were drilled, constructed and sampled in order to determine if the ROD-proposed locations for extraction wells and thus the monitoring well locations were appropriate. Phase 1B consisted of the installation and sampling of the remaining monitoring wells.

Drilling began at well location MW5-3 on June 15, 1995, and concluded at well location MW5-8 on May 24, 1996. In order to expedite the field program, mud rotary drilling activities were generally conducted 24 hours per day, seven days per week. However, MW5-08 and MW5-15, located in the city of Baldwin Park, were drilled during daylight only. The wells were completed to depths ranging from 587 feet below ground surface (bgs) at MW5-05 to 1185 feet bgs at MW5-03. A summary of well construction details is provided in Table 3-2 and Appendix A. The following sections summarize field activities associated with drilling, installation, development, sampling and testing of the MP wells. A more detailed description of the field activities for each well is provided in the well completion reports listed previously.

3.1.1.1 Borehole Drilling

Conductor Casing Installation

Prior to drilling, 14-inch diameter conductor casings (5/16-inch-thick mild steel) were set at each site to depths ranging from 40 to 60 feet bgs. The borehole for the conductor casing was advanced using a bucket auger rig equipped with 30-inch-diameter flight augers, as well as 30-inch-diameter core barrels. The annular space between the borehole wall and the casing was grouted through a temporary tremie pipe with a 10-sack sand-cement slurry to form the sanitary seal for the well, as required by the State of California.

Drilling

During Phase 1A, 10-inch-diameter pilot boreholes were drilled initially, followed by reaming the boreholes to 12.25 inch-diameter. The remaining wells (Phase 1B) were drilled to 12.25-inch-diameter in one pass. Direct mud rotary techniques were employed to drill the multiport monitoring well borings. The boreholes were advanced using a Portadrill TKT mud rotary drill rig. The rig has a total derrick height of approximately 67 feet and uses 4 ½-inch A.P.I. Full Hole drill pipe (i.e., drill pipe with a 4-7/8-inch outside diameter and 3-inch inside diameter).

Throughout drilling operations, CDM and Beylik personnel monitored drilling fluid parameters including sand content, mud weight, and fluid viscosity. Drilling fluid consisted of only pure bentonite (Wyo-Ben Naturalgel) mixed with potable water. The drilling fluid was contained in a portable mud tank (capacity of approximately 2,500 gallons) and recirculated. No additives or synthetic polymers were used. Potable water was provided by nearby fire hydrants. The drilling contractor obtained a water meter from the appropriate agency and connected it to the fire hydrant prior to utilizing the water supply.

Table 3-2
Baldwin Park Operable Unit
Summary of Multiport Well Construction Details

EPA Well No.		Date		Casing (4-inch inner diameter)*				Annular Material		Multiport Casing	
	Zone No.	Start	End	Depth (feet bgs)	Type	Slot Size (inches)	Material	Depth (feet bgs)	Type	Depth (feet bgs)	Type
MW5-03		15-Jun-95	3-Aug-95	0 - 60	Conductor*		Mild Steel	0 - 178	Cement/Grout Seal		
				0 - 215	Blank		Mild Steel	178 - 219	Benseal/8 x 16 Sand Seal		
				215 - 235	Blank		Stainless Steel	219 - 221	Transition Sand	221	Measurement Port (SQ10)
	MW50310			235 - 245	Slotted Screen	0.040	Stainless Steel	221 - 254	8 Mesh Sand (8 x 16)	236.6	Sampling Port
				245 - 265	Blank		Stainless Steel	254 - 257	Transition Sand	247	Pumping Port
				265 - 280	Blank		Mild Steel	257 - 280	Benseal/8 x 16 Sand Seal	252	Measurement Port (LQ9)
				280 - 300	Blank		Stainless Steel	280 - 284	Transition Sand	287	Measurement Port (SQ9)
	MW50309			300 - 310	Slotted Screen	0.040	Stainless Steel	284 - 322	8 Mesh Sand (8 x 16)	301.6	Sampling Port
				310 - 330	Blank		Stainless Steel	322 - 325	Transition Sand	312	Pumping Port
				330 - 380	Blank		Mild Steel	325 - 386	Benseal/8 x 16 Sand Seal	317	Measurement Port (LQ8)
				380 - 400	Blank		Stainless Steel	386 - 388	Transition Sand	387	Measurement Port (SQ8)
	MW50308			400 - 410	Slotted Screen	0.040	Stainless Steel	388 - 426	No.3 Sand (8 x 20)	401.6	Sampling Port
				410 - 430	Blank		Stainless Steel	426 - 429	Transition Sand	412	Pumping Port
				430 - 490	Blank		Mild Steel	429 - 497	Benseal/8 x 20 Sand Seal	417	Measurement Port (LQ7)
				490 - 510	Blank		Stainless Steel	497 - 500	Transition Sand	497	Measurement Port (SQ7)
	MW50307			510 - 520	Wire wrap Screen	0.020	Stainless Steel	500 - 538	No.3 Sand (8 x 20)	511.6	Sampling Port
				520 - 540	Blank		Stainless Steel	538 - 541	Transition Sand	522	Pumping Port
				540 - 570	Blank		Mild Steel	541 - 580	Benseal/8 x 20 Sand Seal	527	Measurement Port (LQ6)
				570 - 590	Blank		Stainless Steel	580 - 583	Transition Sand	577	Measurement Port (SQ6)
	MW50306			590 - 600	Wire wrap Screen	0.020	Stainless Steel	583 - 615	No.3 Sand (8 x 20)	591.6	Sampling Port
				600 - 620	Blank		Stainless Steel	615 - 618	Transition Sand	602	Pumping Port
				620 - 650	Blank		Mild Steel	618 - 656	Benseal/8 x 20 Sand Seal	607	Measurement Port (LQ5)
				650 - 670	Blank		Stainless Steel	656 - 660	Transition Sand	657	Measurement Port (SQ5)
	MW50305			670 - 680	Wire wrap Screen	0.020	Stainless Steel	660 - 693	No.3 Sand (8 x 20)	671.6	Sampling Port
				680 - 700	Blank		Stainless Steel	693 - 696	Transition Sand	682	Pumping Port
				700 - 790	Blank		Mild Steel	696 - 799	Benseal/8 x 20 Sand Seal	687	Measurement Port (LQ4)
				790 - 810	Blank		Stainless Steel	799 - 802	Transition Sand	797	Measurement Port (SQ4)
	MW50304			810 - 820	Wire wrap Screen	0.020	Stainless Steel	802 - 842	No.3 Sand (8 x 20)	811.6	Sampling Port
				820 - 840	Blank		Stainless Steel	842 - 844	Transition Sand	822	Pumping Port
				840 - 900	Blank		Mild Steel	844 - 907	Benseal/8 x 20 Sand Seal	827	Measurement Port (LQ3)
				900 - 920	Blank		Stainless Steel	907 - 911	Transition Sand	907	Measurement Port (SQ3)
	MW50303			920 - 930	Wire wrap Screen	0.020	Stainless Steel	911 - 948	No.3 Sand (8 x 20)	921.6	Sampling Port
				930 - 950	Blank		Stainless Steel	948 - 950	Transition Sand	932	Pumping Port
				950 - 995	Blank		Mild Steel	950 - 1003	Benseal/8 x 20 Sand Seal	937	Measurement Port (LQ2)
				995 - 1015	Blank		Stainless Steel	1003 - 1006	Transition Sand	1002	Measurement Port (SQ2)
	MW50302			1015 - 1025	Wire wrap Screen	0.020	Stainless Steel	1006 - 1041	No.3 Sand (8 x 20)	1016.6	Sampling Port
				1025 - 1045	Blank		Stainless Steel	1041 - 1045	Transition Sand	1027	Pumping Port
				1045 - 1130	Blank		Mild Steel	1045 - 1136	Benseal/8 x 20 Sand Seal	1032	Measurement Port (LQ1)
				1130 - 1150	Blank		Stainless Steel	1136 - 1141	Transition Sand	1137	Measurement Port (SQ1)
	MW50301			1150 - 1160	Wire wrap Screen	0.020	Stainless Steel	1141 - 1200	No.3 Sand (8 x 20)	1151.6	Sampling Port
				1160 - 1180	Blank		Stainless Steel			1162	Pumping Port
				1180 - 1185	End cap		Mild Steel			1177	End Cap

Notes: * Conductor Casing is 14-inch OD

Table 3-2
Baldwin Park Operable Unit
Summary of Multiport Well Construction Details

EPA Well No.		Date		Casing (4-inch inner diameter)*				Annular Material		Multiport Casing	
	Zone No.	Start	End	Depth (feet bgs)	Type	Slot Size (inches)	Material	Depth (feet bgs)	Type	Depth (feet bgs)	Type
MW5-05		18-Jul-95	15-Aug-95	0 - 39.5	Conductor*		Mild Steel	0 - 165	Cement/Grout Seal		
				0 - 198	Blank		Mild Steel	165 - 203	Benseal/8 x 20 Sand Seal		
				198 - 218	Blank		Stainless Steel	203 - 206	Transition Sand	205	Measurement Port
	MW50504			218 - 228	Wire wrap Screen	0.020	Stainless Steel	206 - 240	No.3 Sand (8 x 20)	220	Sampling Port
				228 - 248	Blank		Stainless Steel	240 - 242	Transition Sand	230	Pumping Port
				248 - 360	Blank		Mild Steel	242 - 367	Benseal/8 x 20 Sand Seal	235	Measurement Port
				360 - 380	Blank		Stainless Steel	367 - 370	Transition Sand	367	Measurement Port
	MW50503			380 - 390	Wire wrap Screen	0.020	Stainless Steel	370 - 400	No.3 Sand (8 x 20)	3823	Sampling Port
				390 - 410	Blank		Stainless Steel	400 - 402	Transition Sand	392	Pumping Port
				410 - 444	Blank		Mild Steel	402 - 451	Benseal/8 x 20 Sand Seal	397	Measurement Port
				444 - 464	Blank		Stainless Steel	451 - 455	Transition Sand	451	Measurement Port
	MW50502			464 - 474	Wire wrap Screen	0.020	Stainless Steel	455 - 485	No.3 Sand (8 x 20)	4663	Sampling Port
				474 - 494	Blank		Stainless Steel	485 - 487	Transition Sand	476	Pumping Port
				494 - 532	Blank		Mild Steel	487 - 529	Benseal/8 x 20 Sand Seal	481	Measurement Port
				532 - 552	Blank		Stainless Steel	529 - 539	Transition Sand	539	Measurement Port
	MW50501			552 - 562	Wire wrap Screen	0.020	Stainless Steel	539 - 609	No.3 Sand (8 x 20)	5543	Sampling Port
				562 - 582	Blank		Stainless Steel			564	Pumping Port
				582 - 587	End cap		Mild Steel			574	End Cap
MW5-08		1-Jul-96	30-Jul-96	0 - 40	Conductor*		Mild Steel	0 - 311	Cement/Grout Seal		
				0 - 360	Blank		Mild Steel	311 - 368	Benseal/8 x 20 Sand Seal		
				360 - 380	Blank		Stainless Steel	368 - 371	Transition Sand	368	Measurement Port
	MW50804			380 - 390	Wire wrap Screen	0.020	Stainless Steel	371 - 401	No.3 Sand (8 x 20)	383	Sampling Port
				390 - 410	Blank		Stainless Steel	401 - 405	Transition Sand	393	Pumping Port
				410 - 534	Blank		Mild Steel	405 - 540	Benseal/8 x 20 Sand Seal	398	Measurement Port
				534 - 554	Blank		Stainless Steel	540 - 543	Transition Sand	542	Measurement Port
	MW50803			554 - 564	Wire wrap Screen	0.020	Stainless Steel	543 - 573	No.3 Sand (8 x 20)	557	Sampling Port
				564 - 584	Blank		Stainless Steel	573 - 575	Transition Sand	567	Pumping Port
				584 - 650	Blank		Mild Steel	575 - 654	Benseal/8 x 20 Sand Seal	572	Measurement Port
				650 - 670	Blank		Stainless Steel	654 - 659	Transition Sand	658	Measurement Port
	MW50802			670 - 680	Wire wrap Screen	0.020	Stainless Steel	659 - 693	No.3 Sand (8 x 20)	673	Sampling Port
				680 - 700	Blank		Stainless Steel	693 - 695	Transition Sand	683	Pumping Port
				700 - 775	Blank		Mild Steel	695 - 782	Benseal/8 x 20 Sand Seal	688	Measurement Port
				775 - 795	Blank		Stainless Steel	782 - 785	Transition Sand	783	Measurement Port
	MW50801			795 - 805	Wire wrap Screen	0.020	Stainless Steel	785 - 850	No.3 Sand (8 x 20)	798	Sampling Port
				805 - 825	Blank		Stainless Steel			808	Pumping Port
				825 - 830	End cap		Mild Steel			828	Bottom of End Cap

Notes: * Conductor Casing is 14-inch OD

Table 3-2
Baldwin Park Operable Unit
Summary of Multiport Well Construction Details

EPA Well No.		Date		Casing (4-inch inner diameter)*				Annular Material		Multiport Casing	
	Zone No.	Start	End	Depth (feet bgs)	Type	Slot Size (inches)	Material	Depth (feet bgs)	Type	Depth (feet bgs)	Type
MW5-11		31-Aug-95	6-Oct-95	0 - 59	Conductor*		Mild Steel	0 - 256	Cement/Grout Seal		
				0 - 290	Blank		Mild Steel	256 - 296	Benseal/8 x 20 Sand Seal		
				290 - 310	Blank		Stainless Steel	296 - 297	Transition Sand	298	Measurement Port
	MW51103			310 - 320	Wire wrap Screen	0.020	Stainless Steel	297 - 331	No. 3 Sand (8 x 20)	313	Sampling Port
				320 - 340	Blank		Stainless Steel	331 - 333	Transition Sand	323	Pumping Port
				340 - 510	Blank		Mild Steel	333 - 517	Benseal/8 x 20 Sand Seal	328	Measurement Port
				510 - 530	Blank		Stainless Steel	517 - 518	Transition Sand	518	Measurement Port
	MW51102			530 - 540	Wire wrap Screen	0.020	Stainless Steel	518 - 548	No. 3 Sand (8 x 20)	533	Sampling Port
				540 - 560	Blank		Stainless Steel	548 - 550	Transition Sand	543	Pumping Port
				560 - 670	Blank		Mild Steel	550 - 678	Benseal/8 x 20 Sand Seal	548	Measurement Port
				670 - 690	Blank		Stainless Steel	678 - 681	Transition Sand	678	Measurement Port
	MW51101			690 - 700	Wire wrap Screen	0.010	Stainless Steel	681 - 740	No.2/16 Sand (16 x 30)	693	Sampling Port
				700 - 720	Blank		Stainless Steel			703	Pumping Port
				720 - 725	End Cap		Mild Steel			720	End Cap
MW5-13		7-Dec-95	6-Jan-96	0 - 40	Conductor*		Mild Steel	0 - 288	Cement/Grout Seal		
				0 - 320	Blank		Mild Steel	288 - 327	Benseal/8 x 20 Sand Seal		
				320 - 340	Blank		Stainless Steel	327 - 329	Transition Sand	327	Measurement Port
	MW51303			340 - 350	Wire wrap Screen	0.020	Stainless Steel	329 - 361	No.3 Sand (8 x 20)	342	Sampling Port
				350 - 370	Blank		Stainless Steel	361 - 364	Transition Sand	352	Pumping Port
				370 - 500	Blank		Mild Steel	364 - 507	Benseal/8 x 20 Sand Seal	357	Measurement Port
				500 - 520	Blank		Stainless Steel	507 - 509	Transition Sand	507	Measurement Port
	MW51302			520 - 530	Wire wrap Screen	0.020	Stainless Steel	509 - 539	No.3 Sand (8 x 20)	522	Sampling Port
				530 - 550	Blank		Stainless Steel	539 - 542	Transition Sand	532	Pumping Port
				550 - 664	Blank		Mild Steel	542- 668	Benseal/8 x 20 Sand Seal	537	Measurement Port
				664 - 684	Blank		Stainless Steel	668 - 670	Transition Sand	671	Measurement Port
	MW51301			684 - 694	Wire wrap Screen	0.020	Stainless Steel	670 - 729	No.3 Sand (8 x 20)	686	Sampling Port
				694 - 714	Blank		Stainless Steel			696	Pumping Port
				714 - 719	End Cap		Mild Steel			718	End Cap
MW5-15		30-May-96	25-Jun-96	0 - 40	Conductor*		Mild Steel	0 - 167	Cement/Grout Seal		
				0 - 215	Blank		Mild Steel	167 - 222	Benseal/8 x 20 Sand Seal		
				215 - 225	Blank		Stainless Steel	222 - 224	Transition Sand	223	Measurement Port
	MW51503			235 - 245	Wire Wrap Screen	0.020	Stainless Steel	224 - 255	No. 3 Sand (8 x 20)	238	Sampling Port
				245 - 265	Blank		Stainless Steel	255 - 259	Transition Sand	248	Pumping Port
				265 - 430	Blank		Mild Steel	259 - 437	Benseal/8 x 20 Sand Seal	253	Measurement Port
				430 - 450	Blank		Stainless Steel	437 - 441	Transition Sand	438	Measurement Port
	MW51502			450 - 460	Wire Wrap Screen	0.020	Stainless Steel	441 - 470	No. 3 Sand (8 x 20)	453	Sampling Port
				460 - 480	Blank		Stainless Steel	470 - 474	Transition Sand	463	Pumping Port
				480 - 650	Blank		Mild Steel	474 - 657	Benseal/8 x 20 Sand Seal	468	Measurement Port
				650 - 670	Blank		Stainless Steel	657 - 661	Transition Sand	658	Measurement Port
	MW51501			670 - 680	Wire Wrap Screen	0.020	Stainless Steel	661 - 725	No. 3 Sand (8 x 20)	673	Sampling Port
				680 - 700	Blank		Stainless Steel			683	Pumping Port
				700 - 705	End Cap		Mild Steel			694	Bottom of End Cap

Notes: * Conductor Casing is 14-inch OD

Table 3-2
Baldwin Park Operable Unit
Summary of Multiport Well Construction Details

EPA Well No.		Date		Casing (4-inch inner diameter)*				Annular Material		Multiport Casing	
	Zone No.	Start	End	Depth (feet bgs)	Type	Slot Size (inches)	Material	Depth (feet bgs)	Type	Depth (feet bgs)	Type
MW5-17		2-Oct-95	25-Oct-95	0 - 60	Conductor*		Mild Steel	0 - 250	Cement/Grout Seal		
				0 - 285	Blank		Mild Steel	250 - 290	Benseal/8 x 20 Sand Seal		
				285 - 305	Blank		Stainless Steel	290 - 293	Transition Sand	292	Measurement Port
	MW51703			305 - 315	Wire wrap Screen	0.020	Stainless Steel	293 - 325	No.3 Sand (8 x 20)	307	Sampling Port
				315 - 335	Blank		Stainless Steel	325 - 327	Transition Sand	317	Pumping Port
				335 -520	Blank		Mild Steel	327 - 530	Benseal/8 x 20 Sand Seal	322	Measurement Port
				520 - 540	Blank		Stainless Steel	530 - 533	Transition Sand	527	Measurement Port
	MW51702			540 - 550	Wire wrap Screen	0.020	Stainless Steel	533 - 563	No.3 Sand (8 x 20)	542	Sampling Port
				550 - 570	Blank		Stainless Steel	563 - 565	Transition Sand	552	Pumping Port
				570 - 678	Blank		Mild Steel	565 - 685	Benseal/8 x 20 Sand Seal	557	Measurement Port
				678 - 698	Blank		Stainless Steel	685 - 688	Transition Sand	685	Measurement Port
	MW51701			698 - 708	Wire wrap Screen	0.020	Stainless Steel	688 - 746	No.3 Sand (8 x 20)	700	Sampling Port
				708 - 728	Blank		Stainless Steel			710	Pumping Port
				728 - 733	End Cap		Mild Steel			727	End Cap
MW5-18		29-Apr-96	24-May-96	0 - 40	Conductor*		Mild Steel	0 - 430	Cement/Grout Seal		
				0 - 480	Blank		Mild Steel	430 - 489	Benseal/8 x 20 Sand Seal		
				480 - 500	Blank		Stainless Steel	489 - 490	Transition Sand	487	Measurement Port
	MW51803			500 - 510	Wire Wrap Screen	0.020	Stainless Steel	490 - 519	No. 3 Sand (8 x 20)	502	Sampling Port
				510 - 530	Blank		Stainless Steel	519 - 520	Transition Sand	512	Pumping Port
				530 - 610	Blank		Mild Steel	520 - 617	Benseal/8 x 20 Sand Seal	517	Measurement Port
				610 - 630	Blank		Stainless Steel	617 - 618	Transition Sand	617	Measurement Port
	MW51802			630 - 640	Wire Wrap Screen	0.020	Stainless Steel	618 - 649	No. 3 Sand (8 x 20)	632	Sampling Port
				640 - 660	Blank		Stainless Steel	649 - 652	Transition Sand	642	Pumping Port
				660 - 760	Blank		Mild Steel	652 - 763	Benseal/8 x 20 Sand Seal	647	Measurement Port
				760 - 780	Blank		Stainless Steel	763 - 765	Transition Sand	767	Measurement Port
	MW51801			780 - 790	Wire Wrap Screen	0.020	Stainless Steel	765 - 825	No. 3 Sand (8 x 20)	782	Sampling Port
				790 - 810	Blank		Stainless Steel			792	Pumping Port
				810 - 815	End Cap		Mild Steel			802	Bottom of End Cap

Notes: * Conductor Casing is 14-inch OD

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Prior to mobilization to the well site, the drill rig, shaker table, portable mud tank, drill pipe and bits were decontaminated at the drilling contractor's yard in La Habra. Decontamination activities were periodically observed by CDM personnel at the contractor's supply yard.

Soil Sampling During Drilling

During drilling of each borehole, an on-site CDM representative collected soil cutting grab samples for lithologic description. The grab samples were collected at approximate 10-foot intervals, or at significant changes in borehole lithology, and transferred to resealable plastic bags and clear plastic tackle boxes. Each sample was visually observed and described. Sample descriptions and rig behavior (i.e., variations in drilling rates due to lithology) were used to classify the formation materials using the Unified Soil Classification System (USCS). During drilling activities, color, depth interval, sample descriptions, and other pertinent information regarding the cutting samples were recorded on the field boring log forms. The information contained in the field boring logs was manually input into a commercially available computer program (GINT) and used to generate the lithologic logs contained in the well completion reports (CDM, 1996). A summary of the lithology for each boring is provided in Appendix A.

Geophysical Logging

Down-hole geophysical logging for each borehole was performed by Welenco of Claremont, California. The geophysical logs included spontaneous potential, 16- and 64-inch normal resistivity, point resistivity, gamma ray, and guard resistivity. Geophysical logs are provided in Appendix A. Data collected from the geophysical and lithologic logging were evaluated and used to identify potential screened intervals for the monitoring wells.

Caliper Logging

After geophysical logging was complete, a caliper log was conducted by Welenco to verify the diameter of the boring prior to casing installation. In addition, the caliper log was used to identify areas of washouts which would require additional gravel pack or grout and to calculate the amount of annular fill material needed.

3.1.1.2 Well Design and Construction

Proposed screened intervals for each well were identified in the field immediately after the geophysical logs were completed by representatives from CDM, WQA, CH2M Hill (EPA's contractor), and Harding Lawson & Associates (representing the Baldwin Park Operable Unit Steering Committee) based on interpretation of the lithologic and geophysical logs. The proposed well design was prepared by CDM and then transmitted to EPA, along with lithologic and geophysical data, for approval prior to installation. Upon approval of the proposed well design, a wiper pass was performed with the 12.25-inch diameter drill bit down the entire depth of the borehole to assure that the borehole was the correct diameter. Following the wiper pass, final well construction began. A summary of well construction details for each well is provided in Table 3-2 and Appendix A.

All casing and screen materials were decontaminated by the drilling contractor and inspected for compliance with the technical specifications by the on-site geologist prior to installation. The slot size of each piece of screen was verified by the on-site geologist by using gauges with specified thicknesses.

Prior to installation of the casing for the well, the borehole fluid was thinned to assist in the installation of the annular materials.

All well casing components had the same inner diameter (4 inches) and wall thickness (0.237 inches) and were manufactured with collars at the top of each section. The wells were installed by welding each section of casing. Collars were used to ensure that the inside of the well was free of uneven surfaces, which could potentially damage the MP well system. Sets of three centralizers, spaced 120 degrees apart, were placed at approximately 60-foot intervals along the outside of the mild steel blank casing, to ensure that the casing was centered in the borehole.

Following installation of the well casing, fill materials were installed in the annular space between the casing and the borehole wall using a temporary tremie pipe. Annular fill materials consisted of Lonestar No. 3 sand (8 x 20 gradation), fine-grained silica sand (transition sand) and granular bentonite. In general, gravel pack materials were placed from approximately 10 feet below the bottom of the screen to approximately 10 feet above the top of the screen. A 2- to 3-foot-thick transition sand was placed directly above and below the gravel pack material to separate it from the bentonite/sand annular seal. Annular seal materials consisting of a 1:1 mixture of Lonestar No. 3 sand and granular bentonite were pumped through a construction tremie pipe between each layer of transition sand. A neat cement grout seal (21 sack neat cement with 4 percent bentonite) was pumped through a tremie pipe into the remaining annulus of each borehole.

Video Survey

Prior to installation of the MP system, a video survey was performed in each well. The video surveys were performed by Welenco to confirm screen intervals and also to detect any defects in well construction. No defects were observed in the wells and the depths of the screened intervals were as previously recorded.

3.1.1.3 Well Development

After construction, development of the wells was completed in three phases: (1) initial development using the drill rig to flush out heavy drilling fluids; (2) development using a Smeal rig (truck-mounted) for repeated episodes of swabbing, airlifting, and bailing to remove fine sediments from the gravel pack and formation and to provide for gravel pack consolidation; and (3) final development of each zone using a straddle packer and submersible pump assembly. All equipment used during development was decontaminated prior to installation into the wells.

An alignment test was performed on the wells during development by lowering the straddle packer and submersible pump assembly down the entire length of the well. The submersible pump, excluding the cable, was 3-3/4 inches in diameter.

Initial development with the drill rig began approximately 24 hours after grouting was complete. Each well was flushed with approximately 1,000 gallons of fresh hydrant water to clean the well of heavy drilling fluids. Flushing was performed by pumping hydrant water through a temporary tremie pipe, located 4 to 6 feet from the bottom of the casing. After flushing the well, a single swab or surge block was used to force fine-grained sediment out of the filter pack and break up and remove any material deposited on the wall of the borehole during drilling. A double swab tool was used, with airlifting, for approximately one hour to develop each perforated zone. Development progressed from the top screen down. A stainless steel bailer was used to remove accumulated sediments from the bottom of the well.

Once swabbing and bailing were complete, inflatable packers were used to isolate each zone during pump development. During pump development, the packer assembly was lowered so that one packer was located below and the second packer above the zone of interest. With packers inflated, a submersible pump located between the packers was utilized to remove formation water from each zone. The pump was periodically turned off to allow the column of water to rush down and out of the formation (surging). Pumping and surging continued until the zone was considered clean as noted by the on-site hydrogeologist. Development continued until discharged water was relatively clear (i.e., turbidity at approximately 5 nephelometric turbidity units [NTUs]) and sediment free. The development water was also monitored for temperature, electrical conductivity (EC), and pH. During the final stages of development, each zone was pumped continuously until the field parameters had stabilized to within approximately 10 percent of previous measurements. The amount of water added and removed during development for each well is shown on Table 3-3.

3.1.1.4 MP System Installation

Following well development and the video survey, the Westbay MP well system was installed inside each cased borehole. Completion reports, prepared by Westbay Instruments, Inc., describing the installation and construction of each MP system, were included as an appendix in the individual well completion reports.

In general, the MP system consists of 1.5-inch-diameter polyvinyl chloride (PVC) blank casing, couplings with measurement and pumping ports, and inflatable packers. The bottom packer for each screened zone is placed within the blank stainless steel casing. The upper packer, and a companion packer, are located within the blank stainless steel casing above each zone. The two packers straddling each perforated interval provide a seal along the interior of the steel well casing, thereby stopping cross-contamination and vertical movement of fluids within the well. The third packer is installed to form a quality assurance (QA) zone, so that fluid pressures can be monitored between perforated intervals, thereby testing the integrity of the packers. Bottom packers were not installed at the bottom perforated interval. A typical MP system configuration is shown on Figure 3-2. Table 3-2 summarizes the MP system installed at each monitoring well.

Table 3-3
Baldwin Park Operable Unit
Multiport Well Development Volumes

Well Number	Flush Volume (gallons)	Total Volume Removed (gallons)	Net Volume Removed (gallons)	Average Volume Removed per MP Zone (gallons)
MW5-03	1,660	46,620	44,960	4,496
MW5-05	1,350	24,780	23,430	5,858
MW5-08	1,083	30,680	29,597	7,399
MW5-11	1,000	24,736	23,736	7,912
MW5-13	1,157	15,666	14,509	4,836
MW5-15	1,907	18,102	16,195	5,398
MW5-17	1,000	17,556	16,556	5,519
MW5-18	1,063	18,900	17,837	5,946

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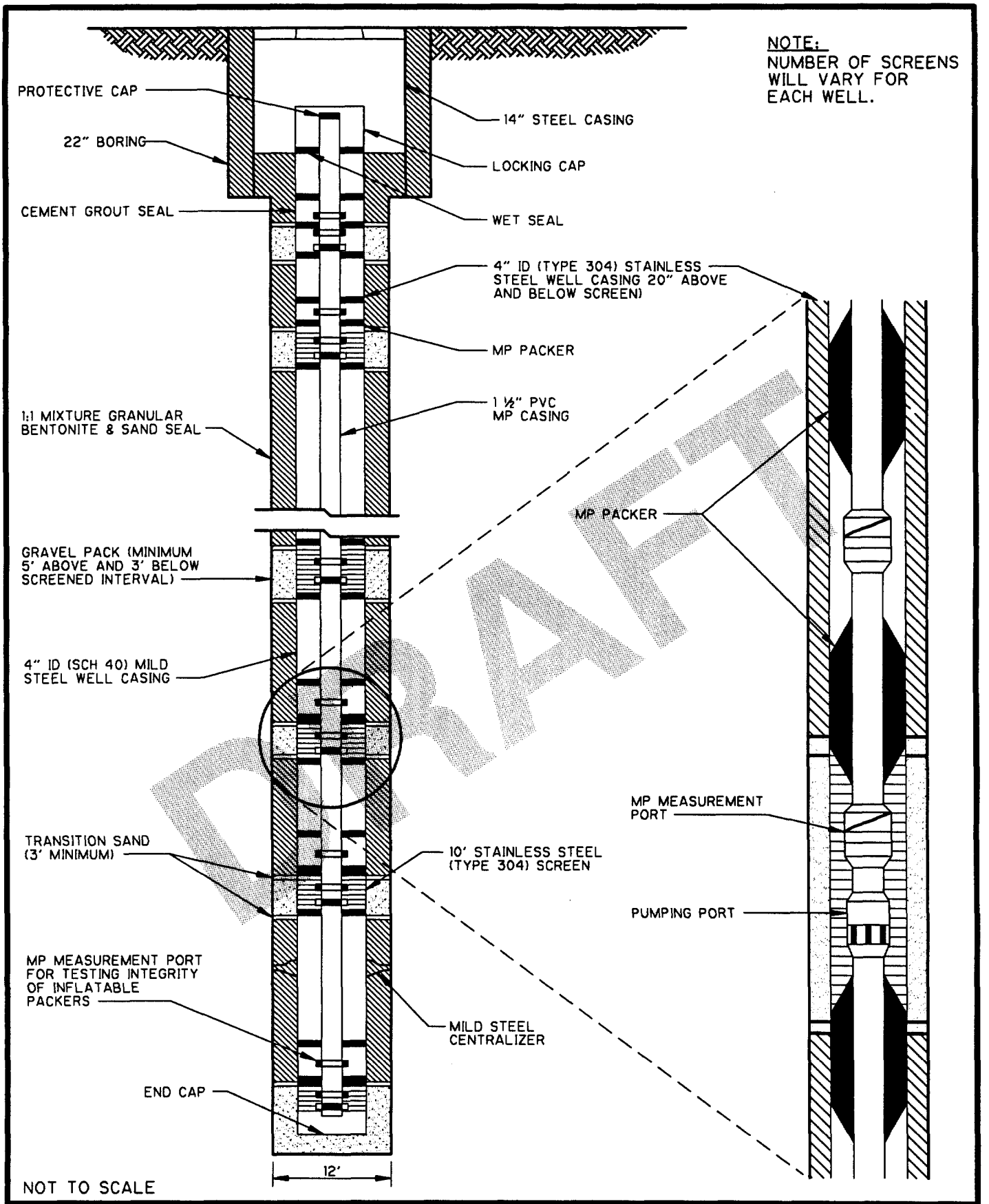

BALDWIN PARK OPERABLE UNIT PRE-REMEDIAL DESIGN

CDM
environmental engineers, scientists, planners, & management consultants

TYPICAL DESIGN DETAIL FOR MULTIPORT MONITORING WELL

Figure 3-2

J:\2581-112\CAD\ MP-WELL 07/22/97 11:11:33 5:52:34 CADD Station #2

Once the MP well system was installed, piezometric pressures were measured to document the performance of all measurement ports prior to inflation of the packers. Following the pre-inflation pressure profile, the packers were inflated sequentially, starting with the bottom packer, using tap water provided by a nearby fire hydrant. Data collected from a post-inflation pressure profile confirmed that the packers were inflated properly and that a seal was present between each perforated interval. Pressure measurements conducted during MP casing installations are also included in the appendices of the individual well completion reports.

MP System Zone Purging

Well installation and development activities can sometimes create an unnatural circulation of formation fluids, thereby causing groundwater adjacent to the MP measurement ports to be non-representative of the formation fluids. Once the casing and packer seals of the MP system have been installed, these non-representative fluids can be removed by purging the MP monitoring zones. The strategy for purging the monitoring zones is highly dependent upon site conditions and can be done in one of two basic ways: (1) purging by natural groundwater flow, or (2) pumping or bailing to purge monitoring zones. Because the hydrogeologic conditions of the BPOU were favorable to relatively high groundwater movement, it was initially anticipated that natural groundwater flow would be sufficient to purge the MP monitoring zones. However, following review of analytical data generated from sampling the first four MP wells, it was determined that purging by natural groundwater flow was not sufficient to ensure stabilization of conditions in the monitoring zones. Therefore, monitoring zones in the last four MP wells (i.e., MW5-13, MW5-18, MW5-15 and MW5-08) were purged manually by bailing, in accordance with a request by EPA (EPA, November 17, 1995).

In wells MW5-13, MW5-18, MW5-15 and MW5-08, water was purged from each monitoring zone following installation of the MP system and packer inflation. Approximately three saturated casing volumes of water were purged from each zone to ensure that non-representative groundwater (i.e., groundwater that has been mixed in the casing from several individual zones during development and installation activities) was replaced by fresh formation water. The saturated casing volume (CV) for each perforated interval was calculated as follows:

$CV = (V_1 - V_2)$, in gallons, where:

$V_1 = \pi * (r_1^2 d_1) * 7.48$ gallons/ft^3 = volume of water between packers inside the 4-inch steel well casing;

$V_2 = \pi * (r_2^2 d_2) * 7.48$ gallons/ft^3 = volume of water displaced by the 1.5-inch PVC MP casing;

$\pi = 3.14$;

r_1 = the radius of the 4-inch steel casing (feet);

r_2 = the radius to the outside of the 1.5-inch PVC MP casing (feet);

d_1 = the thickness of the column of water in the 4-inch steel casing (feet) between packers; and

d_2 = the length of the 1.5-inch PVC MP casing between packers.

Zones were purged individually by opening up one pumping port with an open/close tool, which was provided by Westbay technical personnel, while the remaining pumping ports were closed. With one pumping port open, the MP well behaved like a typical, single-screened monitoring well. Therefore, fluids within the MP casing were hydraulically connected to the formation water during purging. Water from the inside of the MP casing was then bailed out of the well. The bailer was lowered during each run to the same depth in the MP casing, which was just above the uppermost pumping port, as a method to verify that the water contained inside the MP casing was not leaking to the outside formation. Purging progressed from the deepest zone to the shallowest zone.

Groundwater generated during zone purging activities was temporarily contained on-site in 55-gallon steel drums. Purge water was later combined with groundwater generated during the well development activities and disposed of as discussed in Section 3.2.

3.1.1.5 Wellhead Elevation Survey

Bush & Associates Inc. of Irvine, California was subcontracted to survey the eight MP wells installed during the BPOU groundwater monitoring program. Well locations were surveyed based on mean sea level and horizontal control with Los Angeles County benchmarks utilizing California coordinate system values (Zone 7 NAD 27). To be consistent with the coordinate system currently being used in EPA's database for the San Gabriel Basin, horizontal coordinates were also reported utilizing UTM values (Zone 11 NAD 83). Each well was horizontally located to the nearest 0.5 foot or meter (California or UTM coordinates, respectively). The elevation at the north rim of the MP casing and the monitoring well cover were surveyed to the nearest 0.01 foot at each well. In addition, ground surface elevations were surveyed to the nearest 0.10 foot. Surveyed northing and easting coordinates, as well as elevation data, are tabulated in Section 4 of this report.

3.1.1.6 Water Quality Sampling

Groundwater monitoring activities included five rounds of groundwater sampling of eight new MP monitoring wells. Due to the dates of installation, only two rounds of sampling were conducted on well MW5-08 and three rounds of sampling were performed on wells MW5-15 and MW5-18. Table 3-4 summarizes the sampling schedule conducted for each of the wells. Table 3-2 was included previously and summarizes construction details for each of the MP wells. Analytical results from groundwater sampling of the MP wells are tabulated in Section 4 of this report. Copies of the laboratory reports are included in Appendix B.

The following paragraphs summarize the sampling activities performed on each of the MP wells. Because field activities were conducted in general accordance with detailed descriptions and standard operating procedures provided in the project SAP and specifications, a general discussion of field activities has been provided in this report. In a few instances a greater level of detail has been provided to supplement the procedures described in the project planning documents. Deviations from the project planning documents have been noted in sections where they are relevant.

Table 3-4
Baldwin Park Operable Unit
Sampling Schedule Summary

Well Name	Well Recordation Number	Well Status [1]	Date Sampled [4]				
			Initial Sampling [2]	"30-Day" Sampling [2]	First Quarter Sampling [3]	Second Quarter Sampling [2]	Third Quarter Sampling [2]
New MP Wells							
MW5-03 (Zones 1-10)	BPW50301-10	MP	Aug-95	Sep-95	Mar-96	Jun-96	Sep-96
MW5-05 (Zones 1-4)	BPW50501-04	MP	Aug-95	Oct-95	Mar-96	Jun-96	Sep-96
MW5-11 (Zones 1-3)	BPW51101-03	MP	Oct-95	Nov-95	Mar-96	Jun-96	Sep-96
MW5-17 (Zones 1-3)	BPW51701-03	MP	Oct-95	Nov-95	Mar-96	Jun-96	Sep-96
MW5-13 (Zones 1-3)	BPW51301-03	MP	Jan-96	Feb-96	Mar-96	Jun-96	Sep-96
MW5-18 (Zones 1-3)	BPW51801-03	MP	Jun-96	Jul-96	Sep-96		
MW5-15 (Zones 1-3)	BPW51501-03	MP	Jul-96	Aug-96	Sep-96		
MW5-08 (Zones 1-4)	BPW50801-04	MP	Aug-96		Sep-96		
Existing Site Assessment/Observation/MP Wells							
EPA MW5-01 (Zones 1-13)	EPAW5101-13	MP	--	--	Mar-96	Jun-96	Sep-96
ALRC MW-1R	W11AZW1R	MW	--	--	Mar-96 G	Jun-96	Sep-96
ALRC MW-3	W11AZW03	MW	--	--	Mar-96 G	Jun-96 G	Sep-96 G
ALRC MW-9	W11AZW09	MW	--	--	Mar-96	Jun-96 G	Sep-96 G
Norac MW-1	W10NCMW1	MW	--	--	Mar-96 G	Jun-96	Sep-96
LA County 3030F (Key Well)	Z1000006	O	--	--	Apr-96	Jun-96	Sep-96
Water Supply Wells							
Transit Mix 2 (ALRC MW-4)	11900038	P	--	--	Mar-96 G	Jun-96 G	Sep-96 G
CalMat - E-Durbin	01902920	P	--	--	Apr-96	Jun-96	Sep-96
Covina Irrig. Co. - Baldwin 3	01900882	S	--	--	Oct-96		
City of Glendora 07G	01900831	P	--	--	Mar-96 G	Jul-96	Sep-96
LA County - Santa Fe 1	08000070	P	--	--	Mar-96	Jun-96	Sep-96
LPVCWD 02	01901460	P	--	--	Apr-96	Jul-96 S	Oct-96
LPVCWD 03	01902859	P	--	--	Apr-96	Jul-96 S	Oct-96
LPVCWD 04	08000062	P	--	--	Apr-96	Jul-96 S	Oct-96
Polopolus - 01	01902169	S	--	--	Jun-96	Oct-96	
SGVWC B4B	51902858	P	--	--	Apr-96	Jul-96 S	Oct-96
SGVWC B6C	71903093	S	--	--	Apr-96	Jul-96 S	Oct-96
SGVWC B6D	78000098	P	--	--	Apr-96	Jul-96 S	Oct-96
SWS 139W1	01901598	P	--	--	Apr-96	Jul-96 S	Oct-96
SWS 139W4	08000069	P	--	--	Apr-96	Jul-96 S	Oct-96
SWS 139W5	08000095	P	--	--	Apr-96	Jul-96 S	Oct-96
VCWD 2 (W. Maine)	01900028	P	--	--	Apr-96	Jul-96 S	Oct-96
VCWD 3 (Morada)	01900029	S	--	--	Mar-96 G	Jul-96	Sep-96
VCWD 5 (Paddy Lane)	01900031	S	--	--	Jul-96	Sep-96	
VCWD 9 (Big Dalton)	01900035	S	--	--	Mar-96	Jun-96	Sep-96
VCWD 10 (Lante)	08000060	P	--	--	Apr-96		
VCWD 11 (Palm Ave.)	08000039	S	--	--	Jul-96	Sep-96	

- Not a scheduled sampling event.

[1] Well Status: MP = multiport well; MW = site assessment monitoring well; O = observation well; P = water supply well (in service); and S = water supply well (not in service).

[2] Samples analyzed for VOCs (Subarea 1) or VOCs, nitrate and nitrite (Subarea 3).

[3] Samples analyzed for VOCs, nitrate, nitrite, metals, general minerals and radon.

[4] Samples were collected by CDM for WQA, unless otherwise noted (i.e., Stetson Engineers [S] for Watermaster, or GeoSyntec Consultants [G] for Azusa Land Reclamation Co. [ALRC]).

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3.1.1.6.1 Initial and "30-Day" Sampling Events (Rounds 1 and 2)

In accordance with the SAP, groundwater samples were collected initially from each MP well soon after (i.e., less than five days) Westbay installation activities were complete. For wells where individual zones were purged prior to sampling (i.e., wells MW5-08, MW5-13, MW5-15 and MW5-18), the initial sampling event was conducted approximately two weeks after purging activities were complete. A second round of groundwater sampling was then performed approximately one month after the initial sampling event (i.e., the "30-day" sampling event, as specified in the SAP). However, due to access constraints, MW5-05 was not able to be sampled until two months after initial sampling. Samples collected from wells located in the northern portion of the BPOU (Subarea 1) were analyzed for VOCs, and samples collected in the southern portion of the BPOU (Subarea 3) were analyzed for VOCs plus nitrate and nitrite. Nitrates and nitrites were reported as nitrogen (as N). Results from the first two rounds of groundwater sampling were presented in the respective well completion reports and are also in Section 4 of this report.

3.1.1.6.2 First, Second, and Third Quarterly Sampling Events (Rounds 3, 4 and 5)

To the extent possible, the first, second and third quarterly sampling events of the newly-installed MP wells were scheduled to coincide with existing sampling programs (i.e., California Department of Health Services' Title 22 quarterly sampling of active water supply wells and the Los Angeles Regional Water Quality Control Board's [LARWQCB's] Well Installation Program [WIP] sampling of existing site assessment and inactive water supply wells). Because wells MW5-08, MW5-15 and MW5-18 were installed after the first and second quarterly sampling events were completed, one quarterly sampling event was conducted for these three wells.

During the first round of quarterly sampling, groundwater samples were collected from each sampling interval from each new MP well and analyzed for a comprehensive suite of parameters. These parameters included: VOCs, general minerals (i.e., calcium, magnesium, potassium, sodium, chloride, sulfate, carbonate, bicarbonate and hardness), nitrates and nitrites, metals (i.e., aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel and zinc), radon, and total dissolved and suspended solids (TDS and TSS, respectively).

During the second and third quarterly sampling events, groundwater samples were collected approximately three and six months after the first quarter samples, respectively. Samples collected from wells located in Subarea 1 were analyzed for VOCs. Samples collected from wells located in Subarea 3 were analyzed for VOCs plus nitrate and nitrite.

Analytical results from the three quarterly sampling events are discussed in Section 4 of this report.

3.1.1.6.3 Sampling Procedures

As described in the SAP, groundwater samples were collected from each depth-specific zone by using a specially designed sampling tool, provided by Westbay Instruments. The sampling tool and up to four 250 milliliter (ml) stainless steel cylinders were decontaminated prior to the first sample collection and between each zone. At the surface, the sampling tool and empty cylinders were connected in series and then evacuated using a hand-operated vacuum pump. Once prepared, the tool and cylinders were lowered and positioned at the desired zone. Through a series of

commands, the sampling tool was activated at the surface, which caused the surface of the tool to seal against and open the measurement port. Once the measurement port was opened, a valve was opened on the sampling tool, which allowed formation water located between the MP casing and outer steel casing to flow through the sampling tool and into the evacuated cylinders. Once filled, the sample valve and measurement ports were closed, and the tool and filled cylinders were brought to the surface. The zones were sampled sequentially, beginning with the bottom zone.

Once the sample tool and cylinders were recovered at the surface, the sample was depressurized and decanted into alternate containers. The first sample recovered from each zone was used to measure field parameters and then discarded. Temperature, turbidity, pH and electrical conductivity (EC) measurements were monitored at each zone and recorded in the field logbook. Field parameter data are summarized on tables included in Appendix C. Subsequent samples collected from each zone were then used to fill laboratory-provided sample containers. Containers for VOC analyses were filled first, allowing no headspace. If headspace was present, the sample was discarded and a new sample container was filled. Containers for inorganic analyses were filled with the remaining sample from that zone. Subsequent sampling of each zone was conducted if additional sample volume was required for the inorganic containers. Once filled, each sample container was labeled, packaged for shipment, and placed into a cooler containing either ice or blue ice.

The project SAP specified that groundwater samples submitted for analysis of metals, cations and hardness (first quarterly sampling event only), were to be filtered in the field using a 0.45 micron disposable filter and than transferred into a sample container preserved with acid. However, due to the limited sample volume collected during each run to the sampling zone (maximum of 1 liter), field filtering of the samples was not feasible. Therefore, the samples were initially placed in unpreserved containers and then filtered immediately upon receipt by the analytical laboratory.

The SAP also specified that if samples submitted for nitrates and nitrites were collected on Fridays or weekends, then the sample would be field filtered and preserved with sulfuric acid, so that the holding time could be extended from 48 hours to 28 days. However, prior arrangements were made with the laboratory, and the sampling events were scheduled such that the analytical laboratory could analyze the nitrate and nitrite samples within the 48 hour holding time. Therefore, field filtering and preservation of the nitrate and nitrite samples were not required.

3.1.1.6.4 Analytical Methods

The analytical methods used during this project are described in the project SAP, however, a change in VOC methods was necessary due to a change in the project laboratory. During the later portion of the project, the original project laboratory (Thermo Analytical) down-sized its laboratory capabilities, and was no longer able to provide analytical services in support of the BPOU Pre-Remedial Design Groundwater Monitoring Program. Following notification of this decision, Quanterra was selected as the replacement laboratory, based on their experience performing analyses for similar projects and their ability to fulfill the analytical requirements of this project. Quanterra Environmental Services is certified through California Department of Health Services' Environmental Laboratory Accreditation Program (ELAP).

Although Quanterra was selected as the most suitable replacement, they were equipped to analyze VOCs using EPA Method 8260, rather than EPA Method 8021. When the SAP was written, EPA Method 8021 was selected as the analytical method of choice for this project, primarily because of its reduced cost and lower detection limits. However, Quanterra was able to achieve reporting limits that were equal to, or lower than, MCLs while using EPA Method 8260. In addition, Method 8260 is a gas chromatography/mass spectrometry method, which nearly eliminates the possibility of false positive detections. Based on these factors, the change in the analytical method for determination of VOCs was approved by EPA through oral and written communication (EPA, August 14, 1996).

3.1.1.7 Water Level Monitoring

Included as part of the groundwater monitoring program, water level measurements were recorded for each of the MP wells during the initial and "30-day" sampling events, and then monthly beginning with the first quarterly sampling event (March 1996) through the third quarterly sampling event (September 1996).

Because there is no communication between the groundwater and the water in the MP well casing, conventional water level measurements could not be obtained using only an electric water level indicator. Rather, piezometric pressure measurements were recorded within each screened interval of the MP well. Piezometric pressures were recorded at individual measurement ports by utilizing an electric pressure probe in conjunction with a surface data control unit. The pressure probe is equipped with a fluid pressure transducer. The fluid pressure measured inside the Westbay MP casing was compared to the formation pressure outside the casing. This comparison was used to calculate piezometric pressures at discrete screened intervals, which in turn were used to calculate static water levels. All measurements were recorded in the field logbook and on field data sheets. Static water levels and the corresponding groundwater elevations have been compiled in Section 4 of this report.

3.1.2 Water Supply and Site Assessment Well Sampling

A total of 21 water supply wells, four site assessment wells, the Key Well and one EPA MP well were included in the groundwater monitoring program. A listing of the wells monitored and a summary of the well completion details for each of these wells is provided in Table 3-5 and the locations are illustrated on Figure 3-1. Three quarterly rounds of sampling were performed on the site assessment, observation and EPA MP wells. However, there were a few cases where a total of three rounds of sampling could not be performed on some of the water supply wells due to site access limitations or the well's operational condition. Table 3-4 summarizes the sampling schedule conducted for each of the wells included in the monitoring program.

To the extent possible, site assessment and water supply wells were purged and sampled by the owner or Main San Gabriel Basin Watermaster (Watermaster) for the water purveyor, in accordance with procedures previously established by, and approved for, LARWQCB's EMP or DHS' Title 22 quarterly sampling programs. If the existing sampling schedule of these wells did not coincide with the schedule proposed in the SAP, then the samples were collected by WQA, in accordance with procedures specified in the SAP. All other existing wells included in the monitoring program were sampled by WQA in accordance with the procedures specified in the SAP. Table 3-4, the Sampling Schedule Summary, also indicates who was responsible for the collection of each sample.

Table 3-5
Baldwin Park Operable Unit
Summary of Well Construction Details - Existing Wells

Well Recordation Number	Well Owner	Well Name	BPOU Subarea	Total Depth (feet)	Number of Screened Intervals	Screen Intervals (feet)	Well Status [1]
11900038	Transit Mix (ALRC)	2 (ALRC MW-4)	1	630	1	350-614	P
01902920	CalMat (Conrock Co.)	E-Durbin	3	500	2	238-314; 366-484*	P
01900882	Covina Irrigating Co.	Baldwin 3	3	500	2	198-251; 278-484*	S
01900831	City of Glendora	7G	1	500	1	252-474	P
01903012	H. Via Trust	01	3	--	--	--	A
08000070	L.A. County	Santa Fe 1	1	451	1	290-435	P
01901460	La Puente Valley County Water District	02	3	947	8	600-604; 636-675; 678-739; 742-766; 825-833; 835-845; 897-935; 936-940*	P
01902859	La Puente Valley County Water District	03	3	80	1	620-770*	P
08000062	La Puente Valley County Water District	04	3	743	1	550-725*	P
01902169	Polopolus, et al.	01	1	280	1	120-280	Ag
51902858	San Gabriel Valley Water Co.	B4B	3	1,178*	2	920-940; 950-1,154*	P
71903093	San Gabriel Valley Water Co.	B6C	3	526*	3	275-420; 440-465; 480-506*	S
78000098	San Gabriel Valley Water Co.	B6D	3	1,078	6	760-769; 824-836; 855-938; 942-952; 980-992; 1,024-1,032	P
01901598	Suburban Water Systems	139W1	3	400	1	120-349	P

Table 3-5 (Continued)
Baldwin Park Operable Unit
Summary of Well Construction Details - Existing Wells

Well Recordation Number	Well Owner	Well Name	BPOU Subarea	Total Depth (feet)	Number of Screened Intervals	Screen Intervals (feet)	Well Status [1]
08000069	Suburban Water Systems	139W4	3	846	3	566-642; 676-695; 787-825*	P
08000095	Suburban Water Systems	139W5	3	1,220*	1	750-1,060*	P
01901611	Suburban Water Systems	112W1	3	--	--	--	A
01901600	Suburban Water Systems	139W3	3	--	--	--	A
01900028	Valley County Water District	2 (West Maine)	1	600	1	250-580	P
01900029	Valley County Water District	3 (Morada)	1	600*	1	275-585*	S
01900031	Valley County Water District	5 (Paddy Lane)	3	600	1	300-585	SE
01900035	Valley County Water District	9 (Big Dalton)	3	600	1	250-582*	SE
08000060	Valley County Water District	10 (Lante)	1	600	1	275-577*	P
08000039	Valley County Water District	11 (Palm Ave.)	3	622	2	540-582; 594-602	S
W11AZW1R	Azusa Land Reclamation Co.	MW-1R	1	460	1	258-455	MW
W11AZW03	Azusa Land Reclamation Co.	MW-3	1	385	1	180-385	MW
W11AZW09	Azusa Land Reclamation Co.	MW-9	1	451	1	195-450	MW
W10NCMW1	Norac	MW-1	1	340*	1	255-310*	MW
Z1000006	L.A. County Flood Control District	3030F (Key Well)	3	286	1	80-284*	O

Table 3-5 (Continued)
Baldwin Park Operable Unit
Summary of Well Construction Details - Existing Wells

Well Recordation Number	*Well Owner*	*Well Name*	*BPOU Subarea*	*Total Depth (feet)*	*Number of Screened Intervals*	*Screen Intervals (feet)*	*Well Status* [1]
EPAW5113	EPA	MW5-01	3	1,521		216-226	MP
EPAW5112						287-297	
EPAW5111						335-345	
EPAW5110						430-440	
EPAW5109						523-533	
EPAW5108						640-650	
EPAW5107						765-775	
EPAW5106						875-885	
EPAW5105						1,030-1,040	
EPAW5104						1,123-1,133	
EPAW5103						1,256-1,266	
EPAW5102						1,387-1,397	
EPAW5101						1,496-1,505	

Notes:
[1] Well Status:

A	=	Abandoned (Confirmed by well owner)
Ag	=	Inactive agricultural well
MW	=	Site assessment monitoring well
O	=	Observation well
P	=	Water supply well; in service
S	=	Water supply well; not in service due to VOC and/or nitrate contamination
SE	=	Water supply well; not in service, operable; proposed extraction well
*	=	Data were provided by well owners and are different than data provided in EPA's ROD

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Prior to collecting samples, each site assessment, observation or water supply well was pumped until field parameters (i.e., temperature, pH, EC and turbidity) had stabilized and a minimum of three casing volumes had been removed from the well. All field measurements were recorded on well purging forms and are included in Appendix C. For water supply wells that were in operation prior to the sampler's arrival, field parameters were recorded and the sample was immediately collected. For inactive water supply wells that did not have operable motors or where the electricity had been disconnected (in accordance with DHS requirements), Beylik Drilling was contracted by WQA to provide and install all equipment necessary to collect a sample (i.e., temporary motors and/or electricity and discharge piping).

Samples were collected as soon as purging and final measurements of field parameters were complete. Samples were collected through existing access points (e.g., spigots) or from a stainless steel fitting in-line with the discharge piping. To the extent possible, flow rates were reduced at the time of sampling to minimize aeration caused by pumping.

The first quarterly sampling event was scheduled to coincide with sampling round 3 of the newly-installed MP wells. Groundwater samples were analyzed for a comprehensive suite of parameters which included: VOCs, general minerals (i.e., calcium, magnesium, potassium, sodium, chloride, sulfate, carbonate, bicarbonate and hardness), nitrates and nitrites, metals (i.e., aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel and zinc), radon, and total dissolved and suspended solids (TDS and TSS, respectively).

The second and third sampling events were scheduled to coincide with sampling rounds 4 and 5 of the MP wells, which followed approximately three and six months, respectively, after the first quarterly sampling event. Samples collected from Subarea 1 were analyzed for VOCs; whereas, samples collected from Subarea 3 were analyzed for VOCs plus nitrate and nitrite.

Analytical data from the three quarterly rounds of sampling and data that were provided by Watermaster and the well owners are compiled in Section 4 of this report. Copies of the laboratory reports from samples collected by WQA are included in Appendix B of this report.

In addition to water quality sampling, water level measurements were recorded monthly for the site assessment, water supply, observation and existing MP wells. When possible, water level data were collected by the site assessment and the Key Well owners/operators. As with the site assessment wells, purveyors were contacted to obtain monthly water levels for the water supply wells. For the remaining wells in the monitoring program, water levels were measured monthly by WQA, to the extent possible. In some cases, however, monthly static water levels were not obtainable due to the operating status or condition of the well. Piezometric pressures were also monitored on a monthly basis in EPA's MP well by WQA. Static water levels were then calculated using the pressure measurements. Water level data generated during the groundwater monitoring program are compiled in Section 4.

3.1.3 Aquifer Tests

As outlined in the Aquifer Test Plan (CDM, 1995), based on existing well locations and an evaluation of all existing well data, a total of four aquifer tests were performed: three existing water supply wells in the BPOU upper area (Subarea 1) and one currently inactive water supply well in

the lower area (Subarea 3). The following wells were selected for such testing due to their proximity to the existing contamination plume, location relative to proposed extraction, and perforation intervals:

- In Subarea 1, aquifer tests were performed on wells: AZ-2 owned by Transit Mix, Santa Fe No. 1 owned by Los Angeles County and VCWD-08 (Arrow) owned by Valley County Water District. The wells which were monitored during the aquifer tests are W11AZW04, OSCO MW-4 and VCWD-10 (Lante), respectively.

- In Subarea 3, a step drawdown test was performed on VCWD-09 (Big Dalton). No observation wells were available to monitor water level changes produced by pumping in Big Dalton.

Three types of aquifer tests were conducted: step drawdown, constant rate and recovery. Prior to pumping and during pumping and recovery, water levels in pumping and observation wells were monitored using electronic pressure transducers in the pumping well and in adjacent observation wells. Data collected from adjacent wells were used to monitor the effects of drawdown on the system. Data were recorded in a digital format with an automated data acquisition system. Manual measurements were made using an electric water level indicator to calibrate and ensure the accuracy of the transducer readings. Transducer readings were collected on a typical logarithmic progression (e.g., seconds to minutes early in the pumping and recovery periods, to every two hours towards the later stages). Manual measurements were made as frequently as possible in the early stages of pumping and recovery, and every two hours in the later stages. During test pumping, temperature, electrical conductivity (EC), and pH of the discharge water were measured and recorded. The total volume pumped was recorded for each well pumped. The following sections describe the tests conducted at each well.

Near the completion of the constant discharge test at Arrow and Santa Fe No.1, a water sample was collected from the well head for laboratory analysis. The parameters analyzed included VOCs, radon, metals, and general minerals.

<u>Arrow Well</u>

A 72-hour constant discharge test followed by a recovery test was performed at Arrow Well during the period of January 29 through February 1, 1996. The Lante Well, located approximately 100 feet away from the pumping well, was used as an observation well during the test.

<u>Big Dalton Well</u>

Background water levels were monitored for two days prior to the test in order to determine non-pumping water level trends. A step drawdown test was performed on April 1, 1996. The step drawdown test consisted of pumping the well at a constant rate for two hours at each of four different designed flow rates or steps (750, 1,500, 2,250 and 3,040 gallons per minute (gpm)). Pumping rates were measured using a totalizer located approximately ten feet from the well head. The water levels were monitored during the pumping and recovery periods. The average discharge rate for each step, corresponding drawdown and specific capacity values are shown in Section 4.

A constant discharge test was not conducted at the Big Dalton Well because of the high degree of variability in pumping rates for the first 3 to 5 minutes in the step drawdown test when the pump was first turned on. Because the majority of the drawdown occurs in the first portion of the pumping test, the variability in initial pumping would result in unusable data.

Santa Fe No. 1

Aquifer tests were performed using Santa Fe Well No. 1 as the pumping well and Oil and Solvent Recovery Company (OSCO) well MW-4 as an observation well during the time period of February 6 to February 12, 1996. The aquifer test consisted of step drawdown test, followed by a constant discharge test, recovery test and collection of background data.

The step drawdown test was performed on February 6, 1996. The test consisted of pumping the well at a constant rate for one hour at 3 different flow rates (1,532, 1,920, and 2,625 gpm). At the completion of each step, the well was allowed to recover to within 85 percent of the static water level. A 72-hour constant discharge test at a flow rate of 2,700 gpm was performed immediately following the step drawdown test. Water levels were collected prior to, during, and after the test by manual measurement with a water level indicator and also pressure transducers and data logger. In order to evaluate outside influences (e.g., nearby pumping wells, etc.), background water level and barometric pressure measurements were also monitored hourly for a 24-hour baseline period prior to initiating step drawdown testing activities.

AZ-2 Well

Because of the proximity of the AZ-2 well to the proposed extraction area, a pumping test was performed. AZ-2 is used to supply water for the Transit Mix gravel operation, therefore, the pumping tests had to be modified to their pumping schedule and thus short term tests were performed. The short term tests consisted of installing pressure transducers at AZ-2 (the pumping well) and ALR MW-10 (the monitoring well) on February 17, 1996 in order to monitor background water levels. The constant discharge test was delayed because of rain (the gravel operation does not operate during these conditions), therefore one week of background water levels were collected. The short term constant discharge tests were conducted on three consecutive days (February 26th through 28th). Generally the well was pumped at a rate of 1,730 gpm for a period of 12 hours and then allowed to recover until the following morning.

3.2 Disposal of Investigation-Derived Waste

Investigation-derived waste (IDW) generated during field activities included both liquid and solid wastes. The general types of IDW generated included soil cuttings from the installation of eight MP wells, drilling fluids, groundwater generated during aquifer testing, well development and sampling activities, decontamination fluids, disposable health and safety equipment and clothing, as well as other miscellaneous items (i.e., plastic sheeting, empty cement and sand bags, etc.).

Miscellaneous solid waste items were containerized in steel 55-gallon drums and later disposed of directly into solid waste dumpsters. Liquid wastes generated during drilling activities included drilling mud and development water from each well. Groundwater generated during MP zone purging activities was temporarily contained on-site in 55-gallon steel drums. All other liquid

wastes were initially containerized in 20,000-gallon Baker tanks, which were labeled with the materials stored, origin of materials, volume, and date.

At various times throughout drilling activities at each well site, solid and liquid wastes were transported from the well site to a centralized staging area. Liquid wastes were transferred using a vacuum truck from the original Baker tank located at well site to a new storage tank located at the staging area. During transport of liquids to the staging area, a representative from CDM or Beylik escorted the vacuum truck to ensure that the liquids were transferred to the correct Baker tank and that the new storage tank was properly labeled and identified.

3.2.1 Drilling Waste

Soil cuttings were contained in covered roll-off bins. Each bin was labeled with the well identification, depth interval of cuttings, and date generated. As bins were filled, one sample was collected from each roll-off bin. Soil samples representing two roll-off bins were then composited into one sample and submitted for VOC analysis. Generally, VOC results from soil cutting samples were below analytical detection limits.

In addition to VOCs, a total of three composite samples, which represented soil collected from wells MW5-11, MW5-17, and MW5-18, were submitted for metals analyses. The composite samples were analyzed for California Title 26 metals using the waste extraction test (WET) digestion procedure in order to determine the soluble fraction of each metal in the samples. The leachate from each sample was then analyzed using SW-846 methods (EPA Method 6000/7000 series) to determine the soluble concentration of each metal. Analytical results did not show any metals at concentrations greater than the STLC limits.

Based on these analytical results, all soil cuttings generated during drilling activities were transported to Azusa Land Reclamation Company (ALRC) of Azusa, California, for disposal. In total, 710 tons of soil from the eight wells were transported and disposed of at ALRC.

All drilling mud generated from drilling activities was placed in 20,000-gallon Baker tanks. Approximately 150,750 gallons of drilling mud were generated during drilling of the eight wells. Following installation of each well, one composite sample was collected from each Baker tank and submitted to the laboratory for VOC analysis. Analytical results indicated low levels of VOC concentrations (i.e., less than respective MCLs) in several of the samples.

Drilling fluids generated during drilling of wells MW5-03, MW5-05, MW5-11, MW5-13 and MW5-17 were treated at the staging area, following completion of each well, by Sinclair Well Products of Cerritos, California, using a centrifugal process to separate the mud into solids and clear water. After separation was complete, clear liquids from each well site were discharged to the storm drain system. During discharge, field parameters (i.e., pH, temperature, turbidity, EC and chlorides) were monitored and laboratory samples collected to ensure that the quality of the water met discharge requirements imposed by the LARWQCB (LARWQCB, 1991). The solids removal treatment process resulted in elevated chloride concentrations in the treated water from wells MW5-03 and MW5-05. To meet the discharge requirements, hydrant water was used to dilute the treated water prior to discharge into the storm drain. Solids removed from this process were placed in roll-off containers and then transported to ALRC for disposal.

Drilling fluids generated during drilling of wells MW5-08, MW5-15 and MW5-18 were transported to Envirotek, of Arvin, California for disposal. Envirotek is a California non-hazardous waste disposal facility and permitted through Kern County Environmental Health Department.

3.2.2 Development and Purge Water Disposal

In total, 197,040 gallons of groundwater were generated during development activities of the eight MP wells. Following well installation activities at each site, one representative sample was collected from each Baker tank containing development water and submitted to the analytical laboratory for VOC analysis. With the exception of wells MW5-05 and MW5-08, analytical results indicated that development water from the remaining six wells contained concentrations of at least one VOC at levels that exceeded MCLs. Typically, TCE and PCE were the contaminants detected at elevated concentrations in the development water. Based on these results, 130,240 gallons of development water were treated at the staging area using a portable air stripper to reduce VOC concentrations to allowable discharge limits. Following treatment, the development water was discharged to the storm drain system. Development water from wells MW5-05 and MW5-08 did not contain elevated VOC concentrations, therefore, VOC treatment was not required and the water was discharged directly to the storm drain. During discharge of treated and untreated water, representative samples were periodically collected and analyzed for a broad suite of parameters to verify the water met LARWQCB's discharge requirements.

During quarterly groundwater sampling events, purged groundwater from site assessment wells was treated and disposed at the well owner's facilities. Water generated during quarterly sampling of the observation well and inactive water supply wells was containerized in Baker tanks (or 500-gallon poly tank for the observation well) at each well site. Analytical results from each quarterly sampling event indicated that the purge water contained elevated VOC concentrations. Therefore, water generated from these wells was treated with granular-activated carbon to reduce VOC concentrations prior to discharge to the storm drain system. During discharge, a representative sample was collected and analyzed for VOCs to verify the water met LARWQCB's discharge requirements. In total, 212,000 gallons of purge water from quarterly groundwater sampling activities were discharged to the storm drain system.

3.2.3 Aquifer Test Discharge

Large quantities of water were generated during the pumping tests. Two of the wells tested, Arrow and Big Dalton, have well head treatment systems, therefore, the discharge water was treated prior to discharge into the distribution systems. AZ-2 and Santa Fe No.1 do not have an existing treatment system. The Santa Fe No. 1 well was pumped and discharged into a lake via a "rocky river". AZ-2 was being used for the sand and gravel operation during the pumping tests.

3.3 Equipment Calibration and Maintenance

Prior to use, all field equipment was checked and calibrated to verify that it was in good working order. The calibration, maintenance, and operating procedures for all instruments were based upon manufacturer's instructions. All maintenance and calibration operations were documented in the field logbook. General calibration and maintenance procedures that were followed during the field program were provided in the project SAP.

3.4 Sample Handling and Management

The following sections briefly discuss some of the various sample management procedures that were followed during the field activities. Sampling handling and management procedures generally followed those specified in the project SAP. Deviations from the project SAP are also presented in the following sections.

3.4.1 Sample Identification

A coding system was used to identify each sample collected during the field activities. The coding system allowed tracking and retrieval of information concerning a particular sample, and was used to assure that each sample was uniquely identified. Each sample was identified by site number, sample media type, location type or station, and date. The site identification for all samples collected during this investigation was BP, representing the Baldwin Park OU. Codes for sample media type designations were as follows:

GW = Groundwater samples

Quality control (QC) codes were appended to the well number, where appropriate. The following QC codes were used:

P = Performance Evaluation (PE) check
M = Travel Blank (not used)
F = Field Blank
N = Decontamination Rinsate Blank
K = Split (GW samples)

Typical sample identifications are shown below:

Site Number	Sample Media	Well No./Recordation No.	Date
BP-	GW-	MW50203-	072595
BP-	GW-	51902858-	060495

For all MP wells, the last two digits of the well number corresponded to a specific sample port, or depth interval. Sample port designations were determined at the time of MP well installation and were numbered sequentially, with the deepest port designated as -01 and the shallowest port, n. With this numbering system, each sample interval within the MP well was identified as an individual well. The last six digits of each sample indicated the date that the sample was collected. QC codes (i.e., N, F, K, etc.) were appended to the well number in the sample identification. For example, if an equipment decontamination rinsate blank was collected on July 13, 1996 after the collection of a groundwater sample from port 3 of MP well MW5-13, the QC sample was identified as BP-GW-MW51303N-071396.

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3.4.2 Sample Containers and Preservation

Sample preservation, holding time, container, and volume requirements for groundwater samples were summarized in the project SAP. For metals analyses, however, samples were not field filtered as specified in the SAP. Because of the limited sample volume that could be collected from each MP zone, samples collected for metals analyses were placed into unpreserved sample containers and then filtered immediately after receipt by the analytical laboratory. Typically, samples were delivered to the analytical laboratory on the day of sample collection. To keep field protocols consistent throughout the project, samples collected for metals analyses from wells other than MP wells were also collected as unfiltered samples and placed into unpreserved containers.

A second deviation from the SAP was with the collection of samples for radon analyses from the MP wells. Because of the limited sample volume, the sample collection procedure specified in Draft EPA Method 913 (which specifies the collection method for samples collected from water supply wells) was modified for MP wells. Rather than collecting the sample by submerging the sample container inside a larger vessel while the source water overflowed out of the larger vessel, radon samples from MP wells were collected as if they were for VOC analysis. That is, the sample was poured directly from the MP sample cylinders, with as little agitation as possible, into two unpreserved 40-ml glass vials. The vials were filled completely, allowing zero headspace. All containers for groundwater sample collection were procured through the analytical laboratory and were not rinsed before sampling.

3.4.3 Sample Packing and Shipment

All samples collected during this field program were packed and shipped for laboratory analysis in accordance with methods specified in the SAP. Glass sample containers were placed in resealable plastic bags with packing material (i.e., foam dividers) to prevent breakage during shipment. Blue ice or bagged ice were placed in the sample coolers to comply with preservation requirements. A Chain-of-Custody Record was placed in a resealable plastic bag and into the sample cooler. Because the samples were transported directly the laboratory by CDM personnel, in private or company- owned vehicles, the sample coolers were not sealed with strapping tape or custody seals.

3.5 Documentation of Field Activities

Field activities (e.g., well drilling and installation, water quality sampling and field parameter measurements, aquifer testing, etc.) were documented in field logbooks, which were provided for each MP well location and type of activity. Field logbooks were used to record all data collection activities at the site or any deviations from the SAP. Entries were made in pen and erasures were not permitted. If an incorrect entry was made, the data were crossed out with a single line and initialed. Field logbooks were bound and contained water resistant paper with consecutively numbered pages.

3.6 Field Quality Assurance/Quality Control Procedures

Field quality control (QC) samples (i.e., split groundwater samples, equipment decontamination rinsate blanks, field blanks, performance evaluation samples and laboratory QC samples) were collected and handled in accordance with the procedures specified in the project SAP. Blank samples were collected at a target frequency of one blank per day for each parameter. The order of

collection preference was: (1) decontamination rinsate blank; (2) field blank; and, (3) travel blank. Because either decontamination or field blanks were collected each day of sampling, the submittal of travel banks was not required. Equipment decontamination was also performed in accordance with the procedures specified in the project planning document.

All analyses are for the purposes of treatment system design. Therefore, the collection of samples to determine background concentrations was not required for this sampling program. The following sections briefly discuss the field QC program and any deviations from the project SAP. Sample analytical results of field QC samples are compiled in Section 4 of this report.

3.6.1 Duplicate Samples

At a minimum, duplicates of groundwater samples were collected at an approximate rate of 10 percent of the samples collected. Duplicate samples were collected, preserved, packaged, labeled, and sealed in a manner identical to the other samples being collected. Duplicates were collected from wells where moderate levels of contamination were anticipated. Duplicate groundwater samples were collected as splits. For example, a duplicate groundwater sample was collected by splitting the sample between sample containers. In other words, a VOC container for the groundwater sample was filled first, and then a second VOC container was filled, which was considered the duplicate sample. Sample containers for additional groundwater analyses were filled in the same manner. Duplicate samples were analyzed for the same target analytes as the original sample.

3.6.2 Decontamination Rinsate Blanks

Decontamination rinsate blanks were comprised of the final rinse water from decontamination of equipment. The blank was prepared in the field by pouring the appropriate "blank" water through the sampling equipment and into the appropriate sample containers after equipment decontamination. For blanks targeted for organic analyses, laboratory provided organic-free water was used as the "blank" water; whereas, deionized/distilled water was used for the collection of blanks targeted for inorganic analyses. The rinsate blank served as a check to verify the effectiveness of decontamination procedures. A decontamination rinsate blank was collected at a target frequency of one per day. With the exception of radon, decontamination rinsate blanks were analyzed for all target analytes submitted for analysis on that day.

3.6.3 Field Blanks

A field blank consisted of laboratory-provided organic-free water, and was prepared by pouring in the field, the appropriate volume of water from a contaminant-free container into the sample container without contacting sampling equipment. The field blank served to emulate conditions while collecting the groundwater samples and was used to measure possible sample contamination resulting from ambient field/site conditions, such as fugitive dust or vapors. Field blanks were collected during water supply well sampling, when equipment decontamination was not necessary and was submitted to the laboratory for VOC analyses.

3.6.4 Performance Evaluation (PE) Samples

A total of three laboratory performance evaluation (PE) samples were submitted to the laboratory during the groundwater sampling program. PE samples are materials of known composition and concentrations that are prepared by an independent source, which are used to provide a measure of analytical performance and analytical method bias (accuracy). Each PE standard was submitted for VOC analysis and contained analytes that were expected to occur in groundwater at the BPOU. In addition, the PE sample submitted in April 1996 was analyzed for metals and general minerals. PE samples were submitted as double-blind samples to the analytical laboratory. In other words, the PE samples were labeled and identified as if they were typical environmental samples so that the analytical laboratory was unaware when the PE samples were submitted. Results from the PE samples are presented in Section 4 of this report.

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Section 4
Data Presentation and Evaluation

Analytical results and selected field measurement data collected during the period June 1995 through October 1996 are provided in this section. The analytical and field measurement data have been organized into several basic groupings:

- Groundwater analytical results for VOCs (Tables 4-1 through 4-10)
- Groundwater analytical results for Nitrates (Table 4-11)
- Groundwater analytical results for Metals and General Minerals (Tables 4-12 through 4-22)
- Quality assurance sample results (Tables 4-23 through 4-27)
- Well survey data (Table 4-28)
- Groundwater elevation data (Table 4-29)
- Aquifer testing results (Tables 4-30 and 4-31)

Due to the large number, all tables and figures presented in Section 4 have been grouped together and the end of this section.

4.1 Water Quality and Groundwater Elevation Results

Water quality results for the MP wells (eight newly-installed MP monitoring wells and one EPA MP monitoring well), and the Network wells (21 water supply wells, four site assessment wells, and the Key Well) are discussed below. Groundwater elevation results for the MP monitoring wells and Network wells are also discussed in this section.

4.1.1 Water Quality Results

A total of five rounds of water quality samples (i.e., initial, 30-day, and three quarters) were collected from the majority of the MP monitoring wells. Because MW5-08, MW5-15 and MW5-18 were installed towards the end of the project, only two or three rounds of sampling were performed on these wells. Water quality samples were also collected from the majority of Network wells for three quarters (March/April, June/July, and September/October). The following discussion focuses on VOC, nitrate, general mineral water quality results and field quality control sample results. Water quality results are tabulated in Tables 4-1 through 4-21 and Plates 1 through 3. Specifically, the VOC results are found on Tables 4-1 through 4-10 and Plates 1 and 2, the nitrate data is tabulated on Table 4-11 and Plate 3, and the general mineral data are summarized on Tables 4-12 through 4-21. Laboratory data sheets for the quarterly sampling are included in Appendix B. However, the initial and 30-day sampling data sheets are included in the individual well completion reports.

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4.1.1.1 Lateral and Vertical Extent of Groundwater VOC Contamination

The collection of five rounds of water quality data for the MP monitoring wells allows for an evaluation of whether the trends observed during the initial monitoring are persistent or exhibit temporal variation. TCE, PCE, 1,2-DCA and CTC concentrations for the rounds are shown on Plates 1 and 2 next to the respective well location. The maximum contaminant level (MCL) for each constituent is listed on Table 4-1. Graphs showing TCE concentrations versus time for the sampling period are shown on Figures 4-1 through 4-5.

In addition, cross sections showing vertical and lateral trends in TCE, PCE, 1,2-DCA and CTC are shown on Figures 4-6 through 4-17. Contour maps for MCLs and ten times MCLs for TCE, PCE, 1,2-DCA and CTC are illustrated in Figures 4-18 through 4-21. The contour maps were generated using the maximum concentrations for each multiport well. The following discussion is based on the most recent sampling data; September/October 1996.

As shown on Plates 1 and 2 and Figures 4-1 through 4-8, the highest TCE concentrations are located in the northern portion of the OU. The maximum TCE concentration of 1400 µg/l was detected in the shallowest zone (191 feet above MSL, 340-350 feet bgs) in MW5-13, the northern most MP monitoring well in the OU. Moving downgradient (southwest), in the vicinity of MW5-11 and MW5-03, the higher concentrations were detected in the 500 to 600 foot intervals (590 µg/l at 530 to 540 feet bgs [-36 to -46 feet MSL] in MW5-11 and 690 µg/l and 740 µg/l in 510 to 520 [-36 to -46 feet MSL] and 590 to 600 feet bgs [-116 to -126 feet MSL], respectively, in MW5-03). However, TCE concentrations in MW5-17 and MW5-18 were generally lower. TCE concentrations in MW5-17 were generally below the MCL of 5 µg/l in the 540 to 550 (-31 to -41 feet MSL) and 698 to 708 feet bgs (-189 to -199 feet MSL) intervals and range from 130 to 240 µg/l in the 500 to 510 (-6 to -16 feet MSL) and 630 to 640 feet bgs (-136 to -146 feet MSL) intervals in MW5-18. TCE concentrations tend to decrease moving further downgradient as shown on cross section AA (Figure 4-6). As shown on Figure 4-6, which generally follows the axis of the plume, the base of the TCE contamination varies from approximately 700 feet (-170 feet MSL) in the north to approximately 800 feet (-336 to -340 feet MSL) in the vicinity of MW5-03 and MW5-01 to approximately 700 feet bgs (-320 feet MSL) in MW5-15.

Cross section BB, located in Subarea 3, and cross section CC, located in Subarea 1 (Figures 4-7 and 4-8) transect the axis of the plume. Cross section BB shows minor concentrations to the west at the Cal Mat East Durbin Well and MW5-08 (below the MCL in the deepest three intervals, greater than 554 feet bgs [-215 feet MSL]) and just over two times the MCL in the upper interval (380-390 feet bgs [-41 feet MSL]), increasing in the center of the plume to 160 µg/l in MW5-05 (at a depth of 380 feet bgs [-39 feet MSL]) and decreasing again to the southeast to concentrations of 15 µg/l and 0.2 µg/l at Big Dalton and the Suburban 139 well field, respectively.

Cross section CC, in the northern portion of the OU, also transects the plume. TCE concentrations in September were 1 µg/l in the western-most well, Santa Fe 1, increasing to 590 µg/l at a depth of 530 feet bgs (-36 feet MSL) in MW5-11 and then decreasing to 240 µg/l at a depth of 630 feet bgs (-136 feet MSL) in MW5-18 and 2.8 µg/l at the Morada Well to the east.

As discussed in Section 3, MW5-03, MW5-05, MW5-11 and MW5-17 were not purged prior to sampling. Therefore, the initial sampling results for these wells are not believed to be representative of the interval sampled. As shown on Figures 4-1 through 4-5, a comparison of the 30 day sampling results with the first, second and third quarterly sampling results indicates that TCE concentrations vary significantly in some intervals and remain relatively stable in others. Generally, the intervals with the higher concentrations appear to vary more. In the northern portion of the OU, the TCE concentrations in the shallower intervals appear to vary the most (i.e., MW5-13, MW5-17).

PCE concentrations are generally lower than TCE concentrations throughout the OU and follow the same vertical and lateral trends as TCE. However, PCE concentrations in MW5-11 and MW5-17 are generally higher than the TCE concentrations.

As shown on Figures 4-12 to 4-14, the vertical and spatial trends for 1,2-DCA are generally the same as TCE, however, concentrations are significantly lower (ranging from 12 µg/l in MW5-13 [340-350 feet bgs, 191 feet MSL] to non detect).

CTC was detected generally in the lower intervals of the MP monitoring wells. As shown on cross section AA (Figure 4-15), the extent of the CTC contamination ranges from approximately 520 feet bgs (11 feet MSL) in MW5-13 in the north to approximately 600 feet (-110 feet MSL) in MW5-11 and MW5-03 to a maximum depth of approximately 1000 feet (-600 feet MSL) in MW5-01. CTC was also detected at 4.2 µg/l in Well B6D which is perforated from 760 to 1032 feet.

4.1.1.2 Lateral and Vertical Extent of Nitrate Contamination

As mentioned in Section 3, samples collected from wells located in Subarea 3 were analyzed for nitrates during each round of sampling. Whereas, nitrates were analyzed only during the first quarterly round of sampling for samples collected from wells located in Subarea 1. Nitrates were analyzed using EPA Method 300.0 and reported as nitrogen (as N). The state MCL for nitrate (as N) is 10 mg/l. Analytical results from the nitrate analyses for all wells sampled are tabulated in Table 4-11 and illustrated on Plate 3. In addition, cross sections showing vertical and lateral trends in nitrates in March 1996 are shown on Figures 4-22 and 4-23. Figure 4-22 presents cross section AA, which illustrates nitrate concentrations along a northeast/southwest axis in the BPOU; and cross section BB is provided on Figure 4-23, which illustrates nitrate concentrations in Subarea 3, along an east/west axis.

As shown on Table 4-11, nitrate concentrations in each well showed very little temporal fluctuation. This stability is best demonstrated when reviewing data from wells located in Subarea 3, which were sampled at least three times during the monitoring program. Nitrate concentrations measured during each round of quarterly sampling ranged from non-detectable levels to approximately 20 mg/l. The maximum nitrate concentrations were consistently detected in Suburban Water System's (SWS) well 139W1. The greatest nitrate fluctuations were observed in two water supply wells: Glendora 7G and Valley County Water District's (VCWD) well 3 (Morada). Glendora 7G was sampled in March and September 1996 and exhibited nitrate concentrations of 4.5 and 17.7 mg/l, respectively. In the Morada well, a similar trend was observed when nitrate concentrations increased from 2.2 to 13.7 mg/l between March and September 1996. These increases appear to be inconsistent when compared to the stable nitrate trends observed in other wells in the BPOU. In the

shallow portion of the aquifer (i.e, approximately the upper 300 feet), analytical results from the MP wells indicate moderate temporal fluctuations in nitrate concentrations.

Analytical results indicate that the maximum nitrate concentrations are typically observed in the shallowest screened zones, then show a general decrease with depth, which is consistent between rounds of sampling. Although nitrate concentrations generally decrease with depth, the trend is not linear, as shown by data collected from the MP wells.

Trends in the lateral distribution of nitrates are not as apparent. In general, the lateral distribution of elevated nitrate concentrations extends through both the northern and southern sections of the BPOU, with neither area showing a predominant trend. However, analytical results do indicate that the higher nitrate concentrations are typically detected in the eastern portions of both subareas, and then steadily decrease towards the west.

Wells containing nitrates at concentrations that exceed the MCL of 10 mg/l are distributed throughout the OU. During each round of sampling, four wells consistently displayed nitrate concentrations greater than the MCL. Three of the wells are located in Subarea 3, the southern portion of the OU. As mentioned previously, SWS well 139W1 had the highest concentrations and is located in the south central portion of Subarea 3. It should be noted, however, that this well has a very shallow perforated interval (120-349 feet bgs), which typically result in higher concentrations. Other wells in the same well field (i.e., SWS 139W4 and 139W5) that are screened in the deeper zone, do not exhibit nitrate concentrations above the MCL. Other wells in Subarea 3 that have consistently contained elevated nitrates include MP well MW5-05 (zone 4, the uppermost zone), located to the northwest of the SWS well field, and San Gabriel Valley Water Company (SGVWC) well B6C, which is located in the southwestern portion of the OU.

To the northeast, in Subarea 1, the Transit Mix water well AZ-2 (also referred to as ALRC MW-4) has consistently contained nitrate concentrations above the MCL. In addition, the most recent data from September 1996 indicate significant nitrate increases in the Morada and Glendora 7G wells, as discussed previously. Because these increases were significant, historical data were reviewed to determine if the elevated nitrate concentrations were consistent with previous results. Based upon the data review, both wells have historically contained nitrate concentrations that exceed the MCL. Therefore, it appears that the initial nitrate data collected in March 1996 were atypical and not representative of actual conditions.

4.1.1.3 General Mineral Water Quality

As discussed in Section 3, samples were collected from each well during the first quarterly groundwater sampling event and were analyzed for a comprehensive suite of parameters including general minerals (i.e., calcium, magnesium, potassium, sodium, chloride, sulfate, carbonate, bicarbonate and hardness), metals (i.e., aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel and zinc), radon, and total dissolved and suspended solids (TDS and TSS, respectively). These data were collected for treatment system design purposes and are tabulated in Tables 4-12 through 4-21. Table 4-22 summarizes these data and presents maximum, minimum and mean concentrations for each of the metal and general mineral constituents, and are organized according to subarea. Laboratory reports are included in Appendix B.

Metals were typically detected at very low concentrations, if detected at all. However, there were a few instances, as shown on Table 4-22, where the concentrations of some metals exceeded their respective primary or secondary MCLs. The MCL exceedances were more common in the northern portion of the OU, Subarea 1, than in Subarea 3, where the only metal detected at concentrations greater than the MCL was iron. With the exception of barium, there were no apparent trends in the vertical distribution of the metals. Based on data collected from the MP wells, there was a general decreasing trend in barium concentrations with depth.

General mineral analyses indicated that cations (calcium, magnesium, potassium and sodium), chloride, sulfate, alkalinity (bicarbonate and carbonate), TDS and hardness all followed the same general trends in lateral distribution as the metals, where the highest concentrations were detected in Subarea 1. The only exception was with nitrates and nitrites. As discussed in the previous section, the maximum concentrations of nitrates, as well as nitrites, were detected in Subarea 3. Based on data collected from the MP wells, the highest concentrations of most of the general mineral constituents were typically detected in the shallowest zones (i.e., upper 300 feet of the aquifer). In Subarea 1, concentrations of sodium and sulfate appeared to independent of depth; and in Subarea 3, no apparent trends in sodium and potassium concentrations relative to depth were observed.

Analytical results indicated that radon concentrations ranged from 39 to 395 picoCuries per liter (pCi/l). The highest concentrations were detected in Subarea 1; samples collected from three wells in this subarea contained levels that exceed the proposed federal MCL of 300 pCi/l. Radon concentrations did not appear to be dependent upon depth.

4.1.1.4 Field Quality Control Samples

The following sections present the analytical results from field QC samples that were collected during the groundwater monitoring program. Laboratory reports are included in Appendix B and the analytical results are tabulated in Tables 4-23 through 4-27.

Duplicate Samples

At a minimum, duplicates of groundwater samples were collected at a rate of approximately 10 percent of the samples collected. Duplicate samples were collected, preserved, packaged, labeled, and sealed in a manner identical to the other samples being collected. Duplicates were collected from wells where moderate levels of contamination were anticipated and were analyzed for the same target analytes as the original sample.

Duplicate sample analysis provide a measure of precision, or mutual agreement, among individual measurements of the same property, usually under prescribed similar conditions. Precision of reported results is a function of sample homogeneity, inherent field-related variability, shipping variability, and laboratory analytical variability. Field duplicate samples provide a measure of the contribution to overall variability of field-related and to some extent laboratory-related sources.

Precision is best expressed in terms of the standard deviation around the mean or relative percent difference (RPD) between two samples. The RPD between duplicate sample results is calculated using the following equation:

$$RPD = (D_1 - D_2)/[(D_1 + D_2)/2] \times 100$$

where:

RPD=Relative Percent Difference
D_1=First sample value
D_2=Second sample value (duplicate)

Analytical results for the duplicate samples are shown next to the original sample results, which were presented previously in Tables 4-1 through 4-21. In addition, duplicate and original sample results for several of the target VOCs are summarized in Table 4-23, and duplicate sample results for the metals and general mineral analyses are tabulated in Table 4-24. Also shown on these tables, are the RPDs between the original and duplicate samples.

As indicated in Table 4-23, original and duplicate sample results, in general, agree very well with each other. The RPD values demonstrate this agreement and are typically less than 20 percent. There are some sample results, however, where the RPD values are greater than 20 percent. Although the RPD values were elevated in these instances, the original and duplicate results were within the same order of magnitude, which indicates reasonable agreement between the results, and the differences were most likely the result of variability between samples due to field-related and/or laboratory-related sources.

Duplicate analytical results from the metals and general minerals analyses are presented in Table 4-24. In general, the RPD values for the general mineral analyses were very low, indicating that the reproducibility between the original and duplicate samples was within acceptable limits.

Conversely, several of the RPDs for some of the metals exceeded the acceptable limit of 20 percent. In particular, the RPD between the original and duplicate samples for iron, manganese and zinc analyses were high. Based upon a review of the laboratory quality control results (i.e, matrix spike, matrix spike duplicates and laboratory control samples), which were within acceptable limits, the higher RPD values do not appear to be the result of matrix interferences. Because the majority of the iron, manganese and zinc sample results were very low (i.e., less than five times the detection limits), which causes the RPD values to be amplified, the higher RPD values were not considered to be significant.

Equipment Decontamination Rinsate Blanks

Decontamination rinsate blanks were obtained from the final rinse water after decontamination of equipment and were prepared in the field by pouring the rinse water through the sampling equipment and into the appropriate sample containers. Decontamination rinsate blanks were collected each day that samples were collected from MP wells and, with the exception of radon, were analyzed for all target analytes submitted for analysis on that day. When possible, equipment

blanks were collected following sampling of zones with moderate contamination to determine the effectiveness of the decontamination process.

Analytical results from the equipment blank samples are presented in Tables 4-1 through 4-21. In addition, equipment blank results for VOCs are summarized in Table 4-25. As shown in Table 4-25, the majority of VOC detections are from volatile aromatic hydrocarbons (e.g., benzene, toluene, xylenes, etc.), which are most likely the result of using a gasoline generator on-site during sampling.

Several chlorinated VOCs were also detected in the equipment blanks; however, very infrequently and generally at trace concentrations. The most frequently detected chlorinated VOC was methylene chloride, which is a common laboratory contaminant. Therefore, the detection of methylene chloride was not considered significant. TCE was also detected in several of the equipment blanks. Upon comparison of environmental sample results to equipment blank results, it was determined that all environmental samples that were collected after the equipment blanks with detected TCE, also contained TCE. However, the TCE concentrations in the environmental samples were greater than five times the concentrations detected in the respective equipment blanks. Therefore, the TCE detections in the equipment blanks are considered insignificant and do not adversely affect the environmental data.

Field Blanks

Field blanks consisted of organic-free water, and were prepared by pouring in the field, the appropriate volume of water from a contaminant-free container into the sample container without contacting sampling equipment. Field blanks served as a measure of sample contamination resulting from ambient field/site conditions, such as fugitive dust or vapors, and were collected during water supply and site assessment well sampling. Field blanks were submitted to the laboratory for VOC analyses. Laboratory results from field blank analyses are summarized in Table 4-26.

As shown in Table 4-26, the most frequently detected contaminant in the field blank samples was methylene chloride. Upon review of environmental sample results that were collected at the same time as the field blanks, methylene chloride was also detected in each of the samples; however, at concentrations less than five times the field blank concentrations. Because methylene chloride is a common laboratory contaminant, the detections of this compound were most likely the result of laboratory activities and were therefore not considered significant.

The next most frequently detected contaminant in the field blanks was toluene. As with methylene chloride, the detectable concentrations of toluene in the environmental samples were less than five times the field blank concentrations. Therefore, the toluene detections in the environmental samples were most likely the result of field-related and/or laboratory-related activities and were qualified as non-detectable concentrations.

Low levels of two target compounds, TCE and PCE, were detected in several of the field blanks. Upon review of environmental sample results that were collected at the same time as the field blanks, TCE and PCE were also detected in each of the samples, at concentrations greater than five

times the field blank concentrations. Therefore, the field blank concentrations were considered insignificant when compared to the concentrations detected in the samples.

In addition, naphthalene, 1,2-DCA and chloroform were each detected once in the field blank results. Neither 1,2-DCA nor naphthalene were detected in the corresponding environmental samples. Therefore, the detection of these two compounds did not affect the environmental sample results. Chloroform was detected in the environmental sample at a concentration greater than five times the concentration detected in the field blank. The detection of chloroform in the field blank was negligible compared to the concentration detected in the environmental sample.

Performance Evaluation (PE) Samples

A total of three performance evaluation check samples were submitted blind to the laboratory as a way to measure analytical performance and analytical method bias (accuracy). Each PE standard was certified to contain five or six VOCs. The second PE sample was also prepared and analyzed for general minerals and metals. The first two PE samples were submitted to Thermo Analytical, of Santa Ana, California, for analysis; the third PE sample was analyzed by Quanterra Analytical Services, of Santa Ana, California. Analytical results from the PE samples are summarized in Table 4-27.

As shown in the table, the first PE sample was submitted in October 1995, at the beginning of the field activities, and contained six VOCs. Analytical results indicated that four of the VOCs, 1,1-DCE, cis-1,2-DCE, 1,1,1-trichloroethane (1,1,1-TCA) and trichlorotrifluoromethane, were within the acceptable advisory ranges. However, TCE and PCE were detected at concentrations outside of the acceptable advisory ranges. The laboratory reported both compounds at concentrations that were 65 percent of the certified concentration, which is slightly lower than the acceptable advisory limit of approximately 75 percent for these compounds.

The second PE sample was submitted in April 1996 and contained five VOCs that had been frequently detected in earlier environmental samples. These five compounds included CTC, 1,2-DCA, cis-1,2-DCE, TCE and PCE. Analytical results indicated that each compound was detected at a concentration that was within the acceptable advisory range. However, three compounds (chloroform, trans-1,2-DCE and methylene chloride) not included in the PE standard were also detected in the sample. Analytical results from other samples submitted with the PE standard on the same day did not contain chloroform or trans-1,2-DCE. Therefore, it does not appear that the laboratory reported false positive detections for these two compounds. Methylene chloride was detected in the laboratory's method blank and was reported as such.

In general, the laboratory performed relatively well with the metals and general minerals analyses. Analytical results for the metals analyses indicated that, with the exception of aluminum and chromium, all metals in the PE standard were reported at concentrations within the advisory ranges. The laboratory reported a non-detectable concentration (less than 0.0437 mg/l) for aluminum, which was lower than the certified concentration of 0.229 mg/l; and chromium was reported at a concentration of 0.334 mg/l, which exceeded the upper advisory limit of 0.284 mg/l. With the exception of sulfate, TSS and hardness, all general minerals were reported at

concentrations within the advisory ranges. Each of these three constituents were reported at concentrations lower than the acceptable limits.

The third PE sample was analyzed for the same VOCs as the second PE sample; however, the standard was prepared to contain the five compounds at significantly lower concentrations (i.e., approximately 5 µg/l). Analytical results indicated that four of the VOCs (i.e., 1,1-DCE, cis-1,2-DCE, 1,1,1-TCA and trichlorotrifluoromethane) were within the acceptable advisory ranges. CTC was detected at a concentration of 3.0 µg/l, which was slightly less than the acceptable lower limit of 3.08 µg/l. The certified value was 4.22 µg/l. A trace concentration of methylene chloride was also detected in the PE sample, which was most likely the result of laboratory activities.

4.1.2 Groundwater Elevations

As discussed previously in Section 3.1.1.5, the elevations of the MP monitoring wells were surveyed after the wells were installed. The survey results are compiled in Table 4-28. Groundwater elevations for the newly-installed MP monitoring wells and Network wells are compiled in Table 4-29. Groundwater contours for quarterly measurements for MP monitoring wells and Network wells during the March/April, June/July and September/October sampling periods are illustrated in Figures 4-24 through 4-26, respectively. The water supply wells are generally perforated from 300 to 500 feet bgs. Therefore, because the water levels in the different ports in the MP monitoring wells differ somewhat, only one port was used to designate the water level for each multiport well in generating the contour maps. This port generally corresponded to the nearby water supply well perforation interval.

As indicated by the figures, the groundwater flow direction in the Baldwin Park area during the six-month period was generally towards the west-southwest in the northern portion of the OU and to the southwest in the central to southern portion of the OU based on the available data. Based on this six month period, the data indicate minor variations in groundwater flow in the northern portion of the OU due to seasonal influences.

Evaluation of the most recent groundwater elevation data (i.e. September/October, Figure 4-25) indicates that the horizontal hydraulic gradient generally ranged from 8 feet per mile in the northern portion of the OU to approximately 5 feet per mile in the southern portion of the OU, and was generally oriented southwest.

Cross sections with water elevations for each well are shown on Figures 4-27 through 4-35 for three quarters (March/April, June/July, and September/October). Generally the vertical gradients were minimal, however, there appears to be a slight downward gradient in most of the MP monitoring wells. During the March/April monitoring period the difference in water levels between the upper and lower screened intervals (ports) varied from 0.3 feet in MW5-17 to 3.1 feet in MW5-05. The head differences during the June/July monitoring period varied from 0 feet in MW5-17 to 2.6 feet in MW5-05. The September/October head differences varied from 0 feet in MW5-18 to 1.6 feet in MW5-05. These trends are also shown on the hydrographs of the MP monitoring wells and Network wells (Figures 4-36 through 4-40).

MW5-03, MW5-05, MW5-11, and MW5-17, which were installed earlier in the project, exhibited the same temporal trends. Water levels decreased approximately 12 to 17 feet during the period from August 1995 through March 1996 at which time the water levels remained relatively stable (i.e. only fluctuating a maximum of 5 feet) during the period from March to September 1996.

4.2 Data Validation Results

Formal data validation was performed following the guidelines in USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 1994), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 1994), all applicable methods, and the project QAPP and SAP, on approximately 10 percent of the laboratory data generated during the groundwater monitoring program. Technical staff from CDM who were experienced in validation procedures performed the data review. The data validated were selected to obtain a review of all new data generated during the program and to provide an evaluation of all types of analytical results. For example, data packages were selected to include samples from both MP wells and water supply wells, from each quarterly sampling event, and from a wide variety of analyses. Analytical data obtained from well owners or from Watermaster were not validated. The project QAPP specified that if the 10 percent review indicated significant quality problems, that additional data validation would be subsequently performed. Significant quality problems were not encountered so additional validation was not performed.

A total of eight CLP-like data packages were reviewed and validated, which corresponds to two data sets (approximately 10 percent) from each quarterly sampling event. Based on the data review, summary validation reports were prepared and submitted under separate cover to EPA, which presented the results of the validation. Summary validation reports from the eight data packages are included as Appendix D.

Data qualifiers resulting from validation were added to the electronic database, which was periodically updated and provided to EPA. Qualifiers were only applied to data that had been validated and followed the general format specified in Appendix G of the project SAP. Data were considered valid and acceptable except for those analytes that were qualified with a "J" (estimated), "U" (non-detects), "UJ" (non-detect with an estimated detection limit), or "R" (unusable). The "R" qualifier meant that the associated value was unusable. In other words, due to significant QC problems, the analysis was invalid and provided no information as to whether the compound was present or not. Results qualified with an "R" did not appear on data tables because they could be relied upon, even as a last resort. Results qualified with a "J" were estimated; however, this did not necessarily indicate that the data were unusable.

4.3 Aquifer Testing Results

Data from the pumping tests conducted in the BPOU were analyzed to develop estimates of aquifer hydraulic properties in the region. These pumping tests address the ROD requirements of obtaining ancillary data, including hydraulic conductivity measurements and measurements of other aquifer properties. These data assist in the accurate determinations of groundwater flow, and in evaluating the effectiveness of the proposed remedial actions.

Data were analyzed by applying analytical methods based on Theis assumptions to estimate transmissivity and hydraulic conductivity values. Aquifer storage properties were also estimated. Data were taken using manual water level readings and a Hermit data logger with a pressure transducer for automated readings. Pumping rates were measured using a flow totalizer. Pumping test data are included on diskettes in Appendix E.

4.3.1 Arrow Well

A 72 hour constant rate discharge test was conducted at the Arrow Well, 1900034, which is screened from 300 to 524 feet bgs. The Lante Well, 8000060, which is screened from 275 to 577 feet bgs was used as an observation well. The Lante Well is located approximately 100 feet from the Arrow Well.

As shown on Figure 4-41, after approximately 10 minutes of pumping the drawdown decreased rapidly. This was a result of an abrupt change in pumping rate due to a change in discharge conditions. The well pumped initially into a reservoir. Once the reservoir was full the well started pumping into the distribution system. The change in pressure caused the pumping rate to change. For the remainder of the test, the discharge rate varied a maximum of 5 percent which probably was a result of changes in demands on the distribution system. The average rate during the test was 3,425 gpm.

Semi-log plots of the drawdown data at the Arrow and Lante wells are shown in Figures 4-41 and 4-42. Because of the fluctuations in the pumping rate, the data at the Arrow pumping well were not analyzed.

The drawdown data at the Lante observation well were analyzed using a Cooper-Jacob approach. Fluctuations apparent in the pumping well data are somewhat damped out at the observation well, and the observation well data plots in a fairly straight line. Analysis of the later time data yields an estimate of transmissivity of 323,672 ft^2/day. The saturated thickness of the aquifer at the Lante well is approximately 1,100 feet and the screened interval is 300 feet, which yield an estimate of hydraulic conductivity ranging from 300 to 1,100 ft/day. The estimated storage coefficient is 0.0014. This value is consistent with the response of a confined aquifer, indicating some degree of isolation from the water table of the portion of the aquifer stressed and monitored during this test.

Analysis of the recovery data at the pumping and observation wells also follows a Cooper-Jacob method (Figures 4-43 and 4-44). Just as the time-drawdown curve for the pumping period of a test will form a straight line when plotted on a semi-logarithmic diagram, the same simplification also applies to the recovery period of a test. Residual drawdown, the static water level minus the observed water level after pumping has stopped, plotted versus t/t', the ratio of the time since pumping started, t, to the time since pumping stopped, t', will also plot in a straight line. The analysis at the two wells yields estimates of transmissivity of 299,480 and 598,960 ft/day, producing estimates of hydraulic conductivity from 270 to 2,675 ft/day, based upon both the screened interval of the pumping well (225 feet) and the aquifer thickness. Recovery data at the pumping well shows an initial inertial recovery above the static water level. This response may also have been transmitted to the observation well. Therefore, the analysis is performed on the data subsequent to this response.

After the pumping well had been allowed to recover, a 35 minute pumping test was conducted at the Arrow Well while the well pumped only into the reservoir. The pumping test was restarted in an effort to capture the initial drawdown in the well, which responds in a matter of seconds to the initiation of pumping. A semi-log plot of the drawdown data at the Arrow pumping well indicates these data were again not amenable to analysis (see Figure 4-45).

A semi-log plot of the drawdown response at the observation well can be analyzed using the Cooper-Jacob method. The plot shown in Figure 4-46 does not plot in a straight line, thereby not conforming to the assumptions of this analysis. The plots of recovery data at both the pumping well and the observation well, in Figures 4-47 and 4-48, again show a large initial inertial response. Estimates of transmissivity from the recovery data range from 434,900 to 652,337 ft^2/day.

In summary, for both of these tests, the 72 hour constant rate discharge and the 35 minute restart, the most reliable data appears to come from the recovery phase of the tests. Drawdown data taken during the pumping phase of the tests are erratic, possibly impacted by pumping rate changes resulting from changing distribution system demands, and exhibit only relatively small changes in incremental drawdown after the initial drawdown response, therefore limiting their usefulness in estimating aquifer hydraulic properties. The more reliable estimates of transmissivity range from 300,000 to 650,000 ft^2/day, and based upon an aquifer saturated thickness of 1,100 feet and a screened interval of 225 feet, lead to estimates of hydraulic conductivity of 270 to 2,900 ft/day.

4.3.2 Santa Fe Well #1

A step-drawdown test, followed by a 72 hour constant rate discharge test was conducted at Santa Fe Well #1, 8000070, which is screened from 290 to 435 feet bgs. Osco MW-4, W110SMW4, was used as an observation well. It is screened from 230 to 310 feet bgs, and is located approximately 1,600 feet from Sante Fe #1. The step test consisted of 3 one-hour pumping periods, at rates of approximately 1400, 1900, and 2600 gpm, respectively, followed by 30 minute recovery periods. After the third recovery a 72 hour constant rate discharge test was conducted.

A semi-log plot of the drawdown data at the Santa Fe pumping well (see Figure 4-49) produces an estimate of transmissivity of 158,548 ft^2/day. A semi-log plot of the drawdown data at the Osco MW-4 observation well oscillates up and down, as shown in Figure 4-50. Another well cycling on and off may be influencing the water level at this well. Using a Cooper-Jacob method, estimates of transmissivity and the storage coefficient are 172,961 ft^2/day and 0.063. However, the distance to the observation well and the duration of the test may be outside the accepted ranges for these parameters, for the straight-line analysis.

The recovery data at the pumping well yield an estimate of transmissivity of 136,195 ft^2/day after an initial inertial response (Figure 4-51). The recovery data measured at the observation well are very erratic, and cannot be analyzed using the Cooper-Jacob method (Figure 4-52). Based upon the transmissivity estimates at the Santa Fe pumping well, a saturated aquifer thickness of approximately 760 feet in this area, and a screened interval length of 145 feet at Santa Fe Well #1, hydraulic conductivity estimates range from 180 to 1,100 ft/day.

4.3.3 AZ-2 Well

Three shorter duration tests were conducted at well AZ-2, 11900038, which is screened from 350 to 614 feet bgs. Each pumping test was run for approximately 11 hours with pumping at a rate of 1,700 gpm. The well was allowed to recover overnight following each test. Drawdown and recovery data were recorded at both the pumping well and at the observation well, ALR/TMC MW-10, which is screened from 282 to 482 feet bgs, and is located approximately 1300 feet from the pumping well.

Using the later time portion of the drawdown curve at the pumping well (see Figures 4-53 through 4-55), estimates of transmissivity are 409,000, 470,000 and 514,000 ft/day, respectively. The recovery data at the AZ-2 pumping well for the three tests yield estimates of transmissivity ranging from 510,000 to 810,000 ft^2/day (see Figures 4-56 through 4-58).

The estimates of transmissivity from the MW-10 observation well drawdown and recovery data range from 700,000 to 900,000 ft^2/day. The drawdown data from the observation well demonstrates an odd behavior at the end of each of the three tests. The slope of the drawdown curve shifts dramatically during the latter portion of the test, as seen in Figures 4-60 and 4-61. A slight shift is less apparent for pumping test 1, as seen in Figure 4-59. These shifts may be indicative of a boundary effect of an impervious boundary. Estimates of the storage coefficient from the observation well data are approximately 0.001.

Based upon the estimates of transmissivity from the pumping well data, a saturated thickness of approximately 700 feet at this point in the aquifer and a screened interval length of 265 feet, hydraulic conductivity is estimated at 590 to 3,000 ft/day.

4.3.4 Big Dalton Well

A step-drawdown test was performed at the Big Dalton well, 1900035, which is screened from 254 to 587 feet bgs. The step-drawdown tests consisted of 4 steps, each lasting 2 hours. The pumping rates for each of the steps were 750, 1,500, 2,250 and 3,040 gpm, respectively. There was no recovery period between the steps. Recovery data was collected for a period of 15 hours, after the final step was completed.

The specific capacity of the well can be calculated by dividing the pumping rate by the drawdown. An approximate transmissivity can then be estimated using the formula:

$$T = SC*2000 \text{ (Driscoll, 1986)}$$

where,

T = transmissivity (gpd/ft), and
SC = Specific Capacity (gpm/ft)

This calculation ignores well diameter, well efficiency, and pumping duration, as well as specific local aquifer conditions because it is developed based upon generalized aquifer conditions.

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Table 4-30 displays the specific capacities calculated from the step-drawdown data after 120 minutes of pumping for each step, and the estimated transmissivities.

The thickness of the saturated aquifer at this location is approximately 1,600 feet. The length of the screened interval at the Big Dalton wells is 330 feet. This leads to estimates of hydraulic conductivity ranging from 60 to 335 ft/day, somewhat lower than values estimated from the other tests. Hydraulic conductivities estimated from specific capacities may be inaccurate because they neglect the particular characteristics of the well and the test.

A semi-log plot of the recovery data depicting t/t′ versus residual drawdown does not yield a straight line from which to estimate transmissivity (Figure 4-62). The data may have been influenced by the initial slug of water which entered the aquifer from the well casing and surface piping immediately after pumping was discontinued.

4.3.5 Summary of Results

During each of the pumping tests the aquifer in the BPOU area exhibited an almost immediate response to the assumption and cessation of pumping stresses. Aquifer transmissivities estimated from the pumping tests range from 140,000 to 900,000 ft^2/day. Hydraulic conductivity estimates based upon Cooper-Jacob analyses range from 200 to 3,000 ft/day. These estimates are generally consistent with the highly permeable materials located in this section of the San Gabriel Basin. This range of estimates is also comparable to, if somewhat higher, than the hydraulic conductivity values simulated in the groundwater model in this section of the basin (see Section 5). The estimates of the storage coefficient range from 0.001 to 0.063. A summary of the aquifer test results is presented in Table 4-31.

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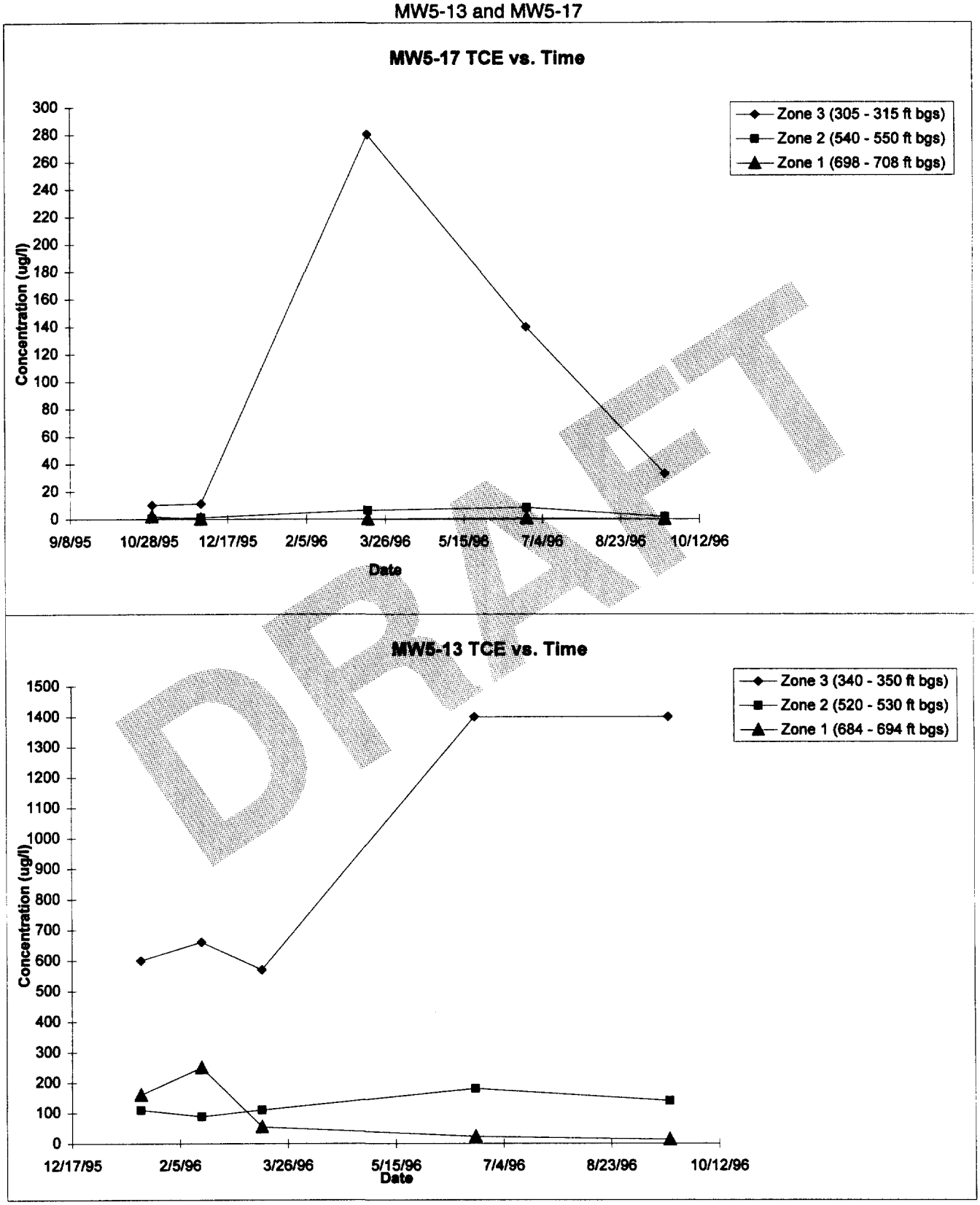
Figure 4-1
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well
TCE Concentration vs. Time
MW5-13 and MW5-17



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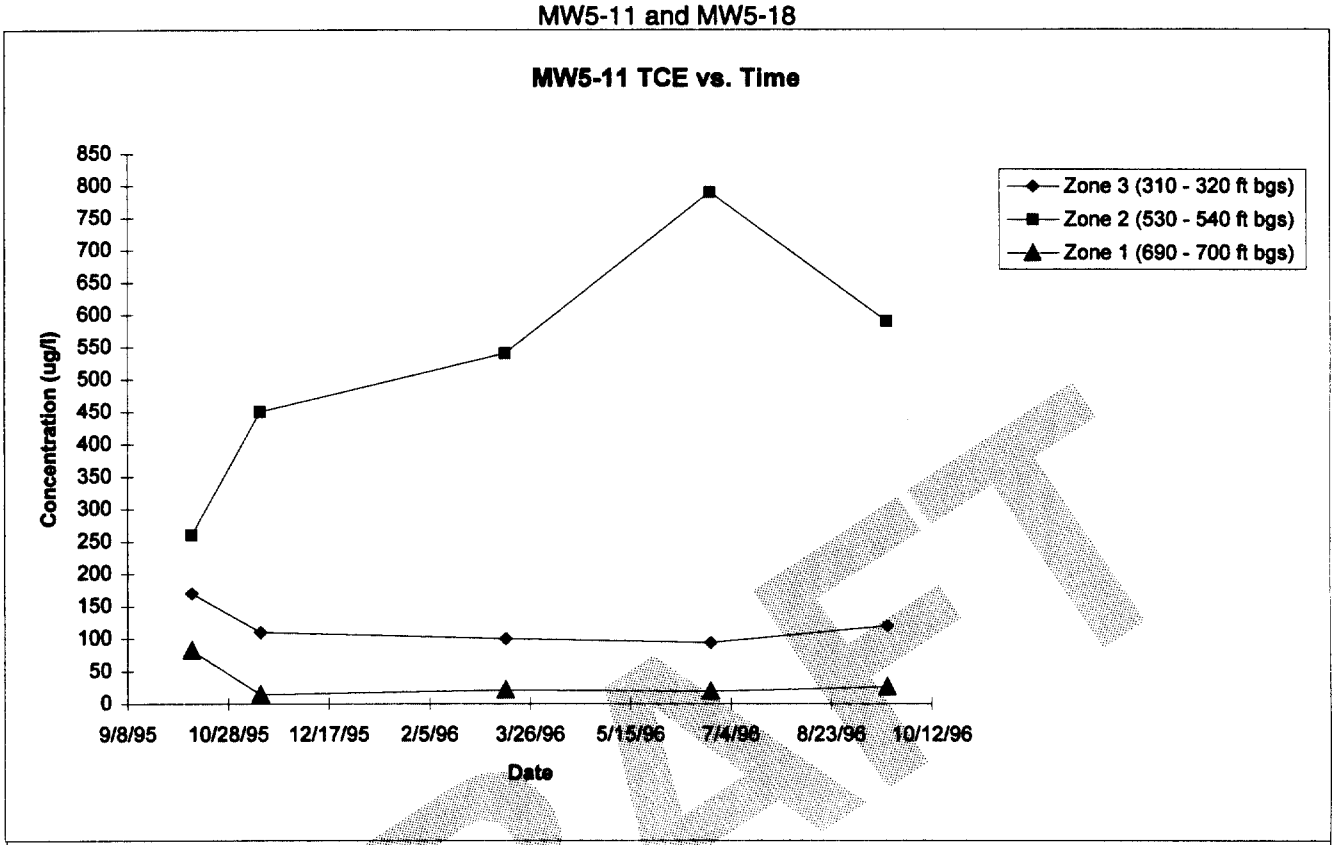
CDM Camp Dresser & McKee
j:\2851-112\sprdshts\Tceconc.xls
9/4/97

Figure 4-2
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well
TCE Concentration vs. Time
MW5-11 and MW5-18



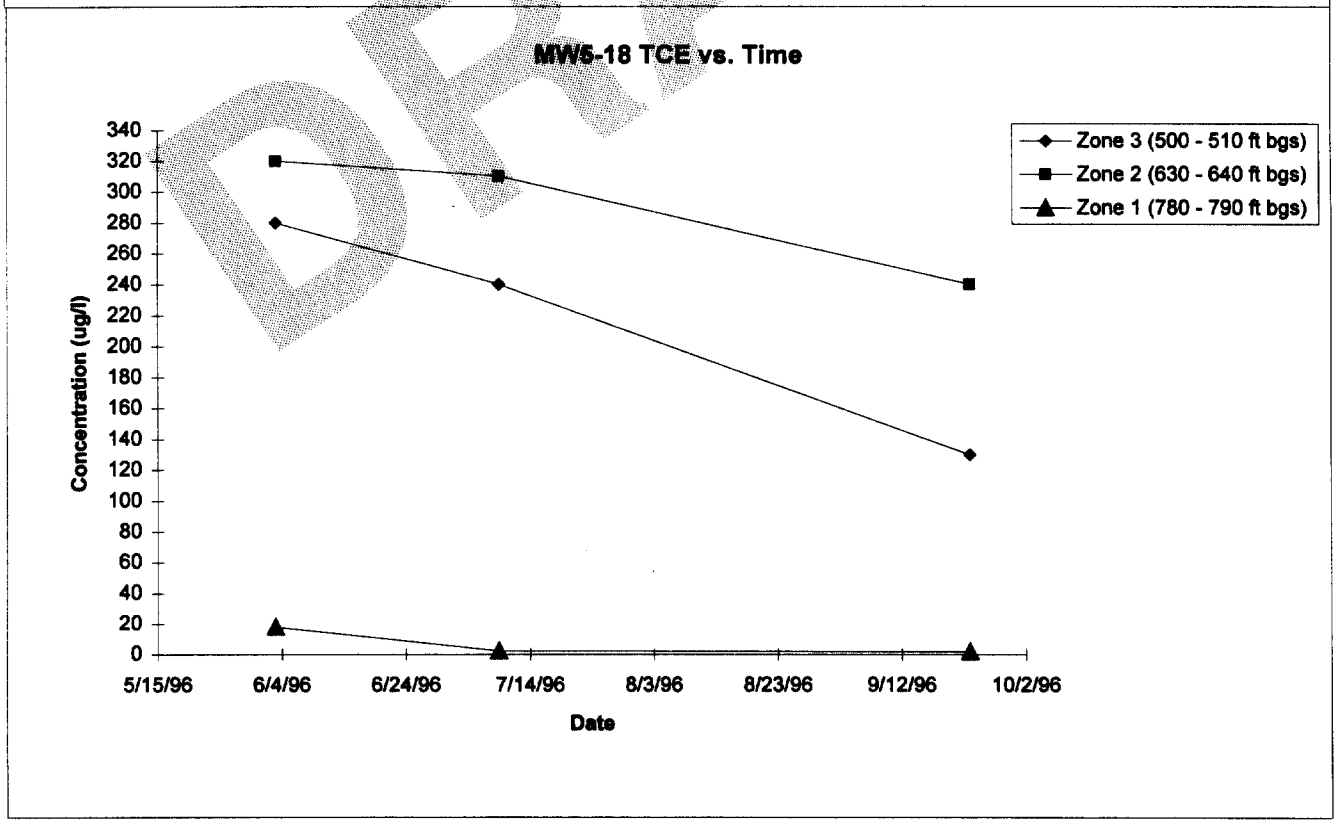


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Figure 4-3
Baldwin Park Operable Unit Pre-Remediation Design
Groundwater Monitoring Well
TCE Concentration vs. Time
MW5-01 and MW5-03

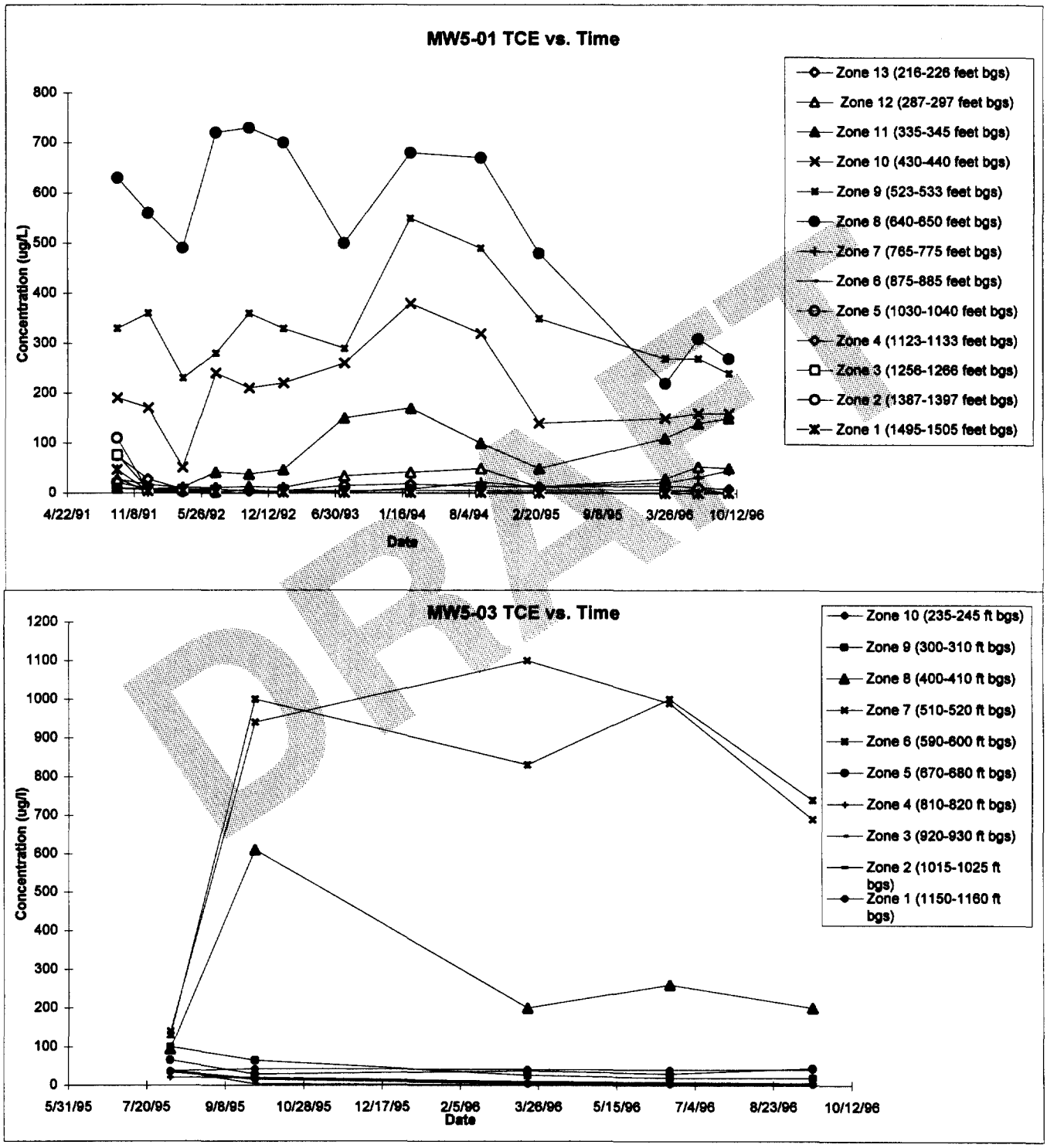

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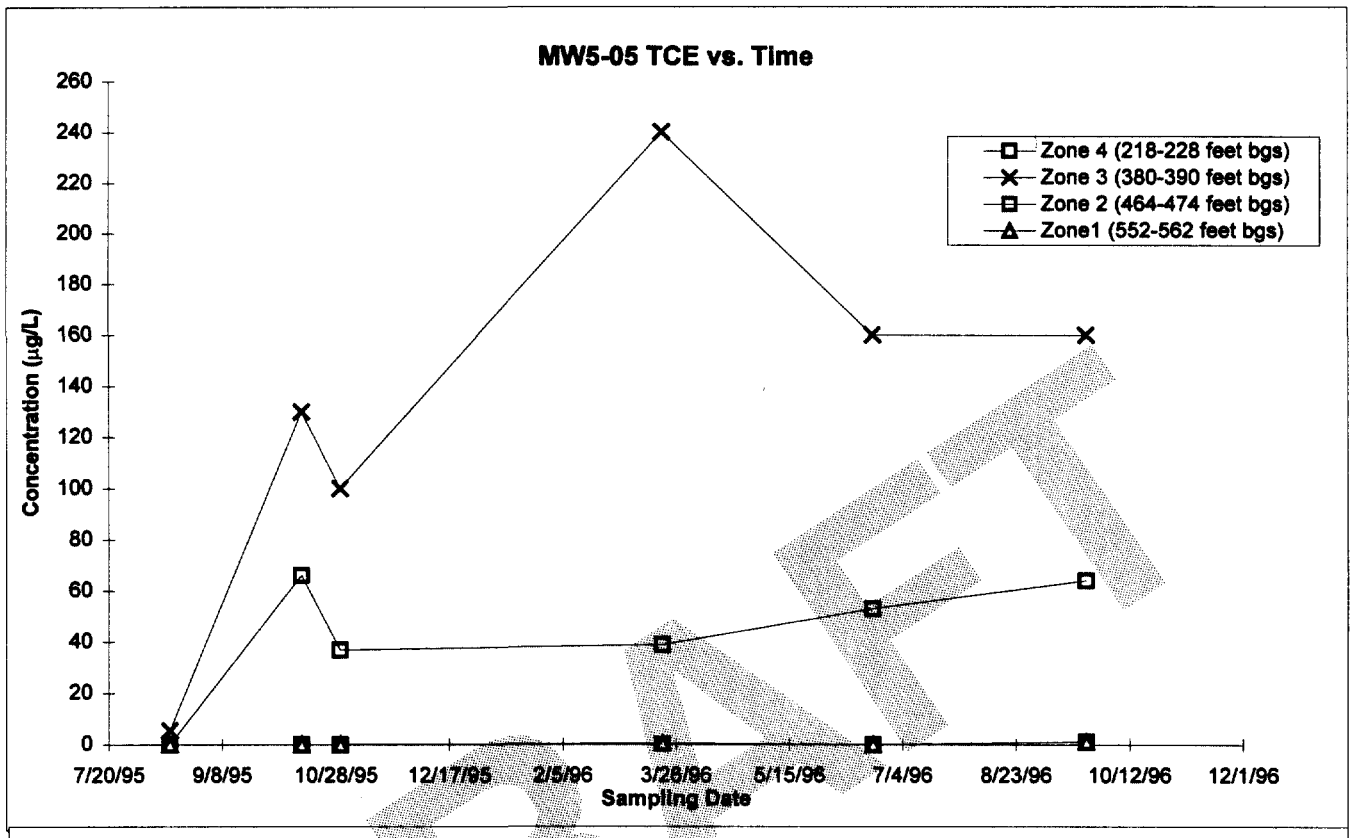
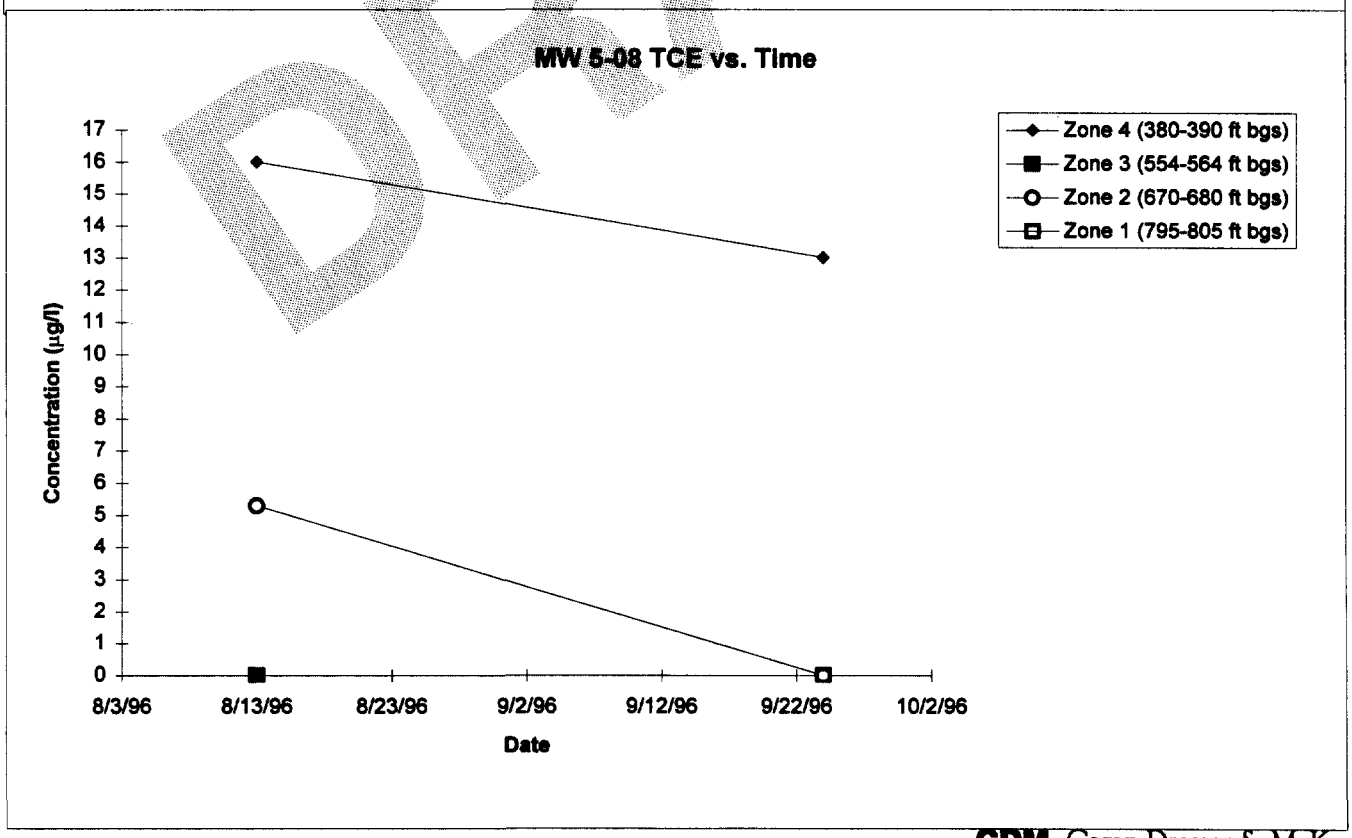
Figure 4-4
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well
TCE Concentrations vs. Time
MW5-05 and MW5-08





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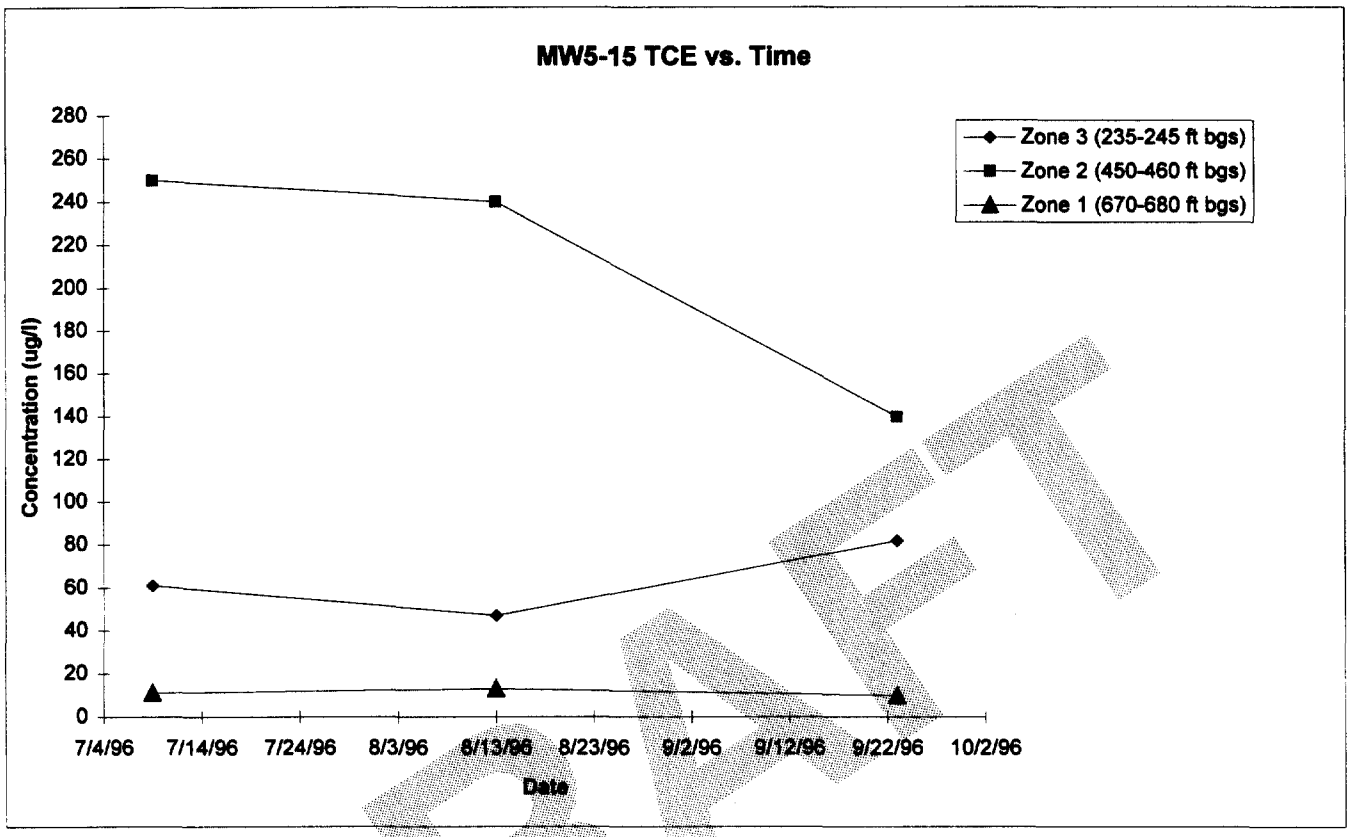
9/4/97

Figure 4-5
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well
TCE Concentrations vs. Time
MW5-15



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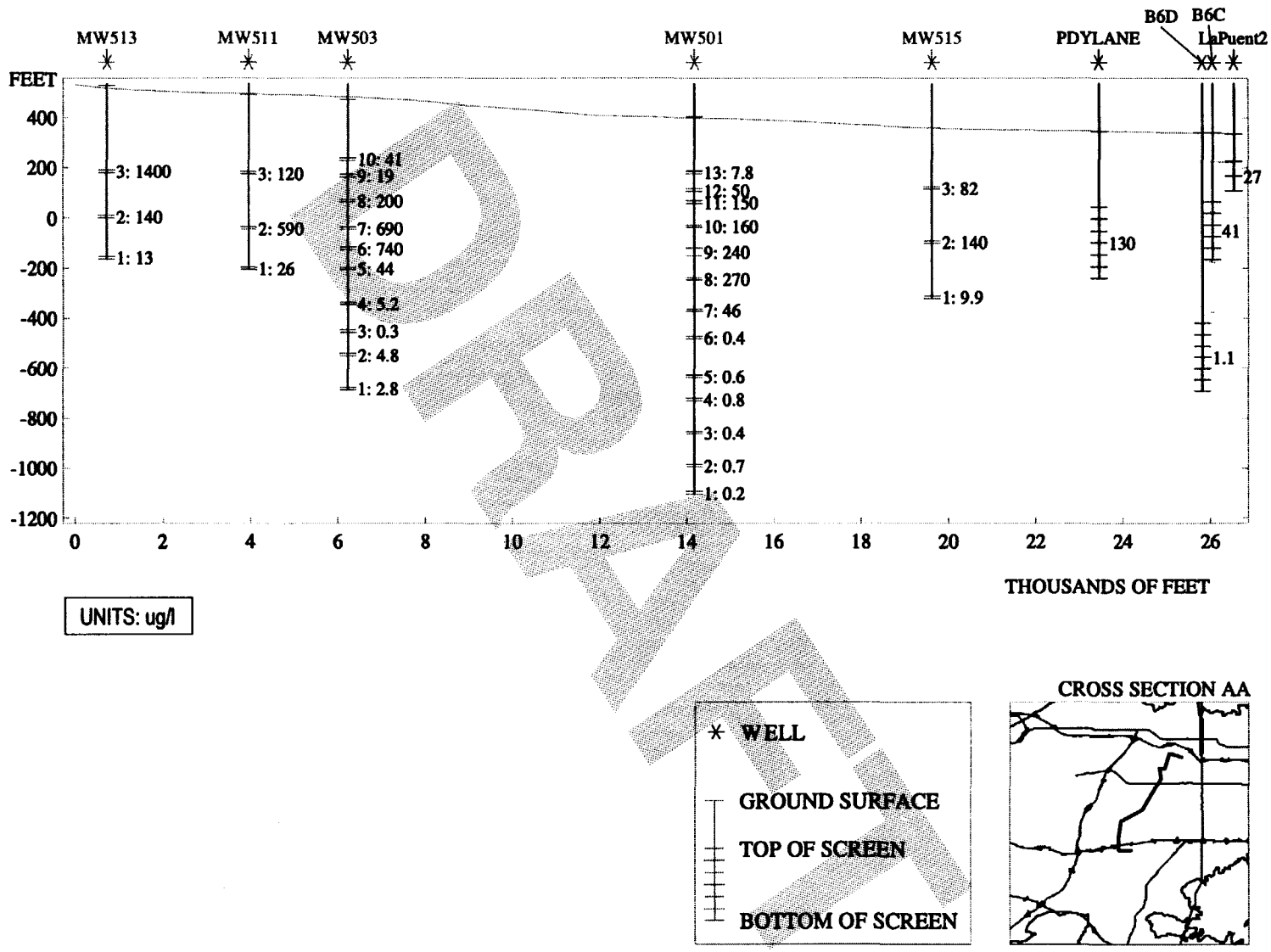

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FIGURE 4-6	Cross Section Showing September-October 1996 TCE Values Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

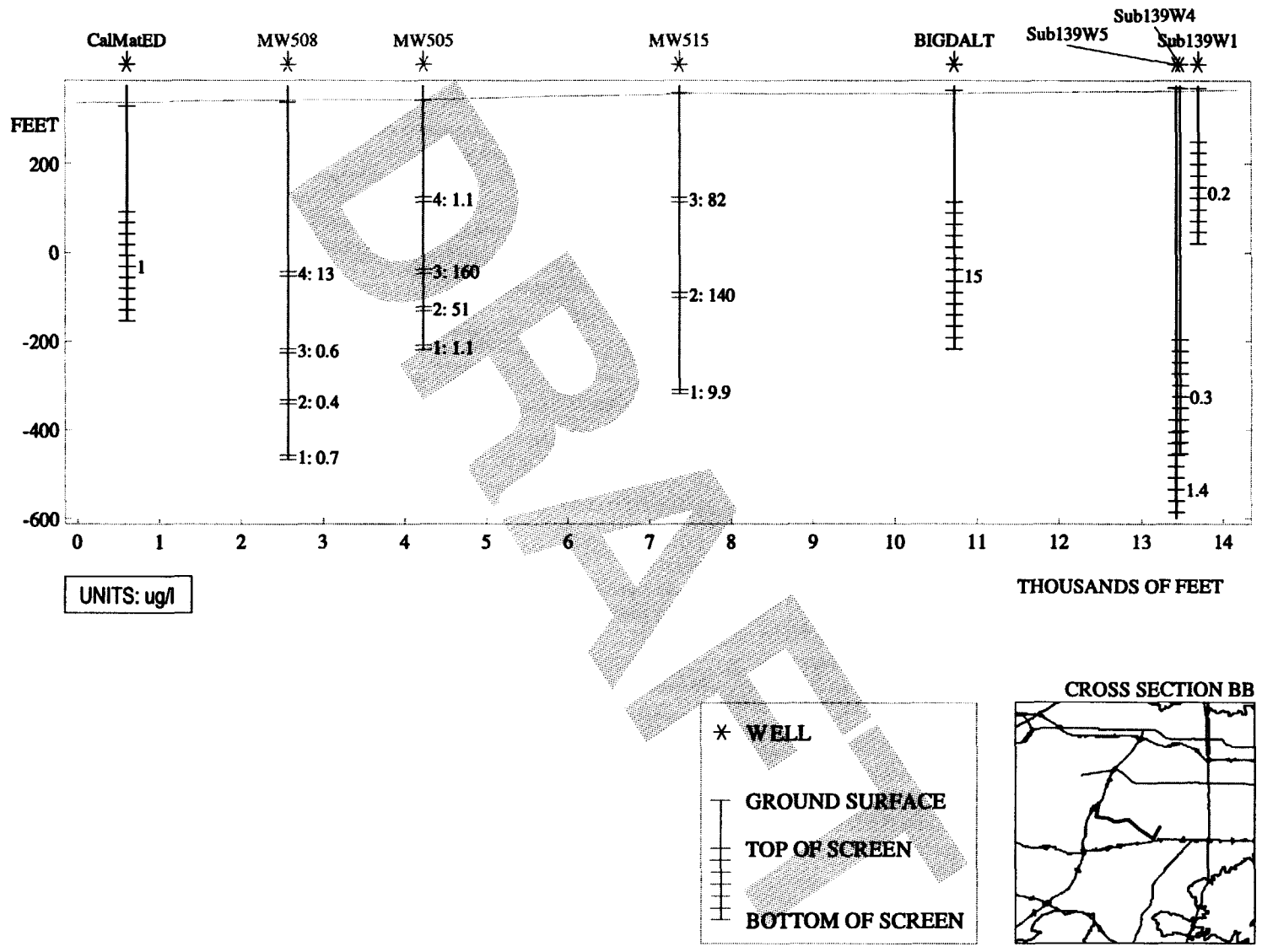

FIGURE 4-7	Cross Section Showing September-October 1996 TCE Values Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

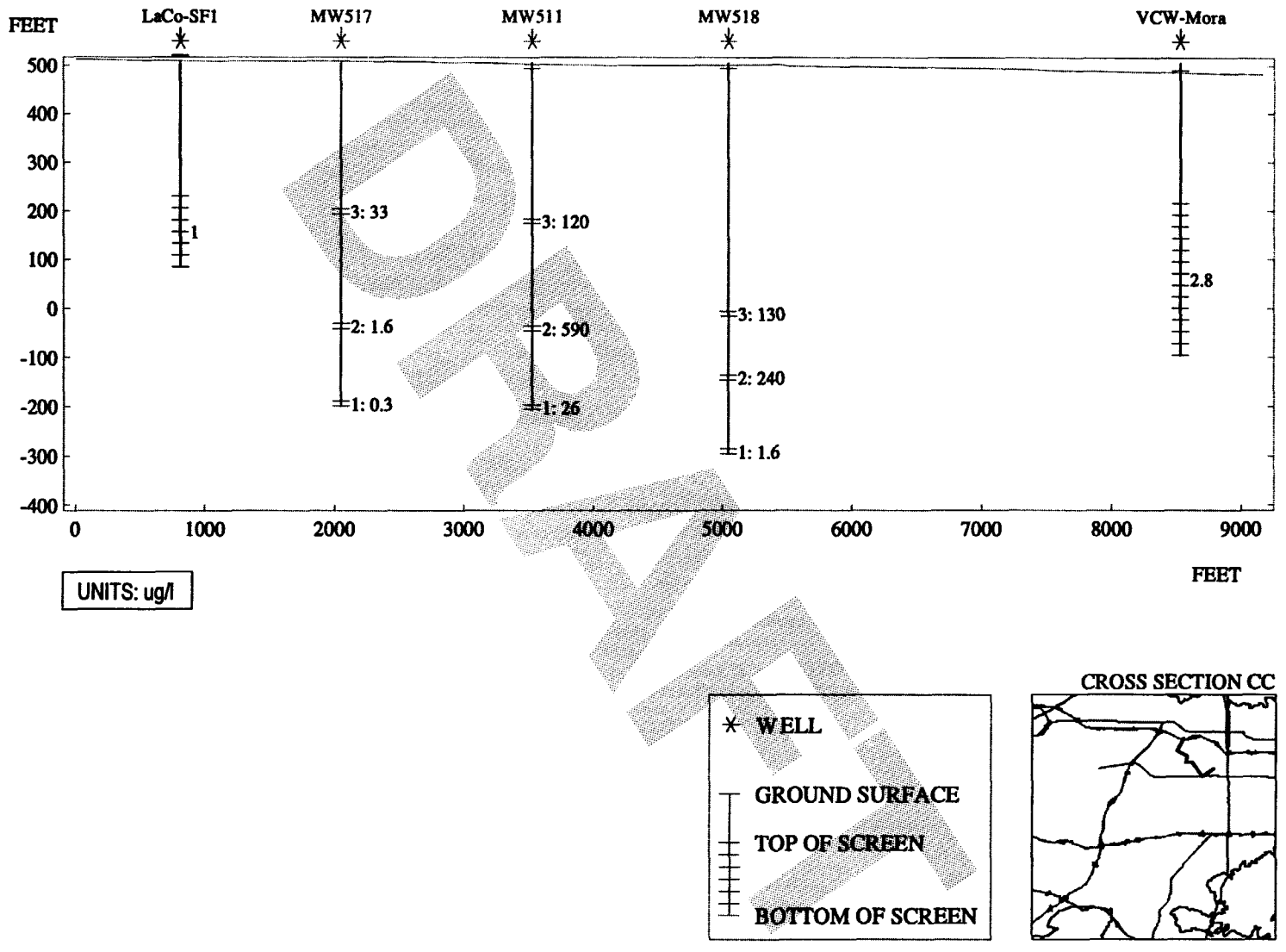

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FIGURE 4-8

Cross Section Showing September - October 1996 TCE Values

Baldwin Park Operable Unit Pre-Remedial Design

CDM

environmental engineers, scientists, planners, & management consultants

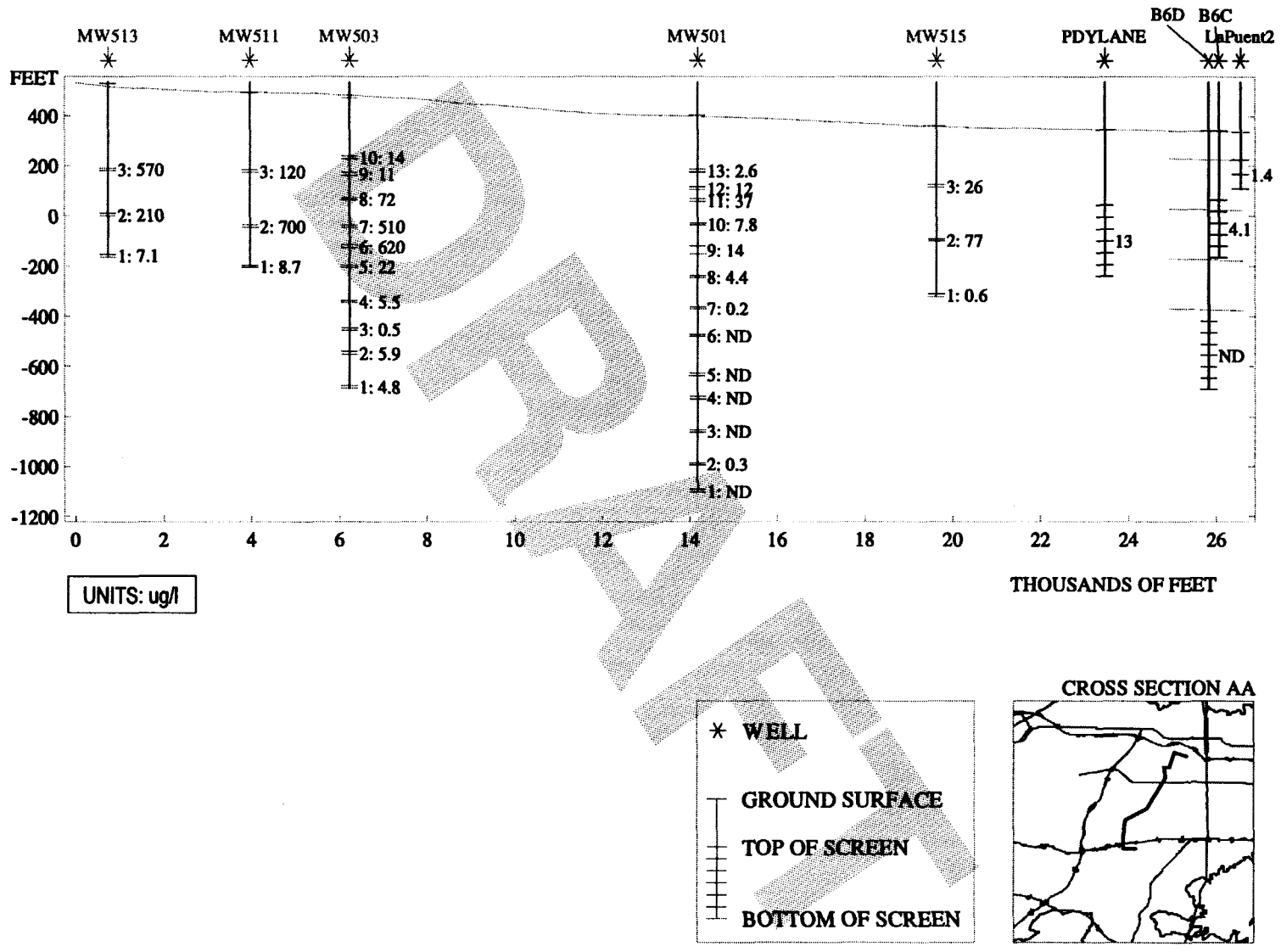

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FIGURE 4-9	Cross Section Showing September-October 1996 PCE Values Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

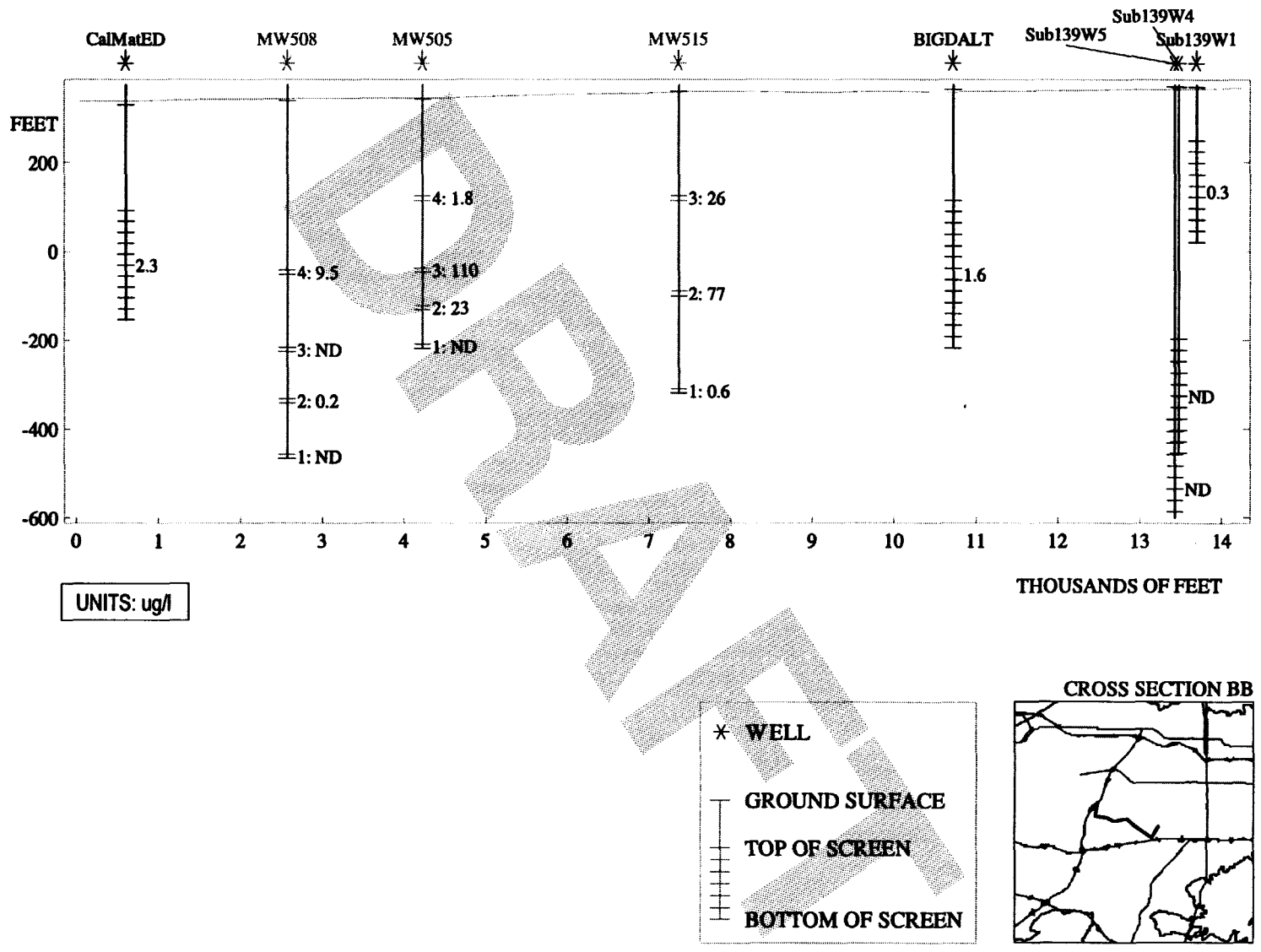

FIGURE 4-10	Cross Section Showing September-October 1996 PCE Values Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

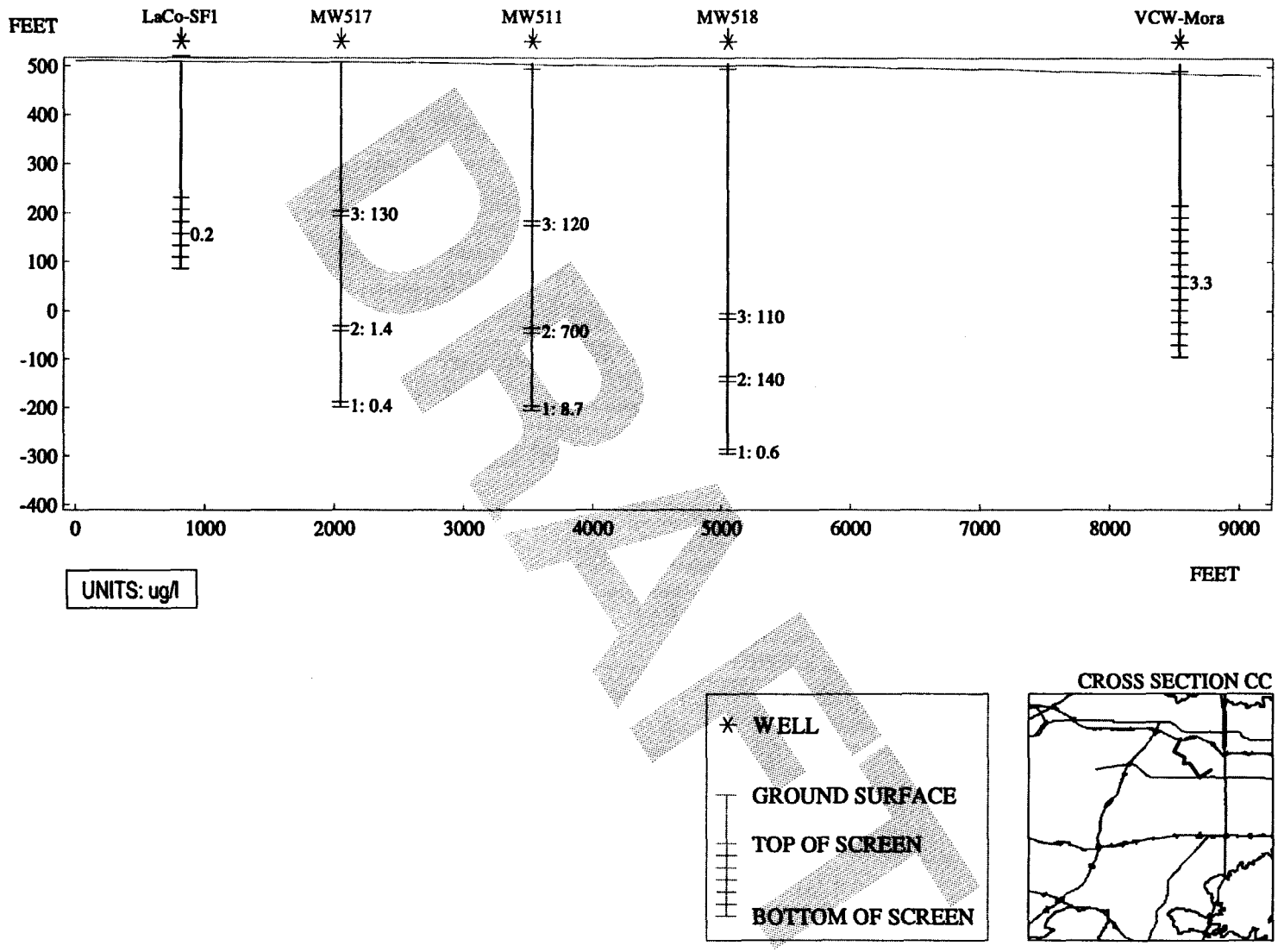

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FIGURE 4-11

Cross Section Showing September-October 1996 PCE Values

Baldwin Park Operable Unit Pre-Remedial Design

CDM

environmental engineers, scientists, planners, & management consultants

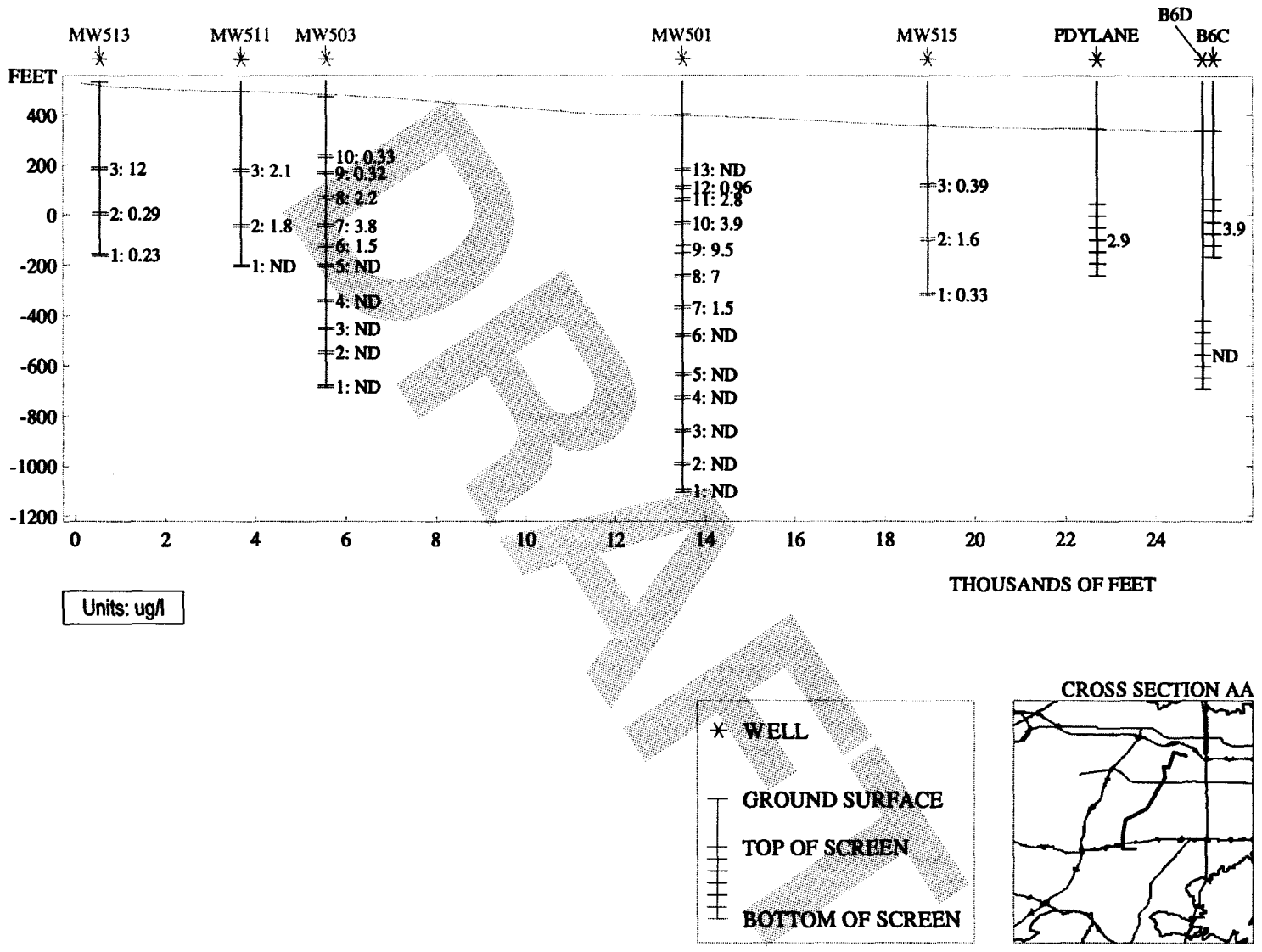

FIGURE 4-12	Cross Section Showing September-October 1996 1,2-DCA Values Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

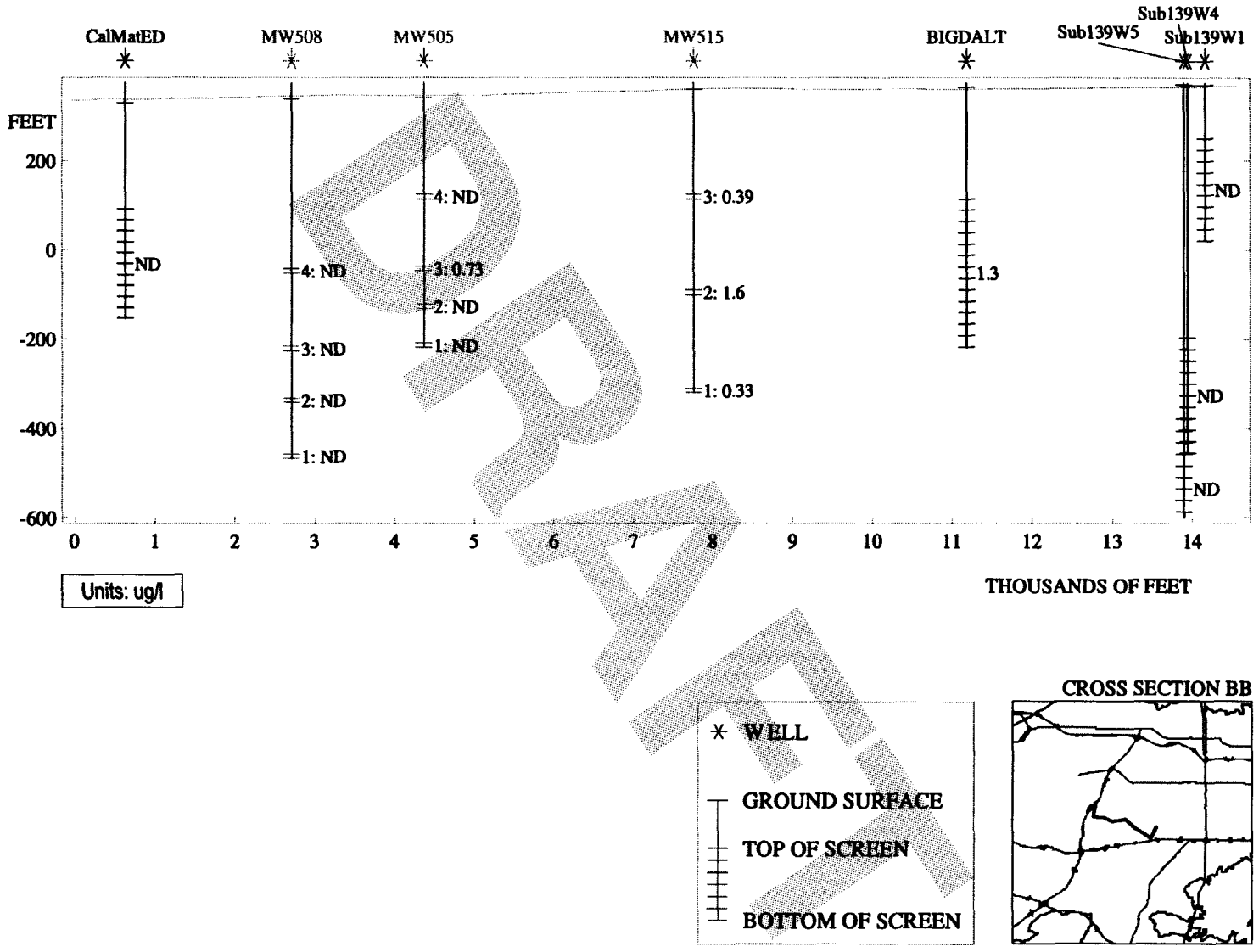

FIGURE 4-13	Cross Section Showing September-October 1996 1,2 DCA Values Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

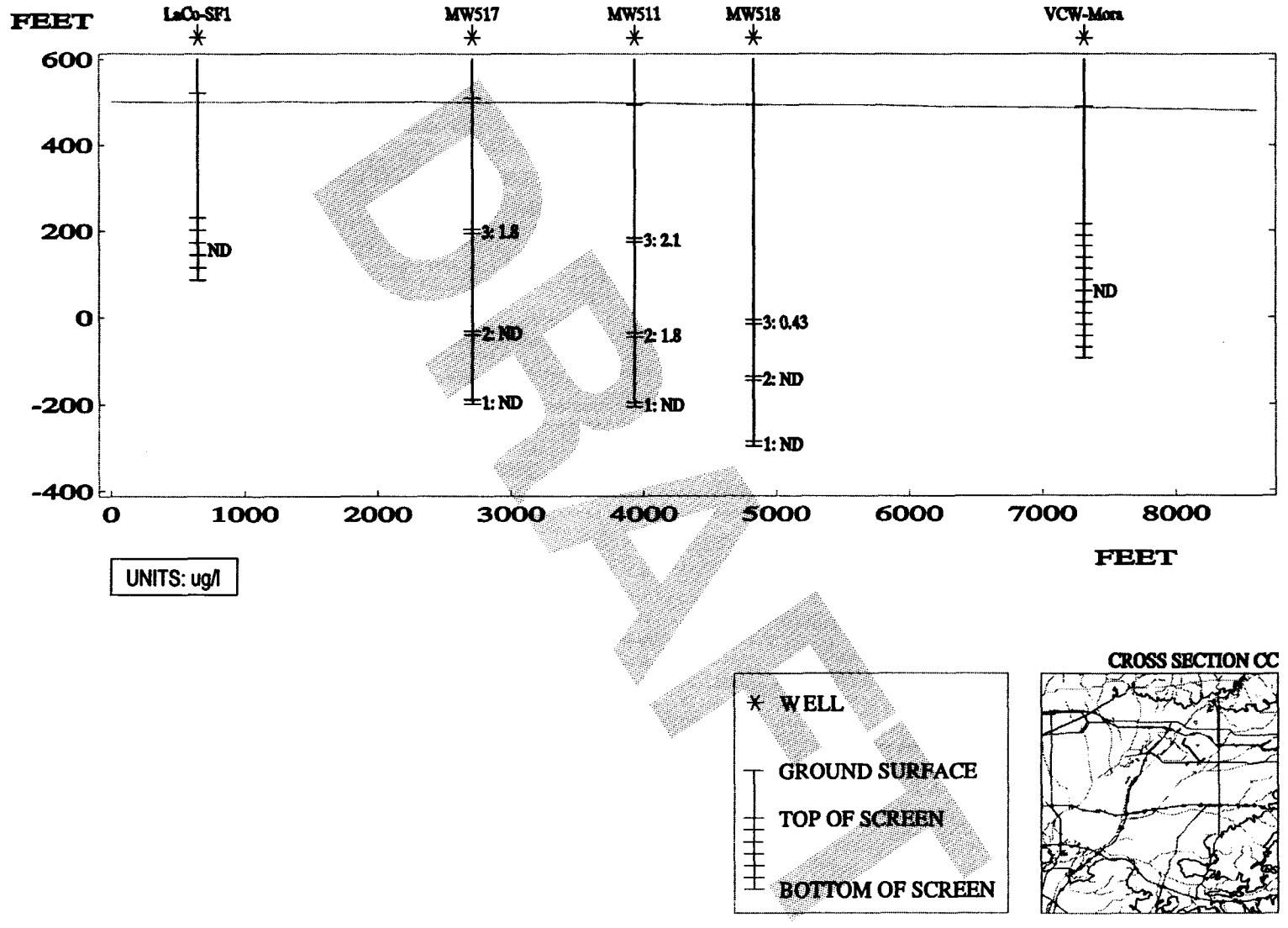

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FIGURE 4-14

Cross Section Showing September-October 1996 1,2-DCA Values

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

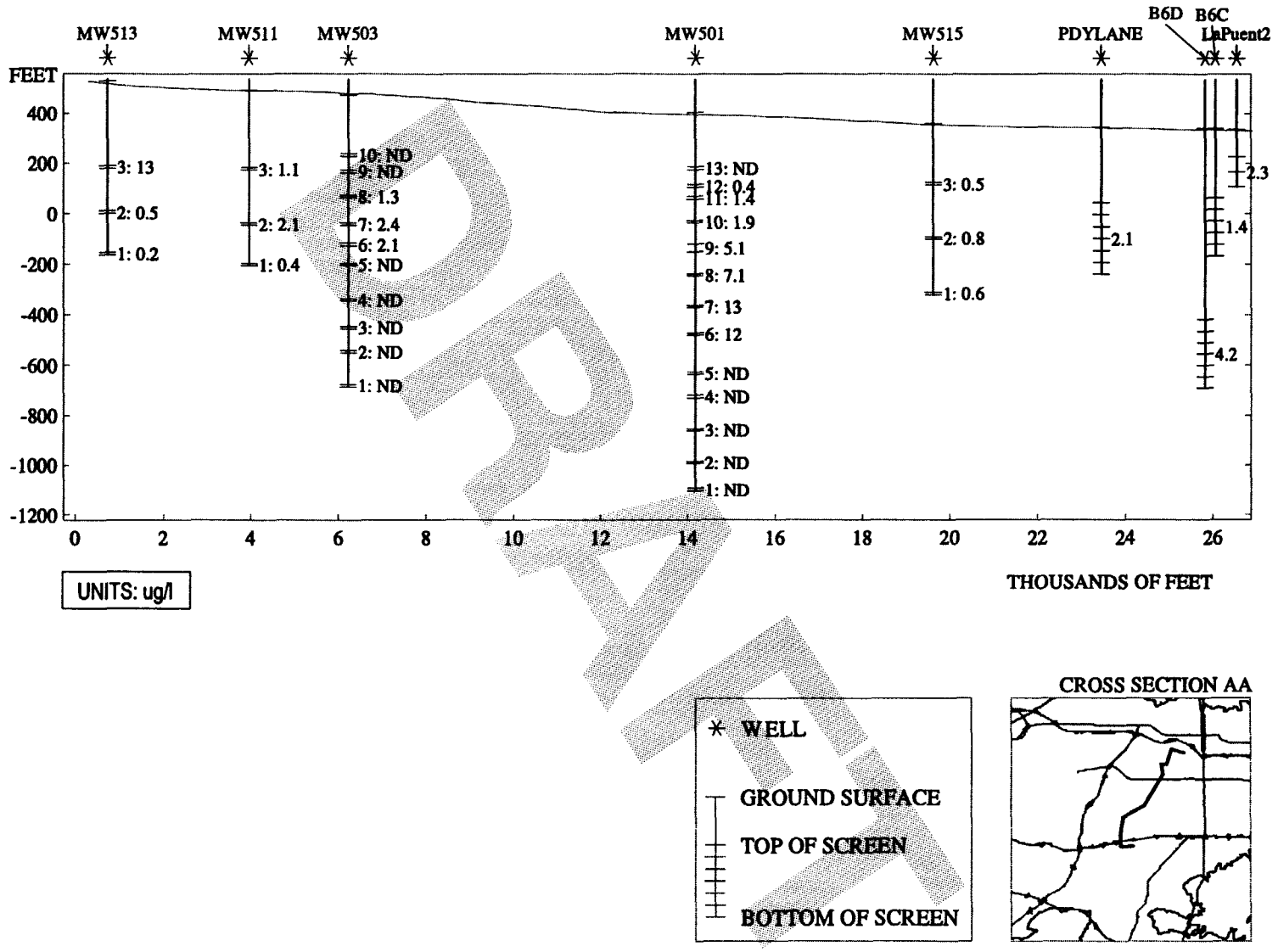

FIGURE 4-15	Cross Section Showing September-October 1996 CTC Values Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

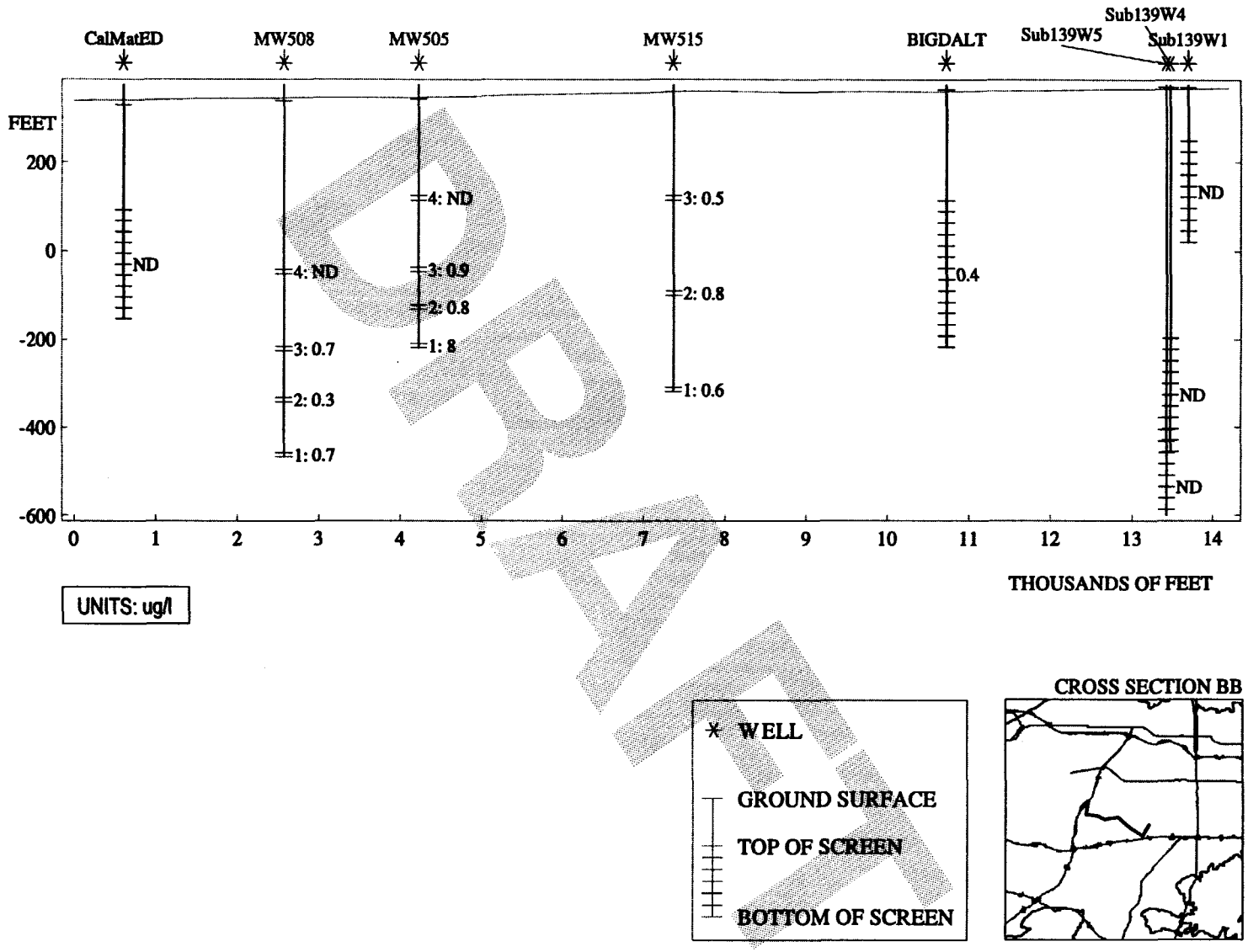

FIGURE 4-16	Cross Section Showing September-October 1996 CTC Values Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

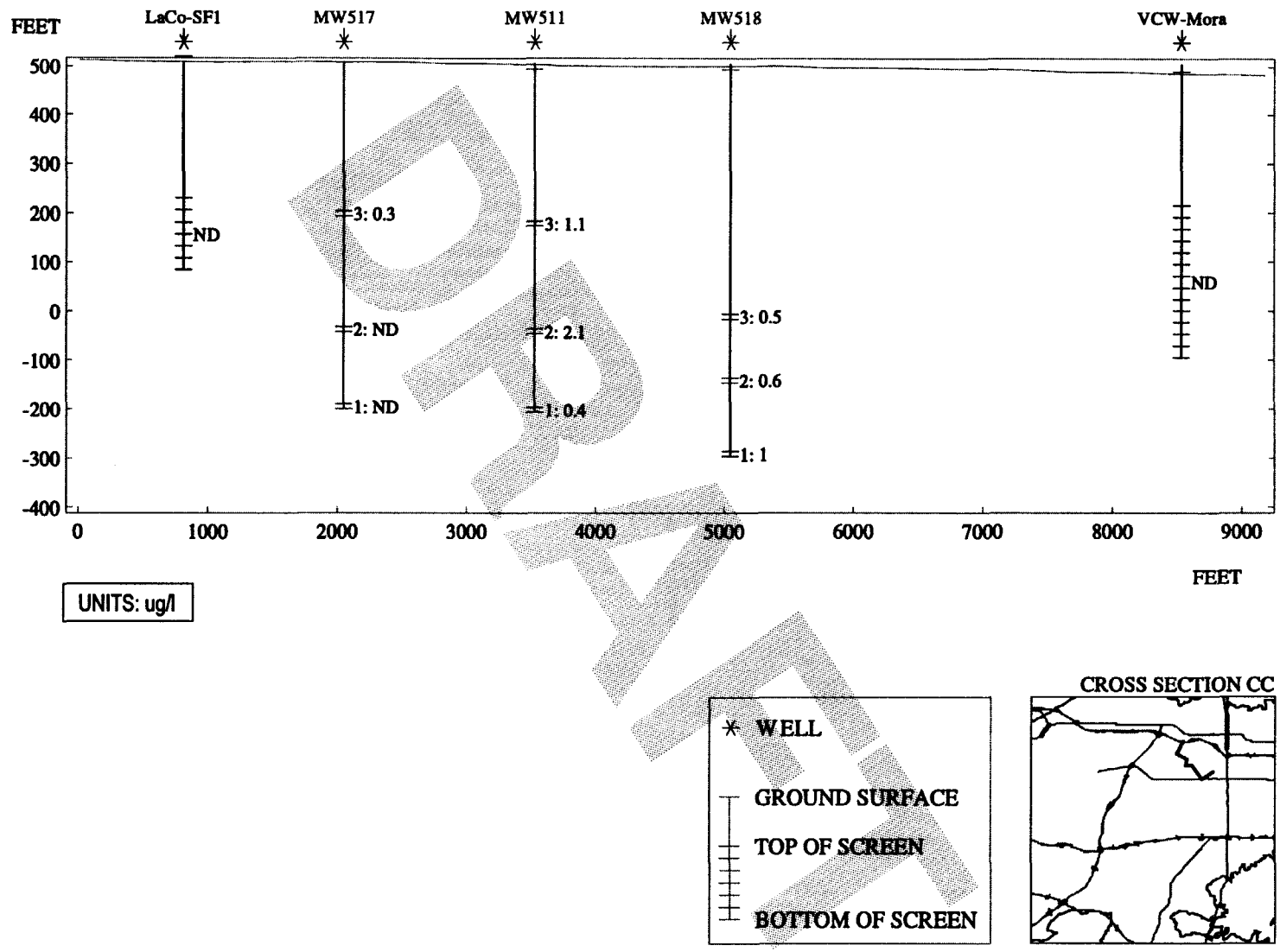

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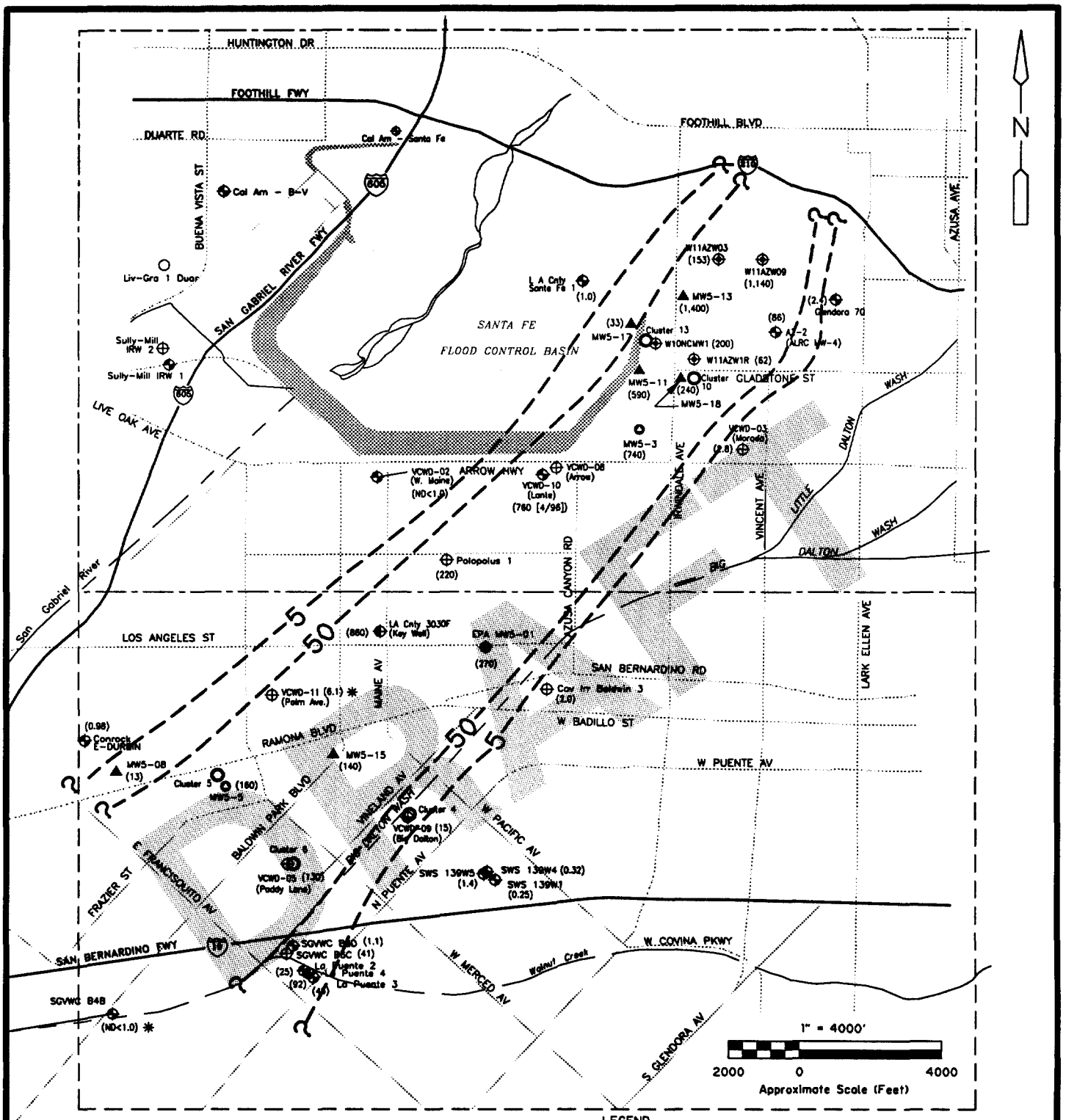
FIGURE 4-17

Cross Section Showing September-October 1996 CTC Values

Baldwin Park Operable Unit Pre-Remedial Design

CDM

environmental engineers, scientists, planners, & management consultants



NOTES

1. These contours are approximate based on available data and may vary temporally. Other interpretations are possible.
2. Posted values for Multiport wells are maximums.

LEGEND

- Multiport (MP) Monitoring Well (Phase 1A)
- MP Monitoring Well (Phase 1B)
- Existing MP Monitoring Well (EPA)
- Active Water Supply Well
- Inactive Water Supply Well
- Site Assessment Monitoring Well
- Observation Well
- Abandoned Well
- Cluster 5 — Proposed treatment system extraction well (EPA's ROD, 1994)
- Approximate boundary of Upper Baldwin Park Project Area (Subarea 1)
- Approximate boundary of Lower Baldwin Park Project Area (Subarea 3)
- (45) — TCE concentrations (ug/l) from September/October 1996
- * — Not contoured due to deeper screen interval
- 5 — TCE contour

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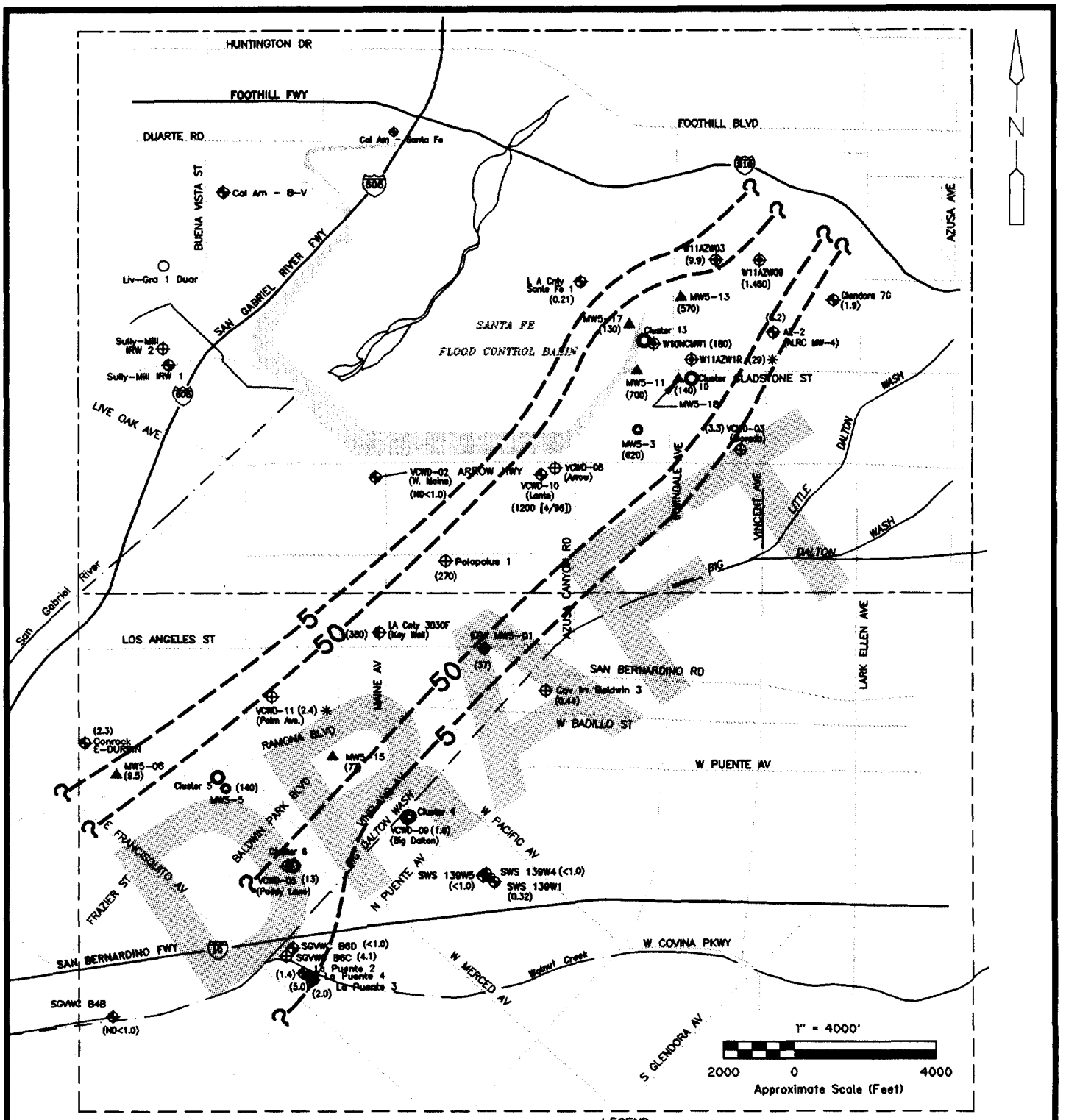
TCE CONCENTRATION MAP SEPTEMBER/OCTOBER 1996

Figure 4-18

J:\2581-112\CAD\ 4-18_TCE 08/25/97 09:06:31 2:26:41 CADD Station #2



NOTES

1. These contours are approximate based on available data and may vary temporally. Other interpretations are possible.
2. Posted values for Multiport wells are maximums.

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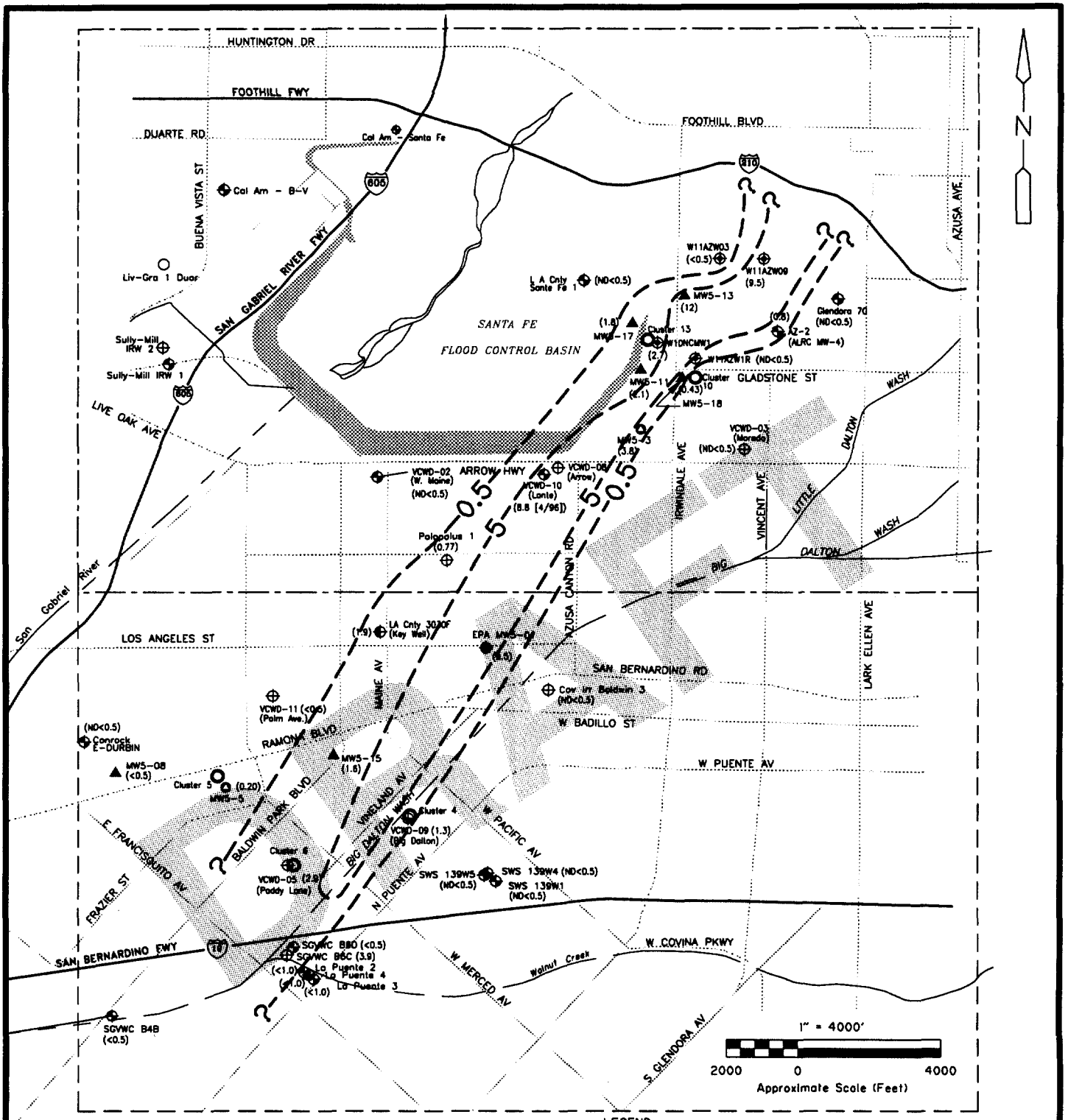
CDM
environmental engineers, scientists, planners, & management consultants

PCE CONCENTRATION MAP SEPTEMBER/OCTOBER 1996

Figure 4-19

J:\2581-112\CAD\ 4-19_PCE 12/12/96 08:05:31 1:00:18 J. La Madrid



NOTES

1. These contours are approximate based on available data and may vary temporally. Other interpretations are possible.
2. Posted values for Multiport wells are maximums.

LEGEND

- Multiport (MP) Monitoring Well (Phase 1A)
- MP Monitoring Well (Phase 1B)
- Existing MP Monitoring Well (EPA)
- Active Water Supply Well
- Inactive Water Supply Well
- Site Assessment Monitoring Well
- Observation Well
- Abandoned Well
- Cluster 5 — Proposed treatment system extraction well (EPA's ROD, 1994)
- Approximate boundary of Upper Baldwin Park Project Area (Subarea 1)
- Approximate boundary of Lower Baldwin Park Project Area (Subarea 3)
- (1.3) — 1,2-DCA concentrations (ug/l) from September/October 1996
- 5 — 1,2-DCA contour

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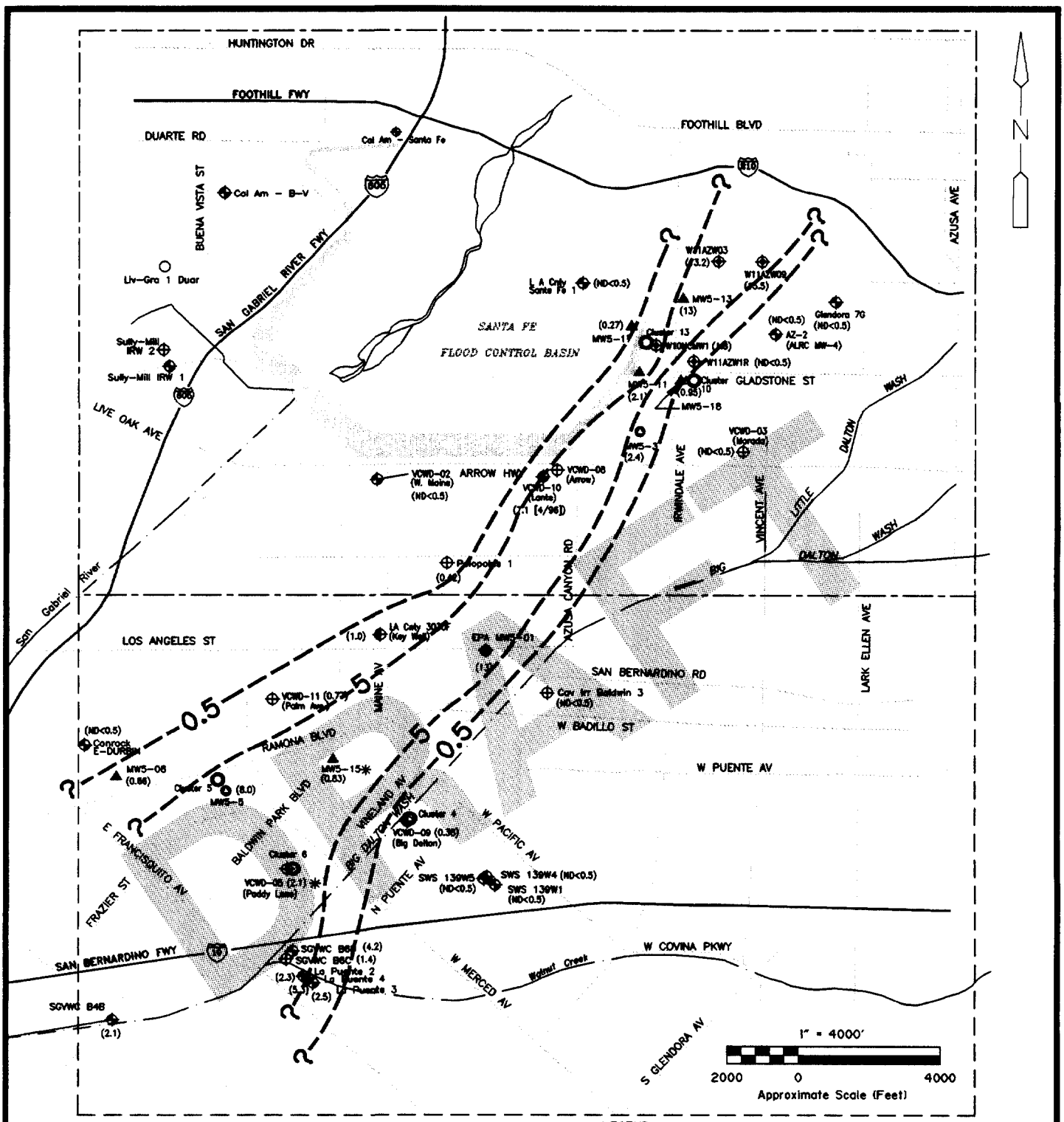
1,2-DCA CONCENTRATION MAP SEPTEMBER/OCTOBER 1996

Figure 4-20

J:\2581-112\CAD\ 4-20_DCA 12/12/96 08:08:53 1:08:31 J. La Madrid



NOTES

1. These contours are approximate based on available data and may vary temporally. Other interpretations are possible.
2. Posted values for Multiport wells are maximums.

LEGEND

- Multiport (MP) Monitoring Well (Phase 1A)
- MP Monitoring Well (Phase 1B)
- Existing MP Monitoring Well (EPA)
- Active Water Supply Well
- Inactive Water Supply Well
- Site Assessment Monitoring Well
- Observation Well
- Abandoned Well
- Cluster 5 — Proposed treatment system extraction well (EPA's ROD, 1994)
- Approximate boundary of Upper Baldwin Park Project Area (Subarea 1)
- Approximate boundary of Lower Baldwin Park Project Area (Subarea 3)
- (45) — Carbon Tetrachloride concentrations (ug/l) from September/October 1996
- * — Not contoured due to shallow screen interval
- 5 — Carbon Tetrachloride contour

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CARBON TETRACHLORIDE CONCENTRATION MAP SEPTEMBER/OCTOBER 1996

Figure 4-21

CADD Station #2 0:27:49 07/22/97 13:21:02 4-21_CTC J:\2581-112\CAD\

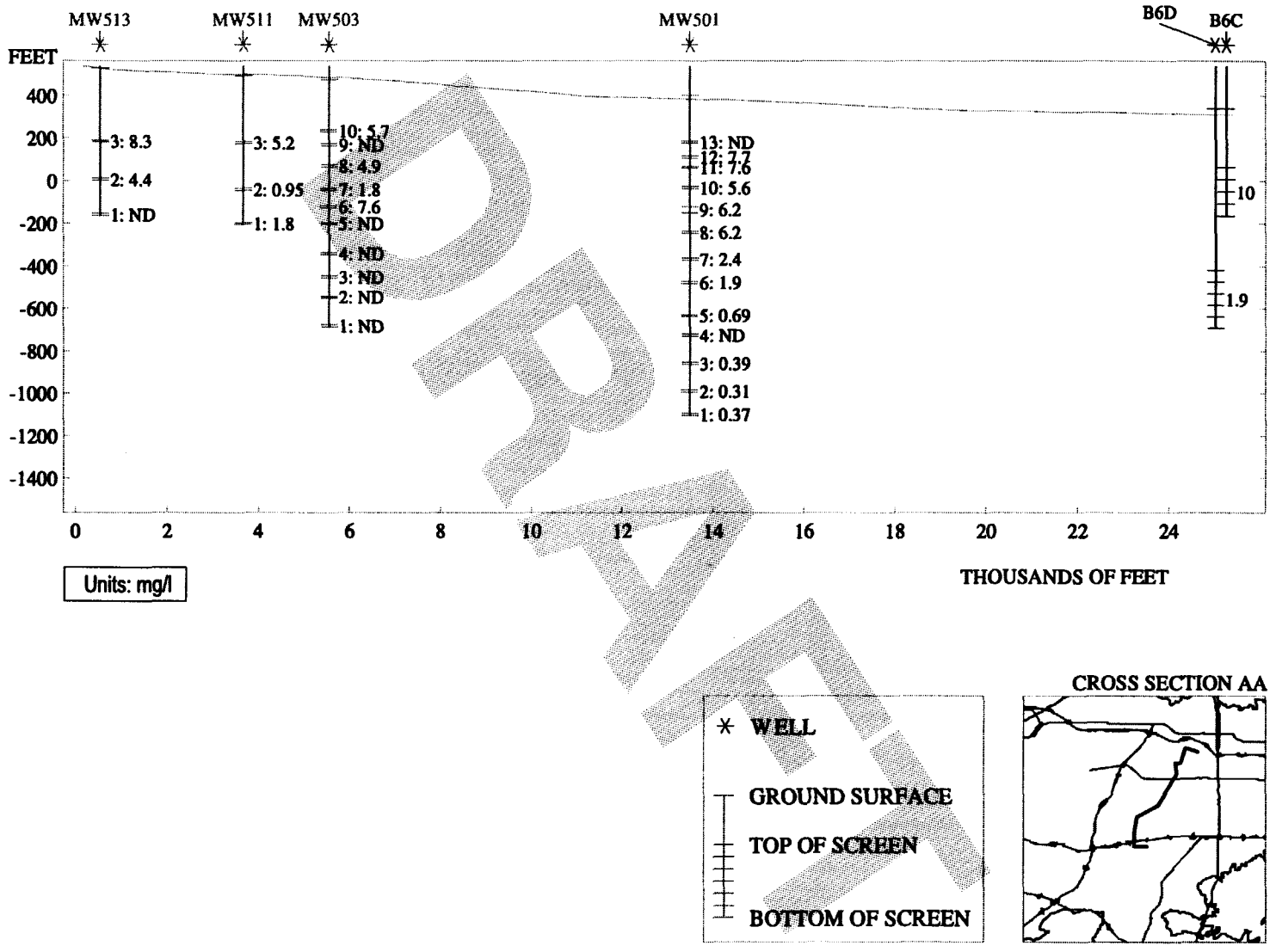

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FIGURE 4-22

Cross Section Showing Average Nitrate (as N) Levels
March-April 1996

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

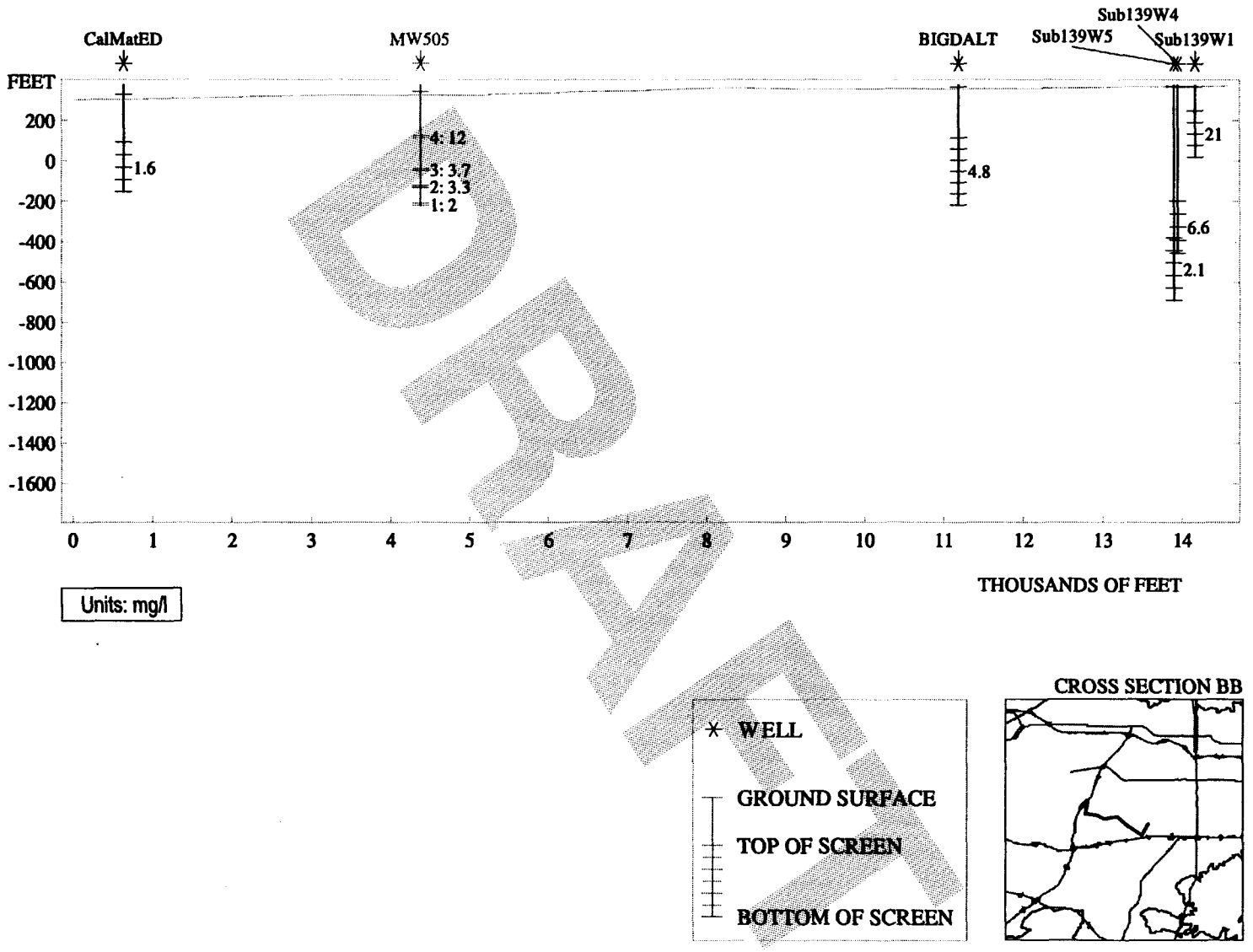

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FIGURE 4-23

Cross Section Showing Average Nitrate (as N) Levels
March-April 1996

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

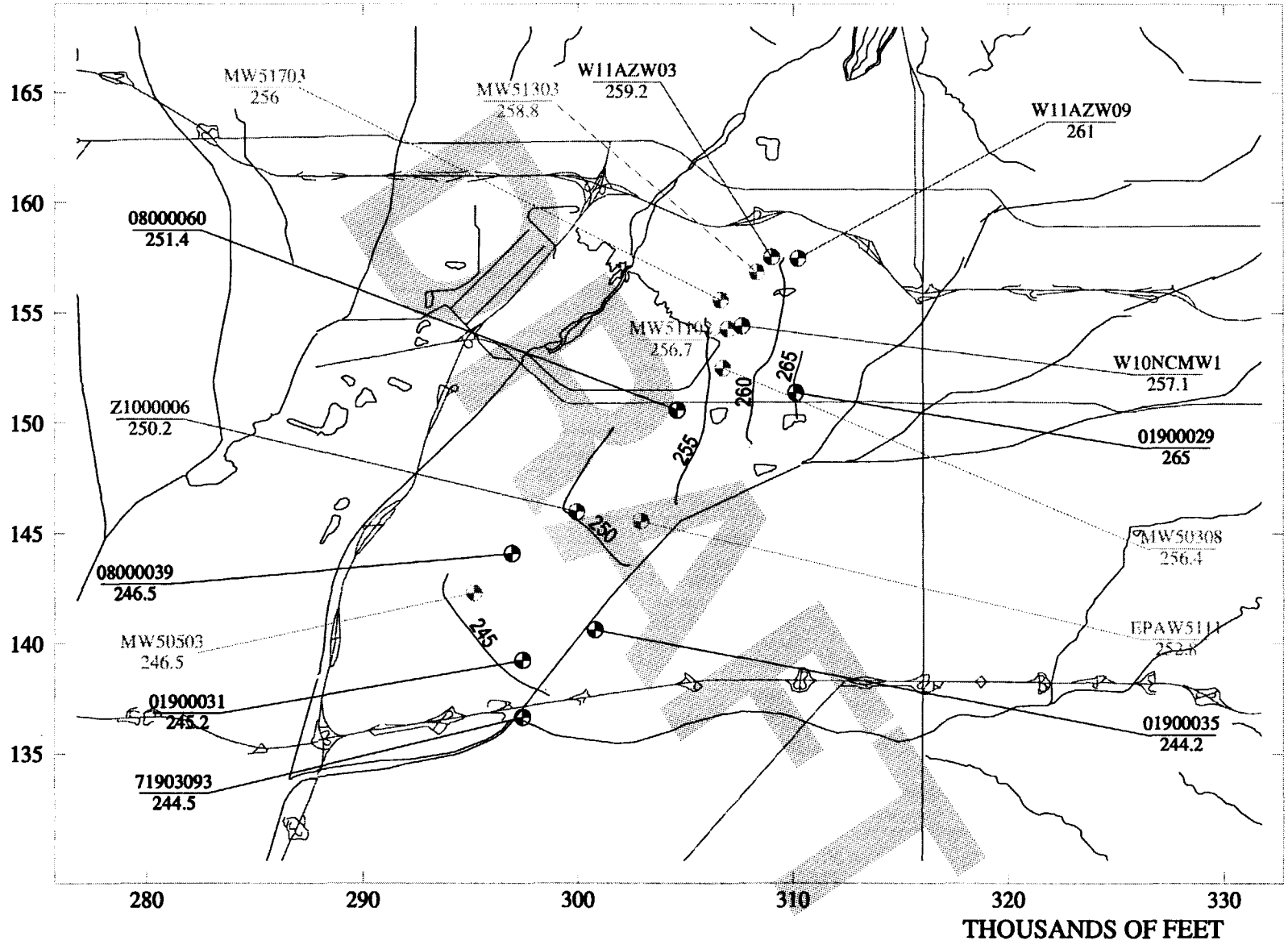

FIGURE 4-24	Contoured Average Water Levels March - April 1996 Baldwin Park Operable Unit	CDM environmental engineers, scientists, planners, & management consultants

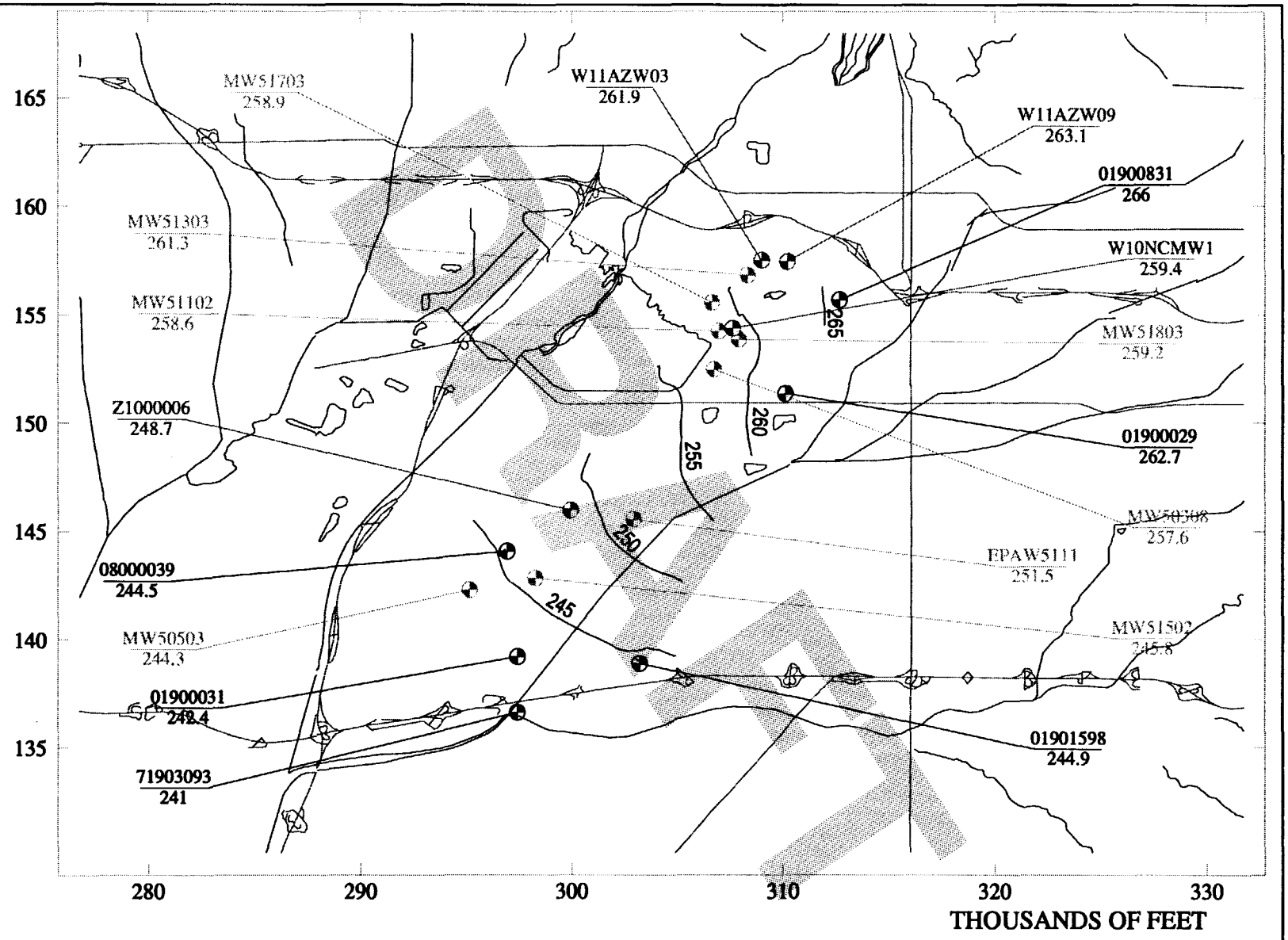

FIGURE 4-25	Contoured Average Water Levels June - July 1996 Baldwin Park Operable Unit	CDM environmental engineers, scientists, planners, & management consultants

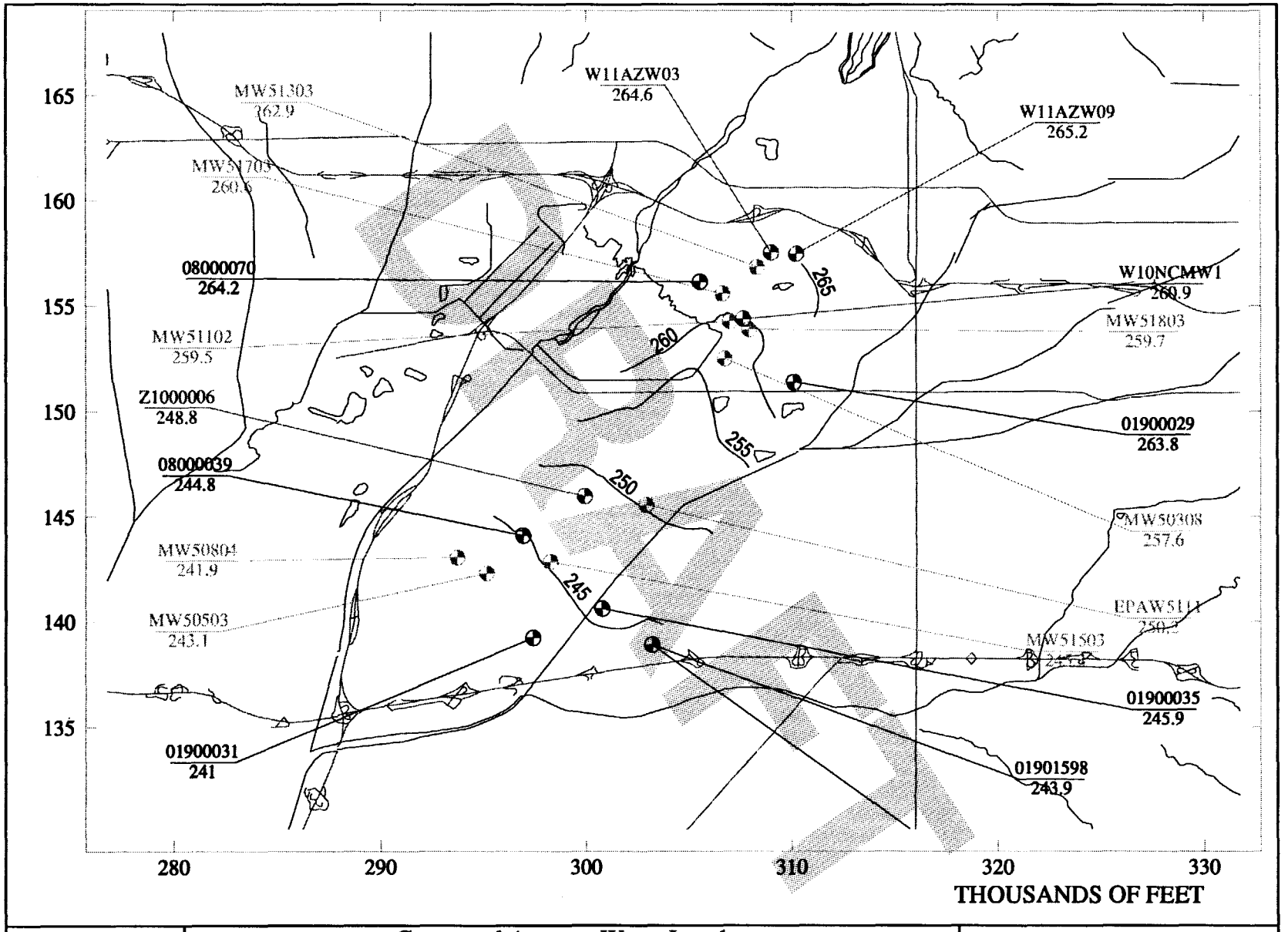

FIGURE 4-26

Contoured Average Water Levels
September - October 1996

Baldwin Park Operable Unit

CDM
environmental engineers, scientists, planners, & management consultants

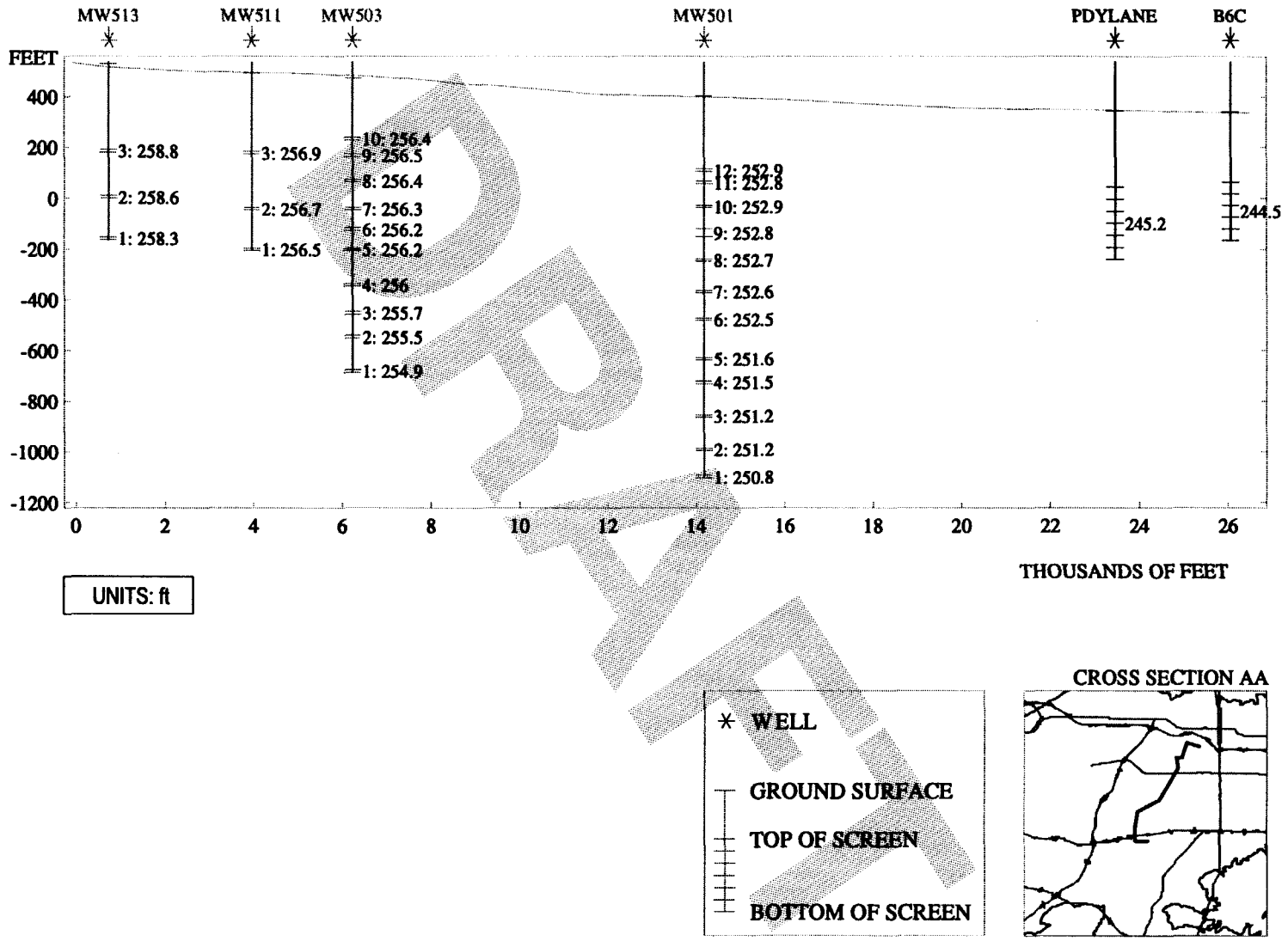

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FIGURE 4-27	Cross Section Showing Average Water Levels March-April 1996 Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

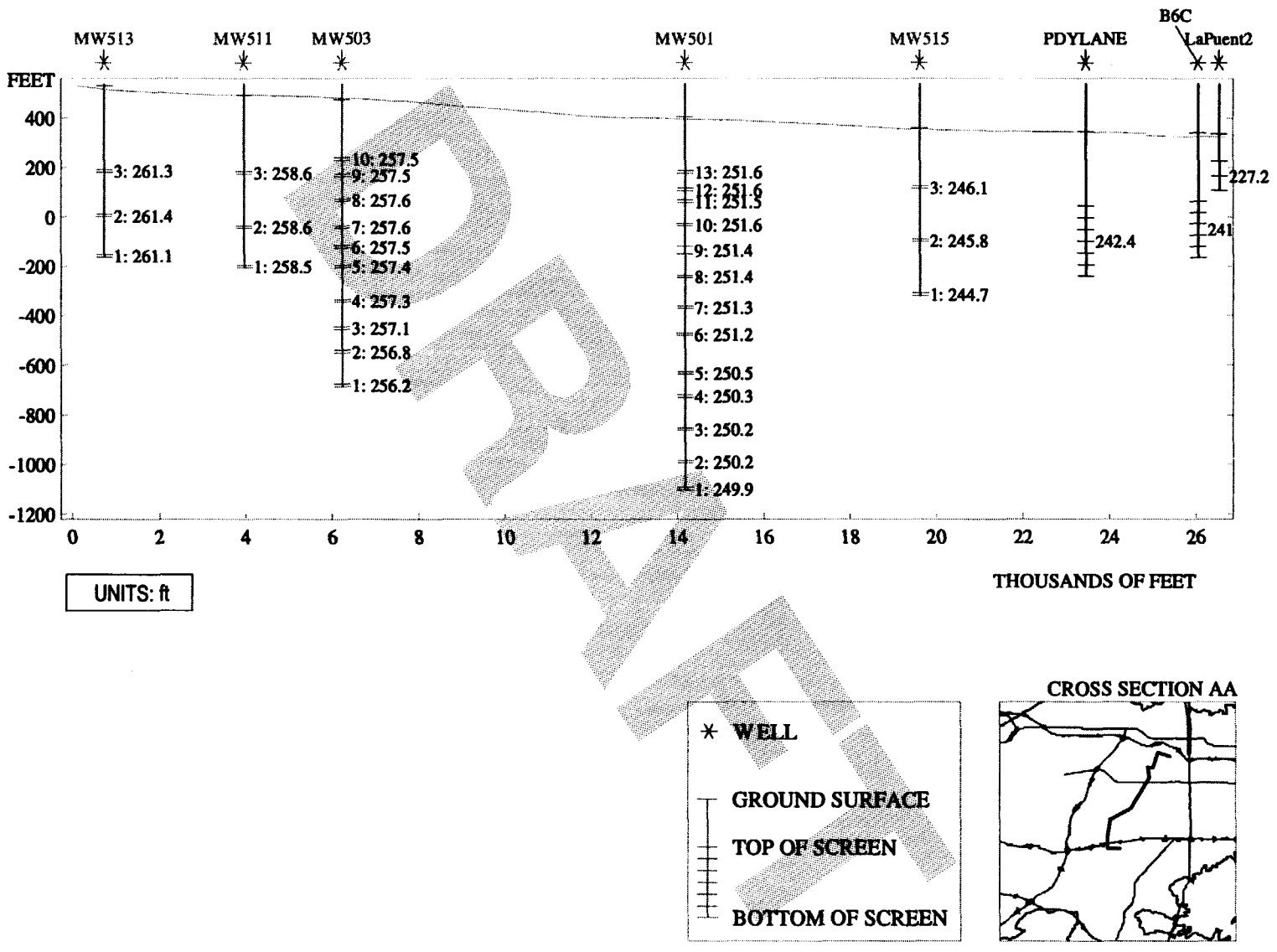

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FIGURE 4-28	Cross Section Showing Average Water Levels June-July 1996 Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

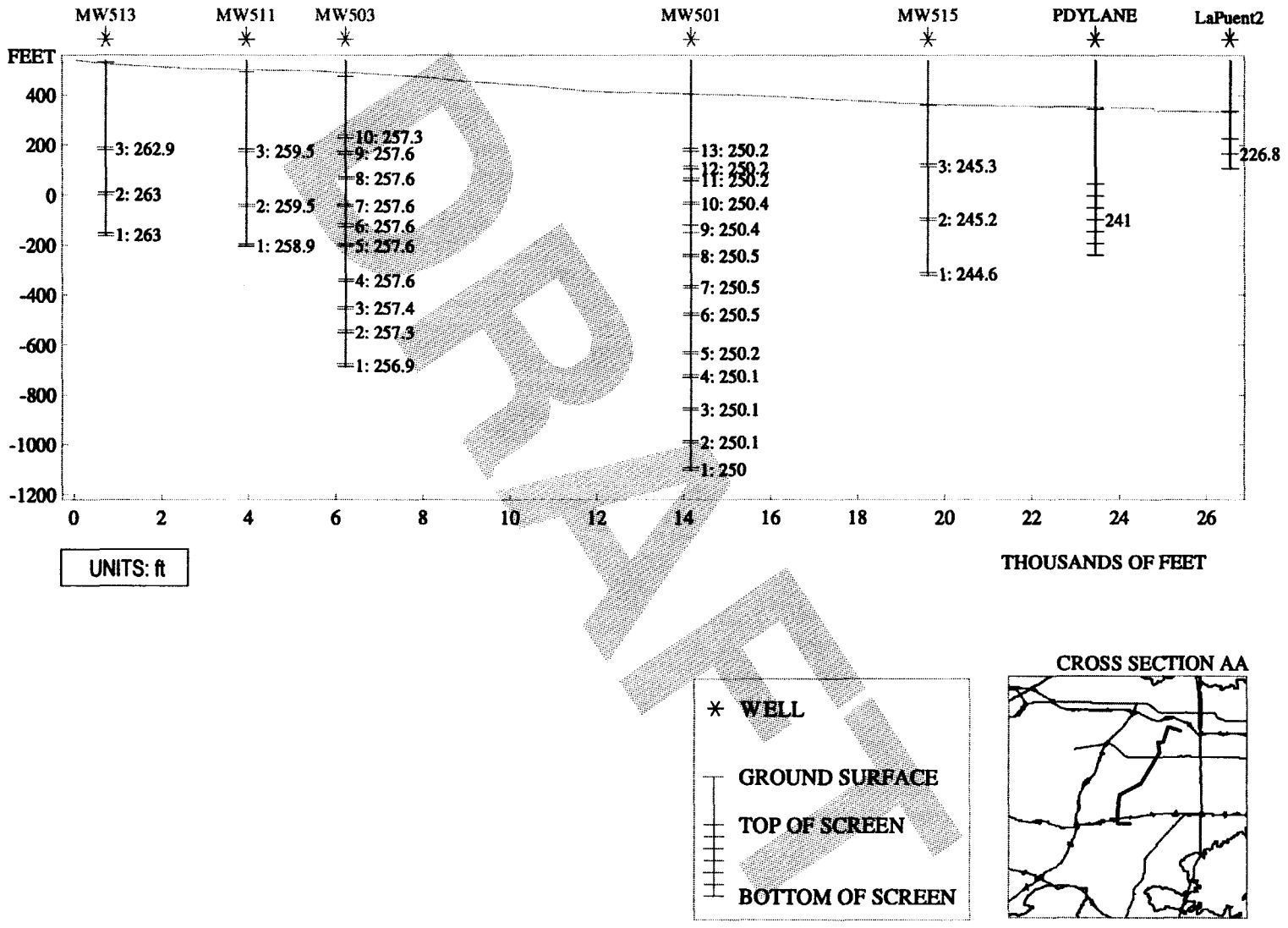

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FIGURE 4-29	Cross Section Showing Average Water Levels September-October 1996 Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

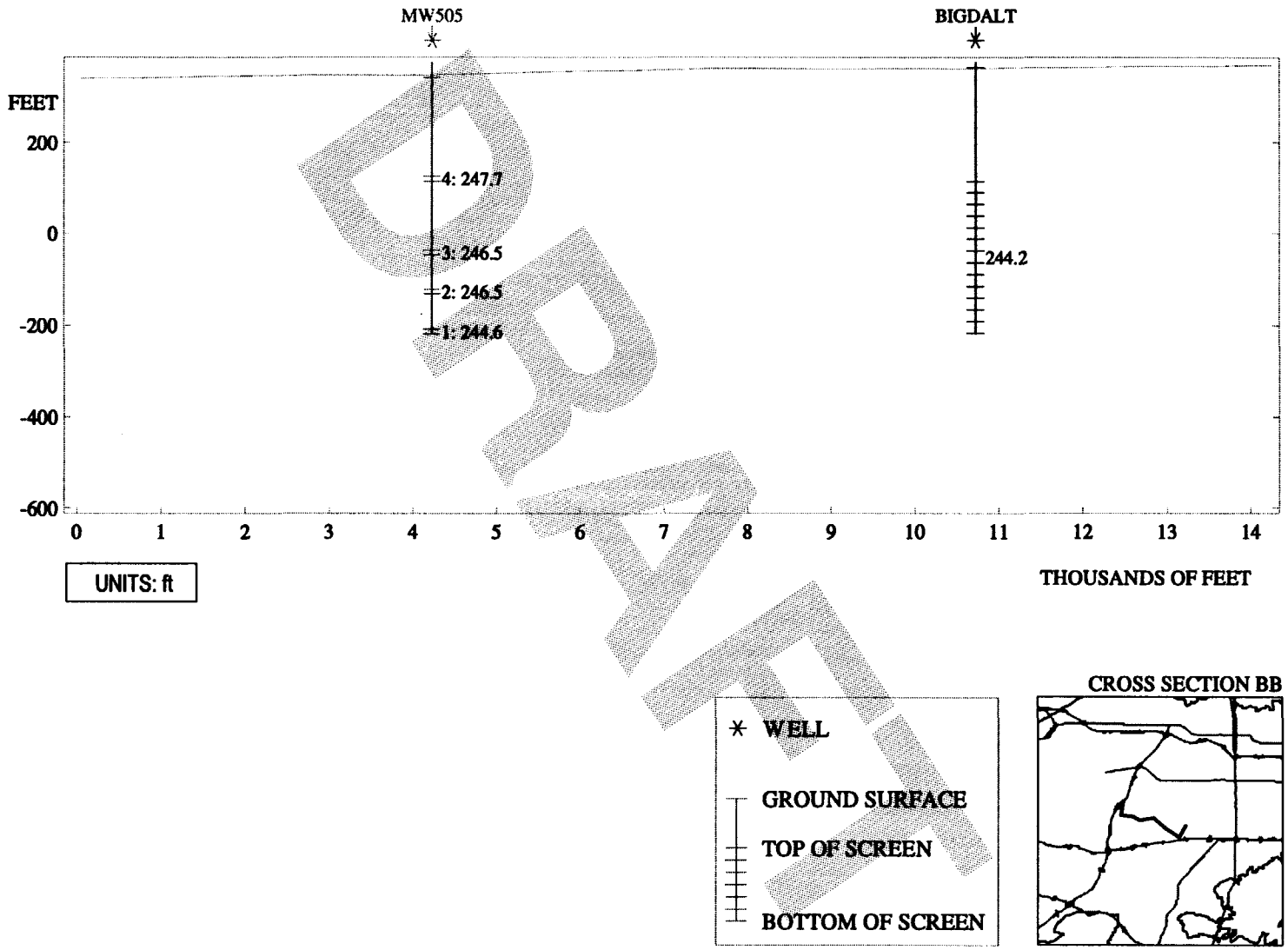

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FIGURE 4-30	Cross Section Showing Average Water Levels March-April 1996 Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

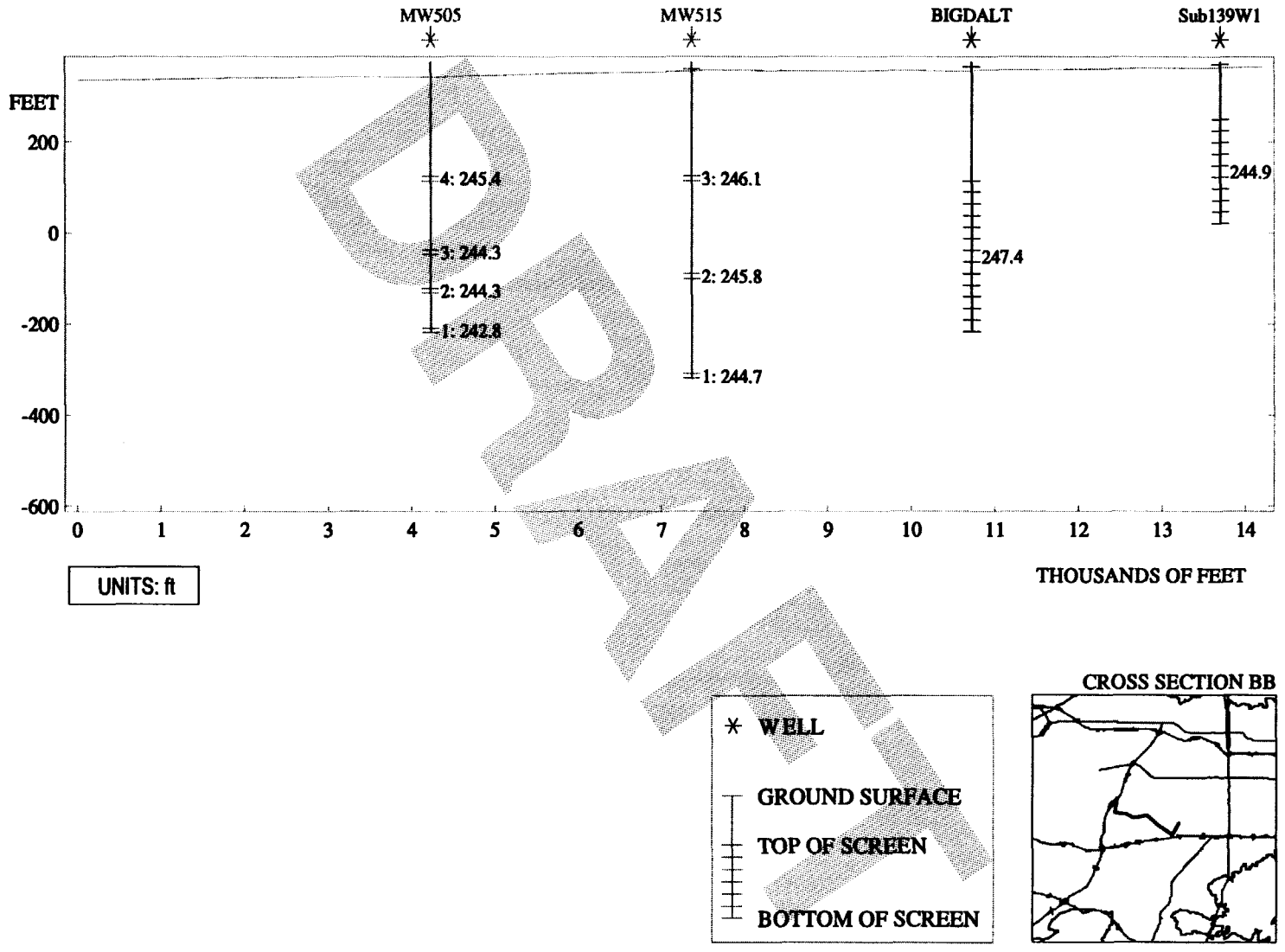

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FIGURE 4-31	Cross Section Showing Average Water Levels June-July 1996 Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

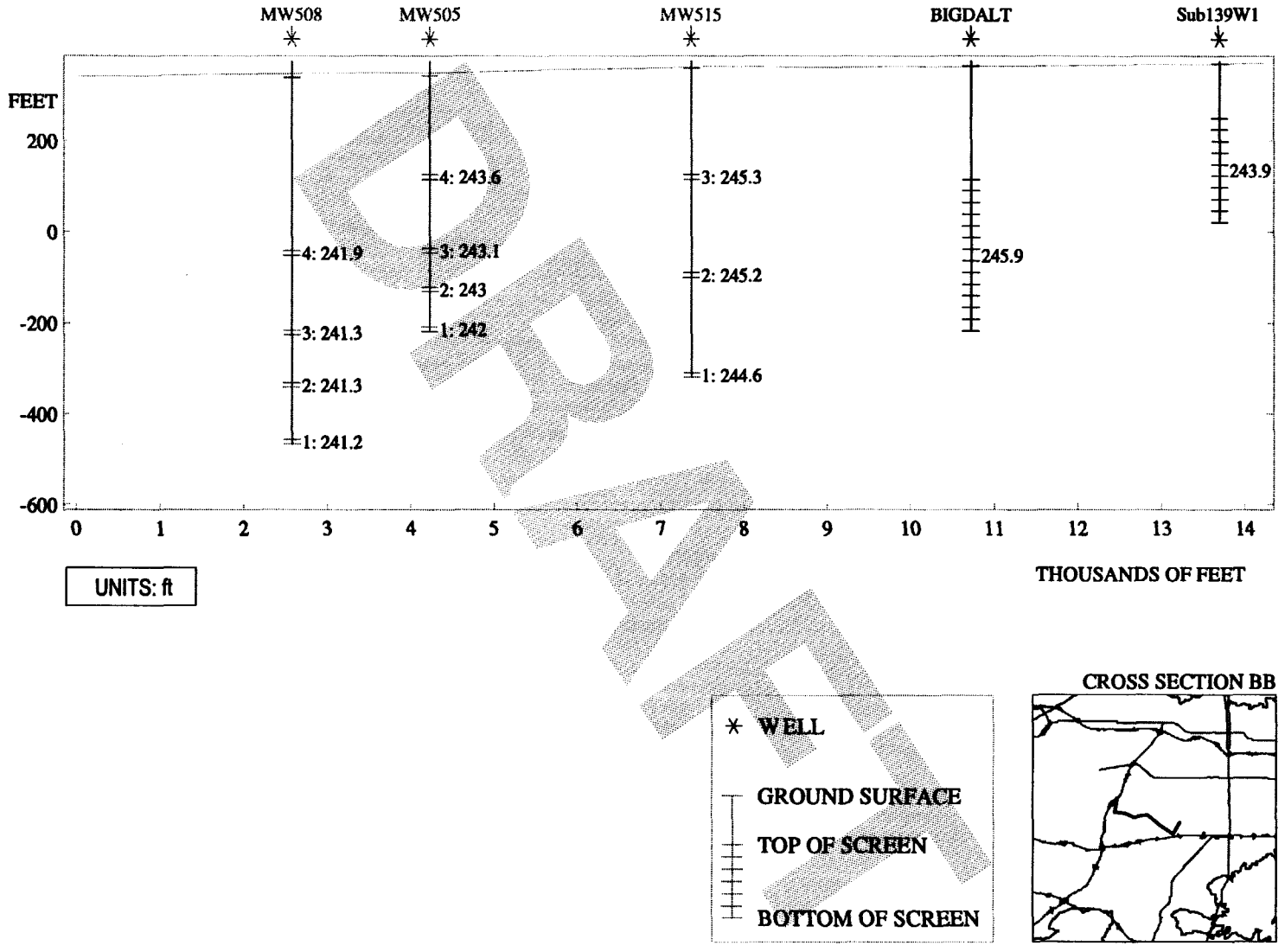

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FIGURE 4-32	Cross Section Showing Average Water Levels September-October 1996 Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

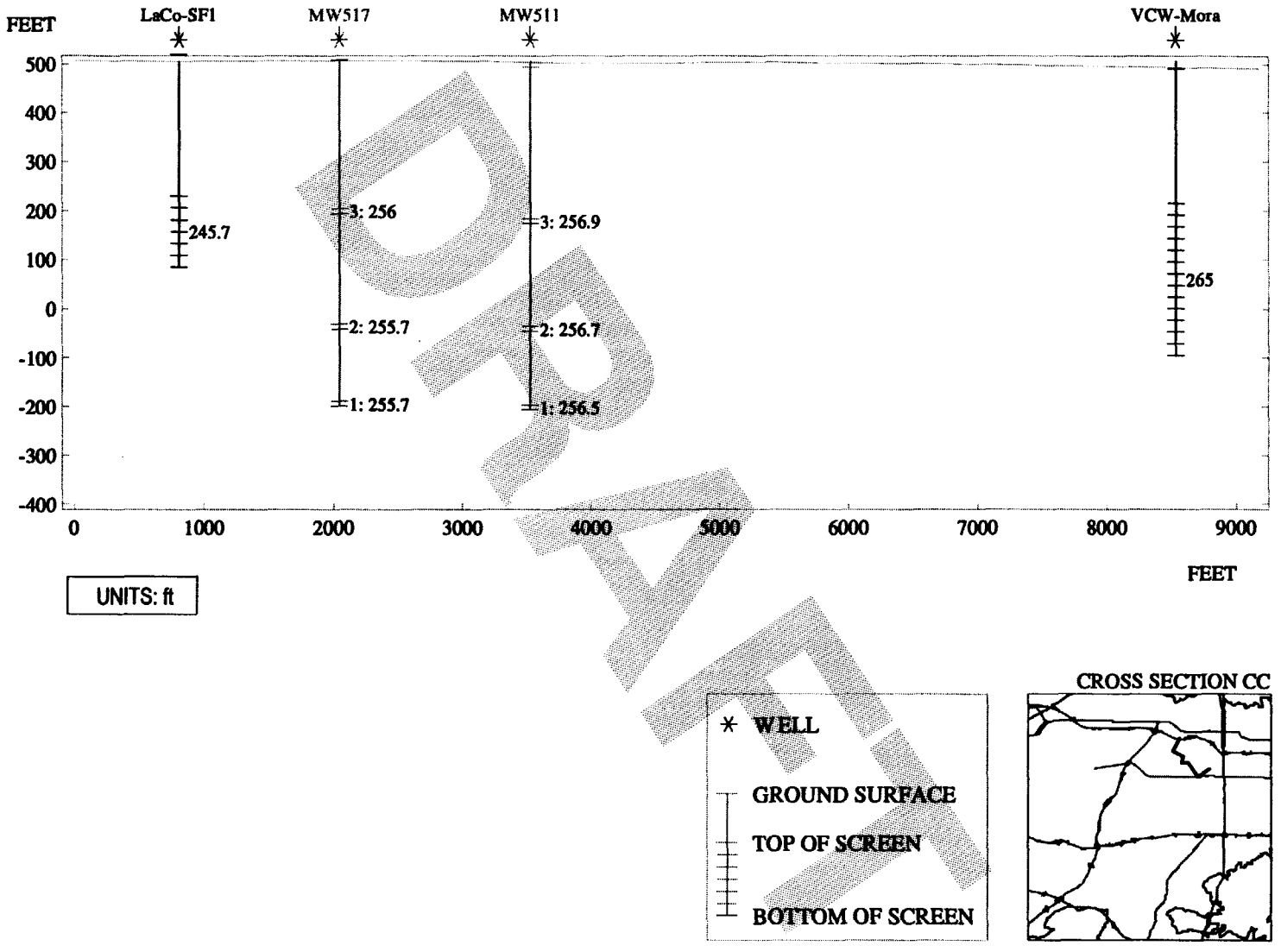

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FIGURE 4-33

Cross Section Showing Average Water Levels
March-April 1996

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

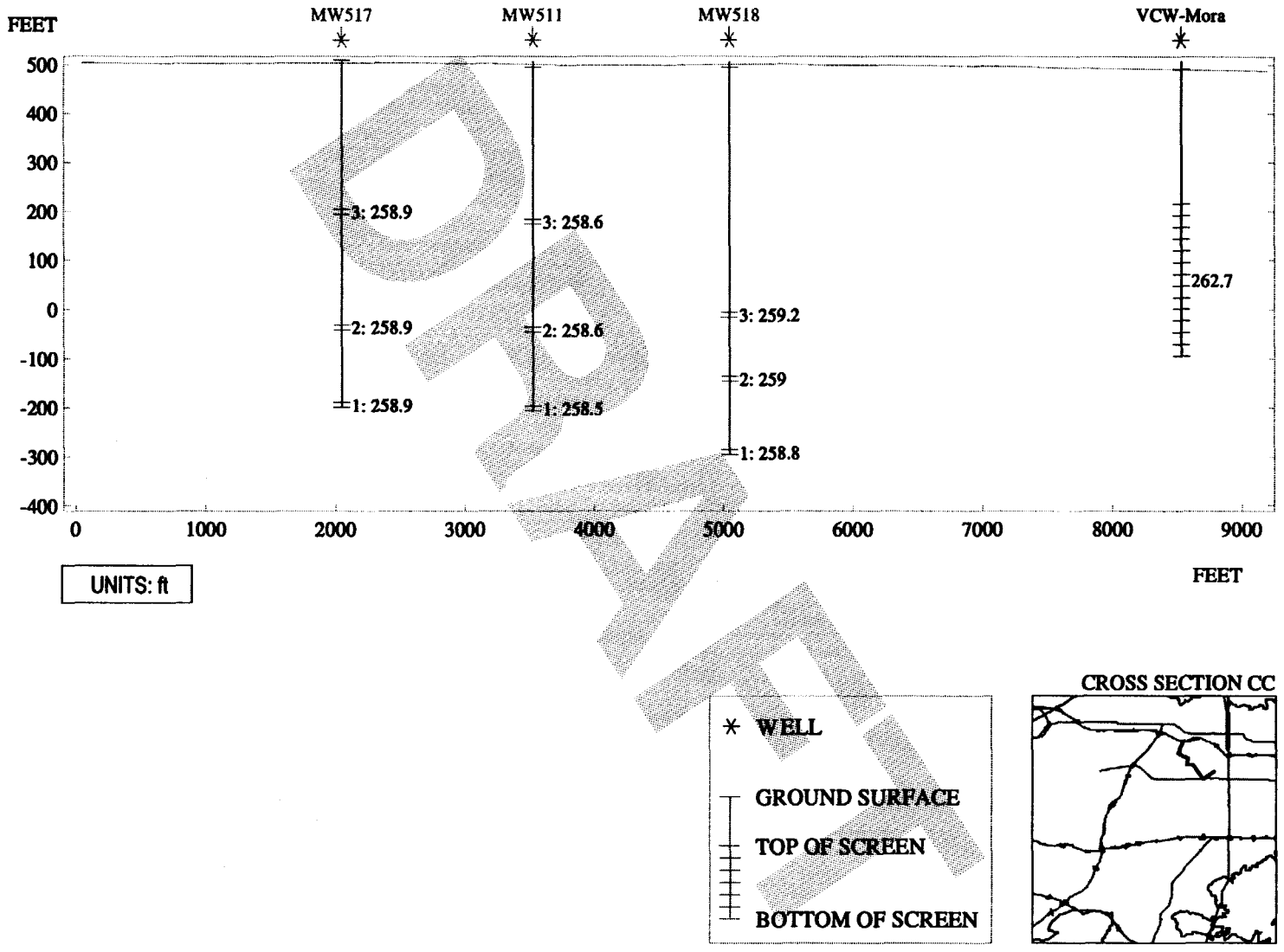

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FIGURE 4-34

Cross Section Showing Average Water Levels
June-July 1996

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

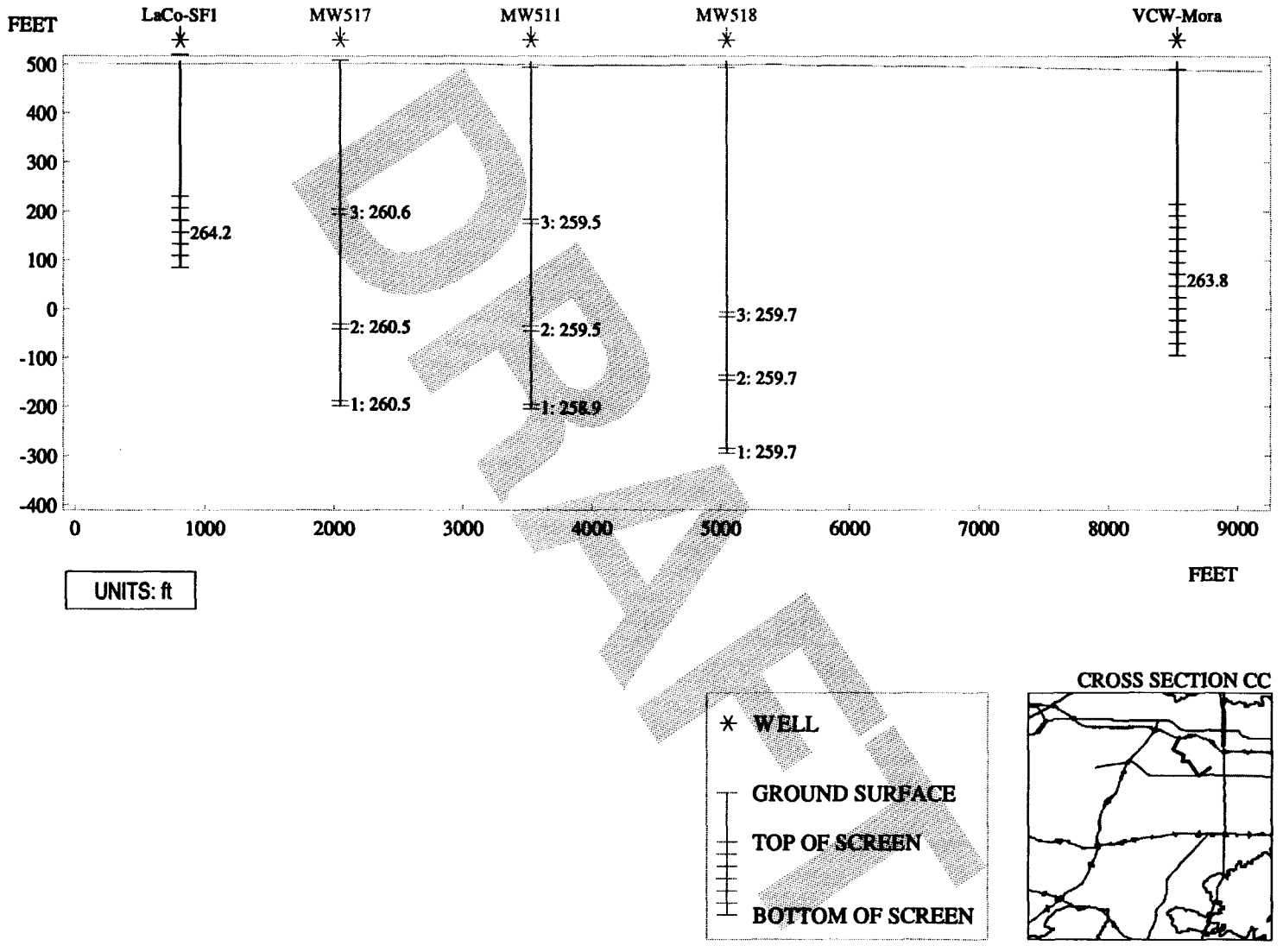

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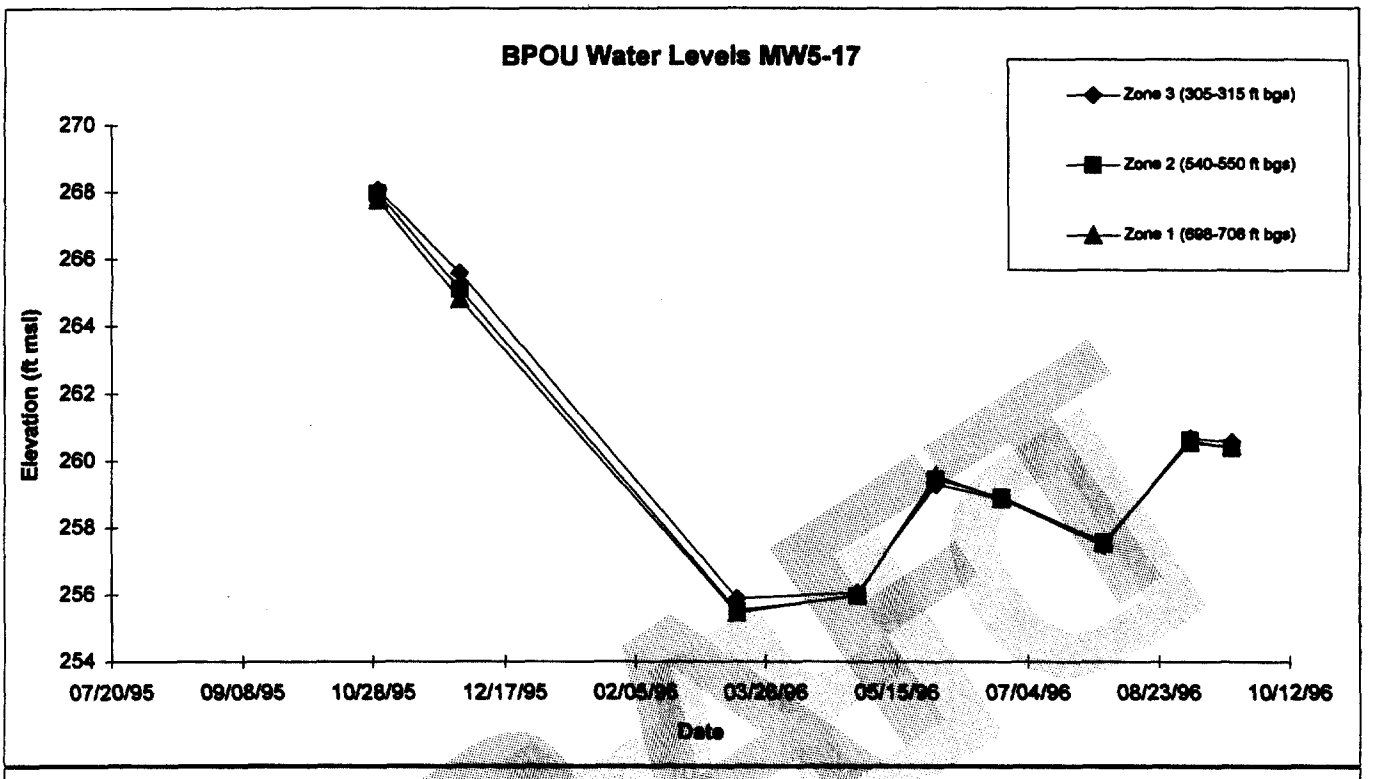
FIGURE 4-35

Cross Section Showing Average Water Levels
September-October 1996

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

Figure 4-36
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well Hydrograph
MW5-13 and MW5-17



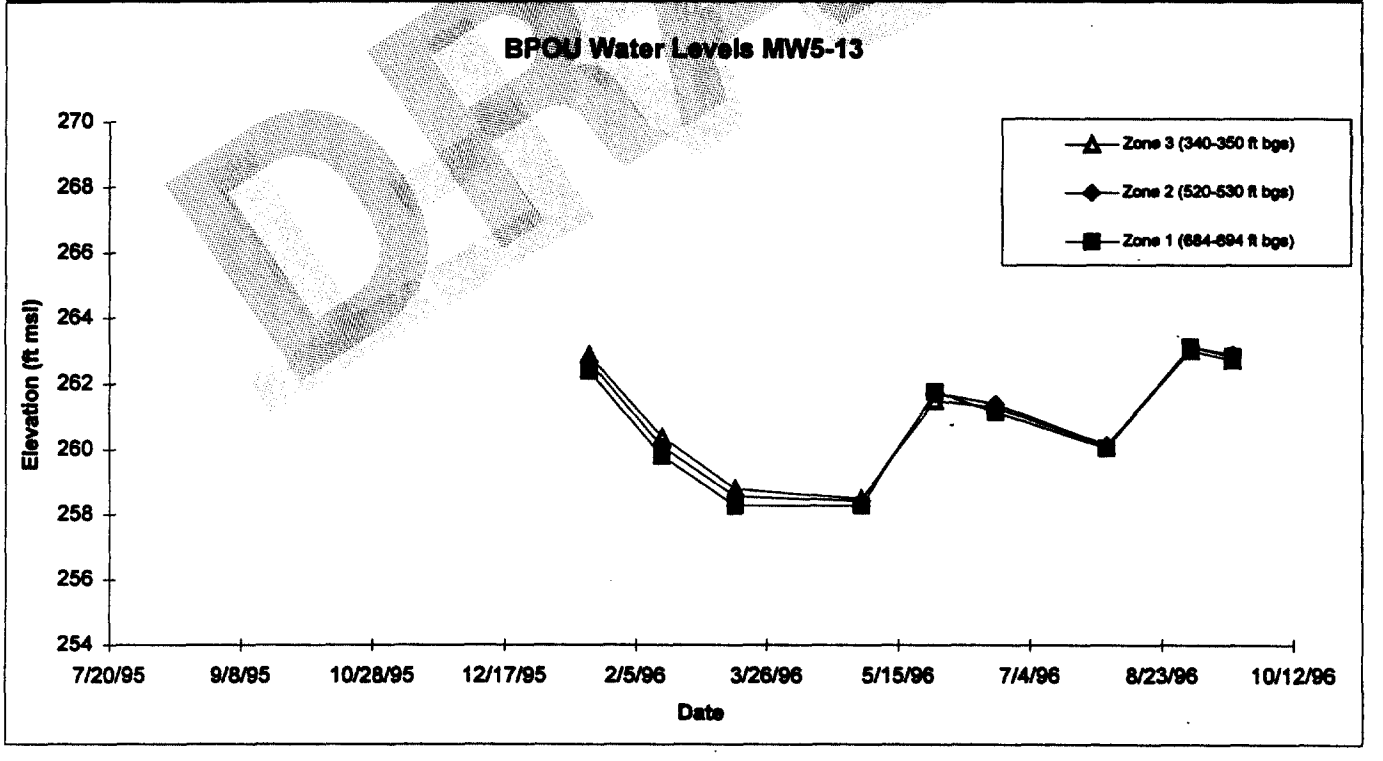


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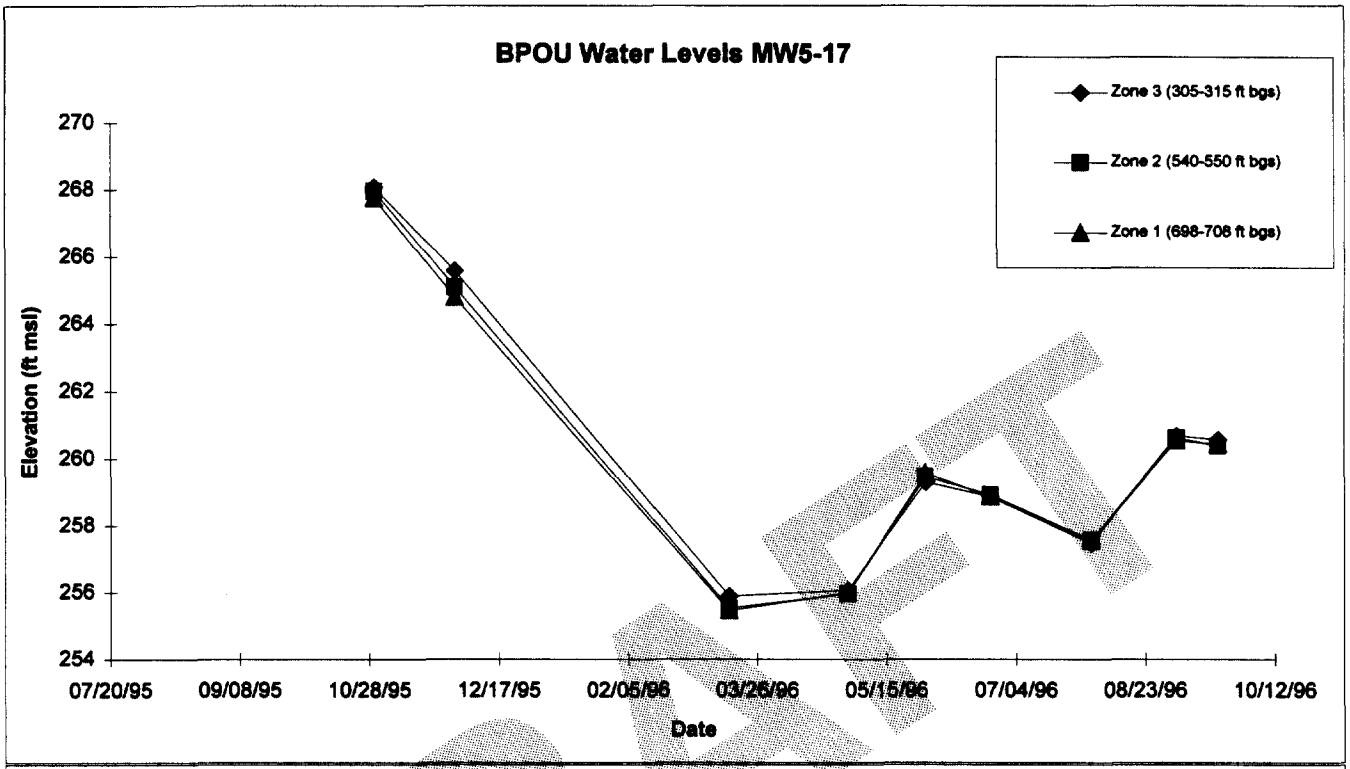
Figure 4-36
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well Hydrograph
MW5-13 and MW5-17



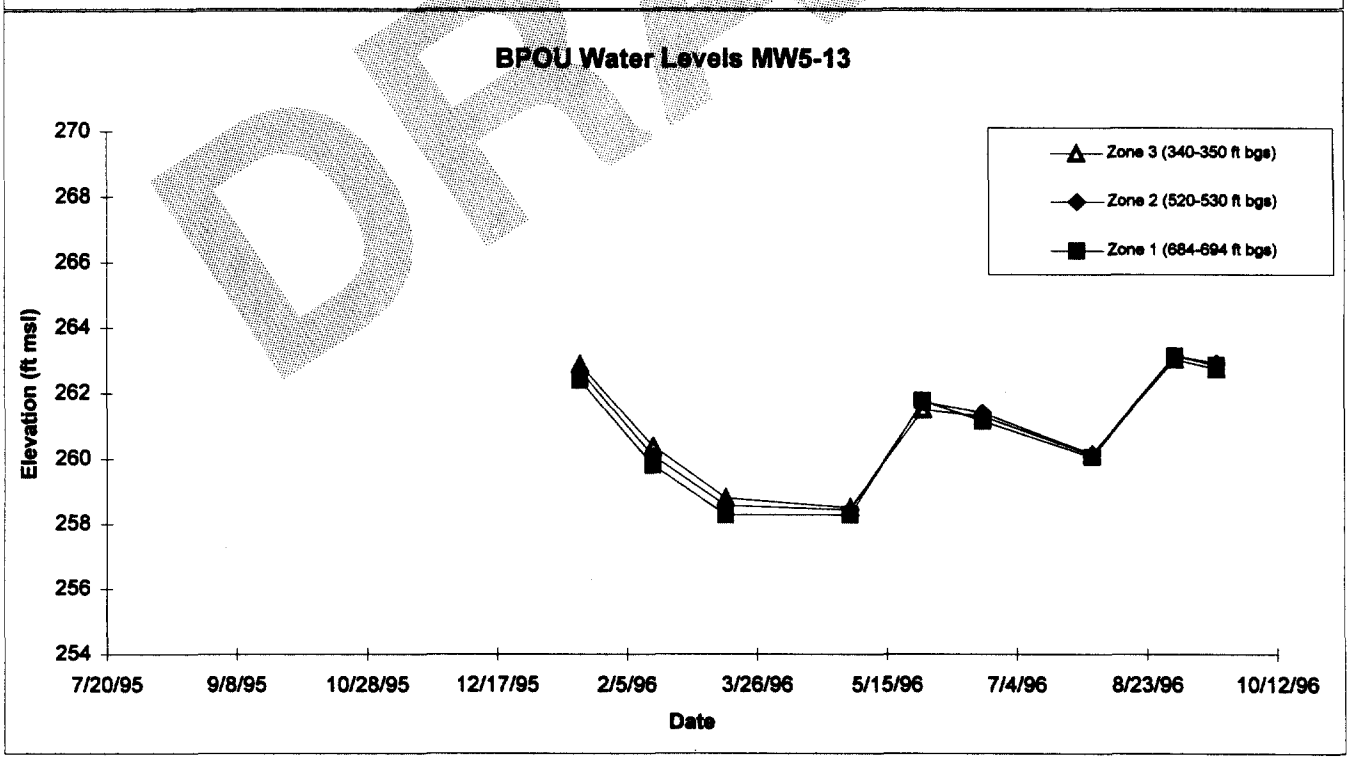


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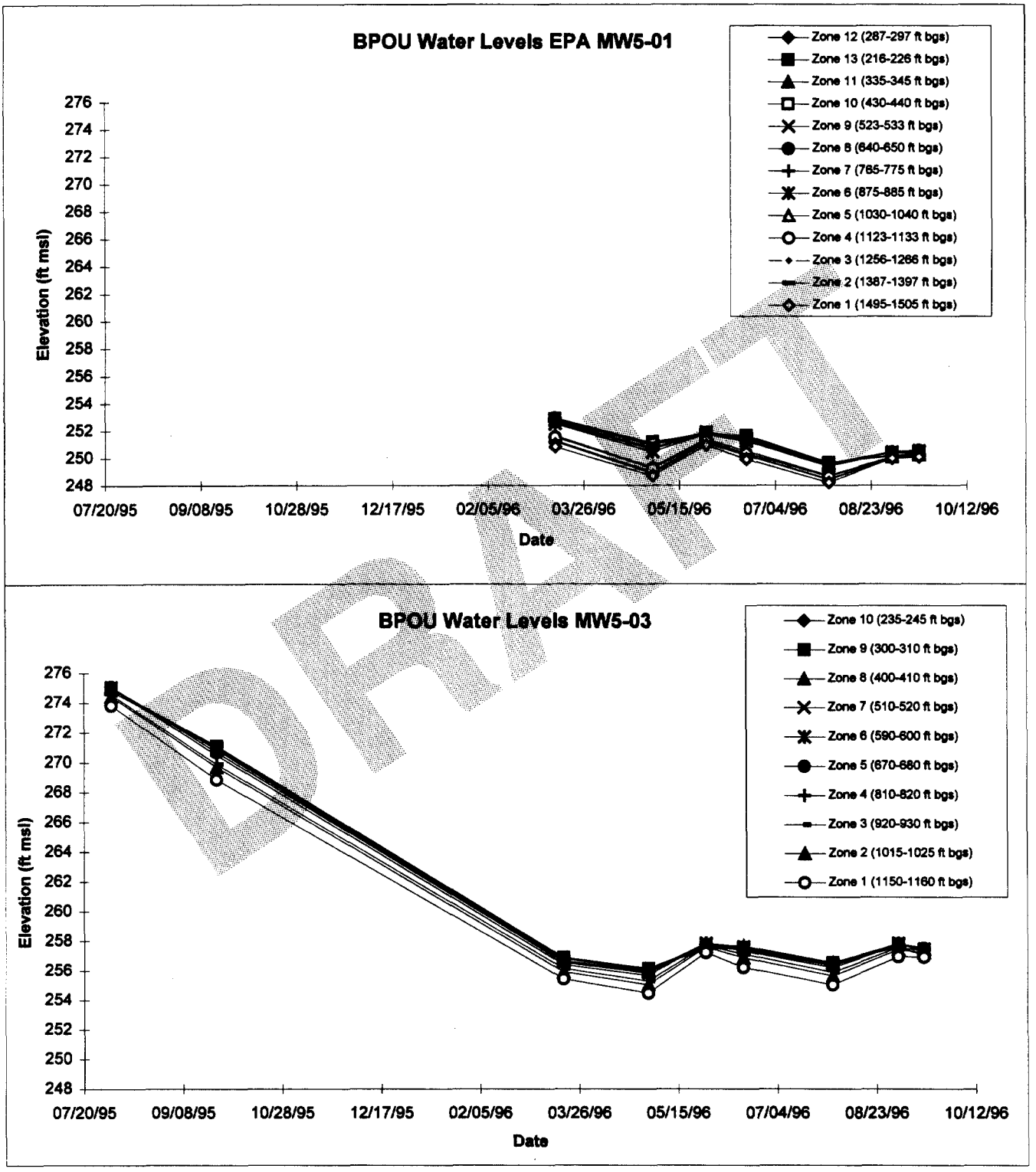
Figure 4-38
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well Hydrograph
MW5-01 and MW5-03



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12/12/96

Figure 4-39
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well Hydrograph
MW5-05 and MW5-08

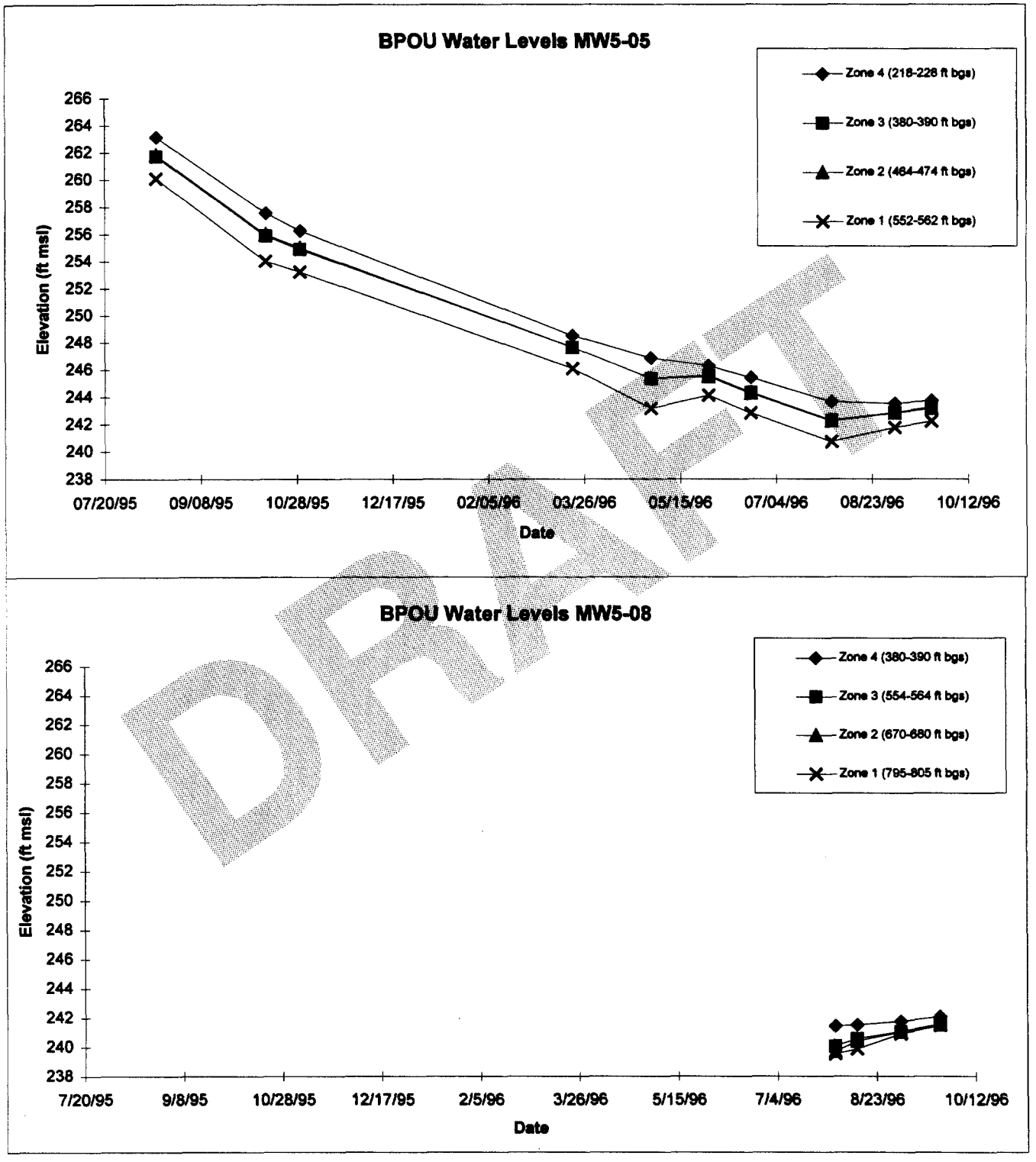

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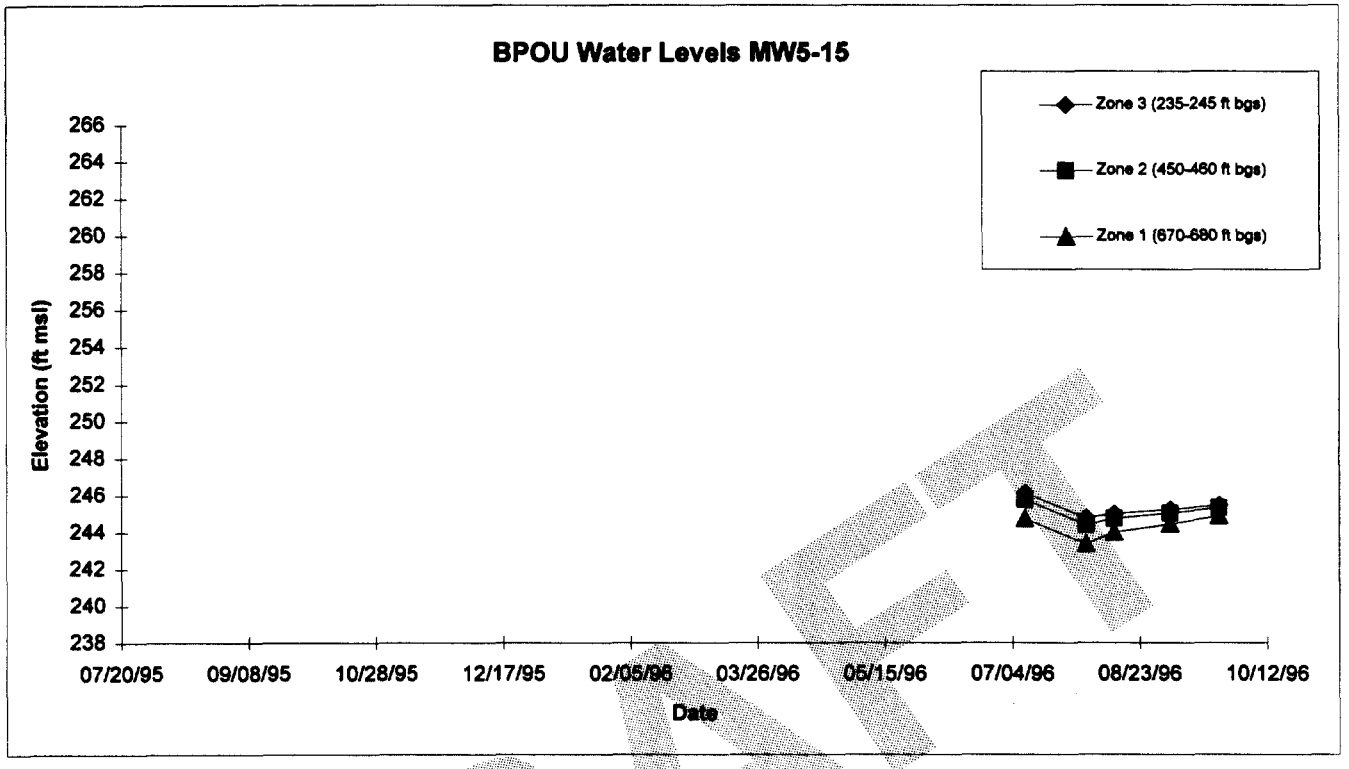
Figure 4-40
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Monitoring Well Hydrograph
MW5-15



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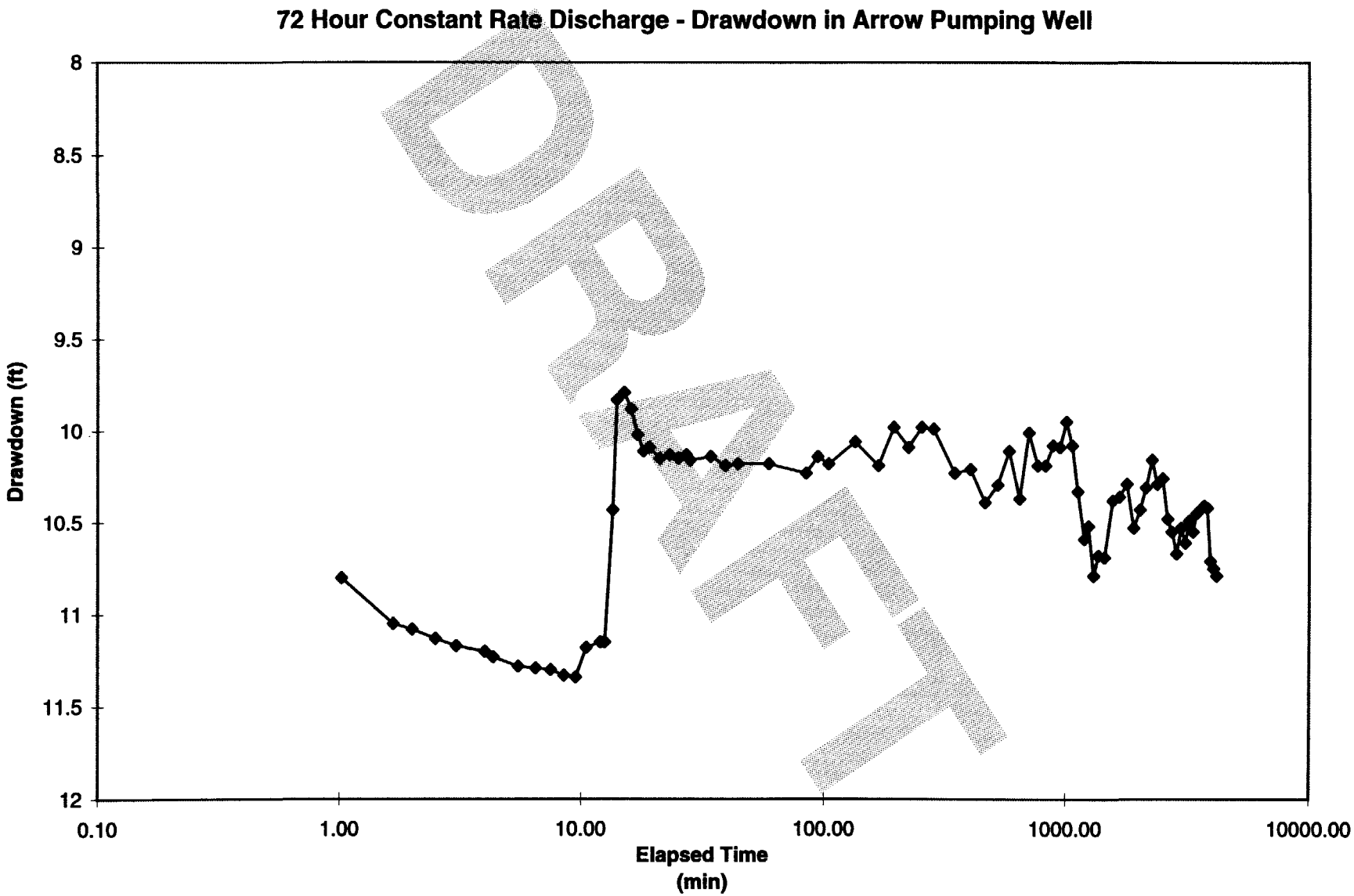
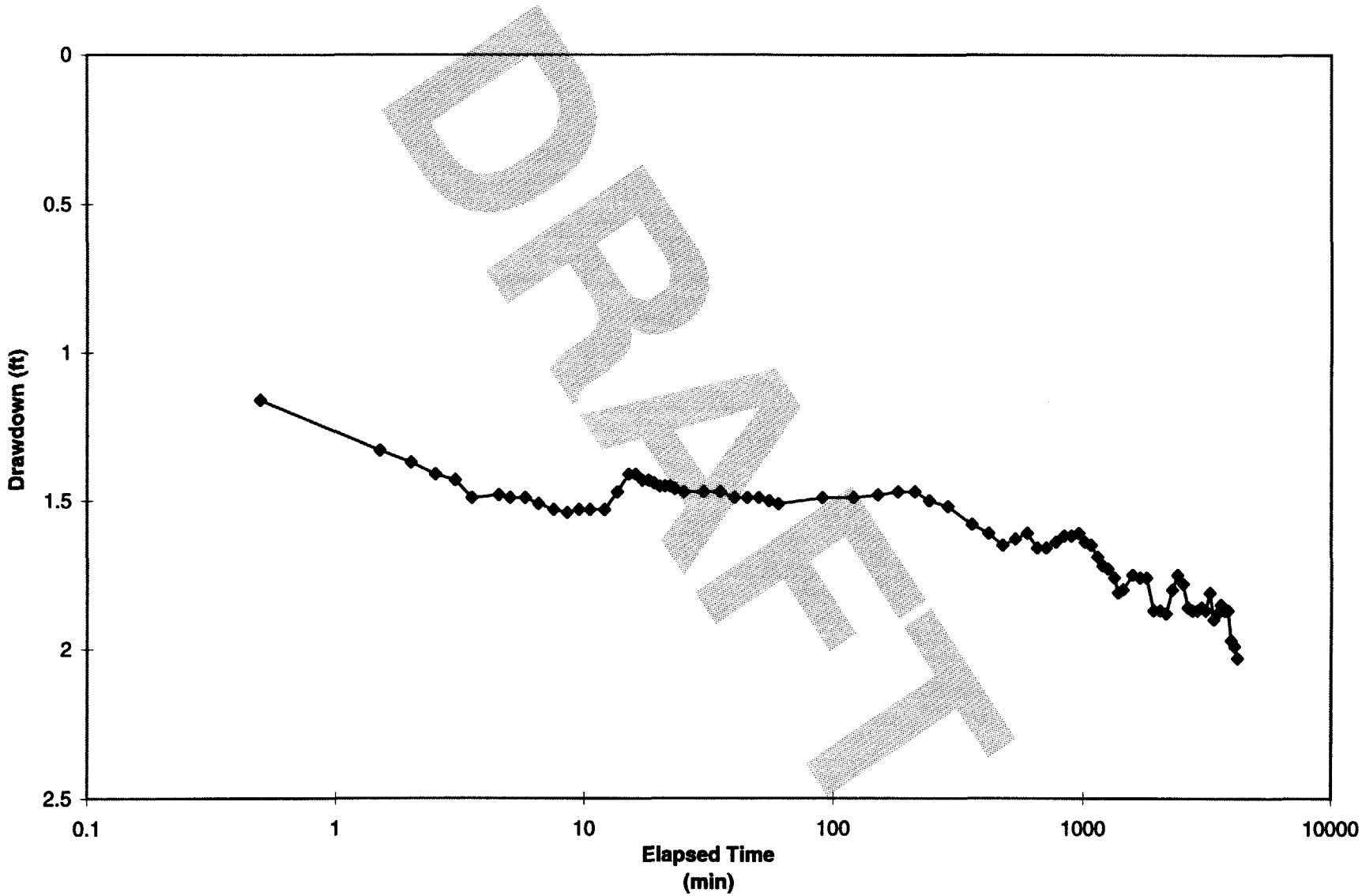
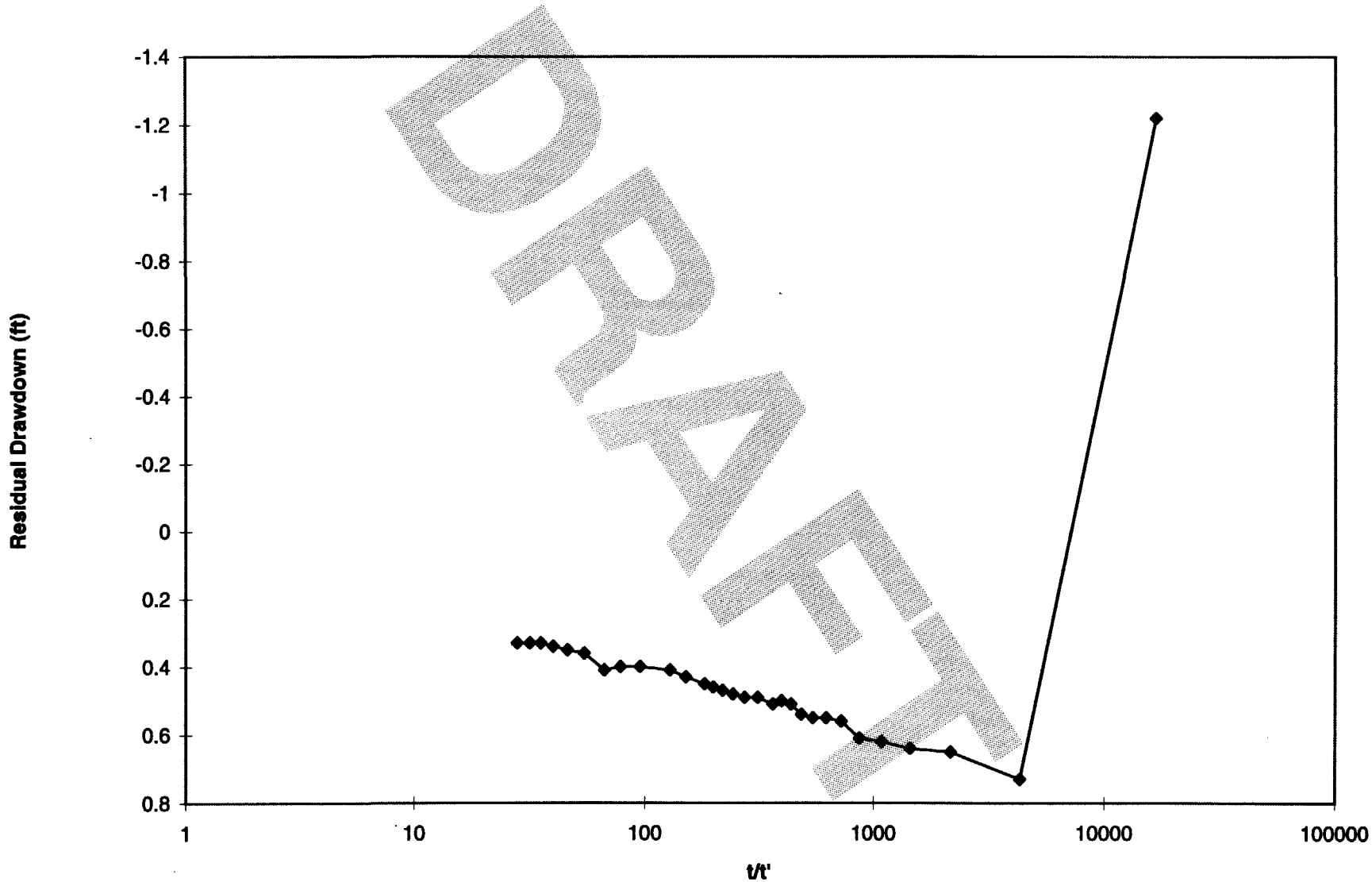

72 Hour Constant Rate Discharge - Drawdown in Arrow Pumping Well
Drawdown (ft)
8
8.5
9
9.5
10
10.5
11
11.5
12
0.10
1.00
10.00
100.00
1000.00
10000.00
Elapsed Time
(min)
DRAFT

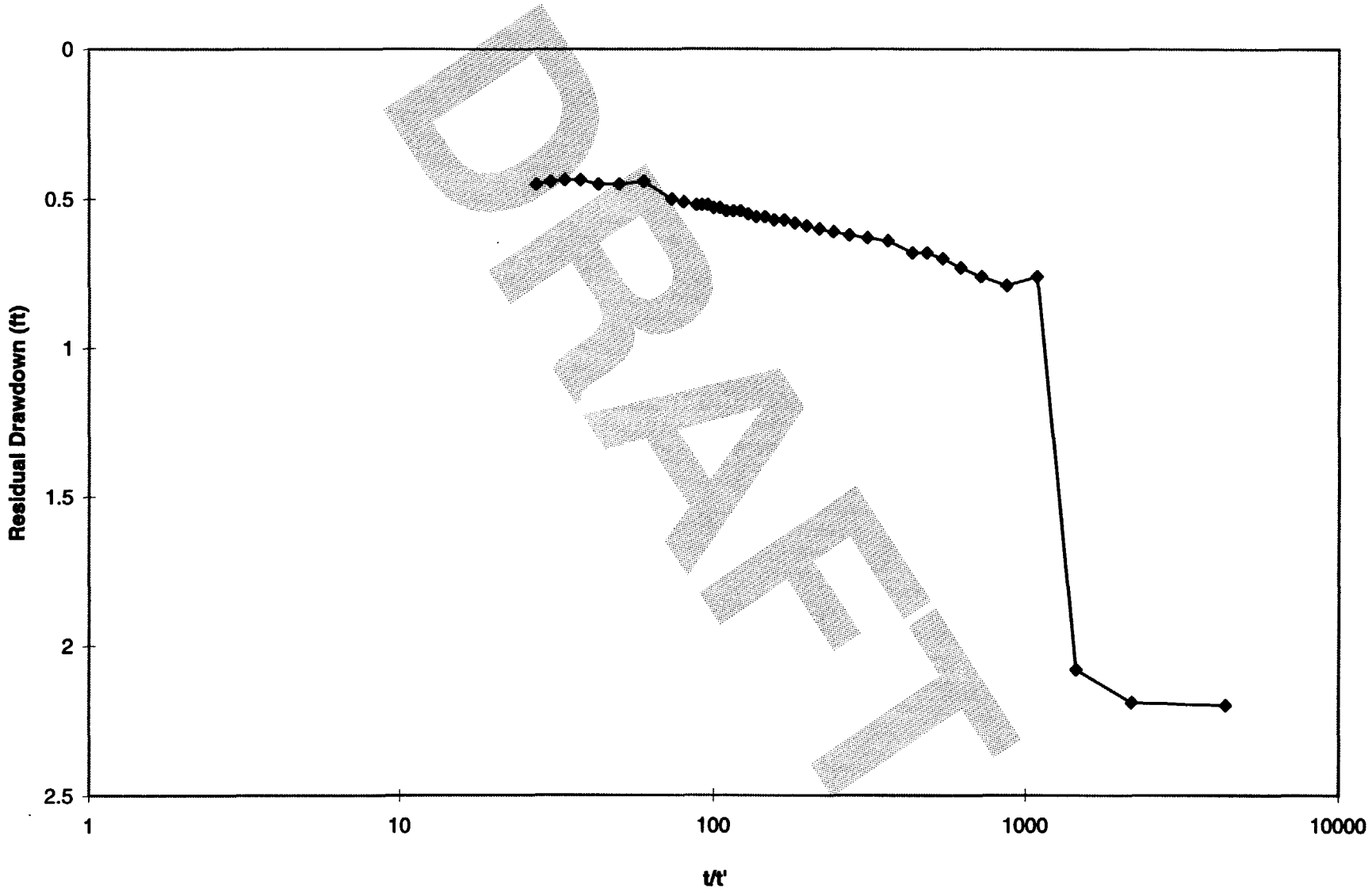
72 Hour Constant Rate Discharge - Drawdown in Lante Observation Well



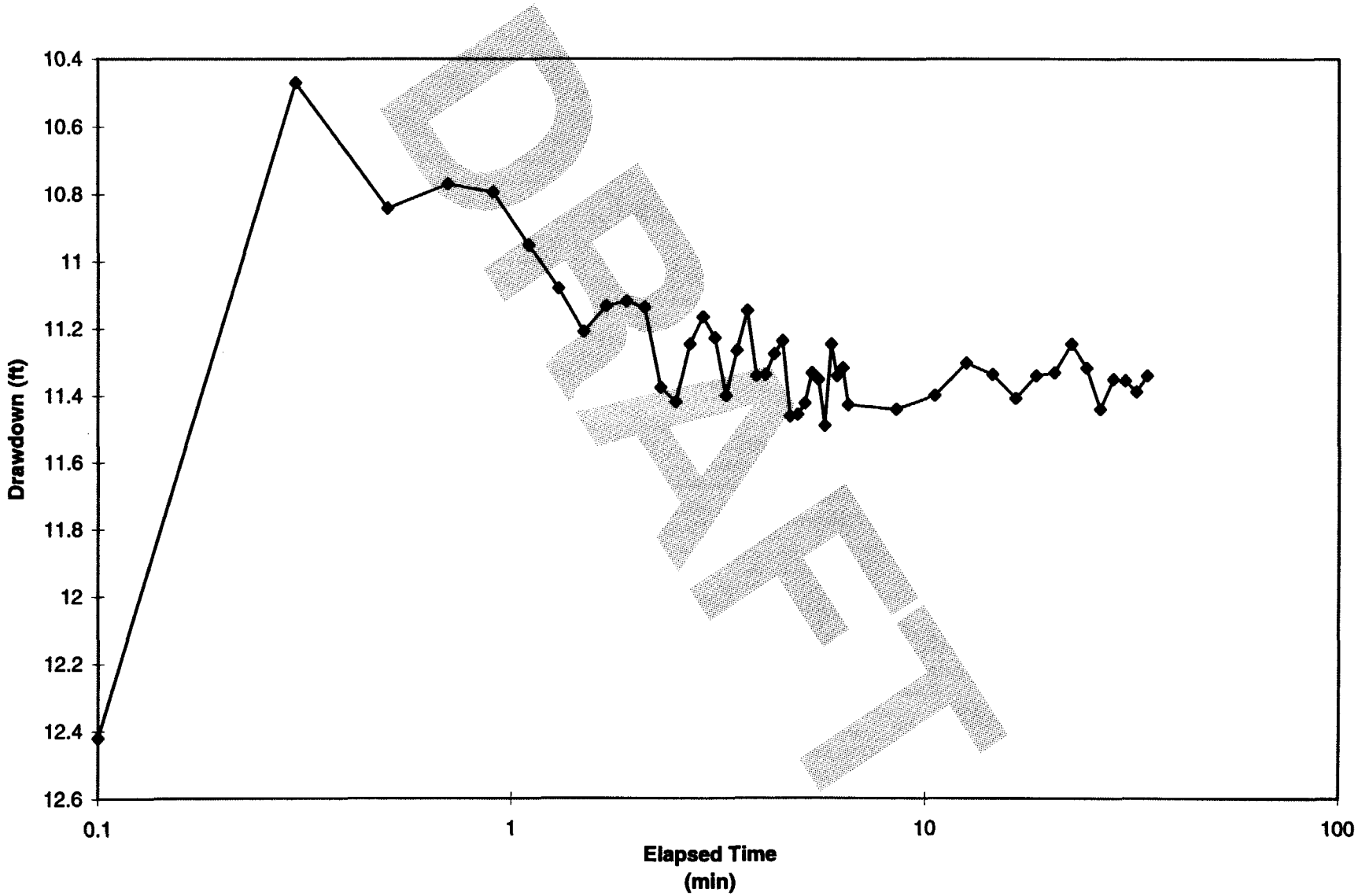
72 Hour Constant Rate Discharge - Recovery Data at Arrow Pumping Well



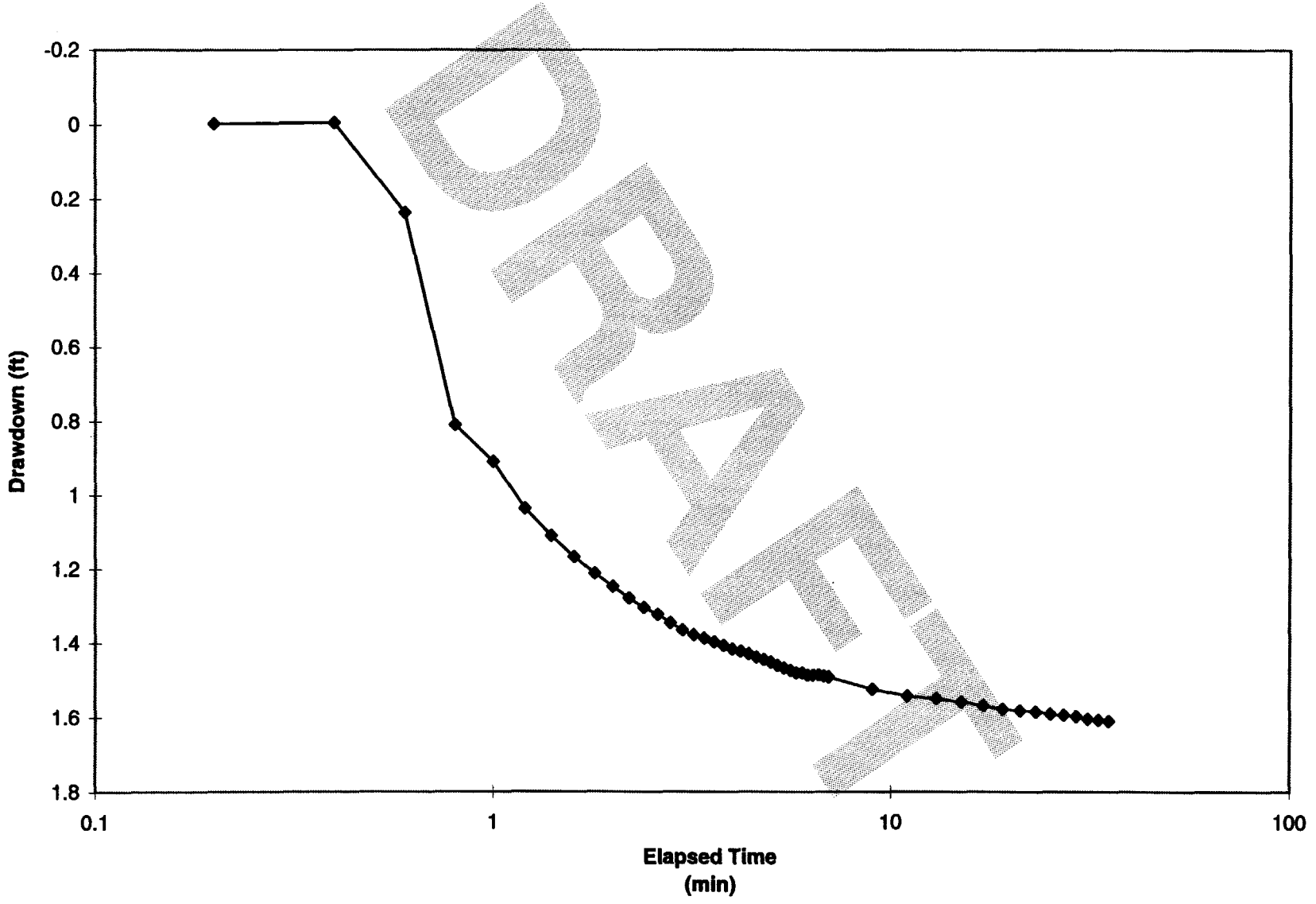
72 Hour Constant Rate Discharge - Recovery Data at Lante Observation Well



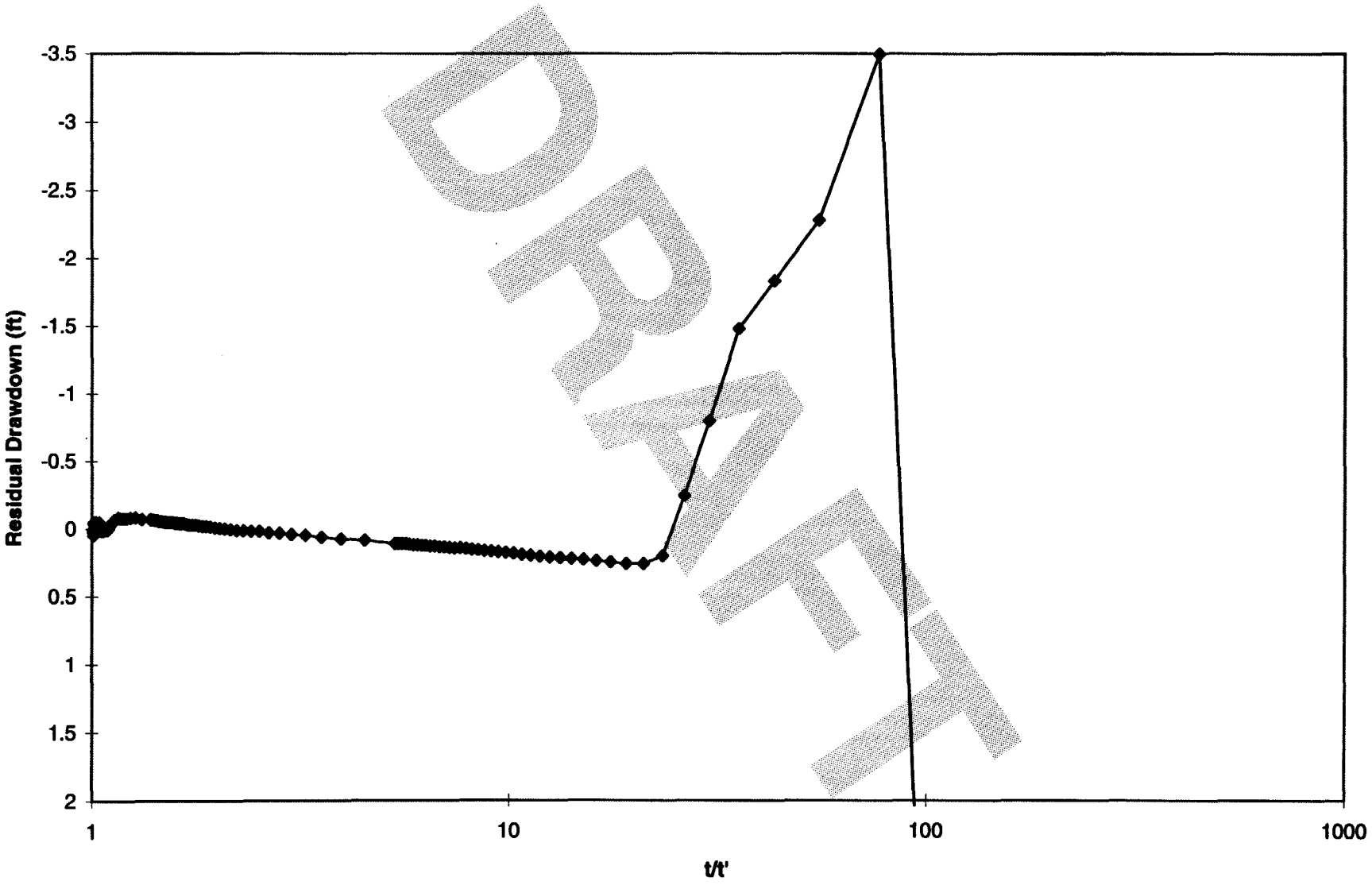
35 Minute Restart - Drawdown in Arrow Pumping Well



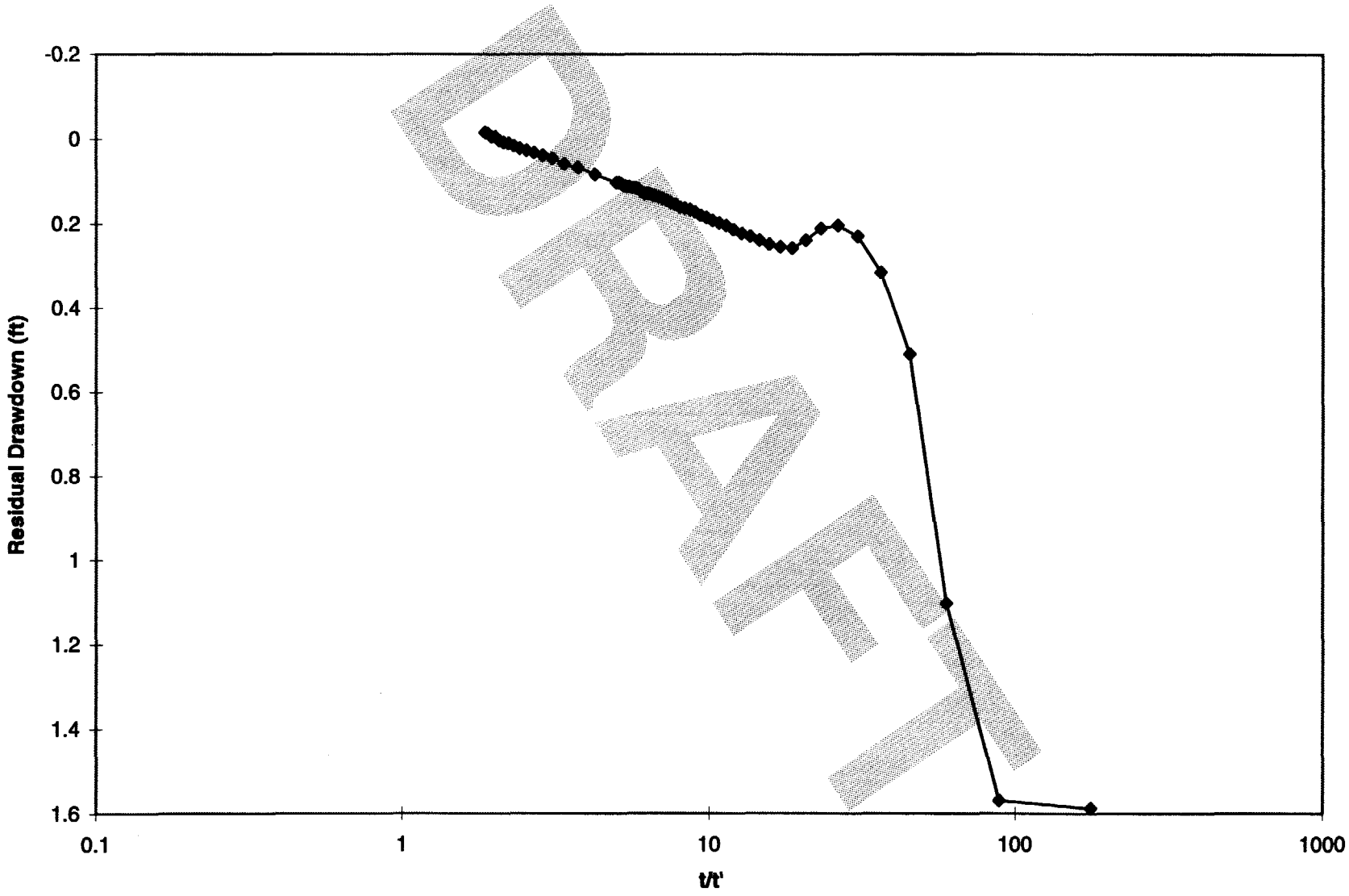
35 Minute Restart - Drawdown in Lante Observation Well



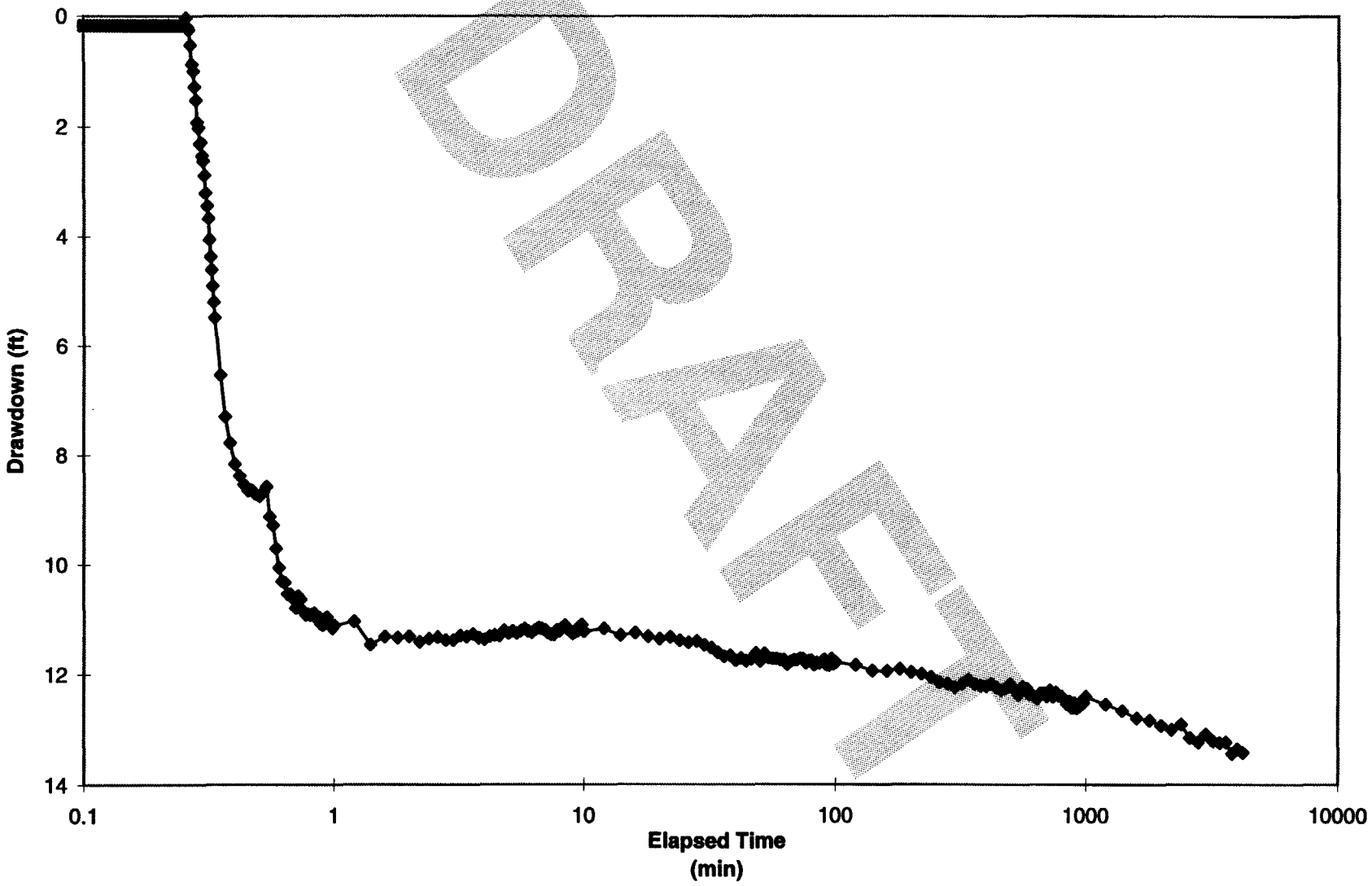
35 Minute Restart - Recovery Data at Arrow Pumping Well



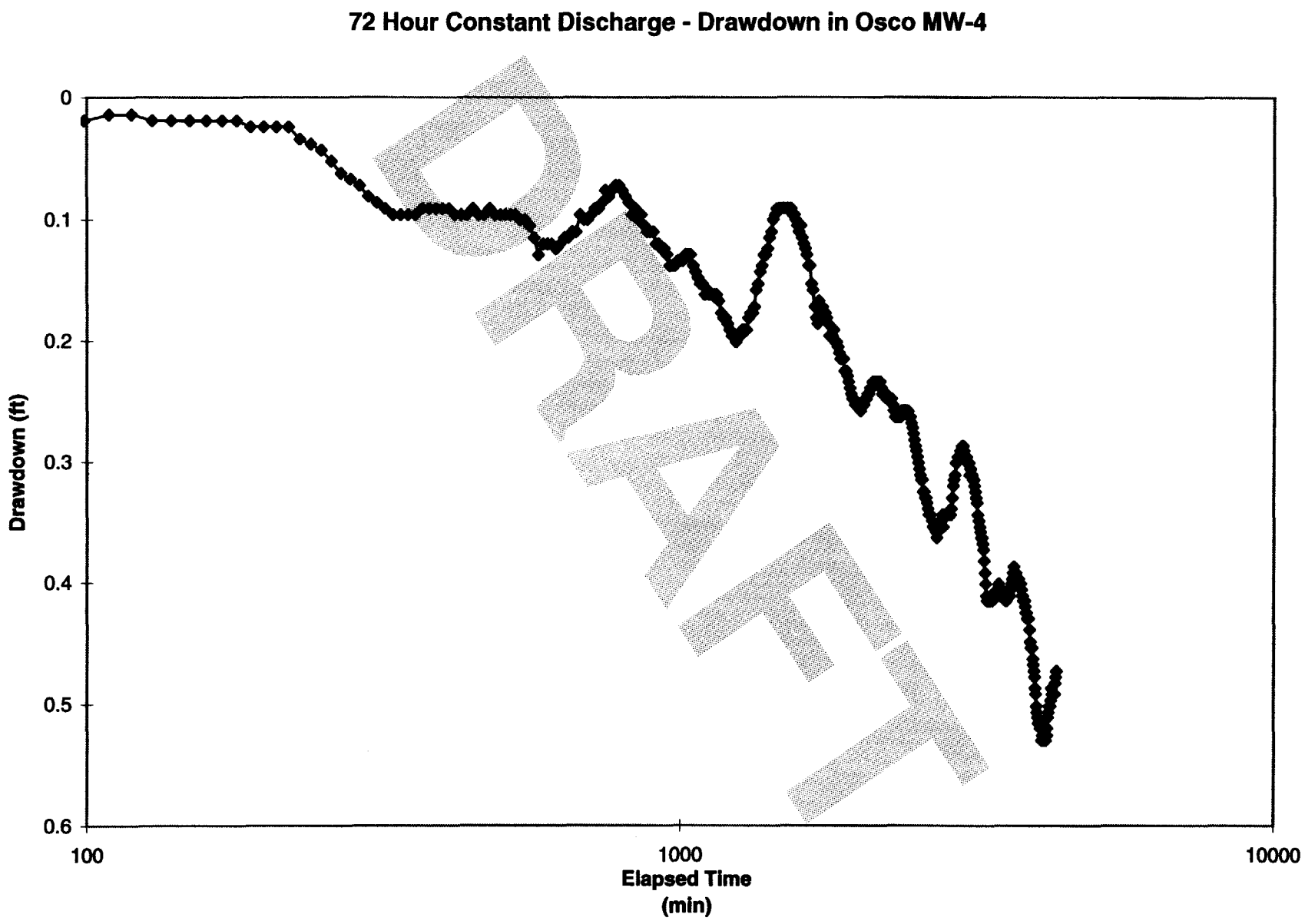
35 Minute Restart - Recovery Data at Lante Observation Well



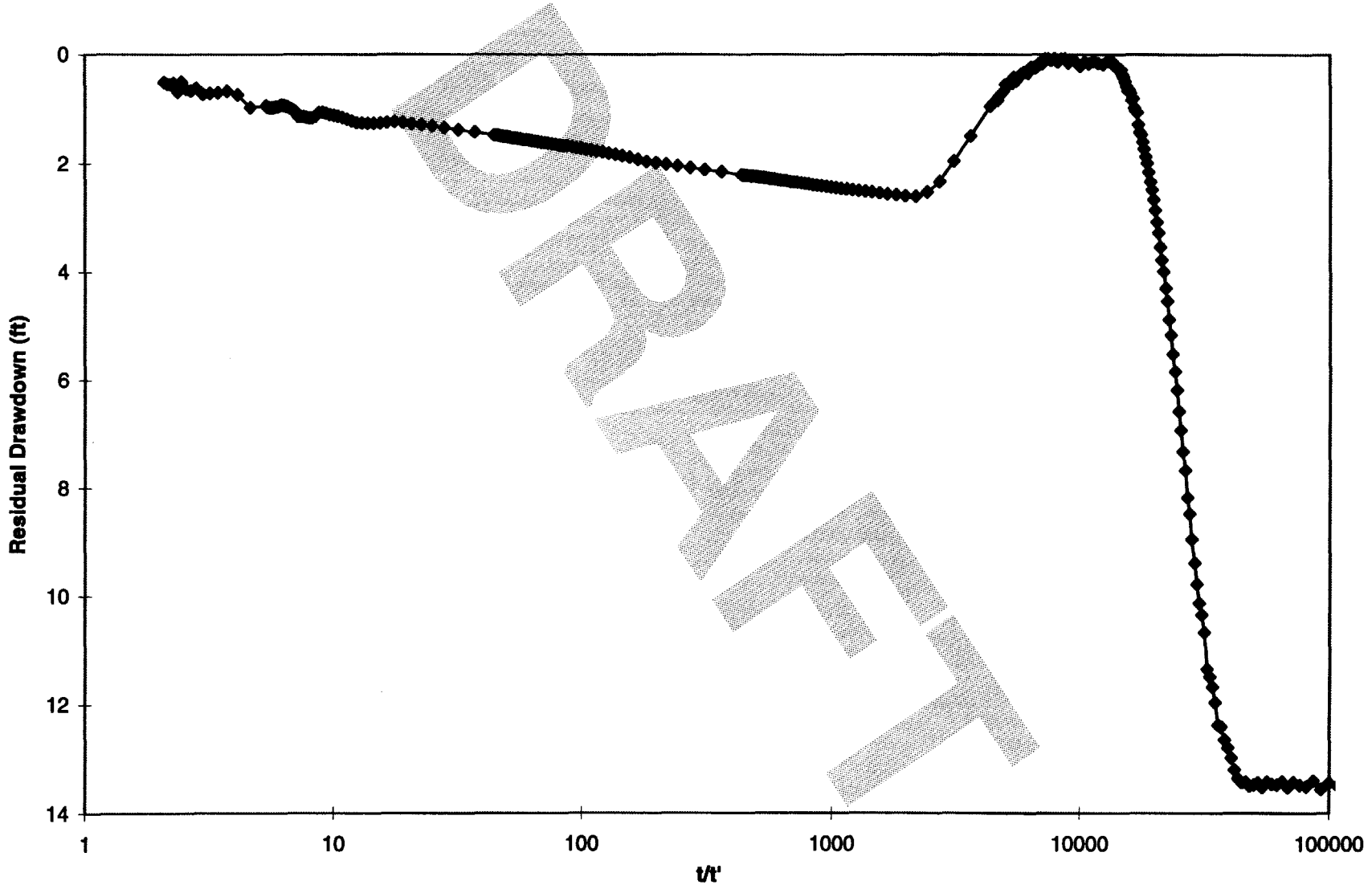
72 Hour Constant Discharge - Drawdown in Santa Fe Pump Well



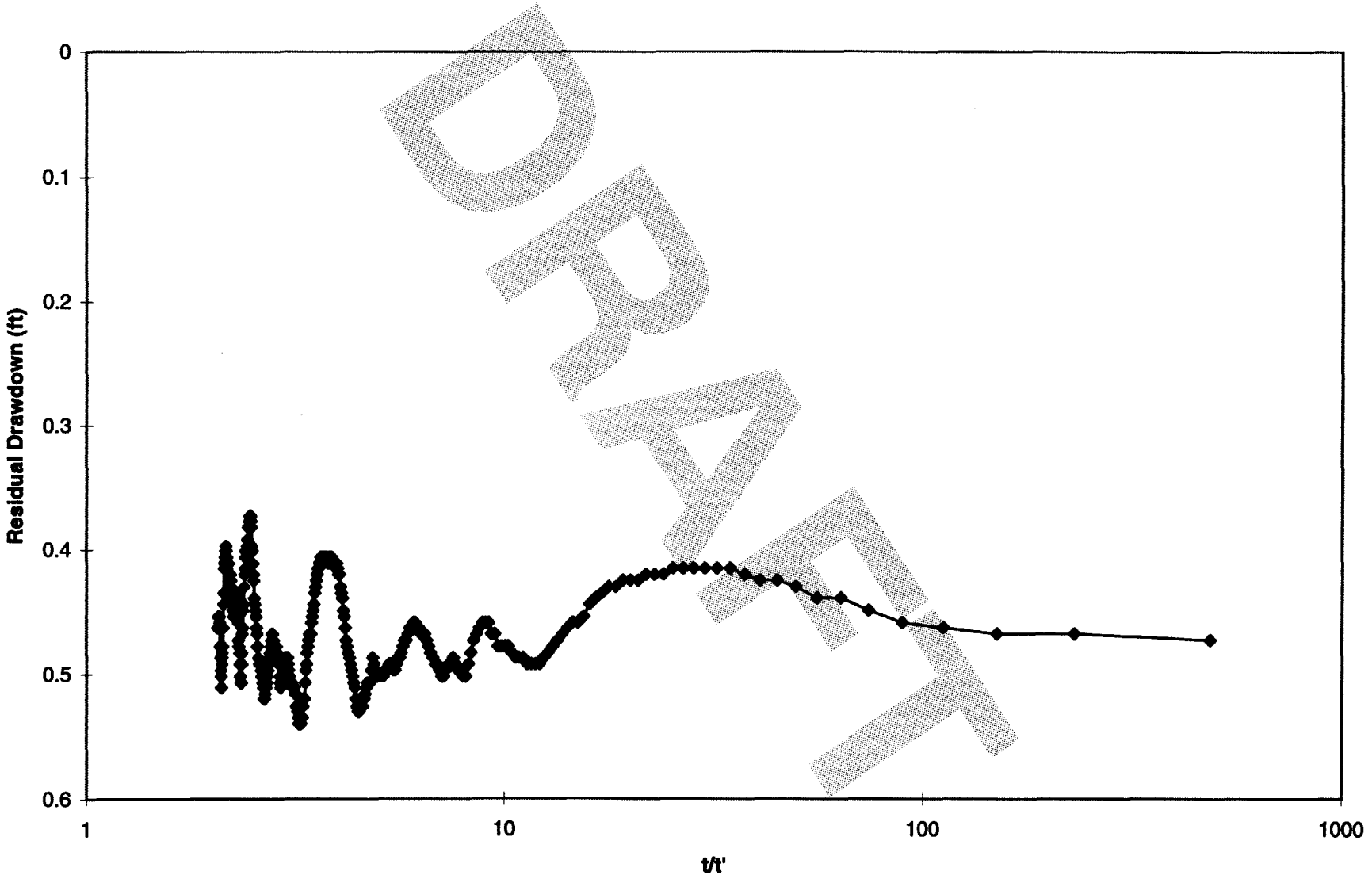
DRAFT


72 Hour Constant Discharge - Drawdown in Osco MW-4
Drawdown (ft)
0
0.1
0.2
0.3
0.4
0.5
0.6
100
1000
10000
Elapsed Time
(min)
DRAFT

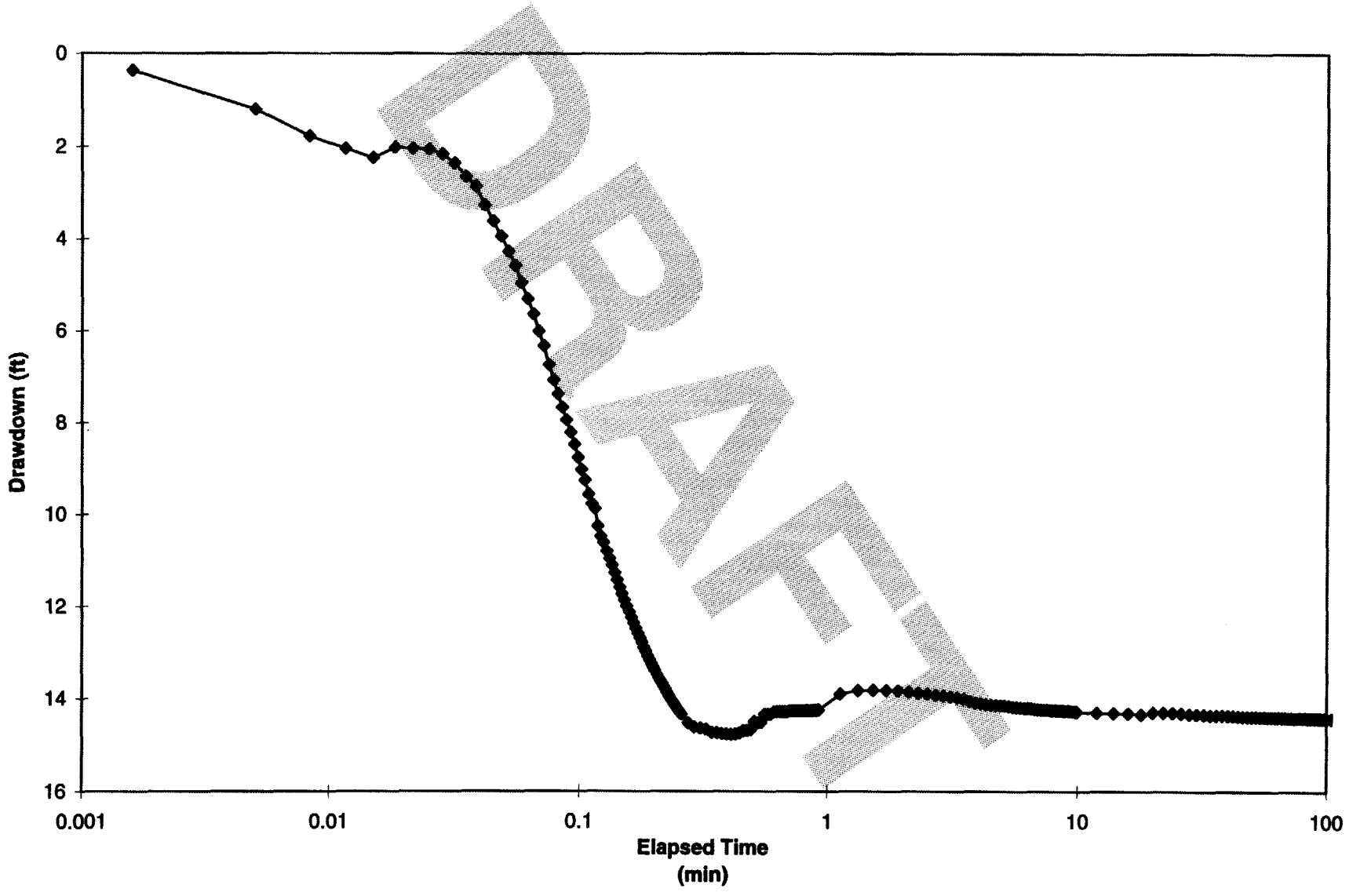
72 Hour Constant Rate Discharge - Recovery Data at Santa Fe Pump Well



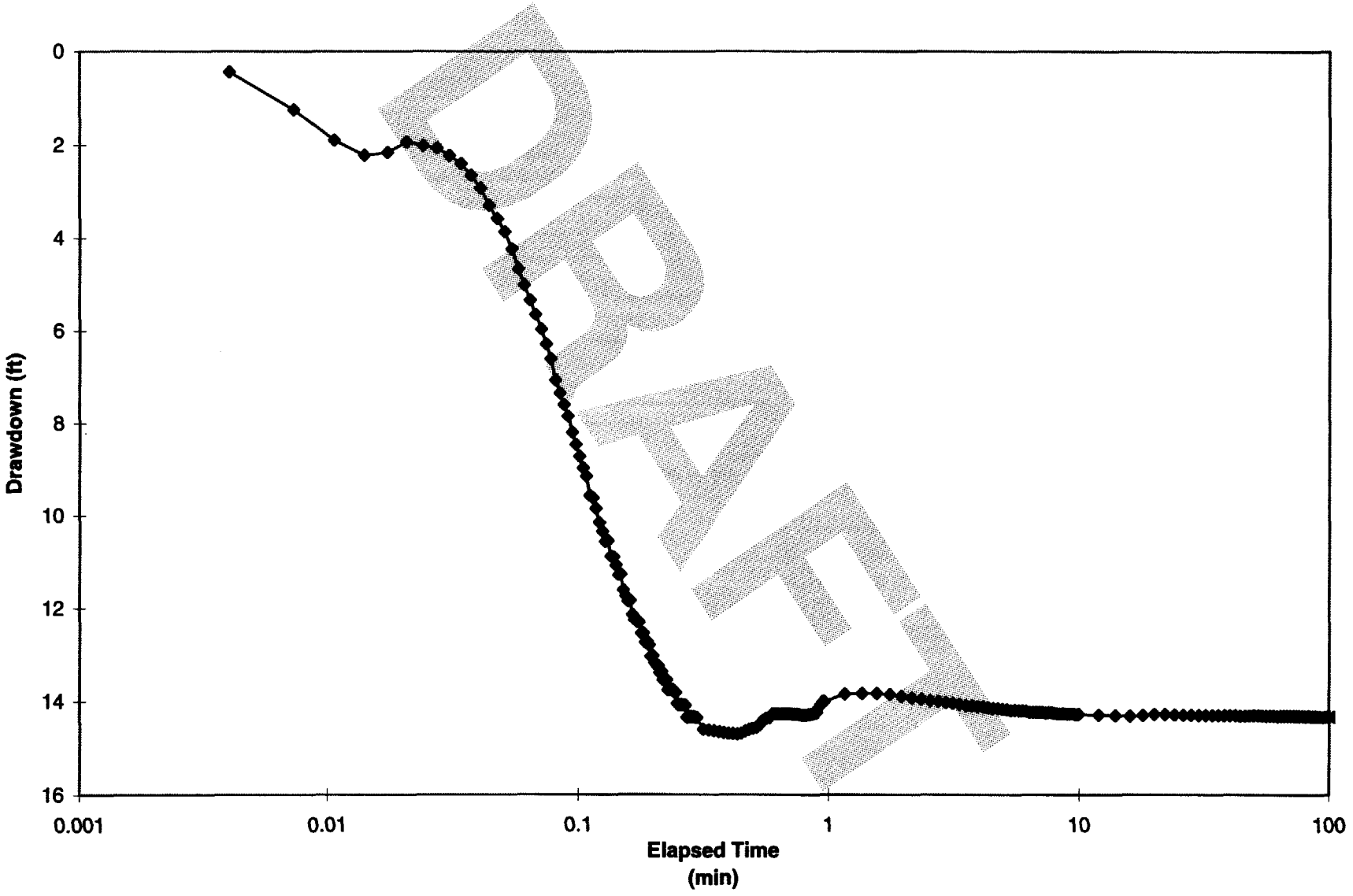
72 Hour Constant Discharge - Recovery Data at Ocso MW-4



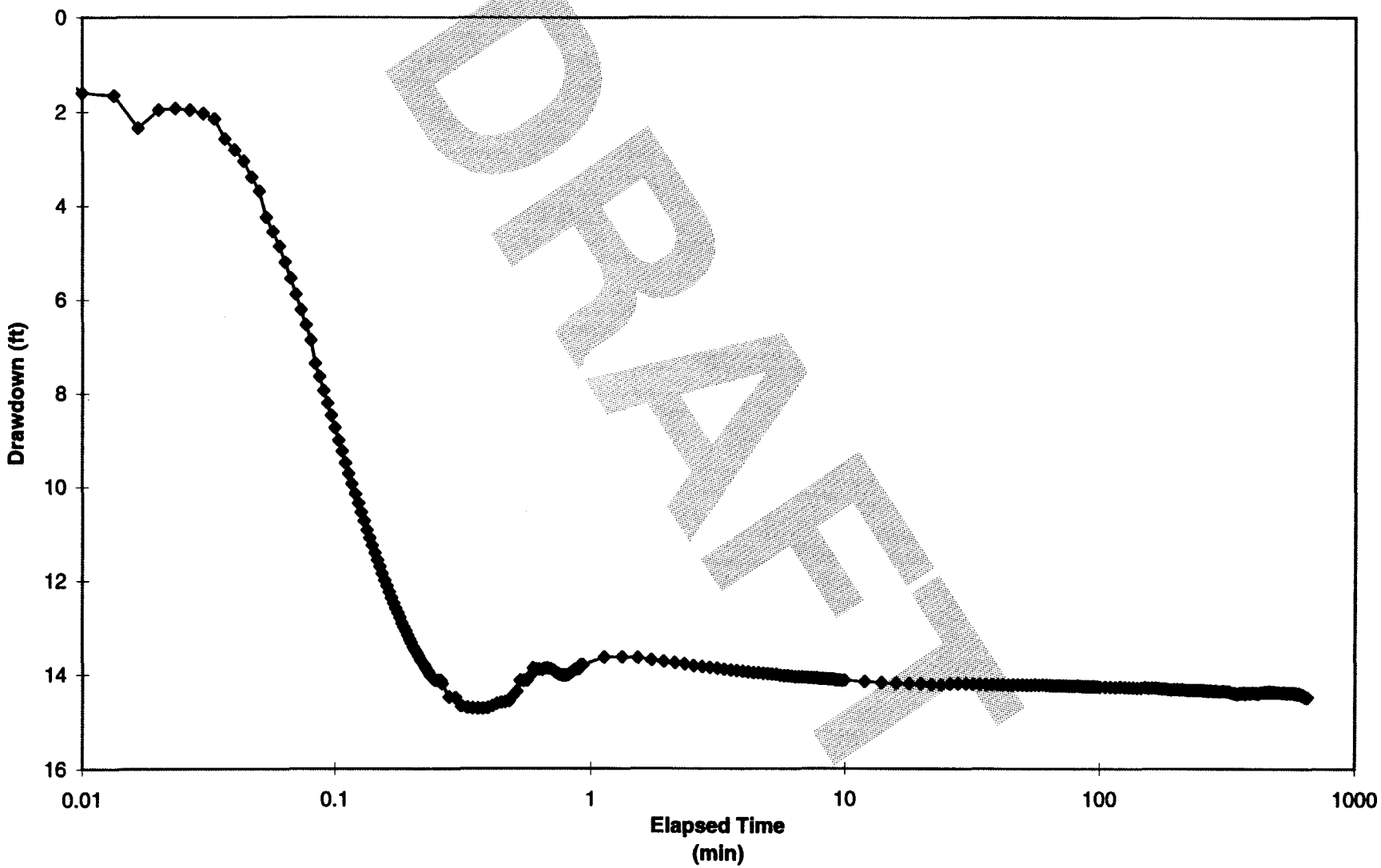
Drawdown at AZ-2 Pumping Well - Pumping Test 1



Drawdown at Pumping Well AZ-2 - Pumping Test 2



Drawdown at AZ-2 Pumping Well - Pumping Test 3



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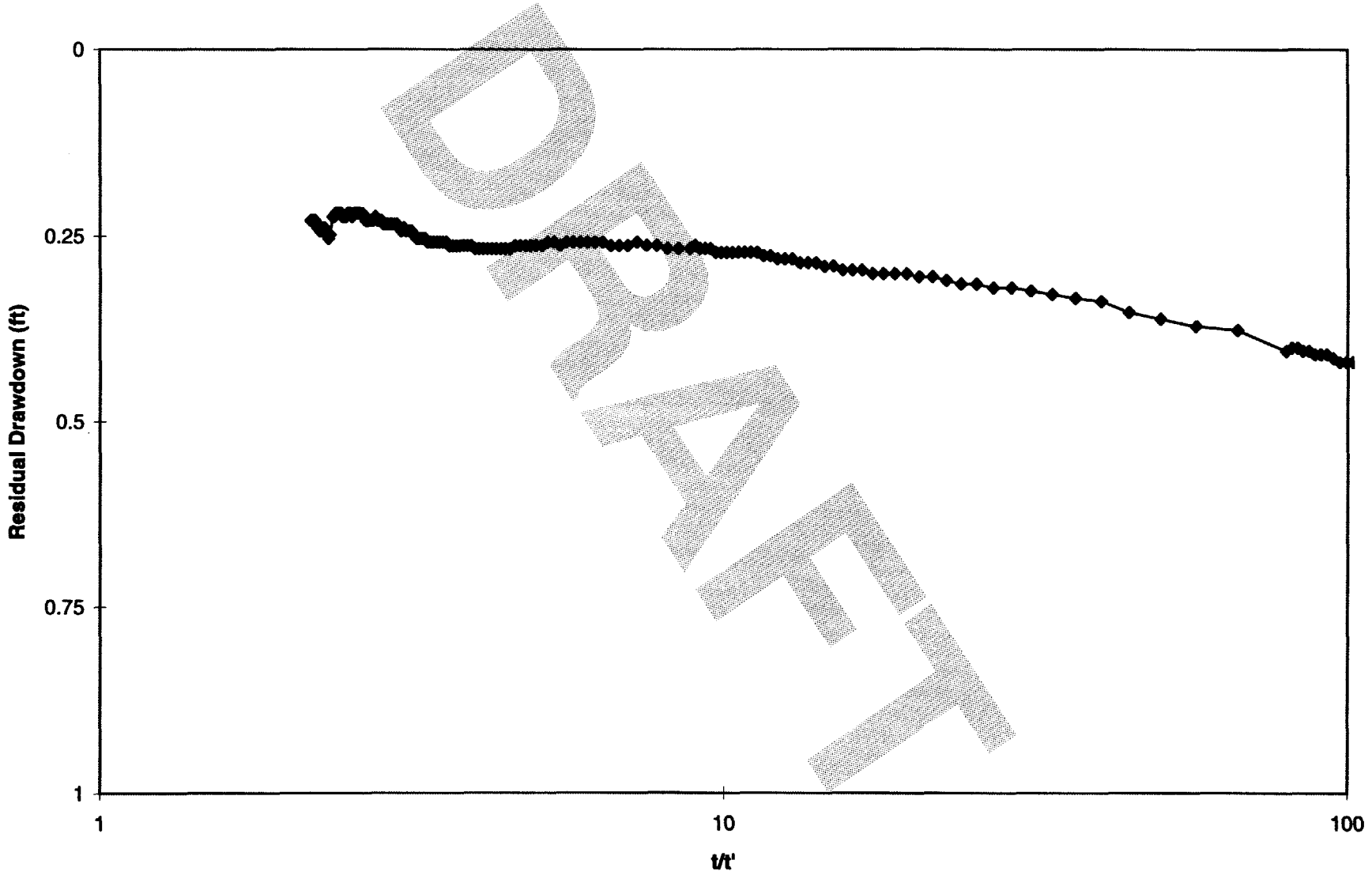
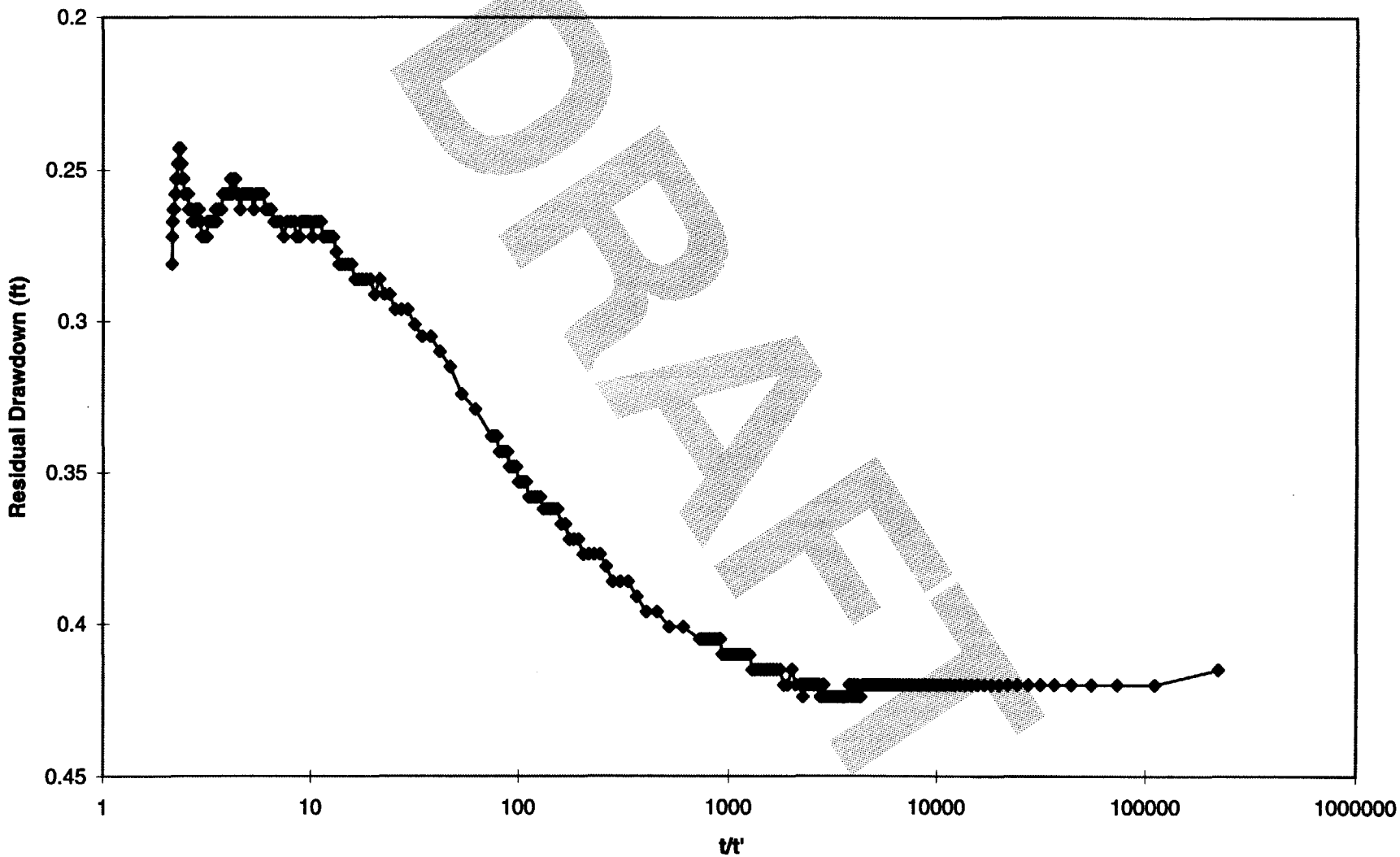
Recovery Data at Pumping Well AZ-2 - Pumping Test 1



Recovery Data at Pumping Well AZ-2 - Pumping Test 2



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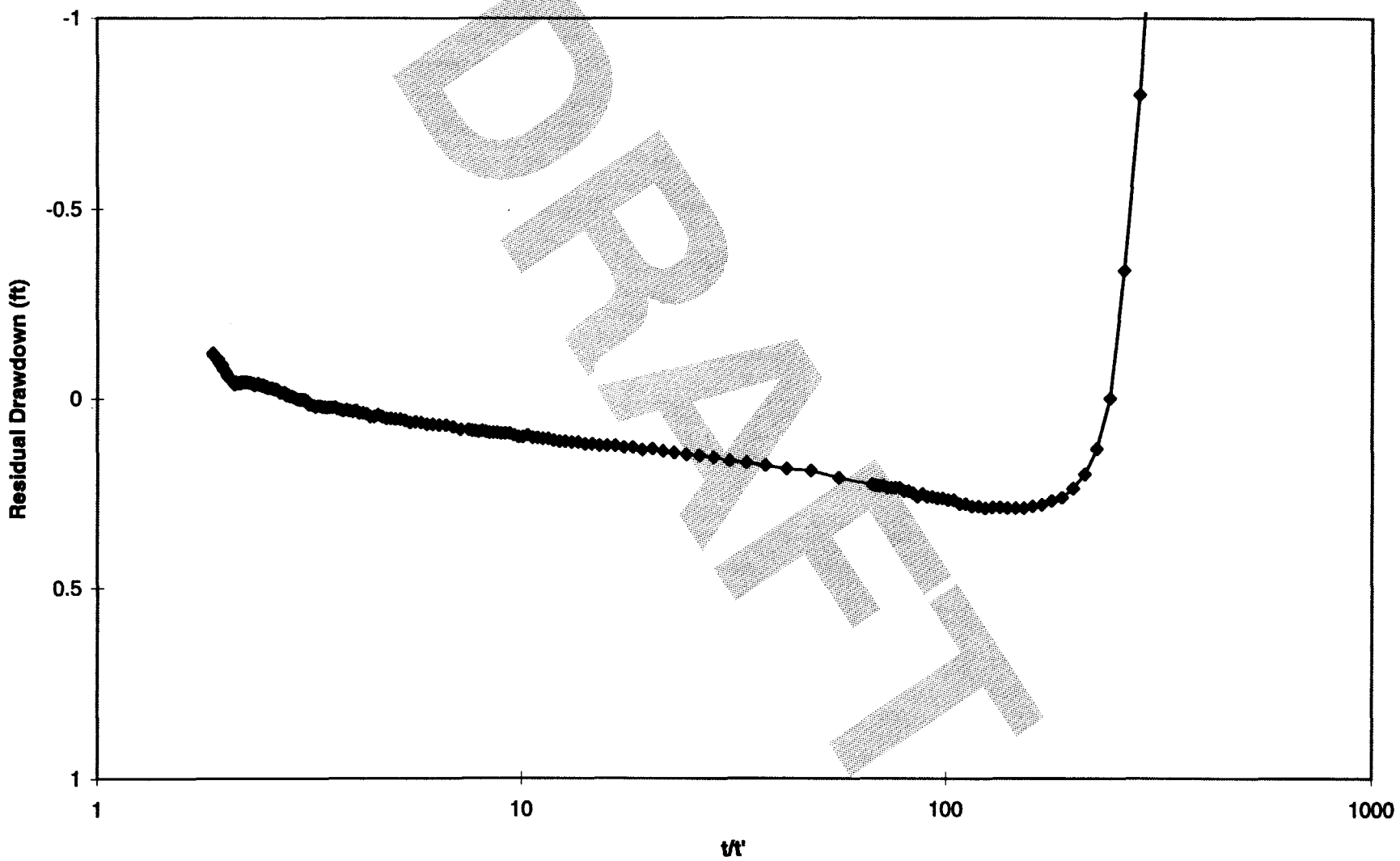
Recovery Data at AZ-2 Pumping Well - Pumping Test 3



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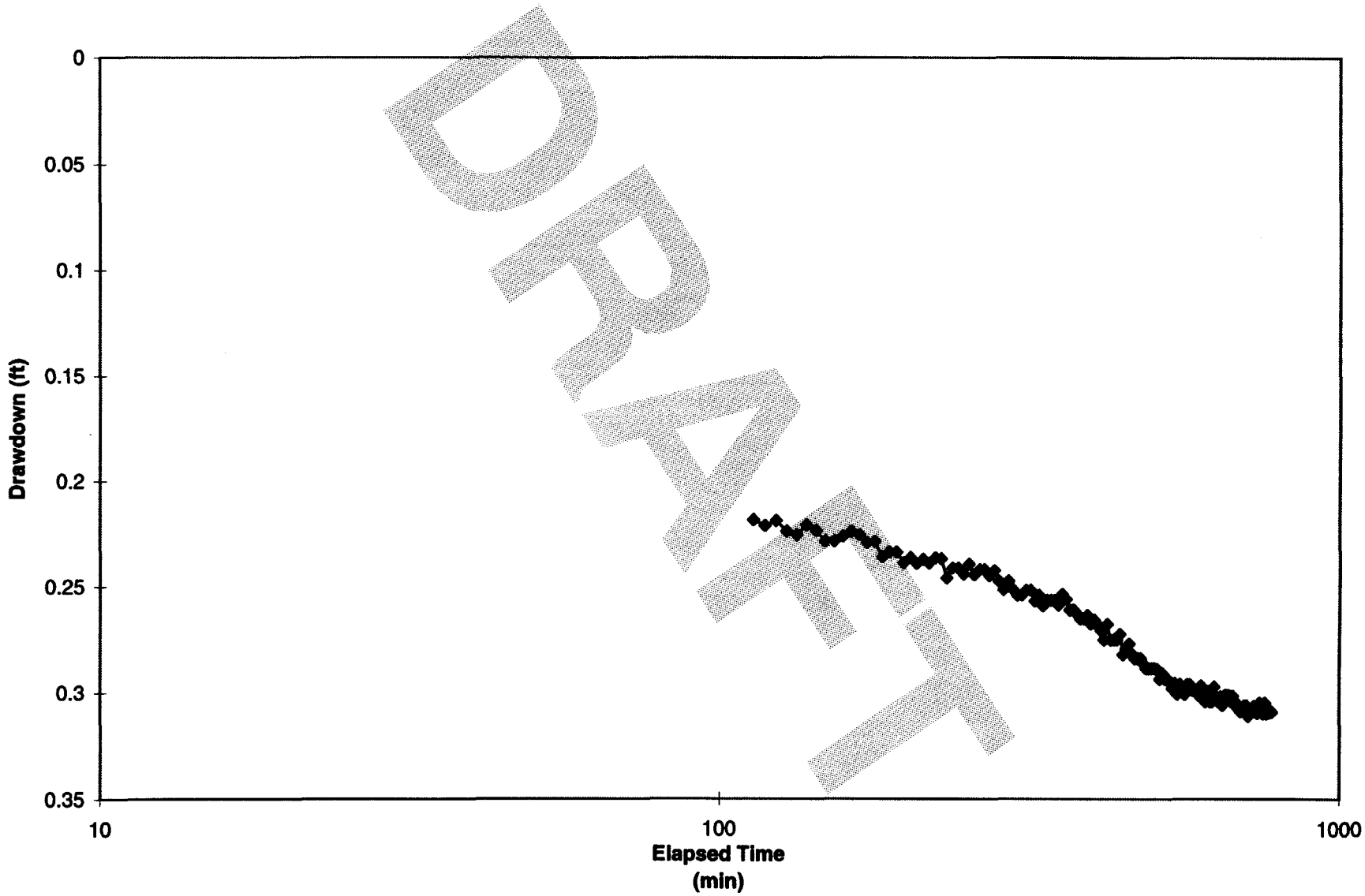
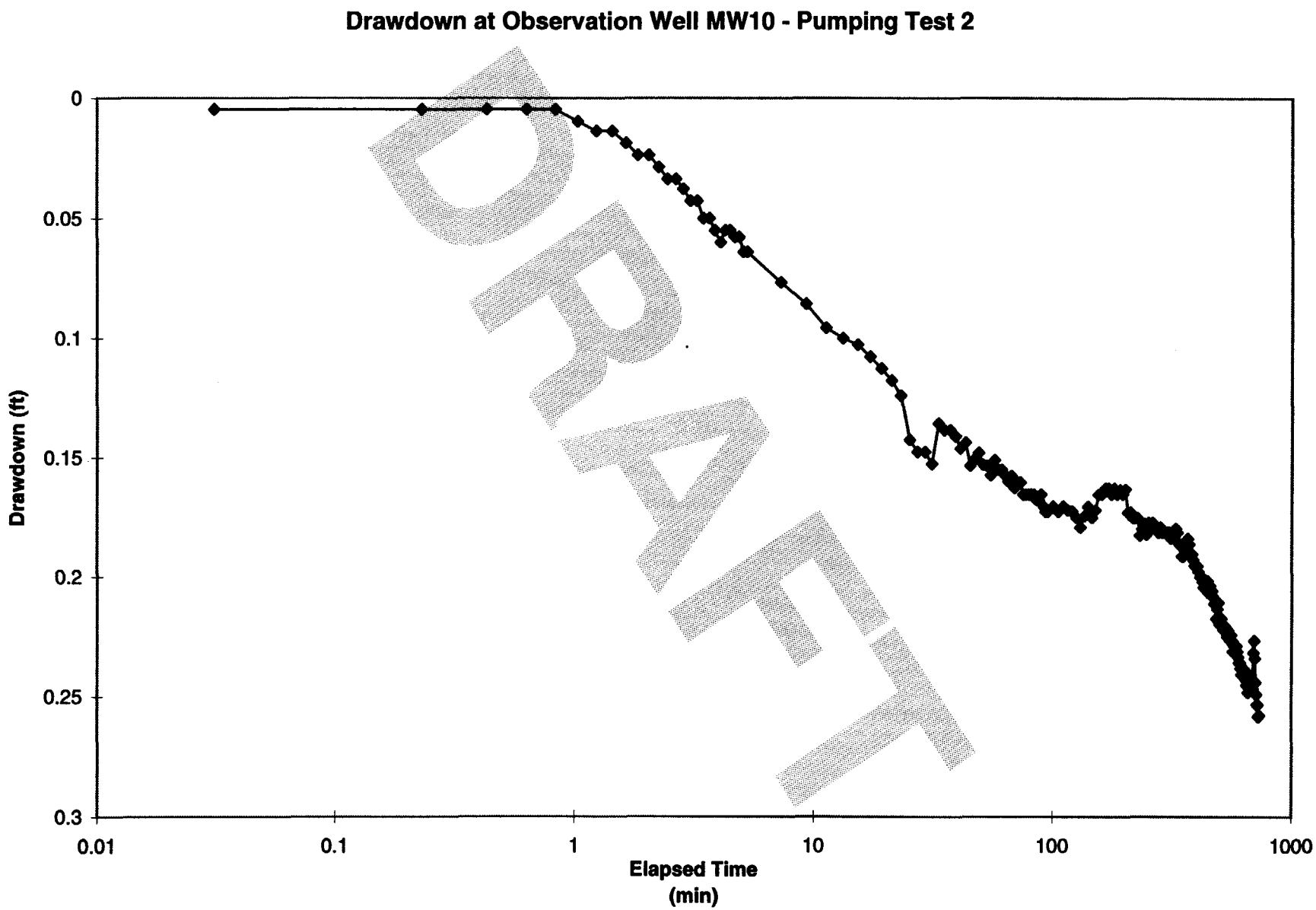
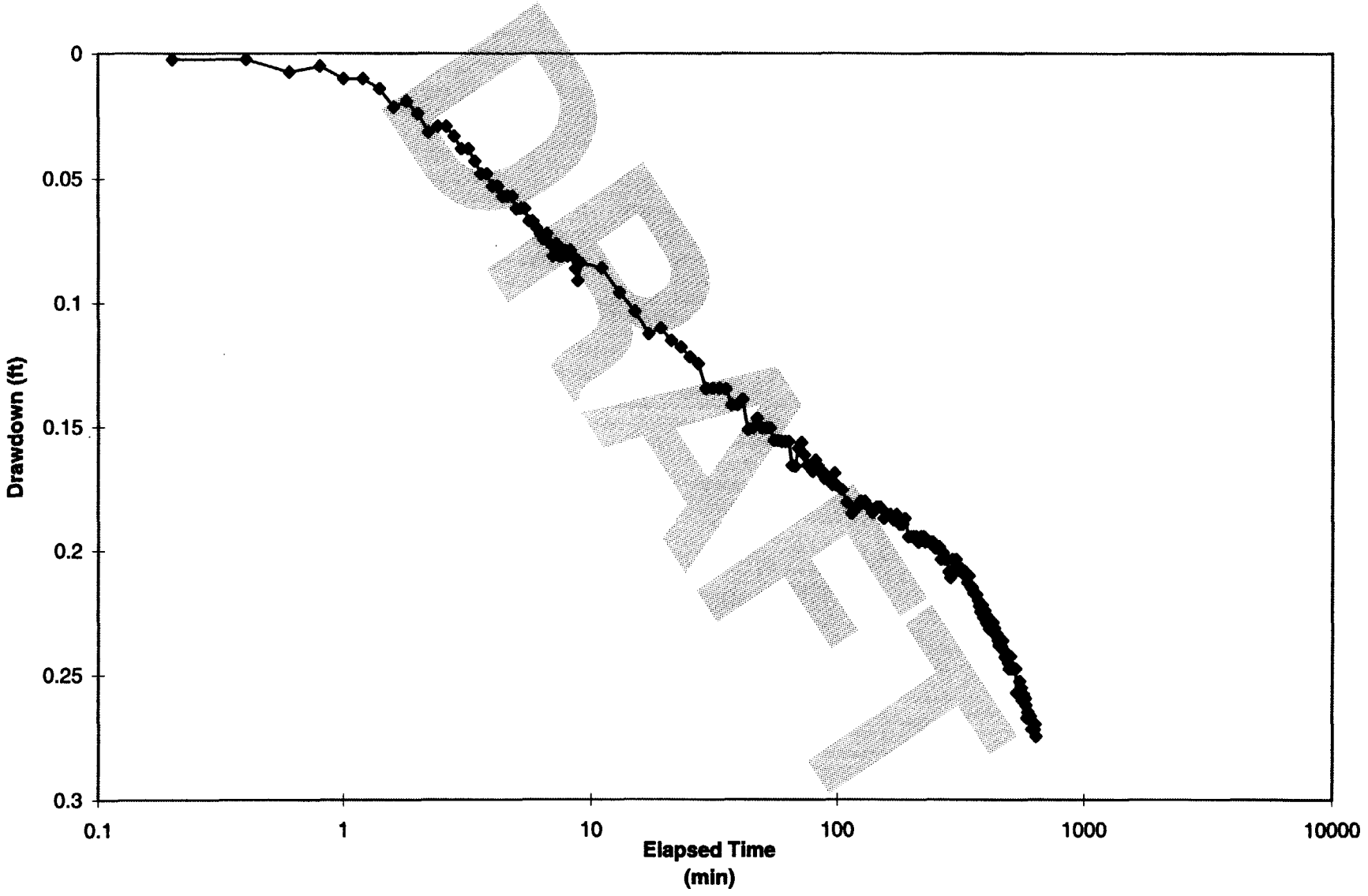
Drawdown at Observation Well MW10 - Pumping Test 1




Drawdown at Observation Well MW10 - Pumping Test 2
Drawdown (ft)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.01
0.1
1
10
100
1000
Elapsed Time
(min)
DRAFT

Drawdown at Observation Well MW10 - Pumping Test 3



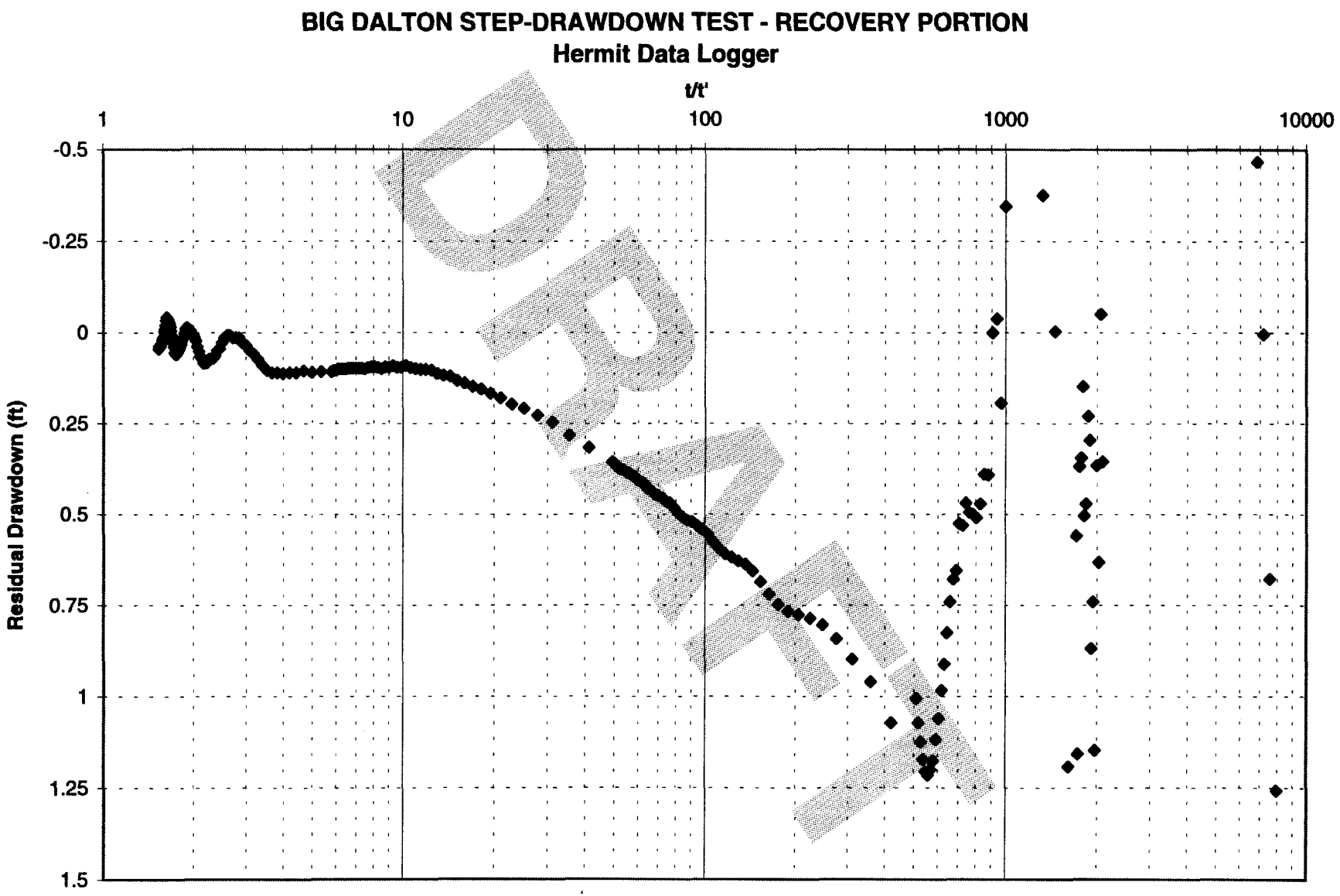

BIG DALTON STEP-DRAWDOWN TEST - RECOVERY PORTION
Hermit Data Logger
t/t'
1
10
100
1000
10000
Residual Drawdown (ft)
-0.5
-0.25
0
0.25
0.5
0.75
1
1.25
1.5
DRAFT

Table 4-1
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-01

Well ID		MW50113					MW50112			MW50111		
Sample Depth (feet bgs)		216-226					287-297			335-345		
Sample Date		13-Mar-96	13-Mar-96	20-Jun-96	19-Sep-96	19-Sep-96	13-Mar-96	20-Jun-96	19-Sep-96	13-Mar-96	20-Jun-96	19-Sep-96
Sample Type[1]		GW	K	GW	GW	K	GW			GW		
VOCs[2,3]	MCL[4]											
Benzene	1	ND<0.09	0.18	ND<0.09	ND<0.50	ND<0.50	ND<0.09	0.090	ND<0.50	0.10	ND<0.09	ND<0.50
Bromobenzene	--	ND<0.13	ND<0.13	ND<0.13	ND<1.0	ND<1.0	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.16	ND<0.11	ND<1.0	ND<1.0	ND<0.16	0.11	ND<1.0	ND<0.16	ND<0.11	ND<1.0
sec-Butylbenzene	--	ND<0.11	0.24	ND<0.11	ND<1.0	ND<1.0	ND<0.11	0.11	ND<1.0	0.21	0.13	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.15	0.46	ND<1.0	ND<1.0	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	ND<0.46	ND<0.46	ND<0.28	ND<0.50	ND<0.50	ND<0.46	0.47	0.39J	1.3	1.6	1.4
Carbon disulfide	--	NA	NA	ND<0.17	ND<5.0	ND<5.0	NA	ND<0.17	ND<5.0	NA	ND<0.17	0.14J
Chloroform	100[b]	0.68	0.73	0.56	0.32J	0.30J	3.0	3.7	3.4	7.8	8.0	9.3
Chloromethane	--	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	3.0
Dichlorodifluoromethane	1000[a]	0.85	ND<0.40	0.79	0.23J	0.26J	1.6	3.3	2.3	2.1	3.2	1.5
1,2-Dichlorobenzene	600	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.0	ND<0.27	0.39	ND<1.0	ND<0.27	ND<0.27	ND<1.0
1,1-Dichloroethane	5	1.0	1.0	0.84	0.44J	0.40J	1.5	1.9	1.8	2.5	2.3	2.1
1,2-Dichloroethane	0.5	ND<0.22	ND<0.22	ND<0.22	ND<1.0	ND<1.0	1.3	1.5	0.96J	3.2	3.1	2.8
1,1-Dichloroethene	6	0.90	0.95	0.62	0.17J	0.19J	1.1	2.3	2.4	3.3	4.6	7.9
cis-1,2-Dichloroethene	6	6.5	6.0	5.1	2.6	2.4	5.1	6.1	5.9	8.8	7.9	7.8
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	ND<0.17	ND<1.0	ND<1.0	ND<0.17	ND<0.17	0.14J	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0
Ethylbenzene	700	ND<0.31	ND<0.31	0.35	0.13J	ND<1.0	ND<0.31	ND<0.16	ND<1.0	ND<0.31	ND<0.16	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.09	ND<0.09	NA	NA	ND<0.09	ND<0.09	NA	ND<0.09	0.13	NA
4-Isopropyltoluene	--	ND<0.24	ND<0.24	ND<0.18	ND<1.0	ND<1.0	ND<0.24	ND<0.18	ND<1.0	ND<0.24	ND<0.18	ND<1.0
Methyl tert butyl ether	35[a]	NA	NA	ND<0.15	ND<5.0	ND<5.0	NA	ND<0.15	ND<5.0	NA	ND<0.15	ND<5.0
Methylene chloride	40[a]	ND<0.29	ND<0.29	ND<0.29	0.67J	1.2J	ND<0.29	ND<0.29	0.99J	ND<0.29	ND<0.29	1.3J
Naphthalene	--	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0
Propylbenzene	--	ND<0.22	ND<0.22	ND<0.56	ND<1.0	ND<1.0	ND<0.22	ND<0.56	ND<1.0	ND<0.22	ND<0.56	ND<1.0
Styrene	100	0.32	0.33	0.71	0.22J	0.18J	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0
Tetrachloroethene	5	7.8	7.7	5.0	2.6	2.8	7.7	11	12	16	24	37
Toluene	150	0.18	0.22	ND<0.13	ND<1.0	ND<1.0	0.16	ND<0.13	ND<1.0	0.13	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	0.64	ND<0.26	ND<0.26	ND<1.0	ND<1.0	ND<0.26	0.33	ND<1.0	ND<0.26	0.94	0.88J
Trichloroethene	5	15	15	12	7.8	7.9	29	53	50	110	140	150
Trichlorofluoromethane	150	ND<0.32	ND<0.32	ND<0.32	ND<1.0	ND<1.0	ND<0.32	ND<0.32	ND<1.0	ND<0.32	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0
Vinyl chloride	0.5	ND<0.20	ND<0.20	ND<0.20	ND<0.50	ND<0.50	ND<0.20	ND<0.20	ND<0.50	ND<0.20	ND<0.20	ND<0.50
o-Xylene	1,750	ND<0.13	ND<0.13	ND<0.11	ND<1.0	ND<1.0	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0
p/m-Xylenes	1,750	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<1.0	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<1.0
EPA Method 300.0												
Nitrate (as N)	10	ND<0.25	ND<0.25	ND<0.25	ND<0.050	ND<0.050	7.7	8.4	8.1	7.6	6.1	2.3
Nitrite (as N)	1	ND<0.25	ND<0.25	ND<0.25	ND<0.050	ND<0.050	0.57	0.26	0.28	3.2	3.7	6.2

Notes:

All VOC concentrations are in µg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-1
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-01

Well ID		MW50110			MW50109				MW50108		
Sample Depth (feet bgs)		430-440			523-533				640-650		
Sample Date		13-Mar-96	20-Jun-96	19-Sep-96	13-Mar-96	20-Jun-96	20-Jun-96	19-Sep-96	13-Mar-96	20-Jun-96	19-Sep-96
Sample Type[1]		GW			GW	GW	K	GW	GW		
VOCs[2,3]	MCL[4]										
Benzene	1	ND<0.09	ND<0.09	ND<0.50	0.095	ND<0.09	ND<0.09	ND<0.50	ND<0.09	ND<0.09	ND<0.50
Bromobenzene	--	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.11	ND<1.0	ND<0.16	ND<0.11	ND<0.11	ND<1.0	ND<0.16	ND<0.11	ND<1.0
sec-Butylbenzene	--	0.13	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<1.0	0.12	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	2.2	2.6	1.9	4.4	5.3	5.8	5.1	4.7	7.2	7.1
Carbon disulfide	--	NA	ND<0.17	ND<5.0	NA	ND<0.17	ND<0.17	ND<5.0	NA	ND<0.17	ND<5.0
Chloroform	100[b]	8.5	9.4	8.9	12	12	13	16	13	7.9	5.8
Chloromethane	--	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0
Dichlorodifluoromethane	1000[a]	7.4	11	5.5	7.9	11	13	7.2	4.3	3.3	1.5
1,2-Dichlorobenzene	600	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0
1,1-Dichloroethane	5	3.4	3.7	2.9	2.6	3.1	3.6	3.1	3.0	0.94	0.59J
1,2-Dichloroethane	0.5	5.8	4.6	3.9	13	11	12	9.5	13	8.2	7.0
1,1-Dichloroethene	6	0.66	0.91	0.96J	1.0	1.3	1.6	1.8	1.2	0.97	0.54J
cis-1,2-Dichloroethene	6	10	11	9.2	9.5	10	11	11	10	5.8	3.7
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	0.22J	ND<0.17	ND<0.17	ND<0.17	0.26J	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0
Ethylbenzene	700	ND<0.31	ND<0.16	ND<1.0	ND<0.31	ND<0.16	ND<0.16	ND<1.0	ND<0.31	ND<0.16	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.09	NA	ND<0.09	ND<0.09	ND<0.09	NA	ND<0.09	ND<0.09	NA
4-Isopropyltoluene	--	ND<0.24	ND<0.18	ND<1.0	ND<0.24	ND<0.18	ND<0.18	ND<1.0	ND<0.24	ND<0.18	ND<1.0
Methyl tert butyl ether	35[a]	NA	ND<0.15	ND<5.0	NA	ND<0.15	ND<0.15	ND<5.0	NA	ND<0.15	ND<5.0
Methylene chloride	40[a]	ND<0.29	0.40	1.7J	0.67	0.45	0.61	1.5J	0.65	ND<0.29	0.84J
Naphthalene	--	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0
Propylbenzene	--	ND<0.22	ND<0.56	ND<1.0	ND<0.22	ND<0.56	ND<0.56	ND<1.0	ND<0.22	ND<0.56	ND<1.0
Styrene	100	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0
Tetrachloroethene	5	7.2	9.2	7.8	8.8	11	13	14	10	6.3	4.4
Toluene	150	0.14	ND<0.13	ND<1.0	0.17	ND<0.13	ND<0.13	ND<1.0	0.19	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	0.48	ND<1.0	ND<0.26	ND<0.26	0.52	ND<1.0	ND<0.26	0.47	ND<1.0
Trichloroethene	5	150	160	160	270	270	310	240	220	310	270
Trichlorofluoromethane	150	ND<0.32	ND<0.32	0.33J	ND<0.32	ND<0.32	ND<0.32	0.57J	0.47	0.41	0.30J
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0
Vinyl chloride	0.5	ND<0.20	ND<0.20	ND<0.50	ND<0.20	ND<0.20	ND<0.20	ND<0.50	ND<0.20	ND<0.20	ND<0.50
o-Xylene	1,750	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0
p/m-Xylenes	1,750	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<1.0
EPA Method 300.0											
Nitrate (as N)	10	5.6	5.6	6.0	6.2	5.9	5.9	6.4	5.2	4.8	4.9
Nitrite (as N)	1	ND<0.25	ND<0.25	ND<0.050	ND<0.25	ND<0.25	ND<0.25	ND<0.050	ND<0.25	ND<0.25	ND<0.050

Notes:

All VOC concentrations are in µg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-1
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-01

Well ID		MW50107			MW50106			MW50105		
Sample Depth (feet bgs)		765-775			875-885			1030-1040		
Sample Date		13-Mar-96	20-Jun-96	18-Sep-96	12-Mar-96	20-Jun-96	18-Sep-96	12-Mar-96	20-Jun-96	18-Sep-96
Sample Type[1]			GW			GW			GW	
VOCs[2,3]	MCL[4]									
Benzene	1	ND<0.09	ND<0.09	ND<0.50	ND<0.09	ND<0.09	ND<0.50	ND<0.09	ND<0.09	ND<0.50
Bromobenzene	--	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.11	ND<1.0	ND<0.16	ND<0.11	ND<1.0	ND<0.16	ND<0.11	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	**8.2**	**9.1**	**13**	**7.0**	**8.7**	**12**	ND<0.46	ND<0.28	ND<0.50
Carbon disulfide	--	NA	ND<0.17	ND<5.0	NA	ND<0.17	ND<5.0	NA	ND<0.17	**0.32J**
Chloroform	100[b]	**1.0**	**1.2**	**1.2**	**0.73**	**0.41**	**0.37J**	ND<0.24	ND<0.24	ND<1.0
Chloromethane	--	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0
Dichlorodifluoromethane	1000[a]	ND<0.40	ND<0.40	ND<1.0	ND<0.40	ND<0.40	ND<1.0	ND<0.40	ND<0.40	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0
1,1-Dichloroethane	5	ND<0.19	ND<0.19	ND<1.0	ND<0.19	ND<0.19	ND<1.0	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	**1.0**	**1.3**	**1.5**	ND<0.22	ND<0.22	ND<0.50	ND<0.22	ND<0.22	ND<0.50
1,1-Dichloroethene	6	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.38	**0.44**	**0.41J**	ND<0.38	ND<0.17	ND<1.0	ND<0.38	ND<0.17	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	ND<1.0	ND<0.17	ND<0.17	ND<1.0	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0
Ethylbenzene	700	ND<0.31	ND<0.16	ND<1.0	ND<0.31	ND<0.16	ND<1.0	ND<0.31	ND<0.16	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.09	NA	ND<0.09	ND<0.09	NA	ND<0.09	ND<0.09	NA
4-Isopropyltoluene	--	ND<0.24	ND<0.18	ND<1.0	ND<0.24	ND<0.18	ND<1.0	ND<0.24	ND<0.18	ND<1.0
Methyl tert butyl ether	35[a]	NA	ND<0.15	ND<5.0	NA	ND<0.15	ND<5.0	NA	ND<0.15	ND<5.0
Methylene chloride	40[a]	ND<0.29	ND<0.29	**0.35J**	ND<0.29	ND<0.29	**0.47J**	ND<0.29	ND<0.29	ND<2.0
Naphthalene	--	**0.39**	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0
Propylbenzene	--	ND<0.22	ND<0.56	ND<1.0	ND<0.22	ND<0.56	ND<1.0	ND<0.22	ND<0.56	ND<1.0
Styrene	100	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0
Tetrachloroethene	5	ND<0.29	ND<0.29	**0.24J**	ND<0.29	ND<0.29	ND<1.0	ND<0.29	ND<0.29	ND<1.0
Toluene	150	**0.16**	**0.22**	ND<1.0	**0.20**	ND<0.13	ND<1.0	**0.15**	**0.22**	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	ND<0.26	ND<1.0	ND<0.26	ND<0.26	ND<1.0	ND<0.26	ND<0.26	ND<1.0
Trichloroethene	5	**21**	**32**	**46**	ND<0.21	ND<0.21	**0.35J**	**0.73**	**0.46**	**0.57J**
Trichlorofluoromethane	150	ND<0.32	ND<0.32	ND<1.0	ND<0.32	ND<0.32	ND<1.0	ND<0.32	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0
Vinyl chloride	0.5	ND<0.20	ND<0.20	ND<0.50	ND<0.20	ND<0.20	ND<0.50	ND<0.20	ND<0.20	ND<0.50
o-Xylene	1,750	ND<0.13	ND<0.11	ND<1.0	**0.13**	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0
p/m-Xylenes	1,750	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<1.0
EPA Method 300.0										
Nitrate (as N)	10	**2.4**	**2.4**	**2.2**	**1.9**	**2.2**	**2.4**	**0.69**	**0.5**	**0.36**
Nitrite (as N)	1	ND<0.25	ND<0.25	ND<0.050	ND<0.25	ND<0.25	ND<0.050	ND<0.25	ND<0.25	ND<0.050

Notes:

All VOC concentrations are in µg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-1
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-01

Well ID		MW50104			MW50103			MW50102			MW50101		
Sample Depth (feet bgs)		1123-1133			1256-1266			1387-1397			1495-1505		
Sample Date		12-Mar-96	19-Jun-96	18-Sep-96	12-Mar-96	19-Jun-96	18-Sep-96	11-Mar-96	19-Jun-96	18-Sep-96	11-Mar-96	19-Jun-96	18-Sep-96
Sample Type[1]		GW			GW			GW			GW		
VOCs[2,3]	MCL[4]												
Benzene	1	ND<0.09	ND<0.09	ND<0.50	**0.21**	ND<0.09	ND<0.50	ND<0.09	**0.65**	ND<0.50	ND<0.09	ND<0.09	ND<0.50
Bromobenzene	--	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.11	ND<1.0	ND<0.16	**0.12**	ND<1.0	ND<0.16	ND<0.11	ND<1.0	ND<0.16	ND<0.11	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	**0.26**	ND<1.0	ND<0.11	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	ND<0.46	ND<0.28	ND<0.50	ND<0.46	ND<0.28	ND<0.50	ND<0.46	ND<0.28	ND<0.50	ND<0.46	ND<0.28	ND<0.50
Carbon disulfide	--	NA	ND<0.17	ND<5.0	NA	ND<0.17	**0.15J**	NA	ND<0.17	ND<5.0	NA	ND<0.17	ND<5.0
Chloroform	100[b]	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0
Chloromethane	--	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0
Dichlorodifluoromethane	1000[a]	ND<0.40	ND<0.40	ND<1.0	ND<0.40	ND<0.40	**0.27J**	ND<0.40	ND<0.40	ND<1.0	ND<0.40	ND<0.40	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	**0.11J**
1,1-Dichloroethane	5	ND<0.19	ND<0.19	ND<1.0	ND<0.19	ND<0.19	ND<1.0	ND<0.19	**1.1**	ND<1.0	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	ND<0.22	ND<0.22	ND<1.0	**0.85**	ND<0.22	ND<1.0	ND<0.22	**3.4**	ND<1.0	ND<0.22	ND<0.22	ND<1.0
1,1-Dichloroethene	6	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.38	ND<0.17	ND<1.0	ND<0.38	ND<0.17	ND<1.0	ND<0.38	**0.98**	ND<1.0	ND<0.38	ND<0.17	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	ND<1.0	ND<0.17	ND<0.17	ND<1.0	ND<0.17	ND<0.17	ND<1.0	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0
Ethylbenzene	700	ND<0.31	ND<0.16	ND<1.0	**2.5**	**0.99**	ND<1.0	ND<0.31	**5.2**	ND<1.0	ND<0.31	ND<0.16	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.09	NA	**0.39**	**0.23**	NA	ND<0.09	ND<0.09	NA	ND<0.09	ND<0.09	NA
4-Isopropyltoluene	--	ND<0.24	ND<0.18	ND<1.0	ND<0.24	ND<0.18	ND<1.0	ND<0.24	ND<0.18	ND<1.0	ND<0.24	ND<0.18	ND<1.0
Methyl tert butyl ether	35[a]	NA	ND<0.15	ND<5.0	NA	ND<0.15	**0.54J**	NA	**0.79**	ND<5.0	NA	ND<0.15	ND<5.0
Methylene chloride	40[a]	ND<0.29	ND<0.29	**0.63J**	ND<0.29	ND<0.29	ND<2.0	ND<0.29	ND<0.29	ND<2.0	ND<0.29	ND<0.29	ND<2.0
Naphthalene	--	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0
Propylbenzene	--	ND<0.22	ND<0.56	ND<1.0	**0.85**	ND<0.56	ND<1.0	ND<0.22	ND<0.56	ND<1.0	ND<0.22	ND<0.56	ND<1.0
Styrene	100	ND<0.13	**0.13**	ND<1.0	**1.6**	**0.87**	ND<1.0	**0.22**	**2.5**	ND<1.0	**0.17**	**0.14**	ND<1.0
Tetrachloroethene	5	ND<0.29	ND<0.29	ND<1.0	ND<0.29	ND<0.29	ND<1.0	ND<0.29	ND<0.29	**0.26J**	ND<0.29	ND<0.29	ND<1.0
Toluene	150	**0.29**	ND<0.13	ND<1.0	**1.1**	**0.46**	ND<1.0	**0.15**	**2.0**	ND<1.0	ND<0.13	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	ND<0.26	ND<1.0	ND<0.26	ND<0.26	ND<1.0	ND<0.26	ND<0.26	ND<1.0	ND<0.26	ND<0.26	ND<1.0
Trichloroethene	5	**0.62**	**0.39**	**0.79J**	**7.3**	**3.2**	**0.44J**	**0.75**	**9.2**	**0.65J**	ND<0.21	ND<0.21	**0.15J**
Trichlorofluoromethane	150	ND<0.32	ND<0.32	ND<1.0	ND<0.32	ND<0.32	ND<1.0	ND<0.32	ND<0.32	ND<1.0	ND<0.32	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	**0.40**	ND<1.0	ND<0.11	**0.55**	ND<1.0	ND<0.11	ND<0.11	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<1.0	**0.57**	**0.52**	ND<1.0	ND<0.11	**0.16**	ND<1.0	ND<0.11	ND<0.11	ND<1.0
Vinyl chloride	0.5	ND<0.20	ND<0.20	ND<0.50	ND<0.20	ND<0.20	ND<0.50	ND<0.20	**3.2**	ND<0.50	ND<0.20	ND<0.20	ND<0.50
o-Xylene	1,750	ND<0.13	ND<0.11	ND<1.0	**1.9**	**0.76**	ND<1.0	ND<0.13	**0.98**	ND<1.0	ND<0.13	ND<0.11	ND<1.0
p/m-Xylenes	1,750	ND<0.35	ND<0.35	ND<1.0	**2.1**	**0.90**	ND<1.0	ND<0.35	**0.95**	ND<1.0	ND<0.35	ND<0.35	ND<1.0
EPA Method 300.0													
Nitrate (as N)	10	ND<0.25	ND<0.25	**0.06**	**0.39**	ND<0.25	ND<0.050	**0.31**	ND<0.25	**0.11**	**0.37**	ND<0.25	**0.056**
Nitrite (as N)	1	ND<0.25	ND<0.25	ND<0.050	ND<0.25	ND<0.25	ND<0.050	ND<0.25	ND<0.25	ND<0.050	ND<0.25	ND<0.25	ND<0.050

Notes:

All VOC concentrations are in µg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-1
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-01

Well ID		QC Samples						
		MW50102	MW50106	MW50113	MW50104	MW50109	MW50104	MW50111
Sample Depth (feet bgs)		--						
Sample Date		11-Mar-96	12-Mar-96	13-Mar-96	19-Jun-96	20-Jun-96	18-Sep-96	19-Sep-96
Sample Type[1]		N						
VOCs[2,3]	**MCL[4]**							
Benzene	1	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.50	ND<0.50
Bromobenzene	--	ND<0.13	ND<0.13	ND<0.13	ND<0.13	ND<0.13	ND<1.0	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.16	ND<0.16	ND<0.11	ND<0.11	ND<1.0	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.11	**0.26**	ND<0.11	ND<0.11	ND<1.0	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.15	**0.63**	ND<0.15	ND<0.15	ND<1.0	ND<1.0
Carbon tetrachloride	0.5	ND<0.46	ND<0.46	ND<0.46	ND<0.28	ND<0.28	ND<0.50	ND<0.50
Carbon disulfide	--	NA	NA	NA	ND<0.17	ND<0.17	ND<5.0	ND<5.0
Chloroform	100[b]	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.0
Chloromethane	--	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<1.0
Dichlorodifluoromethane	1000[a]	ND<0.40	ND<0.40	ND<0.40	ND<0.40	ND<0.40	ND<1.0	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.0
1,1-Dichloroethane	5	ND<0.19	ND<0.19	ND<0.19	ND<0.19	ND<0.19	ND<1.0	ND<1.0
1,2-Dichloroethane	0.5	ND<0.22	ND<0.22	ND<0.22	ND<0.22	ND<0.22	ND<0.50	ND<0.50
1,1-Dichloroethene	6	ND<0.21	ND<0.21	ND<0.21	ND<0.21	ND<0.21	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.38	ND<0.38	ND<0.38	ND<0.17	ND<0.17	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	ND<0.17	ND<0.17	ND<0.17	ND<1.0	ND<1.0
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.0
Ethylbenzene	700	ND<0.31	ND<0.31	ND<0.31	ND<0.16	ND<0.16	ND<1.0	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.09	NA	NA
4-Isopropyltoluene	--	ND<0.24	ND<0.24	ND<0.24	ND<0.18	ND<0.18	ND<1.0	ND<1.0
Methyl tert butyl ether	35[a]	NA	NA	NA	ND<0.15	ND<0.15	ND<5.0	ND<5.0
Methylene chloride	40[a]	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<0.29	**0.35J**	**1.4J**
Naphthalene	--	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<1.0
Propylbenzene	--	ND<0.22	ND<0.22	ND<0.22	ND<0.56	ND<0.56	ND<1.0	ND<1.0
Styrene	100	ND<0.13	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<1.0
Tetrachloroethene	5	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<1.0	ND<1.0
Toluene	150	ND<0.13	**0.18**	**0.18**	ND<0.13	ND<0.13	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	ND<0.26	ND<0.26	ND<0.26	ND<0.26	ND<1.0	ND<1.0
Trichloroethene	5	ND<0.21	ND<0.21	ND<0.21	ND<0.21	ND<0.21	ND<1.0	**0.60J**
Trichlorofluoromethane	150	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<1.0	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<1.0
Vinyl chloride	0.5	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.05	ND<0.05
o-Xylene	1,750	ND<0.13	**0.16**	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<1.0
p/m-Xylenes	1,750	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<1.0
EPA Method 300.0								
Nitrate (as N)	10	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.050	ND<0.050
Nitrite (as N)	1	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.050	ND<0.050

Notes:

All VOC concentrations are in µg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-2
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-03

Well ID		MW50310										MW50309				
Sample Depth (feet bgs)		235-245										300-310				
Sample Date		4-Aug-95	4-Aug-95	27-Sep-95	27-Sep-95	19-Mar-96	19-Mar-96	18-Jun-96	18-Jun-96	17-Sep-96	17-Sep-96	4-Aug-95	27-Sep-95	19-Mar-96	18-Jun-96	17-Sep-96
Sample Type[1]		GW	K	GW	K	GW	K	GW	K	GW	K	GW				
VOCs[2,3]	MCL[4]															
Benzene	1	ND<0.33	ND<0.20	ND<0.20	ND<0.20	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.50	ND<0.50	ND<1.0	ND<0.20	0.39	0.25	ND<0.50
Bromobenzene	--	0.47	0.17	ND<0.15	ND<0.15	ND<0.13	ND<0.13	ND<0.13	ND<0.13	ND<1.0	ND<1.0	ND<0.75	ND<0.15	ND<0.13	ND<0.13	ND<1.0
Bromoform	100 b	ND<0.23	ND<0.14	ND<0.14	ND<0.14	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<1.0	ND<1.0	ND<0.70	ND<0.14	ND<0.25	ND<0.25	ND<1.0
sec-Butylbenzene	--	ND<0.33	ND<0.33	ND<0.26	ND<0.26	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.33	ND<0.26	ND<0.11	0.16	ND<1.0
tert-Butylbenzene	--	ND<0.30	ND<0.30	ND<0.24	ND<0.24	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<1.0	ND<1.0	ND<0.30	ND<0.24	0.68	0.71	ND<1.0
n-Butylbenzene	--	ND<0.25	ND<0.15	ND<0.15	ND<0.15	ND<0.16	ND<0.16	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.75	ND<0.15	ND<0.16	ND<0.11	ND<1.0
Carbon disulfide	--	NA	NA	NA	NA	NA	NA	ND<0.17	ND<0.17	ND<5.0	ND<5.0	NA	NA	NA	ND<0.17	ND<5.0
Carbon tetrachloride	0.5	ND<1.1	ND<0.64	ND<0.64	ND<0.64	ND<0.46	ND<0.46	ND<0.28	ND<0.28	ND<0.50	ND<0.50	ND<3.2	1.3	ND<0.46	ND<0.28	ND<0.50
Chlorobenzene	70	ND<0.38	ND<0.38	ND<0.30	ND<0.30	ND<0.47	ND<0.47	ND<0.14	ND<0.14	ND<1.0	ND<1.0	ND<0.38	ND<0.30	3.1	1.6	0.64J
Chloroethane	--	ND<0.59	ND<0.59	ND<0.47	ND<0.47	ND<0.24	ND<0.24	0.47	ND<0.24	ND<1.0	ND<1.0	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0
Chloroform	100 b	1.4	2.2	3.5	2.4	2.7	3.1	1.8	1.7	1.6	1.1	ND<1.0	1.6	0.89	0.51	0.58J
1,2-Dichlorobenzene	600	ND<0.43	ND<0.26	ND<0.26	ND<0.26	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.0	ND<1.3	0.32	2.2	2.1	1.2
1,3-Dichlorobenzene	130 a	ND<0.45	ND<0.27	ND<0.27	ND<0.27	ND<0.18	ND<0.18	ND<0.18	ND<0.18	ND<1.0	ND<1.0	ND<1.4	ND<0.27	ND<0.18	0.30	0.14J
1,4-Dichlorobenzene	5	ND<0.45	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.0	ND<1.4	ND<0.27	17	16	9.0
1,1-Dichloroethane	5	13	19	17	10	18	19	17	16	15	8.6	ND<1.6	3.7	12	6.1	2.1
1,2-Dichloroethane	0.5	ND<0.23	ND<0.14	0.53	0.44	0.55	0.58	0.43	0.42	0.33J	0.34J	ND<0.70	0.52	ND<0.22	0.33	0.32J
1,1-Dichloroethene	6	29	44	39	17	29	35	43	33	39	14	30	21	32	19	5.4
cis-1,2-Dichloroethene	6	29	37	29	20	31	34	38	35	28	18	7.8	10	20	11	4.8
trans-1,2-Dichloroethene	10	ND<0.61	ND<0.61	ND<0.49	ND<0.49	ND<0.17	ND<0.17	0.35	0.30	0.34J	0.17J	ND<0.61	ND<0.49	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.40	ND<0.24	1.3	0.77	ND<0.24	ND<0.24	0.32	0.29	0.31J	0.21J	ND<1.2	ND<0.24	ND<0.24	ND<0.24	ND<1.0
Dichlorodifluoromethane	1000 a	ND<0.60	ND<0.36	ND<0.36	ND<0.36	ND<0.40	ND<0.40	0.45	0.55	0.32J	ND<1.0	ND<1.8	ND<0.36	ND<0.40	ND<0.40	ND<1.0
Ethylbenzene	700	ND<0.35	ND<0.21	ND<0.21	ND<0.21	ND<0.31	ND<0.31	ND<0.16	ND<0.16	ND<1.0	ND<1.0	ND<1.1	ND<0.21	ND<0.31	ND<0.16	ND<1.0
Isopropylbenzene	--	ND<0.29	ND<0.29	ND<0.33	ND<0.33	ND<0.09	ND<0.09	ND<0.09	ND<0.09	NA	NA	ND<0.29	ND<0.33	0.13	ND<0.09	NA
4-Isopropyltoluene	--	ND<0.28	ND<0.17	ND<0.17	ND<0.17	ND<0.24	ND<0.24	ND<0.18	ND<0.18	ND<1.0	ND<1.0	ND<0.85	ND<0.17	ND<0.24	ND<0.18	ND<1.0
Methylene chloride	40 a	ND<0.77	ND<0.46	0.73	0.94	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<2.0	ND<2.0	ND<2.3	1.1	ND<0.29	ND<0.29	ND<2.0
Methyl tert butyl ether (MTBE)	35 a	NA	NA	NA	NA	NA	NA	ND<0.15	ND<0.15	ND<5.0	ND<5.0	NA	NA	NA	ND<0.15	ND<5.0
Naphthalene	--	1.4B	0.87B	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<1.0	ND<1.5	ND<0.29	0.45	ND<0.37	ND<1.0
Styrene	100	ND<0.41	ND<0.41	ND<0.33	ND<0.33	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.41	ND<0.33	0.16	ND<0.11	ND<1.0
Tetrachloroethene	5	22	30	24	12	22	24	15	13	14	6.4	120	62	16	12	11
Toluene	150	0.71	0.44	ND<0.22	ND<0.22	ND<0.13	ND<0.13	ND<0.13	ND<0.13	ND<1.0	ND<1.0	ND<1.1	ND<0.22	0.17	0.14	ND<1.0
1,1,1-Trichloroethane	200	1.2	2.2	2.4	1.2	1.8	1.9	1.0	0.87	0.86J	0.37J	4.8	4.0	1.3	0.91	0.37J
Trichloroethene	5	37	43	43	30	41	42	40	35	41	21	100	65	26	19	19
Trichlorofluoromethane	150	ND<0.80	ND<0.48	ND<0.48	ND<0.48	0.40	0.45	0.32	ND<0.32	0.35J	ND<1.0	ND<2.4	1.9	0.33	0.89	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.33	ND<0.20	ND<0.20	ND<0.20	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<1.0	ND<0.20	ND<0.11	ND<0.11	ND<1.0
Vinyl chloride	0.5	ND<0.80	0.52	ND<0.48	ND<0.48	ND<0.20	ND<0.20	0.27	0.24	0.35J	ND<0.50	ND<2.4	ND<0.48	2.2	1.2	0.28J
o-Xylene	1,750	ND<0.41	ND<0.41	ND<0.33	ND<0.33	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.41	ND<0.33	ND<0.13	ND<0.11	ND<1.0
p/m-Xylenes	1,750	ND<0.55	ND<0.55	ND<0.44	ND<0.44	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND,1.0	ND<0.55	ND<0.44	ND<0.35	ND<0.35	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996.
All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level
[b] Federal MCL
-- No Standard
B = Also detected in laboratory's method blank.
bgs = below ground surface
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed.

CDM Camp Dresser & McKee
2581-112\aprdsh\5_3ALL.XLS
11/22/96

Table 4-2
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-03

Well ID		MW50308					MW50307					MW50306				
Sample Depth (feet bgs)		400-410					510-520					590-600				
Sample Date		4-Aug-95	26-Sep-95	19-Mar-96	18-Jun-96	17-Sep-96	4-Aug-95	26-Sep-95	19-Mar-96	18-Jun-96	17-Sep-96	4-Aug-95	26-Sep-95	19-Mar-96	18-Jun-96	17-Sep-96
Sample Type[1]		GW					GW					GW				
VOCs[2,3]	MCL[4]															
Benzene	1	ND<1.0	ND<0.20	0.12	ND<0.09	ND<0.50	ND<1.0	ND<0.20	0.17	0.14	ND<0.50	ND<1.0	ND<0.20	ND<0.09	ND<0.09	ND<0.50
Bromobenzene	--	ND<0.75	ND<0.15	ND<0.13	ND<0.13	ND<1.0	ND<0.75	ND<0.15	ND<0.13	ND<0.13	ND<1.0	ND<0.75	ND<0.15	ND<0.13	ND<0.13	ND<1.0
Bromoform	100 b	ND<0.70	ND<0.14	ND<0.25	ND<0.25	ND<1.0	ND<0.70	ND<0.14	ND<0.25	0.58	ND<1.0	ND<0.70	ND<0.14	ND<0.25	ND<0.25	ND<1.0
sec-Butylbenzene	--	ND<0.33	ND<0.26	ND<0.11	ND<0.11	ND<1.0	ND<0.33	ND<0.26	ND<0.11	ND<0.11	ND<1.0	ND<0.33	ND<0.26	ND<0.11	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.30	ND<0.24	ND<0.15	ND<0.15	ND<1.0	ND<0.30	ND<0.24	ND<0.15	ND<0.15	ND<1.0	ND<0.30	ND<0.24	ND<0.15	ND<0.15	ND<1.0
n-Butylbenzene	--	ND<0.75	ND<0.15	ND<0.16	ND<0.11	ND<1.0	ND<0.75	ND<0.15	ND<0.16	ND<0.11	ND<1.0	ND<0.75	ND<0.15	ND<0.16	ND<0.11	ND<1.0
Carbon disulfide	--	NA	NA	NA	ND<0.17	ND<5.0	NA	NA	NA	ND<0.17	0.12J	NA	NA	NA	ND<0.17	ND<5.0
Carbon tetrachloride	0.5	ND<3.2	7.9	1.7	1.8	1.3	ND<3.2	6.3	4.6	5.2	2.4	ND<3.2	4.3	2.2	3.3	2.1
Chlorobenzene	70	ND<0.38	ND<0.30	ND<0.47	ND<0.14	ND<1.0	ND<0.38	ND<0.30	ND<0.47	ND<0.14	ND<1.0	ND<0.38	ND<0.30	ND<0.47	ND<0.14	ND<1.0
Chloroethane	--	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0
Chloroform	100 b	1.0	21	11	8.7	6.0	2.1	19	21	18	11	1.2	5.3	4.0	6.4	4.1
1,2-Dichlorobenzene	600	ND<1.3	ND<0.26	ND<0.27	ND<0.27	ND<1.0	ND<1.3	ND<0.26	ND<0.27	ND<0.27	ND<1.0	ND<1.3	ND<0.26	ND<0.27	ND<0.27	ND<1.0
1,3-Dichlorobenzene	130 a	ND<1.4	ND<0.27	ND<0.18	ND<0.18	ND<1.0	ND<1.4	ND<0.27	ND<0.18	ND<0.18	ND<1.0	ND<1.4	ND<0.27	ND<0.18	ND<0.18	ND<1.0
1,4-Dichlorobenzene	5	ND<1.4	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.4	ND<0.27	ND<0.27	ND<0.27	0.12J	ND<1.4	ND<0.27	ND<0.27	ND<0.27	ND<1.0
1,1-Dichloroethane	5	ND<1.6	3.7	4.8	5.0	2.7	ND<1.6	0.78	0.90	0.86	0.55J	ND<1.6	0.50	ND<0.19	0.59	0.31J
1,2-Dichloroethane	0.5	ND<0.70	5.1	3.2	2.2	2.2	ND<0.70	6.1	6.0	4.8	3.8	ND<0.70	1.7	1.4	1.8	1.5
1,1-Dichloroethene	6	30	220	90	180	84	29	6.3	12	18	9.5	33	4.2	4.2	10	3.5
cis-1,2-Dichloroethene	6	7.9	17	12	11	6.4	9.7	32	31	27	16	14	29	22	28	17
trans-1,2-Dichloroethene	10	ND<0.61	ND<0.49	ND<0.17	0.26	0.14J	ND<0.61	ND<0.49	ND<0.17	ND<0.17	ND<1.0	ND<0.61	ND<0.49	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<1.2	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.2	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.2	ND<0.24	ND<0.24	ND<0.24	ND<1.0
Dichlorodifluoromethane	1000 a	ND<1.8	ND<0.36	ND<0.40	ND<0.40	ND<1.0	ND<1.8	ND<0.36	ND<0.40	ND<0.40	ND<1.0	ND<1.8	ND<0.36	ND<0.40	ND<0.40	ND<1.0
Ethylbenzene	700	ND<1.1	ND<0.21	ND<0.31	ND<0.16	ND<1.0	ND<1.1	ND<0.21	ND<0.31	ND<0.16	ND<1.0	ND<1.1	ND<0.21	ND<0.31	ND<0.16	ND<1.0
Isopropylbenzene	--	ND<0.29	ND<0.33	ND<0.09	ND<0.09	ND<1.0	ND<0.29	ND<0.33	ND<0.09	ND<0.09	NA	ND<0.29	ND<0.33	ND<0.09	ND<0.09	NA
4-Isopropyltoluene	--	ND<0.85	ND<0.17	ND<0.24	ND<0.18	NA	ND<0.85	ND<0.17	ND<0.24	ND<0.18	ND<1.0	ND<0.85	ND<0.17	ND<0.24	ND<0.18	ND<1.0
Methylene chloride	40 a	ND<2.3	0.47	ND<0.29	ND<0.29	ND<2.0	ND<2.3	0.68	ND<0.29	ND<0.29	ND<2.0	ND<2.3	0.61	ND<0.29	ND<0.29	ND<2.0
Methyl tert butyl ether (MTBE)	35 a	NA	NA	NA	ND<0.15	ND<5.0	NA	NA	NA	ND<0.15	ND<5.0	NA	NA	NA	ND<0.15	ND<5.0
Naphthalene	--	ND<1.5	ND<0.29	ND<0.37	ND<0.37	ND<1.0	ND<1.5	ND<0.29	ND<0.37	ND<0.37	ND<1.0	ND<1.5	ND<0.29	ND<0.37	ND<0.37	ND<1.0
Styrene	100	ND<0.41	ND<0.33	ND<0.13	0.20	ND<1.0	ND<0.41	ND<0.33	0.19	0.28	0.14J	ND<0.41	ND<0.33	0.15	0.21	ND<1.0
Tetrachloroethene	5	110	310	91	130	72	150	710	730	790	510	130	830	680	860	620
Toluene	150	ND<1.1	ND<0.22	ND<0.13	ND<0.13	ND<1.0	ND<1.1	ND<0.22	0.19	ND<0.13	ND<1.0	ND<1.1	ND<0.22	0.21	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	4.4	22	16	20	13	ND<1.5	1.4	2.0	2.6	1.5	ND<1.5	0.79	0.66	1.6	0.55J
Trichloroethene	5	94	610	200	260	200	140	940	1,100	990	690	130	1,000	830	1,000	740
Trichlorofluoromethane	150	ND<2.4	ND<0.48	ND<0.32	ND<0.32	ND<1.0	ND<2.4	ND<0.48	ND<0.32	ND<0.32	ND<1.0	ND<2.4	ND<0.48	ND<0.32	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<1.0	ND<0.20	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.20	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.20	ND<0.11	ND<0.11	ND<1.0
Vinyl chloride	0.5	ND<2.4	ND<0.48	ND<0.20	ND<0.20	ND<0.50	ND<2.4	ND<0.48	ND<0.20	ND<0.20	ND<0.50	ND<2.4	ND<0.48	ND<0.20	ND<0.20	ND<0.50
o-Xylene	1,750	ND<0.41	ND<0.33	ND<0.13	ND<0.11	ND<1.0	ND<0.41	ND<0.33	ND<0.13	ND<0.11	ND<1.0	ND<0.41	ND<0.33	ND<0.13	ND<0.11	ND<1.0
p/m-Xylenes	1,750	ND<0.55	ND<0.44	ND<0.35	ND<0.35	ND<1.0	ND<0.55	ND<0.44	ND<0.35	ND<0.35	ND<1.0	ND<0.55	ND<0.44	ND<0.35	ND<0.35	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996.
All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level
[b] Federal MCL
-- No Standard
B = Also detected in laboratory's method blank.
bgs = below ground surface
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed.

Table 4-2
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-03

Well ID		MW50305					MW50304					MW50303				
Sample Depth (feet bgs)		670-680					810-820					920-930				
Sample Date		4-Aug-95	26-Sep-95	18-Mar-96	18-Jun-96	17-Sep-96	4-Aug-95	26-Sep-95	18-Mar-96	18-Jun-96	16-Sep-96	4-Aug-95	26-Sep-95	18-Mar-96	17-Jun-96	16-Sep-96
Sample Type[1]				GW					GW					GW		
VOCs[2,3]	MCL[4]															
Benzene	1	ND<0.50	ND<0.20	ND<0.09	ND<0.09	ND<0.50	ND<0.20	ND<0.20	ND<0.09	ND<0.09	ND<0.50	ND<0.33	ND<0.20	ND<0.09	ND<0.09	ND<0.50
Bromobenzene	--	ND<0.38	ND<0.15	ND<0.13	ND<0.13	ND<1.0	ND<0.15	ND<0.15	ND<0.13	ND<0.13	ND<1.0	ND<0.25	ND<0.15	ND<0.13	ND<0.13	ND<1.0
Bromoform	100 b	ND<0.35	ND<0.14	ND<0.25	ND<0.25	ND<1.0	ND<0.14	ND<0.14	ND<0.25	ND<0.25	ND<1.0	ND<0.23	ND<0.14	ND<0.25	ND<0.25	ND<1.0
sec-Butylbenzene	--	ND<0.33	ND<0.26	0.24	ND<0.11	ND<1.0	ND<0.33	ND<0.26	ND<0.11	ND<0.11	ND<1.0	ND<0.33	ND<0.26	ND<0.11	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.30	ND<0.24	ND<0.15	ND<0.15	ND<1.0	ND<0.30	ND<0.24	ND<0.15	ND<0.15	ND<1.0	ND<0.30	ND<0.24	ND<0.15	ND<0.15	ND<1.0
n-Butylbenzene	--	ND<0.38	ND<0.15	ND<0.16	ND<0.11	ND<1.0	0.29	ND<0.15	ND<0.16	ND<0.11	ND<1.0	ND<0.25	ND<0.15	ND<0.16	ND<0.11	ND<1.0
Carbon disulfide	--	NA	NA	NA	ND<0.17	ND<5.0	NA	NA	NA	ND<0.17	0.13J	NA	NA	NA	ND<0.17	0.12J
Carbon tetrachloride	0.5	ND<1.6	ND<0.64	ND<0.46	ND<0.28	ND<0.50	ND<0.64	ND<0.64	ND<0.46	ND<0.28	ND<0.50	ND<1.1	ND<0.64	ND<0.46	ND<0.46	ND<0.50
Chlorobenzene	70	ND<0.38	ND<0.30	ND<0.47	ND<0.14	ND<1.0	ND<0.38	ND<0.30	ND<0.47	ND<0.14	ND<1.0	ND<0.38	ND<0.30	ND<0.47	ND<0.47	ND<1.0
Chloroethane	--	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0
Chloroform	100 b	1.7	1.2	0.89	0.62	0.76J	1.1	1.4	1.2	1.1	0.81J	2.1	0.99	1.7	1.9	1.7
1,2-Dichlorobenzene	600	ND<0.65	ND<0.26	ND<0.27	ND<0.27	ND<1.0	ND<0.26	ND<0.26	ND<0.27	ND<0.27	ND<1.0	ND<0.43	ND<0.26	ND<0.27	ND<0.27	ND<1.0
1,3-Dichlorobenzene	130 a	ND<0.68	ND<0.27	ND<0.18	ND<0.18	ND<1.0	ND<0.27	ND<0.27	ND<0.18	ND<0.18	ND<1.0	ND<0.45	ND<0.27	ND<0.18	ND<0.18	ND<1.0
1,4-Dichlorobenzene	5	ND<0.68	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.45	ND<0.27	ND<0.27	ND<0.27	ND<1.0
1,1-Dichloroethane	5	7.5	3.8	0.55	0.27	0.25J	6.2	6.4	3.5	2.6	1.4	10	0.83	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	ND<0.35	0.30	ND<0.24	ND<0.22	ND<0.50	ND<0.14	0.37	0.32	ND<0.22	ND<0.50	ND<0.23	ND<0.14	ND<0.22	ND<0.22	ND<0.50
1,1-Dichloroethene	6	31	9.4	2.2	1.3	1.5	11	18	4.9	3.4	1.4	23	2.0	ND<0.21	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	15	6.6	1.5	0.87	0.79J	7.6	9.0	3.9	2.9	1.5	15	1.3	ND<0.38	ND<0.38	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.61	ND<0.49	ND<0.17	ND<0.17	ND<1.0	ND<0.61	ND<0.49	ND,0.17	ND<0.17	ND<1.0	ND<0.61	ND<0.49	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.60	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.40	ND<0.24	ND<0.24	ND<0.24	ND<1.0
Dichlorodifluoromethane	1000 a	ND<0.90	ND<0.36	ND<0.40	ND<0.40	ND<1.0	ND<0.36	ND<0.36	ND<0.40	ND<0.40	ND<1.0	ND<0.60	ND<0.36	ND<0.40	ND<0.40	ND<1.0
Ethylbenzene	700	ND<0.53	ND<0.21	ND<0.31	ND<0.16	ND<1.0	ND<0.21	ND<0.21	ND<0.31	ND<0.16	ND<1.0	ND<0.35	ND<0.21	ND<0.31	ND<0.16	ND<1.0
Isopropylbenzene	--	ND<0.29	ND<0.33	ND<0.09	ND<0.09	NA	ND<0.29	ND<0.33	ND<0.09	ND<0.09	ND<1.0	ND<0.29	ND<0.33	ND<0.09	ND<0.09	NA
4-Isopropyltoluene	--	ND<0.43	ND<0.17	ND<0.24	ND<0.18	ND<1.0	0.30	ND<0.17	ND<0.24	ND<0.18	NA	ND<0.28	ND<0.17	ND<0.24	ND<0.18	ND<1.0
Methylene chloride	40 a	ND<1.2	0.66	ND<0.29	ND<0.29	ND<2.0	ND<0.46	0.81	ND<0.29	ND<0.29	0.15J	ND<0.77	0.78	ND<0.29	ND<0.29	ND<2.0
Methyl tert butyl ether (MTBE)	35 a	NA	NA	NA	0.40	ND<5.0	NA	NA	NA	ND<0.15	ND<5.0	NA	NA	NA	ND<0.15	ND<5.0
Naphthalene	--	ND<0.73	ND<0.29	ND<0.37	ND<0.37	ND<1.0	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<1.0	ND<0.48	ND<0.29	ND<0.37	ND<0.37	ND<1.0
Styrene	100	ND<0.41	ND<0.33	0.46	0.53	0.54J	ND<0.41	ND<0.33	0.72	0.77	0.46J	ND<0.41	ND<0.33	0.47	0.21	0.23J
Tetrachloroethene	5	69	21	22	19	22	25	18	12	9.7	5.5	48	5.6	1.5	0.72	0.50J
Toluene	150	ND<0.55	ND<0.22	0.17	ND<0.13	0.24J	1.6	0.23	0.21	0.21	ND<1.0	ND<0.37	ND<0.22	0.20	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	3.7	1.4	ND<0.26	ND<0.26	0.12J	0.93	0.92	0.31	ND<0.26	ND<1.0	1.4	ND<0.29	ND<0.26	ND<0.26	ND<1.0
Trichloroethene	5	66	29	37	30	44	21	20	9.6	7.7	5.2	40	4.1	0.90	0.38	0.31J
Trichlorofluoromethane	150	ND<1.2	ND<0.48	ND<0.32	ND<0.32	ND<1.0	ND<0.48	ND<0.48	ND<0.32	ND<0.32	ND<1.0	ND<0.80	ND<0.48	ND<0.32	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.50	ND<0.20	ND<0.11	ND<0.11	ND<1.0	ND<0.20	ND<0.20	ND<0.11	ND<0.11	ND<1.0	ND<0.33	ND<0.20	ND<0.11	ND<0.11	ND<1.0
Vinyl chloride	0.5	ND<1.2	ND<0.48	ND<0.20	ND<0.20	ND<0.50	ND<0.48	ND<0.48	ND<0.20	ND<0.20	ND<0.50	ND<0.80	ND<0.48	ND<0.20	ND<0.20	ND<0.50
o-Xylene	1,750	ND<0.41	ND<0.33	ND<0.13	ND<0.11	ND<1.0	ND<0.41	ND<0.33	ND<0.13	ND<0.11	ND<1.0	ND<0.41	ND<0.33	ND<0.13	ND<0.11	ND<1.0
p/m-Xylenes	1,750	ND<0.55	ND<0.44	ND<0.35	ND<0.35	ND<1.0	ND<0.55	ND<0.44	ND<0.35	ND<0.35	ND<1.0	ND<0.55	ND<0.44	ND<0.35	ND<0.35	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level
[b] Federal MCL
-- No Standard
B = Also detected in laboratory's method blank.
bgs = below ground surface
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed.

Table 4-2
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-03

Well ID		MW50302					MW50301				
Sample Depth (feet bgs)		1015-1025					1150-1160				
Sample Date		4-Aug-95	25-Sep-95	18-Mar-96	17-Jun-96	16-Sep-96	4-Aug-95	25-Sep-95	18-Mar-96	17-Jun-96	16-Sep-96
Sample Type[1]		GW					GW				
VOCs[2,3]	MCL[4]										
Benzene	1	ND<0.25	ND<0.20	ND<0.09	ND<0.09	ND<0.50	ND<0.25	ND<0.20	ND<0.09	ND<0.09	ND<0.50
Bromobenzene	--	ND<0.19	ND<0.15	ND<0.13	ND<0.13	ND<1.0	ND<0.19	ND<0.15	ND<0.13	ND<0.13	ND<1.0
Bromoform	100 b	ND<0.18	ND<0.14	ND<0.25	ND<0.25	ND<1.0	ND<0.18	ND<0.14	ND<0.25	ND<0.25	ND<1.0
sec-Butylbenzene	--	ND<0.33	ND<0.26	ND<0.11	ND<0.11	ND<1.0	ND<0.33	ND<0.26	0.24	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.30	ND<0.24	ND<0.15	ND<0.15	ND<1.0	ND<0.30	ND<0.24	ND<0.15	ND<0.15	ND<1.0
n-Butylbenzene	--	ND<0.19	ND<0.15	ND<0.16	ND<0.11	ND<1.0	ND<0.19	ND<0.15	ND<0.16	ND<0.11	ND<1.0
Carbon disulfide	--	NA	NA	NA	ND<0.17	0.35J	NA	NA	NA	ND<0.17	0.13J
Carbon tetrachloride	0.5	ND<0.80	ND<0.64	ND<0.46	ND<0.46	ND<0.50	ND<0.80	ND<0.64	ND<0.46	ND<0.46	ND<0.50
Chlorobenzene	70	ND<0.38	ND<0.30	ND<0.47	ND<0.47	ND<1.0	ND<0.38	ND<0.30	ND<0.47	ND<0.47	ND<1.0
Chloroethane	--	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0	ND<0.59	ND<0.47	ND<0.24	ND<0.24	ND<1.0
Chloroform	100 b	2.3	1.5	1.8	2.0	2.0	1.9	1.3	0.64	0.37	0.30J
1,2-Dichlorobenzene	600	ND<0.33	ND<0.26	ND<0.27	ND<0.27	ND<1.0	ND<0.33	ND<0.26	ND<0.27	ND<0.27	ND<1.0
1,3-Dichlorobenzene	130 a	ND<0.34	ND<0.27	ND<0.18	ND<0.18	ND<1.0	ND<0.34	ND<0.27	ND<0.18	ND<0.18	ND<1.0
1,4-Dichlorobenzene	5	ND<0.34	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.34	ND<0.27	ND<0.27	ND<0.27	ND<1.0
1,1-Dichloroethane	5	9.7	5.6	2.9	2.4	1.6	8.1	6.3	2.9	2.2	1.7
1,2-Dichloroethane	0.5	ND<0.18	0.41	ND<0.22	ND<0.22	ND<0.50	ND<0.18	0.42	ND<0.22	ND<0.22	ND<0.50
1,1-Dichloroethene	6	16	7.5	2.5	1.9	1.3	16	7.9	1.5	0.88	0.91J
cis-1,2-Dichloroethene	6	13	7.7	3.3	2.5	1.5	11	7.3	2.6	1.6	1.0
trans-1,2-Dichloroethene	10	ND<0.61	ND<0.49	ND<0.17	ND<0.17	ND<1.0	ND<0.61	ND<0.49	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.30	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.30	0.32	ND<0.24	ND<0.24	ND<1.0
Dichlorodifluoromethane	1000 a	ND<0.45	ND<0.36	ND<0.40	ND<0.40	ND<1.0	ND<0.45	ND<0.36	ND<0.40	ND<0.40	ND<1.0
Ethylbenzene	700	ND<0.26	ND<0.21	ND<0.31	ND<0.16	0.13J	ND<0.26	ND<0.21	ND<0.31	ND<0.16	0.15J
Isopropylbenzene	--	ND<0.29	ND<0.33	ND<0.09	ND<0.09	NA	ND<0.29	ND<0.33	ND<0.09	ND<0.09	ND<1.0
4-Isopropyltoluene	--	ND<0.21	ND<0.17	ND<0.24	ND<0.18	0.19J	ND<0.21	ND<0.17	ND<0.24	ND<0.18	NA
Methylene chloride	40 a	ND<0.58	ND<0.46	ND<0.29	ND<0.29	ND<2.0	ND<0.58	ND<0.46	ND<0.29	ND<0.29	ND<2.0
Methyl tert butyl ether (MTBE)	35 a	NA	NA	NA	ND<0.15	ND<5.0	NA	NA	NA	0.19	ND<5.0
Naphthalene	--	ND<0.36	ND<0.29	ND<0.37	ND<0.37	ND<1.0	ND<0.36	ND<0.29	ND<0.37	ND<0.37	ND<1.0
Styrene	100	ND<0.41	ND<0.33	1.1	1.0	0.65J	ND<0.41	ND<0.33	0.92	0.74	0.63J
Tetrachloroethene	5	42	19	8.1	7.3	5.8	43	20	6.0	4.6	4.8
Toluene	150	0.89	0.34	0.32	0.19	0.21J	1.1	0.40	0.48	0.33	0.41J
1,1,1-Trichloroethane	200	1.2	0.70	ND<0.26	ND<0.26	ND<1.0	1.0	0.55	ND<0.26	ND<0.26	ND<1.0
Trichloroethene	5	38	18	7.0	5.5	4.8	34	16	4.1	2.9	2.8
Trichlorofluoromethane	150	ND<0.60	ND<0.48	ND<0.32	ND<0.32	ND<1.0	ND<0.60	ND<0.48	ND<0.32	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.25	ND<0.20	ND<0.11	ND<0.11	ND<1.0	ND<0.25	ND<0.20	ND<0.11	ND<0.11	ND<1.0
Vinyl chloride	0.5	ND<0.60	ND<0.48	ND<0.20	ND<0.20	ND<0.50	ND<0.60	ND<0.48	ND<0.20	ND<0.20	ND<0.50
o-Xylene	1,750	ND<0.41	ND<0.33	ND<0.13	ND<0.11	ND<1.0	ND<0.41	ND<0.33	0.18	0.11	ND<1.0
p/m-Xylenes	1,750	ND<0.55	ND<0.44	ND<0.35	ND<0.35	ND<1.0	ND<0.55	ND<0.44	0.36	ND<0.35	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996.
All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level
[b] Federal MCL
-- No Standard
B = Also detected in laboratory's method blank.
bgs = below ground surface
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed.

Table 4-2
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-03

Well ID		QC Samples									
		MW50310	MW50302	MW50308	MW50310	MW50305	MW50310	MW50303	MW50310	MW50304	MW50310
Sample Depth (feet bgs)											
Sample Date		4-Aug-95	25-Sep-95	26-Sep-95	27-Sep-95	18-Mar-96	19-Mar-96	17-Jun-96	18-Jun-96	16-Sep-96	17-Sep-96
Sample Type[1]		N									
VOCs[2,3]	MCL[4]										
Benzene	1	ND<0.20	ND<0.20	**0.42**	**0.23**	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.50	ND<0.50
Bromobenzene	--	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<0.13	ND<0.13	ND<0.13	ND<0.13	ND<1.0	ND<1.0
Bromoform	100 b	ND<0.14	ND<0.14	ND<0.14	ND<0.14	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<1.0	ND<1.0
sec-Butylbenzene	--	ND<0.33	ND<0.26	ND<0.26	ND<0.26	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<1.0
tert-Butylbenzene	--	ND<0.30	ND<0.24	ND<0.24	ND<0.24	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<1.0	ND<1.0
n-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<0.16	ND<0.16	ND<0.11	ND<0.11	ND<1.0	ND<1.0
Carbon disulfide	--	NA	NA	NA	NA	NA	NA	ND<0.17	ND<0.17	ND<5.0	ND<5.0
Carbon tetrachloride	0.5	ND<0.64	ND<0.64	ND<0.64	ND<0.64	ND<0.46	ND<0.46	ND<0.46	ND<0.28	ND<0.50	ND<0.50
Chlorobenzene	70	ND<0.38	ND<0.30	ND<0.30	ND<0.30	ND<0.47	ND<0.47	ND<0.47	ND<0.14	ND<1.0	ND<1.0
Chloroethane	--	ND<0.59	ND<0.47	ND<0.47	ND<0.47	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.0
Chloroform	100 b	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.0
1,2-Dichlorobenzene	600	ND<0.26	ND<0.26	ND<0.26	ND<0.26	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.0
1,3-Dichlorobenzene	130 a	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<0.18	ND<0.18	ND<0.18	ND<0.18	ND<1.0	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	**0.70**	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<1.0
1,1-Dichloroethane	5	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<0.19	ND<0.19	ND<0.19	ND<0.19	ND<1.0	ND<1.0
1,2-Dichloroethane	0.5	ND<0.14	ND<0.14	ND<0.14	ND<0.14	ND<0.22	ND<0.22	ND<0.22	ND<0.22	ND<0.50	ND<0.50
1,1-Dichloroethene	6	ND<0.77	ND<0.77	ND<0.77	ND<0.77	ND<0.21	ND<0.21	ND<0.21	ND<0.21	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.47	ND<0.47	ND<0.47	ND<0.47	ND<0.38	ND<0.38	ND<0.38	ND<0.17	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.61	ND<0.49	ND<0.49	ND<0.49	ND<0.17	ND<0.17	ND<0.17	ND<0.17	ND<1.0	ND<1.0
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.0
Dichlorodifluoromethane	1000 a	ND<0.36	ND<0.36	ND<0.36	ND<0.36	ND<0.40	ND<0.40	ND<0.40	ND<0.40	ND<1.0	ND<1.0
Ethylbenzene	700	ND<0.21	ND<0.21	ND<0.21	ND<0.21	ND<0.31	ND<0.31	ND<0.16	ND<0.16	ND<1.0	ND<1.0
Isopropylbenzene	--	ND<0.29	ND<0.33	ND<0.33	ND<0.33	ND<0.09	ND<0.09	ND<0.09	ND<0.09	NA	NA
4-Isopropyltoluene	--	ND<0.17	ND<0.17	ND<0.17	ND<0.17	ND<0.24	ND<0.24	ND<0.18	ND<0.18	ND<1.0	ND<1.0
Methylene chloride	40 a	**2.9**	**0.91**	ND<0.46	**0.73**	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<2.0	**0.22J**
Methyl tert butyl ether (MTBE)	35 a	NA	NA	NA	NA	NA	NA	ND<0.15	ND<0.15	ND<5.0	ND<5.0
Naphthalene	--	**0.56**	ND<0.29	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<1.0
Styrene	100	ND<0.41	ND<0.33	ND<0.33	ND<0.33	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<1.0
Tetrachloroethene	5	ND<0.41	ND<0.41	ND<0.41	ND<0.41	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<1.0	ND<1.0
Toluene	150	**1.4**	**0.74**	**2.2**	**1.4**	ND<0.13	**0.26**	ND<0.13	ND<0.13	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<0.26	ND<0.26	ND<0.26	ND<0.26	ND<1.0	ND<1.0
Trichloroethene	5	ND<0.33	ND<0.33	ND<0.33	ND<0.33	ND<0.21	ND<0.21	ND<0.21	ND<0.21	ND<1.0	ND<1.0
Trichlorofluoromethane	150	ND<0.48	ND<0.48	ND<0.48	ND<0.48	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<1.0	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<1.0
Vinyl chloride	0.5	ND<0.48	ND<0.48	ND<0.48	ND<0.48	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.50	ND<0.50
o-Xylene	1,750	ND<0.41	ND<0.33	ND<0.33	ND<0.33	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<1.0
p/m-Xylenes	1,750	ND<0.55	ND<0.44	ND<0.44	ND<0.44	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level
[b] Federal MCL
-- No Standard
B = Also detected in laboratory's method blank.
bgs = below ground surface
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed.

Table 4-3
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-05

Well ID		MW50504							MW50503								
Sample Depth (feet bgs)		218 - 228							380 - 390								
Sample Date		16-Aug-95	16-Aug-95	13-Oct-95	30-Oct-95	20-Mar-96	21-Jun-96	23-Sep-96	16-Aug-95	12-Oct-95	12-Oct-95	30-Oct-95	20-Mar-96	20-Mar-96	21-Jun-96	21-Jun-96	23-Sep-96
Sample Type[1]		GW	K	GW					GW		K	GW	GW	K	GW	K	GW
VOCs [2,3]	MCL[4]																
n-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<0.16	ND<0.11	ND<1.0	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<0.16	ND<0.16	**0.40 B**	ND<0.11	ND<1.0
Carbon tetrachloride	0.5	ND<0.64	ND<0.64	ND<0.64	ND<0.64	ND<0.46	ND<0.28	ND<0.50	ND<0.64	**1.7**	**1.4**	ND<0.64	**0.78**	**0.58**	**0.79**	**0.92**	**0.86**
Chloroform	100	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.24	ND<0.24	**0.15J**	ND<0.20	**0.85**	**0.75**	ND<0.20	**1.5**	**1.3**	**1.4**	**1.5**	**1.2**
Chloromethane	--	ND<0.25	ND<0.25	**0.49**	ND<0.25	ND<0.37	ND<0.37	ND<1.0	ND<0.25	**1.4**	ND<0.25	ND<0.25	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0
1,1-Dichloroethane	5	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<0.19	ND<0.19	ND<1.0	ND<0.32	**0.47**	**0.43**	ND<0.32	**0.95**	**0.71**	**0.86**	**0.99**	**0.78J**
1,2-Dichloroethane	0.5	ND<0.14	ND<0.14	ND<0.14	ND<0.14	ND<0.22	ND<0.22	ND<0.50	ND<0.14	**0.53**	**0.51**	ND<0.14	**0.97**	**0.80**	**0.91**	**0.97**	**0.73**
1,1-Dichloroethene	6	ND<0.77	ND<0.77	ND<0.77	ND<0.77	ND<0.21	ND<0.21	ND<1.0	**1.1**	**21**	**18**	**14**	**24**	**18**	**24**	**26**	**23**
cis-1,2-Dichloroethene	6	ND<0.47	ND<0.47	ND<0.47	ND<0.47	ND<0.38	ND<0.17	ND<1.0	ND<0.47	**15**	**14**	**12**	**21**	**17**	**20**	**22**	**19**
Isopropylbenzene	--	ND<0.23	ND<0.23	ND<0.23	ND<0.23	ND<0.09	ND<0.09	ND<1.0	ND<0.23	ND<0.23	ND<0.23	ND<0.23	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<1.0
Methylene chloride	40 [a]	**0.96**	**0.73**	ND<0.46	ND<0.46	ND<0.29	ND<0.29	**1.9J**	**0.82**	ND<0.46	ND<0.46	ND<0.46	ND<0.29	ND<0.29	**0.49**	**0.53**	**1.4J**
Naphthalene	--	ND<0.29	ND<0.29	ND<0.29	ND<0.29	**0.45**	ND<0.37	ND<1.0	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0
Styrene	100	**0.50**	**0.49**	ND<0.33	ND<0.33	ND<0.13	ND<0.11	ND<1.0	**0.44**	ND<0.33	ND<0.33	ND<0.33	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0
Tetrachloroethene	5	ND<0.41	ND<0.41	**0.73**	**0.57**	**1.1**	**1.6**	**1.8**	**3.2**	**90**	**100**	**74**	**180**	**160**	**120**	**140**	**110**
Toluene	150	**0.34**	**0.41**	ND<0.22	ND<0.22	ND<0.13	ND<0.13	ND<1.0	**0.44**	ND<0.22	ND<0.22	ND<0.22	ND<0.13	**0.17**	ND<0.13	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<0.26	ND<0.26	ND<1.0	**0.33**	**9.1**	**7.9**	**8.0**	**11**	**8.6**	**10**	**12**	**10**
Trichloroethene	5	ND<0.33	ND<0.33	ND<0.33	ND<0.33	ND<0.21	ND<0.21	**1.1**	**5.4**	**130**	**150**	**100**	**240**	**200**	**160**	**180**	**160**
Vinyl Chloride	0.5	ND<0.48	ND<0.48	ND<0.48	ND<0.48	ND<0.20	ND<0.20	ND<0.50	ND<0.48	ND<0.48	ND<0.48	ND<0.48	ND<0.20	**0.26**	ND<0.20	ND<0.20	ND<0.50
Freon 113[5]	1200	NA	NA	NA	NA	NA	NA	ND<5.0	NA	NA	NA	NA	NA	NA	NA	NA	**0.89J**
EPA Method 300.0																	
Nitrate (as N)	10	**11**	**11**	**11**	**42**	**12**	**12**	**9.9**	**5.3**	**3.7**	**3.7**	**13**	**3.7**	**3.7**	**3.6**	**3.6**	**3.9**
Nitrite (as N)	1.0	ND<0.10	ND<0.10	ND<0.05	ND<0.10	ND<0.25	ND<0.25	ND<0.050	ND<0.10	ND<0.05	ND<0.05	ND<0.10	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.050

Notes:

All VOC concentrations are in µg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-3
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-05

Well ID		MW50502							MW50501					
Sample Depth (feet bgs)		464 - 474							552 - 562					
Sample Date		16-Aug-95	12-Oct-95	30-Oct-95	20-Mar-96	21-Jun-96	23-Sep-96	23-Sep-96	16-Aug-95	12-Oct-95	30-Oct-95	20-Mar-96	21-Jun-96	23-Sep-96
Sample Type[1]		GW						K	GW					
VOCs [2,3]	**MCL[4]**													
n-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.15	ND<0.16	ND<0.11	ND<1.0	ND<1.0	ND<0.15	ND<0.15	ND<0.15	ND<0.16	ND<0.11	ND<1.0
Carbon tetrachloride	0.5	ND<0.64	**1.4**	ND<0.64	**1.1**	**1.1**	**0.75**	**0.97**	ND<0.64	**11**	**8.0**	**6.8**	**13**	**8**
Chloroform	100	ND<0.20	**0.39**	ND<0.20	ND<0.24	**0.40**	**0.30J**	**0.38J**	ND<0.20	ND<0.20	ND<0.20	ND<0.24	ND<0.24	**0.19J**
Chloromethane	--	ND<0.25	ND<0.25	ND<0.25	ND<0.37	ND<0.37	ND<1.0	ND<1.0	ND<0.25	**0.75**	ND<0.25	ND<0.37	ND<0.37	ND<1.0
1,1-Dichloroethane	5	ND<0.32	ND<0.32	ND<0.32	ND<0.19	ND<0.19	ND<1.0	ND<1.0	ND<0.32	ND<0.32	ND<0.32	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	ND<0.14	**0.30**	ND<0.14	ND<0.22	ND<0.22	ND<0.50	**0.20J**	ND<0.14	ND<0.14	ND<0.14	ND<0.22	ND<0.22	ND<0.50
1,1-Dichloroethene	6	ND<0.77	**10**	**5.2**	**5.2**	**6.9**	**5**	**6.5**	ND<0.77	ND<0.77	ND<0.77	ND<0.21	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.47	**6.3**	**4.6**	**4.9**	**6.9**	**5**	**6**	ND<0.47	ND<0.47	ND<0.47	ND<0.38	ND<0.17	ND<1.0
Isopropylbenzene	--	ND<0.23	ND<0.23	ND<0.23	**0.11**	ND<0.09	ND<1.0	ND<1.0	ND<0.23	ND<0.23	ND<0.23	ND<0.09	ND<0.09	ND<1.0
Methylene chloride	40 [a]	**0.93**	ND<0.46	ND<0.46	ND<0.29	**0.44**	**1.4J**	**1.4J**	**0.80**	ND<0.46	ND<0.46	ND<0.29	ND<0.29	**2.2**
Naphthalene	--	ND<0.29	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<1.0	ND<1.0	ND<0.29	ND<0.29	ND<0.29	**0.40**	ND<0.37	ND<1.0
Styrene	100	**0.62**	ND<0.33	ND<0.33	ND<0.13	ND<0.11	ND<1.0	ND<1.0	**0.51**	ND<0.33	ND<0.33	ND<0.13	ND<0.11	ND<1.0
Tetrachloroethene	5	ND<0.41	**31**	**19**	**19**	**23**	**23**	**29**	ND<0.41	ND<0.41	ND<0.41	**0.77**	ND<0.29	ND<1.0
Toluene	150	**0.37**	ND<0.22	ND<0.22	**0.16**	ND<0.13	ND<1.0	ND<1.0	**0.44**	ND<0.22	ND<0.22	**0.17**	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	ND<0.29	**3.2**	**2.3**	**2.0**	**2.4**	**1.8**	**2.3**	ND<0.29	ND<0.29	ND<0.29	ND<0.26	ND<0.26	ND<1.0
Trichloroethene	5	ND<0.33	**66**	**37**	**39**	**63**	**61**	**64**	ND<0.33	ND<0.33	ND<0.33	**0.54**	ND<0.21	**1.1**
Vinyl Chloride	0.5	ND<0.48	ND<0.48	ND<0.48	ND<0.20	ND<0.20	ND<0.50	ND<0.50	ND<0.48	ND<0.48	ND<0.48	ND<0.20	ND<0.20	ND<0.50
Freon 113[5]	1200	NA	NA	NA	NA	NA	ND<5.0	ND<5.0	NA	NA	NA	NA	NA	ND<5.0
EPA Method 300.0														
Nitrate (as N)	10	**9.3**	**3.6**	**12**	**3.3**	**3.5**	**3.8**	**3.8**	**9.2**	**2.1**	**8.7**	**2.0**	**2.0**	**2.0**
Nitrite (as N)	1.0	ND<0.10	ND<0.05	ND<0.10	ND<0.25	ND<0.25	ND<0.050	ND<0.050	ND<0.10	ND<0.05	ND<0.10	ND<0.25	ND<0.25	ND<0.050

Notes:

All VOC concentrations are in µg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-3
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-05

Well ID		QC Samples				
		MW50504N	MW50504N	MW50504N	MW50504N	MW50504N
Sample Depth (feet bgs)		--	--	--	--	--
Sample Date		16-Aug-95	13-Oct-95	20-Mar-96	21-Jun-96	23-Sep-96
Sample Type[1]		N				
VOCs [2,3]	**MCL[4]**					
n-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.16	ND<0.11	ND<1.0
Carbon tetrachloride	0.5	ND<0.64	ND<0.64	ND<0.46	ND<0.28	ND<0.50
Chloroform	100	ND<0.20	**0.37**	ND<0.24	ND<0.24	ND<1.0
Chloromethane	--	ND<0.25	**0.89**	ND<0.37	ND<0.37	ND<1.0
1,1-Dichloroethane	5	ND<0.32	ND<0.32	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	ND<0.14	ND<0.14	ND<0.22	ND<0.22	ND<0.50
1,1-Dichloroethene	6	ND<0.77	ND<0.77	ND<0.21	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.47	ND<0.47	ND<0.36	ND<0.17	ND<1.0
Isopropylbenzene	--	ND<0.23	ND<0.23	ND<0.09	ND<0.09	ND<1.0
Methylene chloride	40 [a]	**3.5**	**1.5**	ND<0.29	ND<0.29	ND<2.0
Naphthalene	--	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<1.0
Styrene	100	**0.53**	ND<0.33	ND<0.13	ND<0.11	ND<1.0
Tetrachloroethene	5	ND<0.41	ND<0.41	ND<0.29	ND<0.29	ND<1.0
Toluene	150	ND<0.22	**0.81**	ND<0.13	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	ND<0.29	ND<0.29	ND<0.26	ND<0.26	ND<1.0
Trichloroethene	5	ND<0.33	ND<0.33	**0.51**	ND<0.21	ND<1.0
Vinyl Chloride	0.5	ND<0.48	ND<0.48	ND<0.20	ND<0.20	ND<0.50
Freon 113[5]	1200	NA	NA	NA	NA	ND<5.0
EPA Method 300.0						
Nitrate (as N)	10	**0.14**	**0.12**	ND<0.25	ND<0.25	ND<0.050
Nitrite (as N)	1.0	ND<0.10	ND<0.05	ND<0.25	ND<0.25	ND<0.050

Notes:

All VOC concentrations are in µg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-4
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-08

Well ID		MW50804		MW50803		MW50802		MW50801		QC Sample MW50803N
Sample Depth (feet bgs)		380 - 390		554 - 564		670 - 680		795 - 805		--
Sample Date		13-Aug-96	24-Sep-96	13-Aug-96	24-Sep-96	13-Aug-96	24-Sep-96	13-Aug-96	24-Sep-96	24-Sep-96
Sample Type[1]		GW		GW		GW		GW		N
VOCs[2,3]	**MCL[4]**									
Benzene	1	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
n-Butylbenzene	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Carbon tetrachloride	0.5	**0.31 J**	ND<0.50	**0.78**	**0.66J**	**0.62**	**0.33 J**	**1.2**	**0.66**	ND<0.50
Carbon disulfide	--	**0.27 J**	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0
Chlorobenzene	70	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroform	100[b]	**0.11 J**	**0.12 J**	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethane	5	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloroethane	0.5	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
1,1-Dichloroethene	6	**2.1**	**1.6**	ND<1.0	ND<1.0	**0.61 J**	ND<1.0	ND<1.0	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	6	**1.5**	**1.7**	ND<1.0	ND<1.0	**0.41 J**	ND<1.0	ND<1.0	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Methylene chloride	40[a]	ND<2.0	**1.3 J**	ND<2.0	**1.1 J**	ND<2.0	**0.50 J**	ND<2.0	**1.3 J**	**1.8 J**
Methyl tert-butyl ether	35[a]	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	**1.2 J**	**1.0 J**
Styrene	100	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Tetrachloroethene	5	**14**	**9.5**	**0.31 J**	ND<1.0	**4.7**	**0.20 J**	**0.21 J**	ND<1.0	ND<1.0
Toluene	150	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	**1.2**	**0.90 J**	ND<1.0	ND<1.0	**0.35 J**	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2-Trichloroethane	5	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	5	**16**	**13**	**0.31 J**	**0.61 J**	**5.3**	**0.36 J**	**0.21 J**	**0.66 J**	**0.61 J**
Total Xylenes	1,750	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30
EPA Method 300.0										
Nitrate (as N)	10	**3.1**	**0.63**	**1.2**	**1.1**	**1.7**	**1.3**	**1.3**	**1.3**	ND<0.05
Nitrite (as N)	1.0	ND<1.0	ND<0.05	ND<1.0	ND<0.05	ND<1.0	ND<0.05	ND<1.0	ND<0.05	ND<0.05

Notes:

All VOC concentrations are reported in mg/l.

All concentrations for EPA Method 300.0 are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8260.

ND = Not detected at a concentration greater than the limit indicated.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated because value lies between the method and reporting limit.

NA = Not analyzed.

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2581-112\aprdahta\5_8ALL.XLS
11/22/96

Table 4-5
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-11

Well ID		MW51103							MW51102					
Sample Depth (feet bgs)		310 - 320							530 - 540					
Sample Date		10-Oct-95	13-Nov-95	14-Mar-96	14-Mar-96	24-Jun-96	24-Jun-96	20-Sep-96	10-Oct-95	13-Nov-95	13-Nov-95	14-Mar-96	24-Jun-96	20-Sep-96
Sample Type[1]		GW			K	GW	K	GW	GW		K	GW		
VOCs[2,3]	MCL[4]													
Benzene	1	ND<0.2	ND<0.2	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.50	ND<0.2	ND<0.2	ND<0.2	ND<0.09	ND<0.09	ND<0.50
Bromodichloromethane	100[b]	0.41	ND<0.37	ND<0.44	ND<0.44	ND<0.28	ND<0.28	0.22J	0.38	ND<0.37	ND<0.37	ND<0.44	ND<0.28	ND<1.0
n-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.16	ND<0.16	ND<0.11	0.39	ND<1.0	ND<0.15	ND<0.15	ND<0.15	ND<0.16	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.24	ND<0.24	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<0.15	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	2.9	ND<0.64	1.4	1.6	1.1	1.0	1.1	2.7	ND<0.64	ND<0.64	2.8	4.0	2.1
Chloroform	100[b]	1.2	1.4	2.3	2.6	2.8	2.6	2.7	ND<0.20	3.8	4.2	4.6	4.5	3.1
1,2-Dibromoethane (EDB)	0.05	ND<0.24	ND<0.24	ND<0.23	ND<0.23	ND<0.23	ND<0.23	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<0.23	0.38	ND<1.0
1,1-Dichloroethane	5	0.53	0.54	1.2	1.2	1.2	1.1	0.96J	0.58	ND<0.32	ND<0.32	ND<0.19	0.35	0.26J
1,2-Dichloroethane	0.5	1.1	0.96	1.1	1.2	1.5	1.4	2.1	1.2	1.9	2.0	2.8	2.8	1.8
1,1-Dichloroethene	6	35	21	16	18	21	19	21	28	1.4	2.3	1.4	1.8	1.5
cis-1,2-Dichloroethene	6	11	8.3	7.8	8.6	8.9	8.5	14	16	30	34	44	58	39
trans-1,2-Dichloroethene	10	ND<0.49	ND<0.49	ND<0.17	ND<0.17	ND<0.17	ND<0.17	0.27J	ND<0.49	ND<0.49	ND<0.49	ND<0.17	ND<0.17	0.22J
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<0.24	0.15J
Methylene chloride	40[a]	0.57	ND<0.46	1.0B	ND<0.29	0.70	0.70	0.24J	ND<0.46	ND<0.46	ND<0.46	ND<0.29	0.85	0.28J
Methyl tert-butyl ether	35[a]	NA	NA	NA	NA	ND<0.15	1.3	ND<5.0	NA	NA	NA	NA	0.84	ND<5.0
Naphthalene	--	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<0.29	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<1.0
Styrene	100	ND<0.33	ND<0.33	ND<0.13	ND<0.13	0.14	ND<0.11	ND<1.0	ND<0.33	ND<0.33	ND<0.33	0.34	0.23	0.11J
Tetrachloroethene	5	280	170	110	110	97	86	120	350	580	630	650	1,100	700
Toluene	150	ND<0.22	0.28	ND<0.13	ND<0.13	0.20	0.24	ND<1.0	ND<0.22	0.36	0.24	ND<0.13	0.26	ND<1.0
1,1,1-Trichloroethane	200	17	11	6.6	7.7	8.0	7.7	7.7	13	0.89	1.1	ND<0.26	0.29	0.11J
1,1,2-Trichloroethane	5	ND<0.2	ND<0.2	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.2	ND<0.2	ND<0.2	ND<0.27	ND<0.27	0.30J
Trichloroethene	5	170	110	100	100	94	83	120	260	450	470	540	790	590
Trichlorofluoromethane	150	0.59	ND<0.48	1.7	2.0	1.9	1.7	0.70J	0.48	ND<0.48	ND<0.48	ND<0.32	ND<0.32	ND<1.0
p,m-Xylenes	1,750	ND<0.44	ND<0.44	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<0.44	0.53	ND<0.44	ND<0.35	ND<0.35	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination blank

[2] Only compounds detected in one or more samples are listed.

ND = Not detected at a concentration greater than the limit indicated.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

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2581-112\SPRDSHTS\5_11ALL.XLS
11/25/96

Table 4-5
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-11

Well ID		MW51101						QC Samples MW51103N	MW51103N	MW51103N	MW51102N	MW51102N
Sample Depth (feet bgs)		690 - 700						--	--	--	--	--
Sample Date		10-Oct-95	13-Nov-95	14-Mar-96	24-Jun-96	20-Sep-96	20-Sep-96	10-Oct-95	13-Nov-95	14-Mar-96	24-Jun-96	20-Sep-96
Sample Type[1]		GW					K	N				
VOCs[2,3]	MCL[4]											
Benzene	1	ND<0.2	ND<0.2	ND<0.09	ND<0.09	ND<0.50	ND<0.50	ND<0.2	ND<0.2	ND<0.09	ND<0.09	0.12J
Bromodichloromethane	100 [b]	ND<0.37	ND<0.37	ND<0.44	ND<0.28	ND<1.0	ND<1.0	ND<0.37	ND<0.37	ND<0.44	ND<0.28	ND<1.0
n-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.16	ND<0.11	ND<1.0	ND<1.0	ND<0.15	0.19	ND<0.16	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.24	ND<0.24	ND<0.15	ND<0.15	ND<1.0	ND<1.0	ND<0.24	ND<0.24	ND<0.15	0.43	ND<1.0
Carbon tetrachloride	0.5	1.6	ND<0.64	ND<0.46	0.45	0.39J	0.44J	ND<0.64	ND<0.64	ND<0.46	ND<0.28	ND<1.0
Chloroform	100 [b]	0.64	ND<0.20	ND<0.24	ND<0.24	ND<1.0	0.10J	ND<0.20	ND<0.20	ND<0.24	ND<0.24	ND<1.0
1,2-Dibromoethane (EDB)	0.05	ND<0.24	ND<0.24	ND<0.23	ND<0.23	ND<1.0	ND<1.0	ND<0.24	ND<0.24	ND<0.23	ND<0.23	ND<1.0
1,1-Dichloroethane	5	0.38	ND<0.32	ND<0.19	ND<0.19	ND<1.0	ND<1.0	ND<0.32	ND<0.32	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	0.57	ND<0.14	ND<0.22	ND<0.22	ND<0.50	ND<0.50	ND<0.14	ND<0.14	ND<0.22	ND<0.22	ND<1.0
1,1-Dichloroethene	6	19	ND<0.77	ND<0.21	ND<0.21	ND<1.0	ND<1.0	ND<0.77	ND<0.77	ND<0.21	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	4.8	ND<0.47	ND<0.38	ND<0.17	0.21J	ND<1.0	ND<0.47	ND<0.47	ND<0.38	ND<0.17	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.49	ND<0.49	ND<0.17	ND<0.17	ND<1.0	ND<1.0	ND<0.49	ND<0.49	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0
Methylene chloride	40 [a]	0.46	ND<0.46	ND<0.29	ND<0.29	0.32J	0.34J	ND<0.46	ND<0.46	ND<0.29	ND<0.29	0.72J
Methyl tert-butyl ether	35 [a]	NA	NA	NA	0.73	ND<5.0	ND<5.0	NA	NA	NA	ND<0.15	ND<5.0
Naphthalene	--	ND<0.29	ND<0.29	ND<0.37	ND<0.37	ND<1.0	ND<1.0	ND<0.29	ND<0.29	ND<0.37	1.1	ND<1.0
Styrene	100	ND<0.33	ND<0.33	ND<0.13	0.18	0.12J	0.12J	ND<0.33	ND<0.33	ND<0.13	ND<0.11	ND<1.0
Tetrachloroethene	5	140	10	7.9	7.9	8.7	9.8	ND<0.41	ND<0.41	ND<0.29	ND<0.29	ND<1.0
Toluene	150	ND<0.22	0.35	0.16	0.23	ND<1.0	ND<1.0	0.31	0.31	0.17	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	9.8	ND<0.29	ND<0.26	ND<0.26	ND<1.0	ND<1.0	ND<0.29	ND<0.29	ND<0.26	ND<0.26	ND<1.0
1,1,2-Trichloroethane	5	ND<0.2	ND<0.2	ND<0.27	ND<0.27	ND<1.0	ND<1.0	ND<0.2	ND<0.2	ND<0.27	ND<0.27	ND<1.0
Trichloroethene	5	82	14	21	19	26	28	ND<0.33	ND<0.33	ND<0.21	ND<0.21	0.24J
Trichlorofluoromethane	150	ND<0.48	ND<0.48	ND<0.32	ND<0.32	ND<1.0	ND<1.0	ND<0.48	ND<0.48	ND<0.32	ND<0.32	ND<1.0
p,m-Xylenes	1,750	ND<0.44	0.50	ND<0.35	ND<0.35	ND<1.0	ND<1.0	ND<0.44	ND<0.44	ND<0.35	ND<0.35	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination blank

[2] Only compounds detected in one or more samples are listed.

ND = Not detected at a concentration greater than the limit indicated.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996.
All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting li

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-6
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-13

Well ID		MW51303						MW51302					
Sample Depth (feet bgs)		340 - 350						520 - 530					
Sample Date		18-Jan-96	15-Feb-96	14-Mar-96	21-Jun-96	21-Jun-96	19-Sep-96	18-Jan-96	18-Jan-96	15-Feb-96	14-Mar-96	21-Jun-96	19-Sep-96
Sample Type[1]		GW	GW	GW	GW	K	GW	GW	K	GW	GW	GW	GW
VOCs[2,3]	MCL[4]												
Benzene	1	ND<0.09	ND<0.09	ND<0.09	0.14	ND<0.09	ND<0.50	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.50
Bromodichloromethane	100 [b]	ND<0.44	ND<0.44	ND<0.44	ND<0.28	ND<0.28	ND<1.0	ND<0.44	ND<0.44	ND<0.44	ND<0.44	ND<0.28	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.16	ND<0.16	ND<0.11	ND<0.11	ND<1.0	ND<0.16	ND<0.16	ND<0.16	ND<0.16	0.22B	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<0.11	0.17	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	7.2	7.2	4.6	17	16	13	0.79	0.74	ND<0.46	ND<0.46	0.90	0.51J
Chlorobenzene	70	ND<0.47	ND<0.47	ND<0.47	0.19	ND<0.14	ND<1.0	ND<0.47	ND<0.47	ND<0.47	ND<0.47	ND<0.14	ND<1.0
Chloroform	100 [b]	11	12	9.7	30	29	28	1.0	0.88	0.66	ND<0.24	1.2	0.62J
Chloromethane	--	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<0.37	0.33J
1,1-Dichloroethane	5	0.52	0.55	ND<0.19	1.1	1.0	0.89J	ND<0.19	ND<0.19	ND<0.19	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	8.4	9.1	8.7	18	16	12	0.60	0.63	ND<0.22	ND<0.22	0.61	0.29J
1,1-Dichloroethene	6	2.5	3.7	2.2	9.2	8.3	6.9	0.33	0.24	ND<0.21	ND<0.21	0.59	0.45J
cis-1,2-Dichloroethene	6	28	29	21	33	31	30	2.7	2.6	2.3	2.6	5.6	3.7
trans-1,2-Dichloroethene	10	1.0	ND<0.17	ND<0.17	ND<0.17	ND<0.17	0.32J	ND<0.17	ND<0.17	ND<0.17	ND<0.17	ND<0.17	ND<1.0
Methylene chloride	40 [a]	ND<0.29	ND<0.29	ND<0.29	0.47	0.70	0.66J	ND<0.29	ND<0.29	ND<0.29	ND<0.29	0.65	0.51J
Propylbenzene	--	ND<0.22	ND<0.22	ND<0.22	ND<0.56	ND<0.56	ND<1.0	ND<0.22	ND<0.22	0.38	ND<0.22	ND<0.56	ND<1.0
Styrene	100	0.33B	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	0.27B	ND<0.13	ND<0.13	ND<0.13	0.13	ND<1.0
Tetrachloroethene	5	230	230	230	800	720	570	100	93	88	120	280	210
Toluene	150	0.14	0.30	ND<0.13	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<0.13	ND<0.13	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	1.0	1.4	0.63	1.5	1.5	0.87J	ND<0.26	ND<0.26	ND<0.26	ND<0.26	ND<0.26	ND<1.0
1,1,2-Trichloroethane	5	ND<0.27	ND<0.27	ND<0.27	0.85	0.79	0.64J	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0
Trichloroethene	5	600	660	570	1,400	1,300	1400	110	110	88	110	180	140
Trichlorofluoromethane	150	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<0.32	0.32J	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<0.11	0.13	ND<1.0
o-Xylene	1,750	ND<0.13	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	0.27	ND<0.13	ND<0.13	ND<0.13	0.12	ND<1.0
p,m-Xylenes	1,750	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-6
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-13

Well ID		MW51301					QC Samples MW51303N	
Sample Depth (feet bgs)		684 - 694					–	
Sample Date		18-Jan-96	15-Feb-96	14-Mar-96	21-Jun-96	19-Sep-96	18-Jan-96	15-Feb-96
Sample Type[1]		GW	GW	GW	GW	GW	N	
VOCs[2,3]	MCL[4]							
Benzene	1	0.27	0.21	ND<0.09	ND<0.09	ND<0.50	ND<0.09	ND<0.09
Bromodichloromethane	100[b]	ND<0.44	ND<0.44	ND<0.44	ND<0.28	ND<1.0	ND<0.44	ND<0.44
n-Butylbenzene	–	ND<0.16	ND<0.16	ND<0.16	ND<0.11	ND<1.0	ND<0.16	ND<0.16
sec-Butylbenzene	–	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11
tert-Butylbenzene	–	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15
Carbon tetrachloride	0.5	1.4	1.1	ND<0.46	ND<0.28	0.17J	ND<0.46	ND<0.46
Chlorobenzene	70	ND<0.47	ND<0.47	ND<0.47	ND<0.14	ND<1.0	ND<0.47	ND<0.47
Chloroform	100[b]	4.4	6.8	2.0	0.50	0.42J	ND<0.24	ND<0.24
Chloromethane	–	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37
1,1-Dichloroethane	5	ND<0.19	ND<0.19	ND<0.19	ND<0.19	ND<1.0	ND<0.19	ND<0.19
1,2-Dichloroethane	0.5	2.7	4.3	1.8	0.63	0.23J	ND<0.22	ND<0.22
1,1-Dichloroethene	6	1.0	1.6	0.30	ND<0.21	ND<1.0	ND<0.21	ND<0.21
cis-1,2-Dichloroethene	6	6.8	10	3.0	1.2	0.32J	ND<0.38	ND<0.38
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	ND<0.17	ND<0.17	ND<1.0	ND<0.17	ND<0.17
Methylene chloride	40[a]	ND<0.29	ND<0.29	ND<0.29	ND<0.29	0.61J	ND<0.29	ND<0.29
Propylbenzene	–	ND<0.22	0.31	ND<0.22	ND<0.56	ND<1.0	ND<0.22	ND<0.22
Styrene	100	0.36B	ND<0.13	0.30	0.17	ND<1.0	0.23B	ND<0.13
Tetrachloroethene	5	85	140	29	14	7.1	ND<0.29	ND<0.29
Toluene	150	0.19	0.24	0.14	ND<0.13	ND<1.0	ND<0.13	ND<0.13
1,1,1-Trichloroethane	200	ND<0.26	0.63	ND<0.26	ND<0.26	ND<1.0	ND<0.26	ND<0.26
1,1,2-Trichloroethane	5	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27
Trichloroethene	5	160	250	54	23	13	ND<0.21	ND<0.21
Trichlorofluoromethane	150	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<1.0	ND<0.32	ND<0.32
1,2,4-Trimethylbenzene	–	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11
o-Xylene	1,750	ND<0.13	ND<0.13	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.13
p,m-Xylenes	1,750	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

– No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-7
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-15

Well ID		MW51503					
Sample Depth (feet bgs)		235 - 245					
Sample Date		9-Jul-96	9-Jul-96	13-Aug-96	13-Aug-96	23-Sep-96	23-Sep-96
Sample Type[1]		GW	K	GW	K	GW	K
VOCs[2,3]	**MCL[4]**						
Benzene	1	ND<0.09	ND<0.09	ND<0.50	ND<0.50	ND<0.50	ND<0.50
n-Butylbenzene	--	ND<0.11	**0.14**	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Carbon tetrachloride	0.5	**0.33**	**0.33**	**0.23 J**	**0.30 J**	**0.45J**	**0.26J**
Chlorobenzene	70	ND<0.14	ND<0.14	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroform	100[b]	**1.0**	**0.93**	**0.76 J**	**0.92 J**	**1.4**	**1.1**
1,1-Dichloroethane	5	**0.57**	**0.50**	**0.47 J**	**0.54 J**	**0.78J**	**0.60J**
1,2-Dichloroethane	0.5	ND<0.22	ND<0.22	ND<0.50	**0.32 J**	**0.39J**	**0.37J**
1,1-Dichloroethene	6	**5.8**	**5.2**	**3.6**	**4.4**	**8.4**	**5.3**
cis-1,2-Dichloroethene	6	**13**	**11**	**9.5**	**12**	**15**	**13**
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Dichlorodifluoromethane	1000[a]	ND<0.4	ND<0.4	ND<1.0	ND<1.0	**0.21J**	ND<1.0
Methylene chloride	40[a]	ND<0.29	ND<0.29	ND<2.0	ND<2.0	**1.8J**	**0.63J**
Styrene	100	ND<0.11	**0.11**	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	--	ND<0.21	ND<0.21	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Tetrachloroethene	5	**17**	**15**	**14**	**17**	**26**	**18**
Toluene	150	ND<0.13	**0.18**	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	ND<0.26	**0.18 J**	**0.22 J**	**0.44J**	**0.26J**
1,1,2-Trichloroethane	5	ND<0.27	ND<0.27	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	5	**61**	**60**	**47**	**59**	**82**	**60**
o-Xylene	1,750	ND<0.11	**0.12**	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Freon 113[5]	1,200	NA	NA	NA	NA	NA	ND<5.0
EPA Method 300.0							
Nitrate (as N)	10	**2.6**	**2.6**	**2.8**	**2.8**	**3.0**	**3.0**
Nitrite (as N)	1.0	ND<0.25	ND<0.25	ND<0.10	ND<0.10	ND<0.05	ND<0.05

Notes:

All VOC concentrations are reported in µg/l.

All concentrations for EPA method 300.0 are in mg/l.

[1] Sample Type:

GW = Groundwater sample

K = Duplicate (split) sample

N = Equipment decontamination blank

[2] Only compounds detected in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to August 1996. All subsequent samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as 12/95)

[a] California Action Level

[b] Federal MCL

[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting li

ND = Not detected at a concentration greater than the limit indicated.

NA = Not Analyzed.

Table 4-7
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-15

Well ID		MW51502			MW51501			MW51502N	MW51502N	MW51502N
Sample Depth (feet bgs)		450-460			670 - 680			--		
Sample Date		9-Jul-96	13-Aug-96	23-Sep-96	9-Jul-96	13-Aug-96	23-Sep-96	9-Jul-96	13-Aug-96	23-Sep-96
Sample Type[1]		GW	GW	GW	GW	GW	GW	N	N	N
VOCs[2,3]	**MCL[4]**									
Benzene	1	ND<0.09	ND<0.50	ND<0.50	ND<0.09	ND<0.50	ND<0.50	ND<0.09	ND<0.50	ND<0.50
n-Butylbenzene	--	**0.12**	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0
Carbon tetrachloride	0.5	**1.2**	ND<0.50	**0.83**	**0.91**	**1.1**	**0.6**	ND<0.28	ND<0.50	ND<0.50
Chlorobenzene	70	ND<0.14	ND<1.0	ND<1.0	ND<0.14	ND<1.0	ND<1.0	ND<0.14	ND<1.0	ND<1.0
Chloroform	100[b]	**3.5**	**2.5 J**	**2.6**	**0.46**	**0.45 J**	**0.43J**	ND<0.24	ND<1.0	ND<1.0
1,1-Dichloroethane	5	**1.3**	ND<1.0	**0.94J**	ND<0.19	ND<1.0	ND<1.0	ND<0.19	ND<1.0	ND<1.0
1,2-Dichloroethane	0.5	**1.5**	ND<0.50	**1.6**	ND<0.22	**0.42 J**	**0.33J**	ND<0.22	ND<0.50	ND<0.50
1,1-Dichloroethene	6	**25**	**20**	**13**	**0.32**	ND<1.0	ND<1.0	ND<0.21	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	6	**23**	**17**	**16**	**0.47**	ND<1.0	ND<1.0	ND<0.17	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	ND<1.0	ND<1.0	ND<0.17	ND<1.0	ND<1.0	ND<0.17	ND<1.0	ND<1.0
Dichlorodifluoromethane	1000[a]	ND<0.4	ND<1.0	**0.31J**	ND<0.4	ND<1.0	ND<1.0	ND<0.4	ND<1.0	ND<1.0
Methylene chloride	40[a]	ND<0.29	ND<2.0	**0.48J**	ND<2.0	ND<2.0	**1.2J**	ND<0.29	ND<2.0	**1.3J**
Styrene	100	**0.11**	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	--	ND<0.21	ND<1.0	ND<1.0	ND<0.21	ND<1.0	ND<1.0	ND<0.21	ND<1.0	ND<1.0
Tetrachloroethene	5	**160**	**140**	**77**	**1.8**	**0.63 J**	**0.57J**	ND<0.29	ND<1.0	ND<1.0
Toluene	150	**0.27**	ND<1.0	ND<1.0	ND<0.13	ND<1.0	ND<1.0	**0.15**	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	**8.7**	**5.8 J**	**4**	ND<0.26	ND<1.0	ND<1.0	ND<0.26	ND<1.0	ND<1.0
1,1,2-Trichloroethane	5	ND<0.27	ND<1.0	ND<1.0	ND<0.27	ND<1.0	ND<1.0	ND<0.27	ND<1.0	ND<1.0
Trichloroethene	5	**250**	**240**	**140**	**11**	**13**	**9.9**	ND<0.21	**0.35 J**	**0.63J**
o-Xylene	1,750	**0.16**	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0
Freon 113[5]	1,200	NA	NA	**0.66J**	NA	NA	ND<5.0	NA	NA	ND<5.0
EPA Method 300.0										
Nitrate (as N)	10	**3.5**	**3.8**	**3.8**	**3.0**	**3.3**	**3.3**	NA	ND<0.10	ND<0.05
Nitrite (as N)	1.0	ND<0.25	ND<0.10	ND<0.05	ND<0.25	ND<0.10	ND<0.05	NA	ND<0.10	ND<0.05

Notes:

All VOC concentrations are reported in µg/l.

All concentrations for EPA method 300.0 are in mg/l.

[1] Sample Type:

GW = Groundwater sample

K = Duplicate (split) sample

N = Equipment decontamination blank

[2] Only compounds detected in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to August 1996. All subsequent samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as 12/95)

[a] California Action Level

[b] Federal MCL

[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trichloroethane

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not Analyzed.

Table 4-8
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-17

Well ID		MW51703					MW51702				
Sample Depth (feet bgs)		305 - 315					540 - 550				
Sample Date		30-Oct-95	30-Nov-95	15-Mar-96	24-Jun-96	20-Sep-96	30-Oct-95	30-Nov-95	15-Mar-96	24-Jun-96	20-Sep-96
Sample Type[1]		GW					GW				
VOCs[2,3]	MCL [4]										
Benzene	1	ND<0.20	ND<0.20	0.15	ND<0.09	ND<0.50	ND<0.20	ND<0.20	ND<0.09	ND<0.09	ND<0.50
n-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.16	0.18	ND<1.0	ND<0.15	ND<0.15	ND<0.16	ND<0.11	ND<1.0
Carbon tetrachloride	0.5	ND<0.64	ND<0.64	0.47	0.43	0.27J	ND<0.64	ND<0.64	ND<0.46	ND<0.28	ND<0.50
Chlorobenzene	70	ND<0.30	ND<0.30	1.1	0.78	ND<1.0	ND<0.30	ND<0.30	ND<0.47	ND<0.14	ND<1.0
Chloroform	100 [b]	ND<0.20	0.21	2.2	0.97	0.32J	ND<0.20	ND<0.20	ND<0.24	ND<0.24	ND<1.0
1,1-Dichloroethane	5	ND<0.32	ND<0.32	4.4	2.8	0.64J	ND<0.32	ND<0.32	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	0.92	1.0	18	8.6	1.8	ND<0.14	ND<0.14	ND<0.22	ND<0.22	ND<0.50
1,1-Dichloroethene	6	4.1	5.4	43	42	10	ND<0.77	ND<0.77	ND<0.21	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	11	13	180	110	29	ND<0.47	ND<0.47	ND<0.38	0.28	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.49	ND<0.49	0.53	0.54	0.24J	ND<0.49	ND<0.49	ND<0.17	ND<0.17	ND<1.0
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<0.24	ND<0.24	0.27J	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0
Methylene chloride	40 [a]	ND<0.46	ND<0.46	ND<0.29	0.76	0.34J	ND<0.46	ND<0.46	ND<0.29	ND<0.29	0.90J
Methyl tert-butyl ether	35 [a]	NA	NA	NA	1.4	ND<5.0	NA	NA	NA	ND<0.15	ND<5.0
1,1,1,2-Tetrachloroethane	--	ND<0.19	ND<0.19	2.4	1.7	ND<1.0	ND<0.19	ND<0.19	ND<0.21	ND<0.21	ND<1.0
Tetrachloroethene	5	29	28	1,100	670	130	0.73	1.6	6.7	9.4	1.4
Toluene	150	ND<0.22	ND<0.22	ND<0.13	0.20	ND<1.0	ND<0.22	ND<0.22	0.15	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	4.1	4.4	79	49	9.2	ND<0.29	ND<0.29	ND<0.26	ND<0.26	ND<1.0
1,1,2-Trichloroethane	5	ND<0.20	ND<0.20	2.4	1.7	0.34J	ND<0.20	ND<0.20	ND<0.27	ND<0.27	ND<1.0
Trichloroethene	5	10	11	280	140	33	0.40	1.0	6.4	8.4	1.6
Trichlorofluoromethane	150	ND<0.48	ND<0.48	ND<0.32	ND<0.32	ND<1.0	ND<0.48	ND<0.48	ND<0.32	ND<0.32	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-8
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-17

Well ID		MW51701					QC Samples MW51703N	QC Samples MW51703N	QC Samples MW51703N
Sample Depth (feet bgs)		688 - 708					--	--	--
Sample Date		30-Oct-95	30-Nov-95	15-Mar-96	24-Jun-96	20-Sep-96	30-Oct-95	30-Nov-95	15-Mar-96
Sample Type[1]		GW					N		
VOCs[2,3]	MCL[4]								
Benzene	1	ND<0.20	ND<0.20	ND<0.09	ND<0.09	0.19J	ND<0.20	ND<0.20	ND<0.09
n-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.16	ND<0.11	ND<1.0	ND<0.15	ND<0.15	ND<0.16
Carbon tetrachloride	0.5	ND<0.64	ND<0.64	ND<0.46	ND<0.28	ND<0.50	ND<0.64	ND<0.64	ND<0.46
Chlorobenzene	70	ND<0.30	ND<0.30	ND<0.47	ND<0.14	ND<1.0	ND<0.30	ND<0.30	ND<0.47
Chloroform	100[b]	ND<0.20	ND<0.20	ND<0.24	ND<0.24	ND<1.0	ND<0.20	ND<0.20	ND<0.24
1,1-Dichloroethane	5	ND<0.32	ND<0.32	ND<0.19	ND<0.19	ND<1.0	ND<0.32	ND<0.32	ND<0.19
1,2-Dichloroethane	0.5	ND<0.14	ND<0.14	ND<0.22	ND<0.22	ND<0.50	ND<0.14	ND<0.14	ND<0.22
1,1-Dichloroethene	6	ND<0.77	ND<0.77	ND<0.21	0.29	ND<1.0	ND<0.77	ND<0.77	ND<0.21
cis-1,2-Dichloroethene	6	1.4	ND<0.47	ND<0.38	0.50	ND<1.0	ND<0.47	ND<0.47	ND<0.38
trans-1,2-Dichloroethene	10	ND<0.49	ND<0.49	ND<0.17	ND<0.17	ND<1.0	ND<0.49	ND<0.49	ND<0.17
1,2-Dichloropropane	5	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND0.24
Methylene chloride	40[a]	ND<0.46	ND<0.46	ND<0.29	ND<0.29	0.64J	ND<0.46	ND<0.46	ND<0.29
Methyl tert-butyl ether	35[a]	NA	NA	NA	ND<0.15	ND<5.0	NA	NA	NA
1,1,1,2-Tetrachloroethane	--	ND<0.19	ND<0.19	ND<0.21	ND<0.21	ND<1.0	ND<0.19	ND<0.19	ND<0.21
Tetrachloroethene	5	5.3	ND<0.41	0.46	2.4	0.41J	ND<0.41	ND<0.41	ND<0.29
Toluene	150	ND<0.22	0.22	ND<0.13	0.13	ND<1.0	ND<0.22	ND<0.22	0.15
1,1,1-Trichloroethane	200	0.69	ND<0.29	ND<0.26	ND<0.26	ND<1.0	ND<0.29	ND<0.29	ND<0.26
1,1,2-Trichloroethane	5	ND<0.20	ND<0.20	ND<0.27	ND<0.27	ND<1.0	ND<0.20	ND<0.20	ND<0.27
Trichloroethene	5	1.8	ND<0.33	ND<0.21	0.67	0.29J	ND<0.33	ND<0.33	ND<0.21
Trichlorofluoromethane	150	ND<0.48	ND<0.48	ND<0.32	ND<0.32	ND<1.0	ND<0.48	ND<0.48	ND<0.32

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

-- No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

Table 4-9
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
MW5-18

Well ID		MW51803			MW51802			MW51801			QC Sample MW51803N
Sample Depth (feet bgs)		500 - 510			630 - 640			780 - 790			–
Sample Date		3-Jun-96	9-Jul-96	23-Sep-96	3-Jun-96	9-Jul-96	23-Sep-96	3-Jun-96	9-Jul-96	23-Sep-96	3-Jun-96
Sample Type[1]		GW	GW	GW	GW	GW	GW	GW	GW	GW	N
VOCs[2,3]	MCL[3]										
Benzene	1	0.21	0.30	0.16J	ND<0.090	ND<0.09	ND<0.50	ND<0.090	ND<0.09	ND<0.50	ND<0.090
n-Butylbenzene	–	ND<0.11	0.45	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11
Carbon tetrachloride	0.5	1.0	0.95	0.54	1.0	0.74	0.58	1.6	1.4	0.95	ND<0.28
Chlorobenzene	70	ND<0.14	ND<0.14	ND<1.0	ND<0.14	ND<0.14	ND<1.0	ND<0.14	ND<0.14	ND<1.0	ND<0.14
Chloroform	100[b]	3.6	2.6	1.6	0.77	0.56	0.56J	0.33	ND<0.24	0.12J	ND<0.24
1,1-Dichloroethane	5	0.86	0.52	0.44J	0.19	ND<0.19	ND<1.0	ND<0.19	ND<0.19	ND<1.0	ND<0.19
1,2-Dichloroethane	0.5	0.89	0.59	0.43J	ND<0.22	ND<0.22	ND<0.50	ND<0.22	ND<0.22	ND<0.50	ND<0.22
1,1-Dichloroethene	6	16	15	6.6	5.2	4.0	2.1	0.27	ND<0.21	ND<1.0	ND<0.21
cis-1,2-Dichloroethene	6	12	9.6	6.9	5.8	5.2	4.5	0.43	ND<0.17	ND<1.0	ND<0.17
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	ND<1.0	ND<0.17	ND<0.17	ND<1.0	ND<0.17	ND<0.17	ND<1.0	ND<0.17
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	0.22J	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27
Methylene chloride	40[a]	0.51 B	ND<0.29	1.8J	ND<0.29	ND<0.29	1.4J	ND<0.29	ND<0.29	1.6J	ND<0.29
Styrene	100	ND<0.11	0.12	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11
1,1,1,2-Tetrachloroethane	–	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0	ND<0.21
Tetrachloroethene	5	240	220	110	240	230	140	15	2.3	0.61J	ND<0.29
Toluene	150	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<1.0	ND<0.13
1,1,1-Trichloroethane	200	3.2	2.8	1.3	1.1	0.68	0.39J	ND<0.26	ND<0.26	ND<1.0	ND<0.26
1,1,2-Trichloroethane	5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27
Trichloroethene	5	280	240	130	320	310	240	18	2.3	1.6	ND<0.22

Notes:

All VOC concentrations are in µg/l.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996. All other samples were analyzed for VOCs using EPA Method 8260.

[4] California Maximum Contaminant Level (as of 12/95).

[a] California Action Level

[b] Federal MCL

– No Standard

B = Also detected in laboratory's method blank.

bgs = below ground surface

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

CDM Camp Dresser & McKee

2581-112\sprdshts\5_18ALL.XLS
11/22/96

Table 4-10
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
Additional Existing Wells

Well Owner		ALRC/TMC			CalMat Co.			Cov. Irr. Co.	Glendora				LA County			
Well Recordation No.		11900038			01902920			01900882	019000831				08000070			
Well Status		Active			Active			Active	Inactive				Active			
Well Name		MW-4/AZ-2			E-Durbin			Baldwin 3	7G				Santa Fe 1			
Screen Interval (feet bgs)		350-614			238-314 366-484			198-251 278-484	252-474			---	290-435			---
Sampler		GeoSyntec	GeoSyntec	GeoSyntec	CDM	CDM	CDM	CDM	GeoSyntec	CDM	CDM	CDM	CDM	CDM	CDM	CDM
Sample Date		12-Mar-96	10-Jun-96	12-Sep-96	10-Apr-96	27-Jun-96	27-Sep-96	17-Oct-96	27-Mar-96	2-Jul-96	24-Sep-96	2-Jul-96	15-Mar-96	27-Jun-96	20-Sep-96	27-Jun-96
Sample Type[1]		GW			GW			GW	GW	GW	GW	F	GW	GW	GW	F
VOCs [2,4]	MCL[3]															
Acetone	--	ND<1.25	ND<1.25	ND<1.25	NA	NA	NA	NA	ND<1.25	NA	NA	NA	NA	NA	NA	NA
Benzene	1	ND<0.5	ND<0.5	ND<0.5	ND<0.09	ND<0.09	ND<0.5	2.9	ND<0.5	ND<0.09	ND<0.5	ND<0.09	ND<0.09	ND<0.09	ND<0.5	ND<0.09
Bromodichloromethane	100 [b]	ND<0.5	ND<0.5	ND<0.5	ND<0.44	ND<0.28	ND<1.0	ND<1.0	ND<0.5	ND<0.28	ND<1.0	ND<0.28	ND<0.44	ND<0.28	ND<1.0	ND<0.28
n-Butylbenzene	--	NA	NA	NA	ND<0.16	ND<0.11	ND<1.0	ND<1.0	NA	ND<0.11	ND<1.0	ND<0.11	ND<0.16	ND<0.11	ND<1.0	ND<0.11
sec-Butylbenzene	--	NA	NA	NA	ND<0.11	ND<0.11	ND<1.0	ND<1.0	NA	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11
tert-Butylbenzene	--	NA	NA	NA	ND<0.15	ND<0.15	ND<1.0	ND<1.0	NA	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<0.15	ND<1.0	ND<0.15
Carbon tetrachloride	0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.46	ND<0.28	ND<0.5	ND<0.5	ND<0.5	ND<0.28	ND<0.5	ND<0.28	ND<0.46	ND<0.28	ND<0.5	ND<0.28
Chlorobenzene	70	ND<0.5	ND<0.5	ND<0.5	ND<0.47	ND<0.14	ND<1.0	ND<1.0	ND<0.5	ND<0.14	ND<1.0	ND<0.14	ND<0.47	ND<0.14	ND<1.0	ND<0.14
Chloroethane	--	ND<0.75	ND<0.75	ND<0.75	ND<0.24	ND<0.24	ND<1.0	ND<1.0	ND<0.75	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24
Chloroform	100 [b]	ND<0.5	ND<0.5	ND<0.5	ND<0.24	ND<0.24	ND<1.0	0.19J	ND<0.5	ND<0.24	0.14J	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24
Dibromochloromethane	100 [b]	ND<0.5	ND<0.5	ND<0.5	ND<0.24	ND<0.24	ND<1.0	ND<1.0	ND<0.5	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24
1,2-Dibromoethane	--	ND<0.5	ND<0.5	ND<0.5	ND<0.23	ND<0.23	ND<1.0	ND<1.0	ND<0.5	ND<0.23	ND<1.0	ND<0.23	ND<0.23	ND<0.23	ND<1.0	ND<0.23
1,2-Dichlorobenzene	600	ND<0.5	ND<0.5	ND<0.5	ND<0.27	ND<0.27	ND<1.0	ND<1.0	ND<0.5	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.27
1,3-Dichlorobenzene	130 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.18	ND<0.18	ND<1.0	ND<1.0	ND<0.5	ND<0.18	ND<1.0	ND<0.18	ND<0.18	ND<0.18	ND<1.0	ND<0.18
1,4-Dichlorobenzene	5	ND<0.5	ND<0.5	ND<0.5	ND<0.27	ND<0.27	ND<1.0	ND<1.0	ND<0.5	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.27
Dichlorodifluoromethane	1,000 [b]	ND<0.5	ND<0.5	ND<0.5	ND<0.4	ND<0.4	ND<1.0	0.54J	ND<0.5	ND<0.4	0.21J	ND<0.4	ND<0.4	ND<0.4	ND<1.0	ND<0.4
1,1-Dichloroethane	5	4.2	4.0	4.3	ND<0.19	ND<0.19	ND<1.0	0.19J	0.7	ND<0.19	0.22J	ND<0.19	ND<0.19	ND<0.19	ND<1.0	ND<0.19
1,2-Dichloroethane	0.5	ND<0.5	ND<0.5	0.8	1.40	ND<0.22	ND<0.5	ND<0.5	2.5	0.62	ND<0.5	ND<0.22	ND<0.22	ND<0.22	ND<0.5	ND<0.22
1,1-Dichloroethene	6	272	294	262	ND<0.21	ND<0.21	ND<1.0	ND<1.0	73.7	27	20	ND<0.21	ND<0.21	ND<0.21	ND<1.0	ND<0.21
cis-1,2-Dichloroethene	6	1.1	1.1	1.2	ND<0.38	ND<0.17	ND<1.0	0.16J	ND<0.5	ND<0.17	ND<1.0	ND<0.17	ND<0.38	ND<0.17	ND<1.0	ND<0.17
trans-1,2-Dichloroethene	10	ND<0.5	ND<0.5	ND<0.5	ND<0.17	ND<0.17	ND<1.0	ND<1.0	ND<0.5	ND<0.17	0.29J	ND<0.17	ND<0.17	ND<0.17	ND<1.0	ND<0.17
Isopropylbenzene	--	NA	NA	NA	ND<0.09	ND<0.09	ND<1.0	ND<1.0	NA	ND<0.09	ND<1.0	ND<0.09	ND<0.09	ND<0.09	ND<1.0	ND<0.09
Methylene chloride	40 [a]	ND<0.5	ND<0.5	ND<0.5	1.58	ND<0.29	2.1	0.37JB	ND<0.5	ND<0.29	0.32J	ND<0.29	ND<0.29	ND<0.29	ND<2.0	ND<0.29
1-Methylethylbenzene	--	NA	NA	NA	NA	NA	ND<1.0	ND<1.0	NA	NA	ND<1.0	NA	NA	NA	ND<1.0	ND<5.0
Naphthalene	--	ND<0.5	ND<0.5	ND<0.5	ND<0.37	ND<0.37	ND<1.0	ND<1.0	ND<0.5	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<0.37
n-Propylbenzene	--	ND<1.0	ND<1.0	NA	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	100	ND<0.75	ND<0.75	ND<0.75	ND<0.13	ND<0.11	ND<1.0	ND<1.0	ND<0.75	ND<0.11	ND<1.0	ND<0.11	ND<0.13	ND<0.11	ND<1.0	ND<0.11
1,1,1,2-Tetrachloroethane	--	ND<0.5	ND<0.5	ND<0.5	ND<0.21	ND<0.21	ND<1.0	ND<1.0	ND<0.5	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<0.21	ND<1.0	ND<0.21
Tetrachloroethene	5	14.6	ND<0.5	8.2	3.7	2.6	2.3	0.44J	3.4	2.8	1.9	ND<0.29	2.9	0.96	0.21J	ND<0.29
Tetrahydrofuran	--	ND<0.5	15.3	4.7	NA	NA	NA	NA	ND<0.5	NA	NA	NA	NA	NA	NA	NA
Toluene	150	ND<0.5	ND<0.5	ND<0.5	ND<0.13	0.13	ND<1.0	ND<1.0	ND<0.5	ND<0.13	ND<1.0	ND<0.13	ND<0.13	ND<0.13	ND<1.0	ND<0.13
1,1,1-Trichloroethane	200	192	251	239	ND<0.26	ND<0.26	ND<1.0	ND<1.0	267	120	79	ND<0.26	ND<0.26	ND<0.26	ND<1.0	ND<0.26
1,1,2-Trichloroethane	5	ND<0.5	ND<0.5	ND<0.5	ND<0.27	ND<0.27	ND<1.0	ND<1.0	1.2	ND<0.27	0.24J	ND<0.27	ND<0.27	ND<0.27	ND<1.0	ND<0.27
Trichloroethene	5	71.4	92	86	0.92	0.31	0.96J	2.0	7.6	3.4	2.4	ND<0.21	17	5.5	1.0	ND<0.21
Trichlorofluoromethane	150	ND<0.5	ND<0.5	ND<0.5	ND<0.32	ND<0.32	ND<1.0	0.32JB	ND<0.5	ND<0.32	ND<1.0	ND<0.32	ND<0.32	ND<0.32	ND<1.0	ND<0.32
1,2,4-Trimethylbenzene	--	NA	NA	NA	ND<0.11	ND<0.11	ND<1.0	ND<1.0	NA	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11
1,3,5-Trimethylbenzene	--	NA	NA	NA	ND<0.11	ND<0.11	ND<1.0	ND<1.0	NA	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11
Freon 113[5]	1,200	NA	NA	NA	NA	NA	ND<5.0	ND<5.0	NA	NA	ND<5.0	NA	NA	NA	ND<5.0	NA
Vinyl acetate	--	ND<1.25	ND<1.25	ND<0.5	NA	NA	NA	NA	ND<1.25	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	0.5	ND<0.5	ND<0.5	0.6	ND<0.2	ND<0.2	ND<0.5	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.2	ND<0.2	ND<0.2	ND<0.5	ND<0.2
o-Xylene	1,750	ND<0.5	ND<0.5	ND<0.5	ND<0.13	ND<0.11	ND<1.0	ND<1.0	ND<0.5	ND<0.11	ND<1.0	ND<0.11	ND<0.13	ND<0.11	ND<1.0	ND<0.11
p,m-Xylenes	1,750	ND<0.5	ND<0.5	ND<0.5	ND<0.35	ND<0.35	ND<1.0	ND<1.0	ND<0.5	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<0.35
Nitrate (as N)	10	14.9	11.7	11.6	1.6	NA	1.6	2.4	4.6	NA	17.7	NA	3.1	NA	NA	NA
Nitrite (as N)	1	NA	NA	NA	ND<0.25	NA	ND<0.05	ND<1.0	NA	NA	ND<0.05	NA	ND<0.25	NA	NA	NA

Notes:
VOC concentrations are in µg/l.
Nitrate/Nitrite concentrations are in mg/l.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
F = Field blank
NS = No sample collected
[2] Only compounds detected in one or more samples are listed.
[3] California Maximum Contaminant Level (as of 12/95)
[a] California Action Level
[b] Federal MCL
[4] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996 by CDM;
All other samples were analyzed for VOCs using EPA Method 8260 by CDM
VOCs analyzed by EPA method 8260 for samples collected by GeoSyntec.
VOCs analyzed by EPA method 524.2 for samples collected by Stetson Engineers
[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane
-- No Standard
B = Contaminant also detected in laboratory's method blank.
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed
MW = Monitoring Well
bgs = below ground surface
Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well

CDM Camp Dresser & McKee
2581-112\SPRDSHT\WELLDTA.XLS
12/11/96

Table 4-10
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
Additional Existing Wells

Well Owner		La Puente Valley County Water District											
Well Recordation No.		01901460			01902859			08000062				01902859	01902859
Well Status		Active			Active			Active				Active	Active
Well Name		2			3			4				3	3
Screen Interval (feet bgs)		600-947			620-770			550-725				–	–
Sampler		CDM	Stetson	CDM	CDM	Stetson	CDM	CDM	Stetson	CDM	CDM	CDM	CDM
Sample Date		10-Apr-96	1-Jul-96	11-Oct-96	10-Apr-96	1-Jul-96	11-Oct-96	10-Apr-96	1-Jul-96	11-Oct-96	11-Oct-96	10-Apr-96	11-Oct-96
Sample Type[1]		GW			GW			GW	GW	GW	K	F	
VOCs[2,4]	MCL[3]												
Acetone	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1	ND<0.09	ND<0.5	ND<0.5	ND<0.09	ND<0.5	ND<0.5	ND<0.09	ND<0.5	ND<0.5	ND<0.5	ND<0.09	ND<0.5
Bromodichloromethane	100[b]	ND<0.44	ND<0.5	ND<1.0	ND<0.44	ND<0.5	ND<1.0	ND<0.44	ND<0.5	ND<1.0	ND<1.0	ND<0.44	ND<1.0
n-Butylbenzene	–	ND<0.16	ND<0.5	ND<1.0	ND<0.16	ND<0.5	ND<1.0	ND<0.16	ND<0.5	ND<1.0	ND<1.0	ND<0.16	ND<1.0
sec-Butylbenzene	–	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<1.0	ND<0.11	ND<1.0
tert-Butylbenzene	–	ND<0.15	ND<0.5	ND<1.0	ND<0.15	ND<0.5	ND<1.0	ND<0.15	ND<0.5	ND<1.0	ND<1.0	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	2.4	6.6	2.3	3.2	4.9	2.6	6.5	6.0	6.3	6.3	ND<0.46	ND<0.5
Chlorobenzene	70	ND<0.47	ND<0.5	ND<1.0	ND<0.47	ND<0.5	ND<1.0	ND<0.47	ND<0.5	ND<1.0	ND<1.0	ND<0.47	ND<1.0
Chloroethane	–	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<1.0	ND<0.24	ND<1.0
Chloroform	100[b]	1.2	2.4	0.65J	2.0	1.6	1.6	4.0	2.7	3.6	3.4	ND<0.24	ND<1.0
Dibromochloromethane	100[b]	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<1.0	ND<0.24	ND<1.0
1,2-Dibromoethane	–	ND<0.23	NA	ND<1.0	ND<0.23	NA	ND<1.0	ND<0.23	NA	ND<1.0	ND<1.0	ND<0.23	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<1.0	ND<0.27	ND<1.0
1,3-Dichlorobenzene	130[a]	ND<0.18	ND<0.5	ND<1.0	ND<0.18	ND<0.5	ND<1.0	ND<0.18	ND<0.5	ND<1.0	ND<1.0	ND<0.18	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<1.0	ND<0.27	ND<1.0
Dichlorodifluoromethane	1,000[b]	1.2	ND<1.0	0.63J	2.2	ND<1.0	1.5	2.4	ND<1.0	2.0	2.0	ND<0.4	ND<1.0
1,1-Dichloroethane	5	ND<0.19	ND<0.5	ND<1.0	ND<0.19	ND<0.5	0.16J	ND<0.19	ND<0.5	0.27J	0.26J	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	1.9	4.6	1.5	4.1	3.1	2.9	5.0	5.8	6.2	6.1	ND<0.22	ND<0.5
1,1-Dichloroethene	6	0.34	ND<0.5	0.39J	0.36	ND<0.5	0.44J	0.92	ND<0.5	1.6	1.6	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	0.71	ND<0.5	0.74J	0.97	ND<0.5	0.90J	2.4	ND<0.5	2.8	2.9	ND<0.38	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.5	ND<1.0	ND<0.17	ND<0.5	ND<1.0	ND<0.17	ND<0.5	ND<1.0	ND<1.0	ND<0.17	ND<1.0
Isopropylbenzene	–	ND<0.09	ND<0.5	ND<1.0	ND<0.09	ND<0.5	ND<1.0	ND<0.09	ND<0.5	ND<1.0	ND<1.0	ND<0.09	ND<1.0
Methylene chloride	40[a]	0.84B	ND<0.5	ND<2.0	0.80B	ND<0.5	ND<2.0	0.96B	ND<0.5	ND<2.0	ND<2.0	1.0B	ND<2.0
1-Methylethylbenzene	–	NA	NA	ND<1.0	NA	NA	ND<1.0	NA	NA	ND<1.0	ND<1.0	NA	ND<1.0
Naphthalene	–	ND<0.37	ND<0.5	ND<1.0	ND<0.37	ND<0.5	ND<1.0	ND<0.37	ND<0.5	ND<1.0	ND<1.0	ND<0.37	ND<1.0
n-Propylbenzene	–	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	100	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<1.0	ND<0.13	ND<1.0
1,1,1,2-Tetrachloroethane	–	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<0.5	ND<1.0	ND<1.0	ND<0.21	ND<1.0
Tetrachloroethene	5	1.5	3.7	1.4	2.2	2.2	2.0	4.1	3.4	5.0	5.0	ND<0.29	ND<1.0
Tetrahydrofuran	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	150	0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<1.0	ND<0.13	0.079J
1,1,1-Trichloroethane	200	ND<0.26	ND<0.5	ND<1.0	ND<0.26	ND<0.5	ND<1.0	ND<0.26	ND<0.5	ND<1.0	ND<1.0	ND<0.26	ND<1.0
1,1,2-Trichloroethane	5	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<1.0	ND<0.27	ND<1.0
Trichloroethene	5	25	55	25	39	50	45	82	57	92	90	ND<0.21	ND<1.0
Trichlorofluoromethane	150	ND<0.32	ND<0.5	ND<1.0	ND<0.32	ND<0.5	ND<1.0	ND<0.32	ND<0.5	ND<1.0	ND<1.0	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	–	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<1.0	ND<0.11	ND<1.0
1,3,5-Trimethylbenzene	–	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<1.0	ND<0.11	ND<1.0
Freon 113[5]	1,200	NA	NA	ND<5.0	NA	NA	ND<5.0	NA	NA	ND<5.0	ND<5.0	NA	ND<5.0
Vinyl acetate	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.5	ND<0.20	ND<0.5
o-Xylene	1,750	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<1.0	ND<0.13	ND<1.0
p,m-Xylenes	1,750	ND<0.35	ND<0.5	ND<1.0	ND<0.35	ND<0.5	ND<1.0	ND<0.35	ND<0.5	ND<1.0	ND<1.0	ND<0.35	ND<1.0
Nitrate (as N)	10	3.1	6.5	3.5	6.4	6.4	6.0	5.8	5.3	6.1	5.1	NA	NA
Nitrite (as N)	1	ND<0.25	NA	ND<0.05	ND<0.25	NA	ND<0.05	ND<0.25	NA	ND<0.05	ND<0.05	NA	NA

Notes:
VOC concentrations are in µg/l.
Nitrate/Nitrite concentrations are in mg/l.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
F = Field blank
NS = No sample collected
[2] Only compounds detected in one or more samples are listed.
[3] California Maximum Contaminant Level (as of 12/95)
[a] California Action Level
[b] Federal MCL
[4] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996 by CDM;
All other samples were analyzed for VOCs using EPA Method 8260 by CDM
VOCs analyzed by EPA method 8260 for samples collected by GeoSyntec.
VOCs analyzed by EPA method 524.2 for samples collected by Stetson Engineers
[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane
-- No Standard
B = Contaminant also detected in laboratory's method blank.
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than limit indicated.
NA = Not analyzed
MW = Monitoring Well
bgs = below ground surface
Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well

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2561-112\BPRDSHT\WELL DTA.XLS
12/11/96

Table 4-10
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
Additional Existing Wells

Well Owner		San Gabriel Valley Water Company											
Well Recordation No.		51902858			71903093			78000096			51902858	78000096	51902858
Well Status		Active			Active			Active			Active	Active	Active
Well Name		B4B			B6C			B6D			B4B	B6D	B4B
Screen Interval (feet bgs)		920-940, 950-1154			275-420, 440-465, 480-506			760-1032			—	—	—
Sampler		CDM	Stetson	CDM	CDM	Stetson	CDM	CDM	Stetson	CDM	CDM	CDM	CDM
Sample Date		2-Apr-96	18-Jul-96	8-Oct-96	2-Apr-96	17-Jul-96	8-Oct-96	2-Apr-96	17-Jul-96	8-Oct-96	2-Apr-96	8-Oct-96	9-Oct-96
Sample Type[1]		GW			GW			GW			F		
VOCs[2,4]	MCL[3]												
Acetone	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1	ND<0.09	ND<0.5	ND<0.5	ND<0.09	ND<0.5	ND<0.5	ND<0.09	ND<0.5	ND<0.5	ND<0.09	ND<0.5	ND<0.5
Bromodichloromethane	100[b]	ND<0.44	ND<0.5	ND<1.0	ND<0.44	ND<0.5	ND<1.0	ND<0.44	ND<0.5	ND<1.0	ND<0.44	ND<1.0	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.5	ND<1.0	ND<0.16	ND<0.5	ND<1.0	ND<0.16	ND<0.5	ND<1.0	ND<0.16	ND<1.0	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<1.0	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.5	ND<1.0	ND<0.15	ND<0.5	ND<1.0	ND<0.15	ND<0.5	ND<1.0	ND<0.15	ND<1.0	ND<1.0
Carbon tetrachloride	0.5	2.8	2.6	2.1	2.6	3.6	1.4	6.6	5.3	4.2	ND<0.46	ND<0.5	ND<0.5
Chlorobenzene	70	ND<0.47	ND<0.5	ND<1.0	ND<0.47	ND<0.5	ND<1.0	ND<0.47	ND<0.5	ND<1.0	ND<0.47	ND<1.0	ND<1.0
Chloroethane	--	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<1.0	ND<1.0
Chloroform	100[b]	ND<0.24	ND<0.5	ND<1.0	3.4	3.1	2.9	ND<0.24	ND<0.5	0.27J	ND<0.24	ND<1.0	ND<1.0
Dibromochloromethane	100[b]	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<1.0	ND<1.0
1,2-Dibromoethane	--	ND<0.23	NA	ND<1.0	ND<0.23	NA	ND<1.0	ND<0.23	NA	ND<1.0	ND<0.23	ND<1.0	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<1.0	ND<1.0
1,3-Dichlorobenzene	130[a]	ND<0.18	ND<0.5	ND<1.0	ND<0.18	ND<0.5	ND<1.0	ND<0.18	ND<0.5	ND<1.0	ND<0.18	ND<1.0	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<1.0	ND<1.0
Dichlorodifluoromethane	1,000[b]	ND<0.4	ND<1.0	ND<1.0	4.6	ND<1.0	1.8	ND<0.4	ND<1.0	ND<1.0	ND<0.4	ND<1.0	ND<1.0
1,1-Dichloroethane	5	ND<0.19	ND<0.5	ND<1.0	0.96	0.79	0.75J	ND<0.19	ND<0.5	ND<1.0	ND<0.19	ND<1.0	ND<1.0
1,2-Dichloroethane	0.5	ND<0.22	ND<0.5	ND<0.5	6.0	4.6	3.9	ND<0.22	ND<0.5	ND<0.5	0.86	ND<0.5	ND<0.5
1,1-Dichloroethene	6	ND<0.21	ND<0.5	ND<1.0	0.99	0.99	0.72J	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.38	ND<0.5	ND<1.0	2.9	2.7	2.3	ND<0.38	ND<0.5	ND<1.0	ND<0.38	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.5	ND<1.0	ND<0.17	ND<0.5	ND<1.0	ND<0.17	ND<0.5	ND<1.0	ND<0.17	ND<1.0	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.5	ND<1.0	ND<0.09	ND<0.5	ND<1.0	ND<0.09	ND<0.5	ND<1.0	ND<0.09	ND<1.0	ND<1.0
Methylene chloride	40[a]	0.54	ND<0.5	ND<2.0	0.92B	ND<0.5	ND<2.0	0.49	ND<0.5	ND<2.0	0.97	ND<2.0	ND<2.0
1-Methylethylbenzene	--	NA	NA	ND<1.0	NA	NA	NA	NA	ND<1.0	ND<1.0	NA	ND<1.0	ND<1.0
Naphthalene	--	ND<0.37	ND<0.5	ND<1.0	ND<0.37	ND<0.5	ND<1.0	ND<0.37	ND<0.5	ND<1.0	ND<0.37	ND<1.0	ND<1.0
n-Propylbenzene	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	100	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	--	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<1.0	ND<1.0
Tetrachloroethene	5	ND<0.29	ND<0.5	ND<1.0	6.3	5.6	4.1	ND<0.29	ND<0.5	ND<1.0	ND<0.29	ND<1.0	ND<1.0
Tetrahydrofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<1.0	ND<1.0
Toluene	150	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	0.667J	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	ND<0.5	ND<1.0	ND<0.26	ND<0.5	ND<1.0	ND<0.26	ND<0.5	ND<1.0	ND<0.26	ND<1.0	ND<1.0
1,1,2-Trichloroethane	5	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<1.0	ND<1.0
Trichloroethene	5	ND<0.21	ND<0.5	ND<1.0	61	37	41	1.4	1.1	1.1	ND<0.21	ND<1.0	ND<1.0
Trichlorofluoromethane	150	ND<0.32	ND<0.5	ND<1.0	ND<0.32	ND<0.5	ND<1.0	ND<0.32	ND<0.5	ND<1.0	ND<0.32	ND<1.0	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<1.0	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<1.0	ND<1.0
Freon 113[5]	1,200	NA	NA	ND<5.0	NA	NA	ND<5.0	NA	NA	ND<5.0	NA	ND<5.0	ND<5.0
Vinyl acetate	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5
o-Xylene	1,750	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<1.0	ND<1.0
p,m-Xylenes	1,750	ND<0.35	ND<0.5	ND<1.0	ND<0.35	ND<0.5	ND<1.0	ND<0.35	ND<0.5	ND<1.0	ND<0.35	ND<1.0	ND<1.0
Nitrate (as N)	10	1.1	1.4	1.1	10	10.4	10.1	1.9	1.9	2.0	NA	NA	NA
Nitrite (as N)	1	ND<0.25	NA	ND<0.05	ND<0.25	NA	ND<0.05	ND<0.25	NA	ND<0.05	NA	NA	NA

Notes:

VOC concentrations are in µg/l.
Nitrate/Nitrite concentrations are in mg/l.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
F = Field blank
NS = No sample collected
[2] Only compounds detected in one or more samples are listed.
[3] California Maximum Contaminant Level (as of 12/95)

[a] California Action Level
[b] Federal MCL
[4] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996 by CDM;
All other samples were analyzed for VOCs using EPA Method 8260 by CDM
VOCs analyzed by EPA method 8260 for samples collected by GeoSyntec.
VOCs analyzed by EPA method 524.2 for samples collected by Stetson Engineers
[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane
-- No Standard
B = Contaminant also detected in laboratory's method blank.
J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than limit indicated.
NA = Not analyzed
MW = Monitoring Well
bgs = below ground surface
Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well

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2561-112\SPRDSHT\WELLDTA.XLS
12/11/98

Table 4-10
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
Additional Existing Wells

Well Owner		Suburban Water Systems										
Well Recordation No.		01901598			08000069			08000095			08000095	08000069
Well Status		Active			Active			Active			Active	Active
Well Name		139W1			139W4			139W5			139W5	139W4
Screen Interval (feet bgs)		120-349			566-642, 676-695, 787-825			750-1060			---	---
Sampler		CDM	Stetson	CDM	CDM	Stetson	CDM	CDM	Stetson	CDM	CDM	CDM
Sample Date		12-Apr-96	3-Jul-96	7-Oct-96	12-Apr-96	3-Jul-96	7-Oct-96	12-Apr-96	3-Jul-96	7-Oct-96	12-Apr-96	7-Oct-96
Sample Type[1]		GW			GW			GW			F	
VOCs [2,4]	MCL[3]											
Acetone	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1	ND<0.09	ND<0.5	ND<0.5	ND<0.09	ND<0.5	ND<0.5	ND<0.09	ND<0.5	ND<0.5	ND<0.09	ND<0.5
Bromodichloromethane	100 [b]	ND<0.44	ND<0.5	ND<1.0	ND<0.44	ND<0.5	ND<1.0	ND<0.44	ND<0.5	ND<1.0	ND<0.44	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.5	ND<1.0	ND<0.16	ND<0.5	ND<1.0	ND<0.16	ND<0.5	ND<1.0	ND<0.16	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.5	ND<1.0	ND<0.15	ND<0.5	ND<1.0	ND<0.15	ND<0.5	ND<1.0	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	ND<0.46	ND<0.5	ND<0.5	ND<0.46	ND<0.5	ND<0.5	ND<0.46	ND<0.5	ND<0.5	ND<0.46	ND<0.5
Chlorobenzene	70	ND<0.47	ND<0.5	ND<1.0	ND<0.47	ND<0.5	ND<1.0	ND<0.47	ND<0.5	ND<1.0	ND<0.47	ND<1.0
Chloroethane	--	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<1.0
Chloroform	100 [b]	0.27	ND<0.5	0.33J	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<1.0
Dibromochloromethane	100 [b]	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<0.5	ND<1.0	ND<0.24	ND<1.0
1,2-Dibromoethane	--	ND<0.23	NA	ND<1.0	ND<0.23	NA	ND<1.0	ND<0.23	NA	ND<1.0	ND<0.23	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<1.0
1,3-Dichlorobenzene	130 [a]	ND<0.18	ND<0.5	ND<1.0	ND<0.18	ND<0.5	ND<1.0	ND<0.18	ND<0.5	ND<1.0	ND<0.18	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<1.0
Dichlorodifluoromethane	1,000 [b]	ND<0.4	ND<1.0	ND<1.0	ND<0.4	ND<1.0	ND<1.0	ND<0.4	ND<1.0	ND<1.0	ND<0.4	ND<1.0
1,1-Dichloroethane	5	ND<0.19	ND<0.5	ND<1.0	ND<0.19	ND<0.5	ND<1.0	ND<0.19	ND<0.5	ND<1.0	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	ND<0.22	ND<0.5	ND<0.5	ND<0.22	ND<0.5	ND<0.5	ND<0.22	ND<0.5	ND<0.5	ND<0.22	ND<0.5
1,1-Dichloroethene	6	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.38	ND<0.5	ND<1.0	ND<0.38	ND<0.5	ND<1.0	ND<0.38	ND<0.5	ND<1.0	ND<0.38	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.5	ND<1.0	ND<0.17	ND<0.5	ND<1.0	ND<0.17	ND<0.5	ND<1.0	ND<0.17	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.5	ND<1.0	ND<0.09	ND<0.5	ND<1.0	ND<0.09	ND<0.5	ND<1.0	ND<0.09	ND<1.0
Methylene chloride	40 [a]	0.36	ND<0.5	ND<2.0	0.66	ND<0.5	ND<2.0	0.33	ND<0.5	ND<2.0	0.56	ND<2.0
1-Methylethylbenzene	--	NA	NA	ND<1.0	NA	NA	ND<1.0	NA	NA	ND<1.0	NA	ND<1.0
Naphthalene	--	ND<0.37	ND<0.5	ND<1.0	ND<0.37	ND<0.5	ND<1.0	ND<0.37	ND<0.5	ND<1.0	ND<0.37	ND<1.0
n-Propylbenzene	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	100	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<1.0
1,1,1,2-Tetrachloroethane	--	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<0.5	ND<1.0	ND<0.21	ND<1.0
Tetrachloroethene	5	0.50	ND<0.5	0.32J	ND<0.29	ND<0.5	ND<1.0	ND<0.29	ND<0.5	ND<1.0	ND<0.29	ND<1.0
Tetrahydrofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	150	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	ND<0.5	ND<1.0	ND<0.26	ND<0.5	ND<1.0	ND<0.26	ND<0.5	ND<1.0	ND<0.26	ND<1.0
1,1,2-Trichloroethane	5	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<0.5	ND<1.0	ND<0.27	ND<1.0
Trichloroethene	5	0.41	ND<0.5	0.25J	ND<0.21	0.51	0.32J	1.1	1.4	1.4	ND<0.21	ND<1.0
Trichlorofluoromethane	150	ND<0.32	ND<0.5	ND<1.0	ND<0.32	ND<0.5	ND<1.0	ND<0.32	ND<0.5	ND<1.0	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<0.5	ND<1.0	ND<0.11	ND<1.0
Freon 113[5]	1,200	NA	NA	ND<5.0	NA	NA	ND<5.0	NA	NA	ND<5.0	NA	ND<5.0
Vinyl acetate	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5
o-Xylene	1,750	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<0.5	ND<1.0	ND<0.13	ND<1.0
p,m-Xylenes	1,750	ND<0.35	ND<0.5	ND<1.0	ND<0.35	ND<0.5	ND<1.0	ND<0.35	ND<0.5	ND<1.0	ND<0.35	ND<1.0
Nitrate (as N)	10	21	21.0	20.1	6.8	6.1	6.9	2.1	1.9	2.0	NA	NA
Nitrite (as N)	1	ND<0.25	NA	ND<0.05	ND<0.25	NA	ND<0.05	ND<0.25	NA	ND<0.05	NA	NA

Notes:
VOC concentrations are in µg/l.
Nitrate/Nitrite concentrations are in mg/l.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
F = Field blank
NS = No sample collected
[2] Only compounds detected in one or more samples are listed.
[3] California Maximum Contaminant Level (as of 12/95)
[a] California Action Level
[b] Federal MCL
[4] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996 by CDM;
All other samples were analyzed for VOCs using EPA Method 8260 by CDM
VOCs analyzed by EPA method 8260 for samples collected by GeoSyntec.
VOCs analyzed by EPA method 524.2 for samples collected by Stetson Engineers
[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane
-- No Standard
B = Contaminant also detected in laboratory's method blank.
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than limit indicated.
NA = Not analyzed
MW = Monitoring Well
bgs = below ground surface
Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well

Table 4-10
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
Additional Existing Wells

Well Owner		Valley County Water District												
Well Recordation No.		01900028				01900029				01900031				
Well Status		Active				Inactive				Inactive				
Well Name		West Maine (2)				Morada (3)				Paddy Lane (5)				
Screen Interval (feet bgs)		250-580			—	275-585				300-585			—	—
Sampler		CDM	Stetson	CDM	CDM	GeoSyntec	CDM	CDM	CDM	CDM	CDM	CDM	CDM	CDM
Sample Date		11-Apr-96	19-Jul-96	17-Oct-96	17-Oct-96	26-Mar-96	1-Jul-96	1-Jul-96	24-Sep-96	12-Jul-96	12-Jul-96	26-Sep-96	12-Jul-96	26-Sep-96
Sample Type[1]		GW	GW	GW	F	GW	GW	F	GW	GW	K	GW	F	F
VOCs [2,4]	MCL[3]													
Acetone	--	NA	NA	NA	NA	ND<1.25	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1	ND<0.09	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.09	ND<0.09	ND<0.5	ND<0.09	ND<0.09	ND<0.5	ND<0.09	ND<0.5
Bromodichloromethane	100 [b]	ND<0.44	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.28	ND<0.28	0.16J	ND<0.28	ND<0.28	ND<1.0	ND<0.28	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.5	ND<1.0	ND<1.0	NA	ND<0.11	ND<0.11	ND<1.0	0.12	0.16	ND<1.0	ND<0.11	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<1.0	NA	ND<0.11	ND<0.11	ND<1.0	0.16	0.13	ND<1.0	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.5	ND<1.0	ND<1.0	NA	ND<0.15	ND<0.15	ND<1.0	0.30	ND<0.15	ND<1.0	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	ND<0.46	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.28	ND<0.28	ND<0.5	4.0	3.9	2.1	ND<0.28	ND<0.5
Chlorobenzene	70	ND<0.47	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.14	ND<0.14	ND<1.0	ND<0.14	ND<0.14	ND<1.0	ND<0.14	ND<1.0
Chloroethane	--	ND<0.24	ND<0.5	ND<1.0	ND<1.0	ND<0.75	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<1.0
Chloroform	100 [b]	ND<0.24	ND<0.5	ND<1.0	ND<1.0	1.2	1.1	ND<0.24	0.86J	5.7	5.8	4.6	ND<0.24	0.054J
Dibromochloromethane	100 [b]	ND<0.24	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<1.0
1,2-Dibromoethane	--	ND<0.23	NA	ND<1.0	ND<1.0	ND<0.5	ND<0.23	ND<0.23	ND<1.0	ND<0.23	ND<0.23	ND<1.0	ND<0.23	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<1.0
1,3-Dichlorobenzene	130 [a]	ND<0.18	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.18	ND<0.18	ND<1.0	ND<0.18	ND<0.18	ND<1.0	ND<0.18	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<1.0
Dichlorodifluoromethane	1,000 [b]	ND<0.4	ND<1.0	ND<1.0	ND<1.0	1.6	1.2	ND<0.4	0.68J	6.2	6.2	3.3	ND<0.4	ND<1.0
1,1-Dichloroethane	5	ND<0.19	ND<0.5	ND<1.0	ND<1.0	1.0	0.87	ND<0.19	1.0	3.2	3.2	2.5	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	ND<0.22	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.22	ND<0.22	ND<0.5	3.8	4.0	2.9	ND<0.22	ND<0.5
1,1-Dichloroethene	6	ND<0.21	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.21	ND<0.21	ND<1.0	5.2	5.5	3.6	ND<0.21	ND<1.0
cis-1,2-Dichloroethene	6	ND<0.38	ND<0.5	ND<1.0	ND<1.0	3.8	2.7	ND<0.17	3.3	15	16	13	ND<0.17	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.17	ND<0.17	0.12J	0.18	0.20	0.28J	ND<0.17	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.5	ND<1.0	ND<1.0	NA	ND<0.09	ND<0.09	ND<1.0	0.17	ND<0.09	ND<1.0	ND<0.09	ND<1.0
Methylene chloride	40 [a]	ND<0.29	ND<0.5	0.36JB	0.25JB	ND<0.5	ND<0.29	ND<0.29	1.1J	ND<0.29	ND<0.29	0.41J	ND<0.29	0.51J
1-Methylethylbenzene	--	NA	NA	ND<1.0	ND<1.0	NA	NA	NA	ND<1.0	NA	NA	ND<1.0	NA	ND<1.0
Naphthalene	--	ND<0.37	ND<0.5	ND<1.0	0.23J	ND<0.5	ND<0.37	ND<0.37	ND<1.0	ND<0.37	0.93	ND<1.0	ND<0.37	ND<1.0
n-Propylbenzene	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	100	ND<0.13	ND<0.5	ND<1.0	ND<1.0	ND<0.75	ND<0.11	ND<0.11	ND<1.0	0.14	0.11	ND<1.0	ND<0.11	ND<1.0
1,1,1,2-Tetrachloroethane	--	ND<0.21	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<1.0
Tetrachloroethene	5	ND<0.29	ND<0.5	ND<1.0	ND<1.0	3.9	4.1	ND<0.29	3.3	19	19	13	ND<0.29	ND<1.0
Tetrahydrofuran	--	NA	NA	NA	NA	ND<0.5	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	150	ND<0.13	ND<0.5	ND<1.0	0.11J	ND<0.5	ND<0.13	0.16	ND<1.0	0.18	0.16	ND<1.0	0.16	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.26	ND<0.26	ND<1.0	0.79	0.49	0.21J	ND<0.26	ND<1.0
1,1,2-Trichloroethane	5	ND<0.27	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<1.0
Trichloroethene	5	ND<0.21	ND<0.5	ND<1.0	ND<1.0	2.9	2.8	ND<0.21	2.8	130	120	130	ND<0.21	0.52J
Trichlorofluoromethane	150	ND<0.32	ND<0.5	0.31JB	0.36JB	ND<0.5	ND<0.32	ND<0.32	ND<1.0	0.62	0.61	ND<1.0	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<1.0	NA	ND<0.11	ND<0.11	ND<1.0	0.18	0.17	0.27J	ND<0.11	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.5	ND<1.0	ND<1.0	NA	ND<0.11	ND<0.11	ND<1.0	0.13	0.13	ND<1.0	ND<0.11	ND<1.0
Freon 113[5]	1,200	NA	NA	ND<5.0	ND<5.0	NA	NA	NA	ND<5.0	NA	NA	ND<5.0	NA	ND<5.0
Vinyl acetate	--	NA	NA	NA	NA	ND<1.25	NA	NA	ND<1.0	NA	NA	NA	NA	NA
Vinyl chloride	0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.2	ND<0.2	ND<0.5	ND<0.2	ND<0.20	ND<0.5	ND<0.2	ND<0.5
o-Xylene	1,750	ND<0.13	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.11	ND<0.11	ND<1.0	0.18	0.11	ND<1.0	ND<0.11	ND<1.0
p,m-Xylenes	1,750	ND<0.35	ND<0.5	ND<1.0	ND<1.0	ND<0.5	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<1.0
Nitrate (as N)	10	0.71	NA	NA	NA	2.2	13	NA	13.7	6.7	6.7	7.1	NA	NA
Nitrite (as N)	1	ND<0.25	NA	NA	NA	NA	ND<0.25	NA	ND<0.05	ND<0.25	ND<0.25	ND<0.05	NA	NA

Notes:
VOC concentrations are in µg/l.
Nitrate/Nitrite concentrations are in mg/l.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
F = Field blank
NS = No sample collected
[2] Only compounds detected in one or more samples are listed.
[3] California Maximum Contaminant Level (as of 12/95)
[a] California Action Level
[b] Federal MCL
[4] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996 by CDM;
All other samples were analyzed for VOCs using EPA Method 8260 by CDM
VOCs analyzed by EPA method 8260 for samples collected by GeoSyntec.
VOCs analyzed by EPA method 524.2 for samples collected by Stetson Engineers
[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane
-- No Standard
B = Contaminant also detected in laboratory's method blank.
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than limit indicated.
NA = Not analyzed
MW = Monitoring Well
bgs = below ground surface
Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well

CDM Camp Dresser & McKee
2561-112\SPROSHT\WELL.DTA.XLS
12/11/96

Table 4-10
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
Additional Existing Wells

Well Owner		Valley County Water District									
Well Recordation No.		01900035					08000060		08000039		
Well Status		Inactive					Active		Inactive		
Well Name		Big Dalton (9)					Lante (10)		Palm (11)		
Screen Interval (feet bgs)		250-582					275-577	—	540-582, 594-602		
Sampler		CDM	CDM	CDM	CDM	CDM	CDM	CDM	CDM	CDM	CDM
Sample Date		22-Mar-96	22-Mar-96	26-Jun-96	26-Jun-96	24-Sep-96	11-Apr-96	11-Apr-96	10-Jul-96	10-Jul-96	25-Sep-96
Sample Type[1]		GW	K	GW	K	GW	GW	F	GW	F	GW
VOCs[2,4]	MCL[3]										
Acetone	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<0.5	0.11	ND<0.09	ND<0.09	ND<0.09	ND<0.5
Bromodichloromethane	100[b]	ND<0.44	ND<0.44	ND<0.28	ND<0.28	ND<1.0	ND<0.44	ND<0.44	ND<0.28	ND<0.28	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.16	ND<0.11	ND<0.11	ND<1.0	0.22	ND<0.16	ND<0.11	ND<0.11	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<0.15	ND<0.15	ND<1.0
Carbon tetrachloride	0.5	0.96	0.82	0.63	0.62	0.38J	7.1	ND<0.46	0.96	ND<0.28	0.77
Chlorobenzene	70	ND<0.47	ND<0.47	ND<0.14	ND<0.14	ND<1.0	0.49	ND<0.47	ND<0.14	ND<0.14	ND<1.0
Chloroethane	--	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0
Chloroform	100[b]	1.9	1.9	1.4	1.4	1.2	19	ND<0.24	ND<0.24	ND<0.24	ND<1.0
Dibromochloromethane	100[b]	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<0.24	ND<0.24	ND<1.0
1,2-Dibromoethane	--	ND<0.23	ND<0.23	ND<0.23	ND<0.23	ND<1.0	ND<0.23	ND<0.23	ND<0.23	ND<0.23	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	0.34	ND<0.27	ND<0.27	ND<0.27	ND<1.0
1,3-Dichlorobenzene	130[a]	ND<0.18	ND<0.18	ND<0.18	ND<0.18	ND<1.0	0.21	ND<0.18	ND<0.18	ND<0.18	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0
Dichlorodifluoromethane	1,000[b]	4.6	4.0	2.0	2.0	1.3	ND<0.4	ND<0.4	0.88	ND<0.4	0.88J
1,1-Dichloroethane	5	0.86	0.83	0.43	0.41	0.31J	0.7	ND<0.19	ND<0.19	ND<0.19	ND<1.0
1,2-Dichloroethane	0.5	2.0	2.0	1.7	1.7	1.3	0.6	ND<0.22	ND<0.22	ND<0.22	ND<0.5
1,1-Dichloroethene	6	0.41	0.42	ND<0.21	0.24	ND<1.0	110	ND<0.21	0.49	ND<0.21	1.0
cis-1,2-Dichloroethene	6	1.9	2.0	1.1	1.2	0.85J	51	ND<0.38	0.36	ND<0.17	0.53J
trans-1,2-Dichloroethene	10	ND<0.17	ND<0.17	ND<0.17	ND<0.17	ND<1.0	0.38	ND<0.17	ND<0.17	ND<0.17	ND<1.0
Isopropylbenzene	--	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<1.0	ND<0.09	ND<0.09	ND<0.09	ND<0.09	ND<1.0
Methylene chloride	40[a]	ND<0.29	ND<0.29	ND<0.29	ND<0.29	ND<2.0	1.1B	0.74B	ND<0.29	ND<0.29	1.1J
1-Methylethylbenzene	--	NA	NA	NA	NA	ND<1.0	NA	NA	NA	NA	ND<1.0
Naphthalene	--	ND<0.37	ND<0.37	ND<0.37	ND<0.37	ND<1.0	ND<0.37	0.37	ND<0.37	ND<0.37	ND<1.0
n-Propylbenzene	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	100	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0
1,1,1,2-Tetrachloroethane	--	ND<0.21	ND<0.21	ND<0.21	ND<0.21	ND<1.0	0.54	ND<0.21	ND<0.21	ND<0.21	ND<1.0
Tetrachloroethene	5	4.3	6.6	3.9	4.3	1.6	1,300	0.36	1.9	0.48	2.4
Tetrahydrofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	150	ND<0.13	ND<0.13	0.18	ND<0.13	ND<1.0	ND<0.13	ND<0.13	0.21	ND<0.13	ND<1.0
1,1,1-Trichloroethane	200	ND<0.26	ND<0.26	ND<0.26	ND<0.26	ND<1.0	76	ND<0.26	0.33	ND<0.26	0.22J
1,1,2-Trichloroethane	5	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<1.0	0.60	ND<0.27	ND<0.27	ND<0.27	ND<1.0
Trichloroethene	5	26	25	16	16	16	700	ND<0.21	3.6	ND<0.21	6.1
Trichlorofluoromethane	150	ND<0.32	ND<0.32	ND<0.32	ND<0.32	ND<1.0	2.8	ND<0.32	ND<0.32	ND<0.32	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<1.0
Freon 113[5]	1,200	NA	NA	NA	NA	ND<5.0	NA	NA	NA	NA	ND<5.0
Vinyl acetate	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	0.5	ND<0.2	ND<0.2	ND<0.2	ND<0.2	ND<0.5	ND<0.2	ND<0.2	ND<0.2	ND<0.2	ND<0.5
o-Xylene	1,750	ND<0.13	ND<0.13	ND<0.11	ND<0.11	ND<1.0	ND<0.13	ND<0.13	0.12	ND<0.11	ND<1.0
p,m-Xylenes	1,750	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<0.35	ND<0.35	ND<1.0
Nitrate (as N)	10	4.8	4.9	4.3	4.3	4.4	6.4	NA	2.3	NA	2.3
Nitrite (as N)	1	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.05	ND<0.25	NA	ND<0.25	NA	ND<0.05

Notes:
VOC concentrations are in µg/L.
Nitrate/Nitrite concentrations are in mg/L.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
F = Field blank
NS = No sample collected
[2] Only compounds detected in one or more samples are listed.
[3] California Maximum Contaminant Level (as of 12/95)

[a] California Action Level
[b] Federal MCL
[4] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996 by CDM;
All other samples were analyzed for VOCs using EPA Method 8260 by CDM
VOCs analyzed by EPA method 8260 for samples collected by GeoSyntec.
VOCs analyzed by EPA method 524.2 for samples collected by Stetson Engineers
[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane
-- No Standard
B = Contaminant also detected in laboratory's method blank.
J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than limit indicated.
NA = Not analyzed
MW = Monitoring Well
bgs = below ground surface
Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well

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2561-112\SPRDSHT\WELLDTA.XLS
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Table 4-10
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
Additional Existing Wells

Well Owner		ALRC											
Well Recordation No.		W11AZW1R					W11AZW03			W11AZW09			
Well Status		MW					MW			MW			
Well Name		MW-1R					MW-3			MW-9			
Screen Interval (feet bgs)		258-455					180-385			195-450			
Sampler		GeoSyntec	GeoSyntec	CDM	GeoSyntec	CDM	GeoSyntec	GeoSyntec	GeoSyntec	GeoSyntec	CDM	GeoSyntec	GeoSyntec
Sample Date		14-Mar-96	13-Jun-96	13-Jun-96	12-Sep-96	12-Sep-96	13-Mar-96	11-Jun-96	11-Sep-96	13-Mar-96	13-Mar-96	11-Jun-96	11-Sep-96
Sample Type[1]		GW	GW	K	GW	K	GW			GW	K	GW	GW
VOCs [2,4]	MCL[3]												
Acetone	--	4.6	ND<1.25	NA	ND<1.25	NA	ND<1.25	ND<1.25	ND<1.25	ND<1.25	NA	ND<1.25	ND<1.25
Benzene	1	ND<0.5	ND<0.5	0.49	ND<0.5	0.37J	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.09	ND<0.5	ND<0.5
Bromodichloromethane	100 [b]	ND<0.5	ND<0.5	ND<0.44	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.44	ND<0.5	ND<0.5
n-Butylbenzene	--	NA	NA	ND<0.11	NA	ND<1.0	NA	NA	NA	NA	ND<0.16	NA	NA
sec-Butylbenzene	--	NA	NA	0.84	NA	ND<1.0	NA	NA	NA	NA	ND<0.11	NA	NA
tert-Butylbenzene	--	NA	NA	0.43	NA	ND<1.0	NA	NA	NA	NA	ND<0.15	NA	NA
Carbon tetrachloride	0.5	ND<0.5	4.0	ND<0.28	0.8	ND<0.5	10.2	17.2	13.2	0.6	0.65	3.4	16.6
Chlorobenzene	70	1.7	1.0	0.66	0.7	0.51J	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.47	ND<0.5	ND<0.5
Chloroethane	--	ND<0.75	ND<0.75	ND<0.24	ND<0.75	ND<1.0	ND<0.75	ND<0.75	ND<0.75	ND<0.75	ND<0.24	36.6	ND<0.75
Chloroform	100 [b]	ND<0.5	ND<0.5	0.47	ND<0.5	0.47J	3.8	2.7	1.0	1.4	1.7	4.8	17.3
Dibromochloromethane	100 [b]	ND<0.5	ND<0.5	ND<0.24	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.24	ND<0.5	ND<0.5
1,2-Dibromoethane	--	ND<0.5	ND<0.5	ND<0.23	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.23	ND<0.5	1.2
1,2-Dichlorobenzene	600	3.6	2.3	1.8	1.4	1.3J	ND<0.5	ND<0.5	1.4	ND<0.5	ND<0.27	ND<0.5	ND<0.5
1,3-Dichlorobenzene	130 [a]	0.6	ND<0.5	0.31	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.18	ND<0.5	ND<0.5
1,4-Dichlorobenzene	5	29.7	21.4	14	13.6	9.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.27	ND<0.5	ND<0.5
Dichlorodifluoromethane	1,000 [b]	ND<0.5	ND<0.5	ND<0.4	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.4	ND<0.5	ND<0.5
1,1-Dichloroethane	5	5.6	7.3	6.2	7.2	5.1	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.19	ND<0.5	1.7
1,2-Dichloroethane	0.5	ND<0.5	ND<0.5	0.35	ND<0.5	0.41J	1.9	ND<0.5	ND<0.5	ND<0.5	0.39	1.0	9.5
1,1-Dichloroethene	6	49.2	97.1	130	177	170	3.3	3.1	1.9	0.5	0.32	1.4	7.4
cis-1,2-Dichloroethene	6	ND<0.5	7.6	6.4	8.5	6.8	15.2	6.9	4.0	3.0	4.1	26.3	383
trans-1,2-Dichloroethene	10	ND<0.5	ND<0.5	ND<0.17	ND<0.5	0.33J	0.6	ND<0.5	ND<0.5	ND<0.5	ND<0.17	ND<0.5	4.3
Isopropylbenzene	--	NA	NA	0.14	NA	ND<1.0	NA	NA	NA	NA	ND<0.09	NA	NA
Methylene chloride	40 [a]	ND<0.5	ND<0.5	ND<0.29	ND<0.5	ND<2.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.29	ND<0.5	ND<0.5
1-Methylethylbenzene	--	NA	NA	NA	NA	ND<1.0	NA	NA	NA	NA	NA	NA	NA
Naphthalene	--	ND<0.5	ND<0.5	ND<0.37	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.3	ND<0.5	ND<0.5
n-Propylbenzene	--	ND<1.0	ND<1.0	ND<1.0	NA	ND<1.0	ND<1.0	ND<1.0	NA	ND<1.0	ND<1.0	ND<1.0	NA
Styrene	100	ND<0.75	ND<0.75	ND<0.11	ND<0.75	ND<1.0	ND<0.75	ND<0.75	ND<0.75	ND<0.75	ND<0.13	ND<0.75	ND<0.75
1,1,1,2-Tetrachloroethane	--	ND<0.5	ND<0.5	ND<0.21	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.21	ND<0.5	ND<0.5
Tetrachloroethene	5	3.3	20.7	20	16.5	29	10.4	10.5	9.9	26.2	29	123	1450
Tetrahydrofuran	--	29.1	9.9	NA	4.7	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	NA	ND<0.5	2.2
Toluene	150	ND<0.5	ND<0.5	0.14	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.13	ND<0.5	ND<0.5
1,1,1-Trichloroethane	200	6.5	20	19	32	33	ND<0.5	1.1	ND<0.5	ND<0.5	ND<0.26	0.5	ND<0.5
1,1,2-Trichloroethane	5	ND<0.5	ND<0.5	ND<0.27	ND<0.5	ND<1.0	ND<0.5	48.3	ND<0.5	ND<0.5	ND<0.27	10.2	ND<0.5
Trichloroethene	5	13.4	47.3	52	70	62	262	ND<0.5	153	24.1	24	103	1140
Trichlorofluoromethane	150	ND<0.5	ND<0.5	ND<0.32	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.32	ND<0.5	1.0
1,2,4-Trimethylbenzene	--	NA	NA	ND<0.11	NA	ND<1.0	NA	NA	NA	NA	ND<0.11	NA	NA
1,3,5-Trimethylbenzene	--	NA	NA	ND<0.11	NA	ND<1.0	NA	NA	NA	NA	ND<0.11	NA	NA
Freon 113[5]	1,200	NA	NA	NA	NA	ND<5.0	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	--	ND<1.25	ND<1.25	NA	ND<1.25	NA	ND<1.25	ND<1.25	ND<1.25	ND<1.25	NA	ND<1.25	1.4
Vinyl chloride	0.5	3.4	1.2	0.91	0.5	0.27J	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5
o-Xylene	1,750	ND<0.5	ND<0.5	ND<0.11	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.13	ND<0.5	ND<0.5
p,m-Xylenes	1,750	ND<0.5	ND<0.5	ND<0.35	ND<0.5	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.35	ND<0.5	ND<0.5
Nitrate (as N)	10	ND<0.1	1.2	NA	1.3	NA	6.6	5.2	4.8	4.8	6.1	5.5	7.2
Nitrite (as N)	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<0.25	NA	NA

Notes:
VOC concentrations are in µg/l.
Nitrate/Nitrite concentrations are in mg/l.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
F = Field blank
NS = No sample collected
[2] Only compounds detected in one or more samples are listed.
[3] California Maximum Contaminant Level (as of 12/95)
[a] California Action Level
[b] Federal MCL
[4] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996 by CDM;
All other samples were analyzed for VOCs using EPA Method 8260 by CDM
VOCs analyzed by EPA method 8260 for samples collected by GeoSyntec.
VOCs analyzed by EPA method 524.2 for samples collected by Stetson Engineers
[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane
-- No Standard
B = Contaminant also detected in laboratory's method blank.
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than limit indicated.
NA = Not analyzed
MW = Monitoring Well
bgs = below ground surface
Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well

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Table 4-10
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - VOCs
Additional Existing Wells

Well Owner		LA County						Norac				Polopolus		
Well Recordation No.		Z1000006						W10NCMW1				01902169		
Well Status		Observation Well						MW				Inactive Irrigation		
Well Name		Key Well						1				1		
Screen Interval (feet bgs)		80-284						255-310				120-260		
Sampler		CDM	CDM	CDM	CDM	CDM	CDM	GeoSyntec	CDM	CDM	CDM	CDM	CDM	CDM
Sample Date		19-Apr-96	25-Jun-96	25-Sep-96	19-Apr-96	25-Jun-96	25-Sep-96	15-Mar-96	27-Jun-96	27-Sep-96	27-Sep-96	27-Jun-96	1-Oct-96	1-Oct-96
Sample Type[1]		GW			F			GW			F	GW	GW	F
VOCs [2,4]	MCL[3]													
Acetone	--	NA	NA	NA	NA	NA	NA	1.9	NA	NA	NA	NA	NA	NA
Benzene	1	0.093	ND<0.09	0.20J	ND<0.09	ND<0.09	ND<0.5	ND<0.5	0.15	0.12J	ND<0.5	ND<0.09	ND<0.5	ND<0.5
Bromodichloromethane	100 [b]	ND<0.44	ND<0.28	0.56J	ND<0.44	ND<0.28	ND<1.0	ND<0.5	ND<0.28	0.18J	ND<1.0	ND<0.28	6.3	ND<1.0
n-Butylbenzene	--	ND<0.16	ND<0.11	ND<1.0	ND<0.16	ND<0.11	ND<1.0	NA	ND<0.11	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0
sec-Butylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	NA	ND<0.11	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0
tert-Butylbenzene	--	ND<0.15	ND<0.15	ND<1.0	ND<0.15	ND<0.15	ND<1.0	NA	ND<0.15	ND<1.0	ND<1.0	ND<0.15	ND<1.0	ND<1.0
Carbon tetrachloride	0.5	1.4	1.2	1.0	ND<0.48	ND<0.28	ND<0.5	1.8	1.9	1.8	ND<0.5	0.44	0.42J	ND<0.5
Chlorobenzene	70	ND<0.47	ND<0.14	0.16J	ND<0.47	ND<0.14	ND<1.0	ND<0.5	ND<0.14	ND<1.0	ND<1.0	ND<0.14	0.13J	ND<1.0
Chloroethane	--	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.75	ND<0.24	ND<1.0	ND<1.0	ND<0.24	ND<1.0	ND<1.0
Chloroform	100 [b]	21	17	18	ND<0.24	ND<0.24	ND<1.0	2.0	2.4	3.6	ND<1.0	67	68	ND<1.0
Dibromochloromethane	100 [b]	ND<0.24	ND<0.24	ND<1.0	ND<0.24	ND<0.24	ND<1.0	ND<0.5	ND<0.24	ND<1.0	ND<1.0	0.68	ND<1.0	ND<1.0
1,2-Dibromoethane	--	ND<0.23	ND<0.23	ND<1.0	ND<0.23	ND<0.23	ND<1.0	ND<0.5	ND<0.23	ND<1.0	ND<1.0	ND<0.23	ND<1.0	ND<1.0
1,2-Dichlorobenzene	600	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.5	ND<0.27	ND<1.0	ND<1.0	ND<0.27	ND<1.0	ND<1.0
1,3-Dichlorobenzene	130 [a]	ND<0.18	ND<0.18	ND<1.0	ND<0.18	ND<0.18	ND<1.0	ND<0.5	ND<0.18	ND<1.0	ND<1.0	ND<0.18	ND<1.0	ND<1.0
1,4-Dichlorobenzene	5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.5	ND<0.27	ND<1.0	ND<1.0	ND<0.27	ND<1.0	ND<1.0
Dichlorodifluoromethane	1,000 [b]	ND<0.4	ND<0.4	ND<1.0	ND<0.4	ND<0.4	ND<1.0	ND<0.5	ND<0.4	ND<1.0	ND<1.0	ND<0.4	ND<1.0	ND<1.0
1,1-Dichloroethane	5	3.0	2.4	3.2	ND<0.19	ND<0.19	ND<1.0	1.8	0.71	0.83	ND<1.0	1.5	1.6	ND<1.0
1,2-Dichloroethane	0.5	2.1	1.8	1.9	ND<0.22	ND<0.22	ND<0.5	1.7	2.2	2.7	ND<0.5	0.93	0.77J	ND<0.5
1,1-Dichloroethene	6	87	85	72	ND<0.21	ND<0.21	ND<1.0	46.7	20	21	ND<1.0	36	26	ND<1.0
cis-1,2-Dichloroethene	6	69	81	81	ND<0.36	ND<0.17	ND<1.0	12.2	14	17	ND<1.0	27	30	ND<1.0
trans-1,2-Dichloroethene	10	ND<0.17	0.36	0.71J	ND<0.17	ND<0.17	ND<1.0	ND<0.5	ND<0.17	0.46J	ND<1.0	0.57	1.2	ND<1.0
Isopropylbenzene	--	0.14	ND<0.09	ND<1.0	ND<0.09	ND<0.09	ND<1.0	NA	ND<0.09	ND<1.0	ND<1.0	ND<0.09	ND<1.0	ND<1.0
Methylene chloride	40 [a]	0.92	0.94	1.3J	ND<0.29	ND<0.29	0.83J	ND<0.5	ND<0.29	0.39J	3.9	ND<0.29	0.51J	2.5
1-Methylethylbenzene	--	NA	NA	ND<1.0	NA	NA	ND<1.0	NA	NA	ND<1.0	ND<1.0	NA	0.76J	ND<1.0
Naphthalene	--	ND<0.37	ND<0.37	ND<1.0	ND<0.37	ND<0.37	ND<1.0	ND<0.5	ND<0.37	ND<1.0	ND<1.0	ND<0.37	ND<1.0	ND<1.0
n-Propylbenzene	--	ND<1.0	ND<1.0	ND<1.0	NA	NA	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.7	ND<1.0
Styrene	100	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0	ND<0.75	ND<0.11	ND<1.0	ND<1.0	ND<0.11	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	--	ND<0.21	ND<0.21	ND<1.0	ND<0.21	ND<0.21	ND<1.0	ND<0.5	ND<0.21	0.22J	ND<1.0	ND<0.21	ND<1.0	ND<1.0
Tetrachloroethene	5	300	400	300	ND<0.29	0.44	ND<1.0	160	150	190	ND<1.0	360	270	ND<1.0
Tetrahydrofuran	--	NA	NA	NA	NA	NA	NA	ND<0.5	NA	NA	NA	NA	ND<1.0	ND<1.0
Toluene	150	0.53	0.14	ND<1.0	ND<0.13	ND<0.13	ND<1.0	ND<0.5	0.19	ND<1.0	ND<1.0	0.13	0.14J	0.24J
1,1,1-Trichloroethane	200	29	19	21	ND<0.26	ND<0.26	ND<1.0	19.4	9.9	0.8	ND<1.0	24	20	ND<1.0
1,1,2-Trichloroethane	5	ND<0.27	ND<0.27	ND<1.0	ND<0.27	ND<0.27	ND<1.0	ND<0.5	ND<0.27	ND<1.0	ND<1.0	ND<0.27	ND<1.0	ND<1.0
Trichloroethene	5	640	680	660	ND<0.21	0.68	0.26J	131	130	200	1.8	260	220	1.2
Trichlorofluoromethane	150	ND<0.32	0.52	0.39J	ND<0.32	ND<0.32	ND<1.0	2.0	0.80	0.34J	ND<1.0	ND<0.32	ND<1.0	ND<1.0
1,2,4-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.11	0.93J	ND<1.0
1,3,5-Trimethylbenzene	--	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<0.11	ND<0.11	ND<1.0	ND<1.0	ND<0.11	1.9	ND<1.0
Freon 113[5]	1,200	NA	NA	1.4J	NA	NA	ND<5.0	NA	NA	4.8J	ND<5.0	NA	ND<5.0	ND<5.0
Vinyl acetate	--	NA	NA	NA	NA	NA	NA	ND<1.25	NA	NA	NA	NA	NA	NA
Vinyl chloride	0.5	ND<0.2	ND<0.2	ND<0.5	ND<0.2	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5	ND<0.2	ND<0.5	ND<0.5
o-Xylene	1,750	ND<0.13	ND<0.11	ND<1.0	ND<0.13	ND<0.11	ND<1.0	ND<0.5	ND<0.11	ND<1.0	ND<1.0	ND<0.11	0.79J	ND<1.0
p,m-Xylenes	1,750	ND<0.35	ND<0.35	ND<1.0	ND<0.35	ND<0.35	ND<1.0	ND<0.5	ND<0.35	ND<1.0	ND<1.0	ND<0.35	0.79J	ND<1.0
Nitrate (as N)	10	10	8.9	7.6	NA	NA	NA	0.2	NA	NA	NA	7.6	NA	NA
Nitrite (as N)	1	ND<0.25	ND<0.25	ND<0.05	NA	NA	NA	NA	NA	NA	NA	ND<0.25	NA	NA

Notes:

VOC concentrations are in µg/l.

Nitrate/Nitrite concentrations are in mg/l.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
F = Field blank
NS = No sample collected

[2] Only compounds detected in one or more samples are listed.

[3] California Maximum Contaminant Level (as of 12/95)

[a] California Action Level

[b] Federal MCL

[4] VOCs were analyzed using EPA Method 8021 for samples collected prior to September 1996 by CDM; All other samples were analyzed for VOCs using EPA Method 8260 by CDM
VOCs analyzed by EPA method 8260 for samples collected by GeoSyntec.
VOCs analyzed by EPA method 524.2 for samples collected by Stetson Engineers

[5] Freon 113 is 1,1,2-Trichloro-1,2,2-trifluoroethane

-- No Standard

B = Contaminant also detected in laboratory's method blank.

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than limit indicated.

NA = Not analyzed

MW = Monitoring Well

bgs = below ground surface

Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well

CDM Camp Dresser & McKee

2561-112\SPRDSHT\WELLDTA.XLS
12/11/96

Table 4-11
Baldwin Park Operable Unit
Summary of Nitrate Analytical Data

Well Name	Recordation No.	Screened Interval (feet bgs)	Sample Date	NO_3 Concentration (as N)	NO_3 Concentration (as NO_3) [1]
EPA MW5-1 (Zone 13)	EPAW5113	216-226	03/13/96	ND<0.25	ND<1.1
			06/20/96	ND<0.25	ND<1.1
			09/19/96	ND<0.05	ND<1.1
EPA MW5-1 (Zone 12)	EPAW5112	287-297	03/13/96	7.7	34.1
			06/20/96	8.4	37.2
			09/19/96	8.1	35.9
EPA MW5-1 (Zone 11)	EPAW5111	335-345	03/13/96	7.6	33.6
			06/20/96	6.1	27.0
			09/19/96	2.3	10.2
EPA MW5-1 (Zone 10)	EPAW5110	430-440	03/13/96	5.6	24.8
			06/20/96	5.6	24.8
			09/19/96	6.0	26.6
EPA MW5-1 (Zone 9)	EPAW5109	523-533	03/13/96	6.2	27.4
			06/20/96	5.9	26.1
			09/19/96	6.4	28.3
EPA MW5-1 (Zone 8)	EPAW5108	640-650	03/13/96	6.2	27.4
			06/20/96	4.8	21.2
			09/19/96	4.9	21.7
EPA MW5-1 (Zone 7)	EPAW5107	765-775	03/13/96	2.4	10.6
			06/20/96	2.4	10.6
			09/18/96	2.2	9.7
EPA MW5-1 (Zone 6)	EPAW5106	875-885	03/12/96	1.9	8.4
			06/20/96	2.2	9.7
			09/18/96	2.4	10.6
EPA MW5-1 (Zone 5)	EPAW5105	1030-1040	03/12/96	0.7	3.1
			06/20/96	0.5	2.2
			09/18/96	0.4	1.6
EPA MW5-1 (Zone 4)	EPAW5104	1123-1133	03/12/96	ND<0.25	ND<1.1
			06/19/96	ND<0.25	ND<1.1
			09/18/96	0.1	0.3
EPA MW5-1 (Zone 3)	EPAW5103	1256-1266	03/12/96	0.4	1.7
			06/19/96	ND<0.25	ND<1.1
			09/18/96	ND<0.05	ND<0.22
EPA MW5-1 (Zone 2)	EPAW5102	1387-1397	03/11/96	0.3	1.4
			06/19/96	ND<0.25	ND<1.1
			09/18/96	0.1	0.5
EPA MW5-1 (Zone 1)	EPAW5101	1495-1505	03/11/96	0.4	1.6
			06/19/96	ND<0.25	ND<1.1
			09/18/96	0.1	0.2

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Table 4-11
Baldwin Park Operable Unit
Summary of Nitrate Analytical Data

Well Name	Recordation No.	Screened Interval (feet bgs)	Sample Date	NO_3 Concentration (as N)	NO_3 Concentration (as NO_3) [1]
MW5-03 (Zone 10)	BPW50310	235-245	03/19/96	5.7	25.2
MW5-03 (Zone 9)	BPW50309	300-310	03/19/96	ND<0.25	ND<1.1
MW5-03 (Zone 8)	BPW50308	400-410	03/19/96	4.9	21.7
MW5-03 (Zone 7)	BPW50307	510-520	03/19/96	1.8	8.0
MW5-03 (Zone 6)	BPW50306	590-600	03/19/96	7.6	33.6
MW5-03 (Zone 5)	BPW50305	670-680	03/18/96	ND<0.25	ND<1.1
MW5-03 (Zone 4)	BPW50304	810-820	03/18/96	ND<0.25	ND<1.1
MW5-03 (Zone 3)	BPW50303	920-930	03/18/96	ND<0.25	ND<1.1
MW5-03 (Zone 2)	BPW50302	1015-1025	03/18/96	ND<0.25	ND<1.1
MW5-03 (Zone 1)	BPW50301	1150-1160	03/18/96	ND<0.25	ND<1.1
MW5-05 (Zone 4)	BPW50504	218 - 228	08/16/95	11.0	48.7
			10/13/95	11.0	48.7
			10/30/95	42 *	186 *
			03/20/96	12.0	53.1
			06/21/96	12.0	53.1
			09/23/96	9.9	43.8
MW5-05 (Zone 3)	BPW50503	380 - 390	08/16/95	9.3	41.2
			10/12/95	3.7	16.4
			10/30/95	13 *	58 *
			03/20/96	3.7	16.4
			06/21/96	3.6	15.9
			09/23/96	3.9	17.3
MW5-05 (Zone 2)	BPW50502	464 - 474	08/16/95	9.3	41.2
			10/12/95	3.6	15.9
			10/30/95	12 *	53 *
			03/20/96	3.3	14.6
			06/21/96	3.5	15.5
			09/23/96	3.8	16.8
MW5-05 (Zone 1)	BPW50501	552 - 562	08/16/95	9.2	40.7
			10/12/95	2.1	9.3
			10/30/95	8.7 *	38 *
			03/20/96	2.0	8.9
			06/21/96	2.0	8.9
			09/23/96	2.0	8.9
MW5-08 (Zone 4)	BPW50804	380 - 390	08/13/96	3.1	13.7
			09/24/96	0.6	2.8
MW5-08 (Zone 3)	BPW50803	554 - 564	08/13/96	1.2	5.3
			09/24/96	1.1	4.9
MW5-08 (Zone 2)	BPW50802	670 - 680	08/13/96	1.7	7.5
			09/24/96	1.3	5.8
MW5-08 (Zone 1)	BPW50801	795 - 805	08/13/96	1.3	5.8
			09/24/96	1.3	5.8
MW5-11 (Zone 3)	BPW51103	310 - 320	03/14/96	5.2	23.0
MW5-11 (Zone 2)	BPW51102	530 - 540	03/14/96	1.0	4.2
MW5-11 (Zone 1)	BPW51101	690 - 700	03/14/96	1.8	8.0

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Table 4-11
Baldwin Park Operable Unit
Summary of Nitrate Analytical Data

Well Name	Recordation No.	Screened Interval (feet bgs)	Sample Date	NO_3 Concentration (as N)	NO_3 Concentration (as NO_3) [1]
MW5-13 (Zone 3)	BPW51303	340 - 350	03/14/96	8.3	36.7
MW5-13 (Zone 2)	BPW51302	520 - 530	03/14/96	4.4	19.5
MW5-13 (Zone 1)	BPW51301	684 - 694	03/14/96	ND<0.25	ND<1.1
MW5-15 (Zone 3)	BPW51503	235 - 245	08/13/96	2.8	12.4
			09/23/96	3.0	13.3
MW5-15 (Zone 2)	BPW51502	450-460	08/13/96	3.8	16.8
			09/23/96	3.8	16.8
MW5-15 (Zone 1)	BPW51501	670 - 680	08/13/96	3.3	14.6
			09/23/96	3.3	14.6
MW5-17 (Zone 3)	BPW51703	305 - 315	03/15/96	7.6	33.6
MW5-17 (Zone 2)	BPW51702	540 - 550	03/15/96	2.8	12.4
MW5-17 (Zone 1)	BPW51701	698 - 708	03/15/96	1.5	6.6
MW5-18 (Zone 3)	BPW51803	500 - 510	09/23/96	2.2	9.7
MW5-18 (Zone 2)	BPW51802	630 - 640	09/23/96	7.7	34.1
MW5-18 (Zone 1)	BPW51801	780 - 790	09/23/96	3.0	13.3
CalMat E-DURBIN	01902920	238-314;	04/10/96	1.6	7.1
		366-484	09/27/96	1.5	6.6
Covina Irrig. Co. Baldwin 3	01900882	198-251; 278-484	10/17/96	2.4	10.6
Glendora 07G	01900831	252-474	03/27/96	4.5	19.9
			09/24/96	17.7	78.3
LA County Santa Fe 1	08000070	290-435	03/15/96	3.1	13.7
LPVCWD 02	01901460	600-947	04/10/96	3.1	13.7
			07/01/96	5.5	24.2
			10/11/96	3.5	15.5
LPVCWD 03	01902859	620-770	04/10/96	5.4	23.9
			07/01/96	5.4	23.9
			10/11/96	6.0	26.6
LPVCWD 04	08000062	550-725	04/10/96	5.8	25.7
			07/01/96	5.3	23.6
			10/11/96	5.1	22.6
Polopolus 01	01902169	120-280	06/27/96	7.5	33.2
SGVWC B4B	51902858	920-940;	04/02/96	1.1	4.9
		950-1154	07/18/96	1.4	6.0
			10/09/96	1.1	4.9
SGVWC B6C	71903093	275-420;	04/02/96	10.0	44.3
		440-465;	07/17/96	10.4	46.0
		480-506	10/08/96	10.1	44.7
SGVWC B6D	78000098	760-1032	04/02/96	1.9	8.4
			07/17/96	1.9	8.3
			10/08/96	2.0	8.9

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Table 4-11
Baldwin Park Operable Unit
Summary of Nitrate Analytical Data

Well Name	Recordation No.	Screened Interval (feet bgs)	Sample Date	NO_3 Concentration (as N)	NO_3 Concentration (as NO_3) [1]
SWS 139W1	01901598	120-349	04/12/96	21.0	92.9
			07/03/96	21.0	92.9
			10/07/96	20.1	89.0
SWS 139W4	08000069	566-642;	04/12/96	6.6	29.2
		676-695;	07/03/96	6.1	27.0
		787-825	10/07/96	5.9	26.1
SWS 139W5	08000095	750-1060	04/12/96	2.1	9.3
			07/03/96	1.9	8.4
			10/07/96	2.0	8.9
VCWD 2 (WEST MAINE)	01900028	250-580	04/11/96	0.7	3.1
VCWD 3 (MORADA)	01900029	275-585	03/26/96	2.2	9.7
			09/24/96	13.7	60.6
VCWD 5 (PADDY LANE)	01900031	300-585	07/12/96	6.7	29.7
VCWD 9 (BIG DALTON)	01900035	250-582	03/22/96	4.8	21.2
			06/26/96	4.3	19.0
			09/24/96	4.4	19.5
VCWD 10 (LANTE)	08000060	275-577	04/11/96	6.4	28.3
VCWD 11 (PALM AVE)	08000039	540-582;	07/10/96	2.3	10.2
		584-602	09/25/96	2.3	10.2
3030F (Key Well)	Z1000006	80-284	04/19/96	10.0	44.3
			06/25/96	8.9	39.4
			09/25/96	7.5	33.2
Norac MW-1	W10NCMW1	255-310	03/15/96	0.2	0.9
AZ-2 (ALRC MW-4)	11900038	350-614	03/12/96	14.9	65.9
			06/10/96	11.7	51.8
			09/12/96	11.6	51.3
ALRC MW-1R	W11AZW1R	258-455	03/14/96	ND<0.1	ND<0.4
			06/13/96	1.2	5.3
			09/12/96	1.3	5.8
ALRC MW-3	W11AZW03	180-385	03/13/96	6.6	29.2
			06/11/96	5.2	23.0
			09/11/96	4.8	21.2
ALRC MW-9	W11AZW09	195-450	03/13/96	4.8	21.2
			06/11/96	5.5	24.3
			09/11/96	7.2	31.9

Notes:

[1] Nitrate concentration (as NO_3) calculated by multiplying nitrate concentration (as N) by 4.426

Data collected during BPOU pre-remedial design groundwater monitoring program.

All results are reported in mg/l.

ND = Not detected at a concentration greater than the limit shown.

* Laboratory reported nitrate concentration as N; however, nitrate concentration appears to be reported as NO_3.

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Table 4-12
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
MW5-01

Well ID			MW50113		MW50112	MW50111	MW50110	MW50109	MW50108	MW50107	MW50106
Sample Depth (ft bgs)			216-226		287-297	335-345	430-440	523-533	640-650	765-775	875-885
Sample Date			13-Mar-96	13-Mar-96	13-Mar-96	13-Mar-96	13-Mar-96	13-Mar-96	13-Mar-96	13-Mar-96	12-Mar-96
Sample Type[1]			GW	K	GW	GW	GW	GW	GW	GW	GW
Metals	Method	MCL[2]									
Aluminum	6010	1	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	0.129	ND<0.0437
Arsenic	7060	0.05	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299
Barium	6010	1	0.0865	0.107	0.158	0.197	0.154	0.142	0.148	0.0824	0.0940
Cadmium	6010	0.005	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	6010	0.05	ND<0.0018	ND<0.0018	ND<0.0018	ND<0.0018	0.01780	0.0193	0.0217	0.00250	ND<0.0018
Copper	6010	1 [a]	0.00642	0.00651	0.00490	0.00438	0.00990	0.00933	0.00705	0.00723	0.00274
Iron	6010	0.30 [a]	ND<0.0225	0.0260	0.0484	0.0280	0.0357	0.0259	0.330	0.0828	0.0468
Lead	7421	0.05	ND<0.000636	0.000740	0.00132	0.00107	0.00332	ND<0.000636	0.000870	ND<0.000636	0.00112
Manganese	6010	0.05 [a]	0.00250	0.00240	0.00260	0.00360	0.00580	0.00220	0.00210	0.00220	ND<0.002
Mercury	7470	0.002	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	0.000310	0.000330	0.000360	ND<0.000173	ND<0.000173
Nickel	6010	0.1	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047
Zinc	6010	5 [a]	0.0196	0.0464	0.0335	0.0412	0.0501	0.0340	0.0313	0.0283	0.0626
General Minerals											
Calcium	6010	--	27.0	32.6	65.5	91.0	81.0	75.2	75.2	42.5	40.9
Magnesium	6010	--	11.6	12.6	14.9	20.7	13.9	13.5	13.9	9.77	11.3
Potassium	6010	--	5.35	5.16	4.39	4.05	3.47	2.91	3.56	2.64	2.75
Sodium	6010	--	32.9	28.2	18.7	19.3	20.3	18.7	19.9	20.8	19.0
Chloride	300.0	250 [a]	36	36	35	40	31	26	26	8.4	9.1
Nitrate (as N)	300.0	10	ND<0.25	ND<0.25	7.7	7.6	5.6	6.2	6.2	2.4	1.9
Nitrite (as N)	300.0	1	ND<0.25	ND<0.25	0.57	3.2	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25
Sulfate	300.0	250 [a]	38	38	36	43	33	31	30	26	34
Bicarbonate Alk.	310.1	--	110	120	170	250	220	220	220	150	140
Carbonate Alk.	310.1	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
TDS	160.1	500 [a,b]	250	260	360	480	400	370	360	260	250
TSS	160.2	--	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
Hardness	130.2	--	180	180	260	320	290	270	270	160	150
Radon ^{222} (pCi/l)	913	300 [b,c]	39	57	103	87	109	123	105	116	70

Notes:

All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

ND = Not detected at a concentration greater than the limit indicated.

[2] California Maximum Contaminant Level (as of 12/95)
[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
bgs = below ground surface
NA = Not analyzed

Table 4-12
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
MW5-01

Well ID			MW50105	MW50104	MW50103	MW50102	MW50101	QC Samples MW50102	QC Samples MW50106	QC Samples MW50113
Sample Depth (ft bgs)			1030-1040	1123-1133	1256-1266	1387-1397	1495-1505	--		
Sample Date			12-Mar-96	12-Mar-96	12-Mar-96	11-Mar-96	11-Mar-96	11-Mar-96	12-Mar-96	13-Mar-96
Sample Type[1]			GW	GW	GW	GW	GW	N		
Metals	**Method**	**MCL[2]**								
Aluminum	6010	1	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	0.3580	ND<0.0437	ND<0.0437
Arsenic	7060	0.05	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299
Barium	6010	1	0.110	0.0729	0.126	0.119	0.119	0.00386	0.00419	0.00366
Cadmium	6010	0.005	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	6010	0.05	0.00269	ND<0.0018	ND<0.0018	0.00191	0.00642	0.00317	0.00268	ND<0.0018
Copper	6010	1 [a]	0.00804	0.00658	0.0842	0.00580	0.00793	0.5370	0.00773	0.00371
Iron	6010	0.30 [a]	0.0259	ND<0.0225	0.0491	ND<0.0225	0.0284	0.0639	0.0324	ND<0.0225
Lead	7421	0.05	0.00113	ND<0.000636	0.00100	0.000680	ND<0.000636	0.00104	ND<0.000636	ND<0.000636
Manganese	6010	0.05 [a]	ND<0.002	ND<0.002	0.0188	0.00280	0.00270	0.00330	0.512	ND<0.002
Mercury	7470	0.002	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173
Nickel	6010	0.1	ND<0.0047	ND<0.0047	ND<0.0047	0.00527	ND<0.0047	0.7090	ND<0.0047	ND<0.0047
Zinc	6010	5 [a]	0.0436	0.0268	0.0310	0.0743	0.0493	0.9500	ND<0.0175	ND<0.0175
General Minerals										
Calcium	6010	--	26.2	23.8	29.2	40.5	33.4	0.511	0.736	0.798
Magnesium	6010	--	13.5	12.9	11.2	13.5	12.3	0.131	0.226	0.186
Potassium	6010	--	3.96	4.11	4.61	3.93	4.22	ND<0.358	ND<0.358	ND<0.358
Sodium	6010	--	29.3	26.0	41.9	28.2	28.8	0.814	0.688	0.430
Chloride	300.0	250 [a]	11	13	12	12	12	ND<0.25	ND<0.25	ND<0.25
Nitrate (as N)	300.0	10	0.69	ND<0.25	0.39	0.31	0.37	ND<0.25	ND<0.25	ND<0.25
Nitrite (as N)	300.0	1	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25
Sulfate	300.0	250 [a]	23	23	27	29	27	ND<1.0	ND<1.0	ND<1.0
Bicarbonate Alk.	310.1	--	150	130	170	180	170	ND<1.0	3.0	ND<1.0
Carbonate Alk.	310.1	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
TDS	160.1	500 [a,b]	230	200	260	270	260	ND<12	ND<12	ND<12
TSS	160.2	--	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
Hardness	130.2	--	130	120	130	170	150	90	16	12
Radon [222] (pCi/l)	913	300 [b,c]	66	52	101	103	126	NA	NA	NA

Notes:

All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

ND = Not detected at a concentration greater than the limit indicated.

[2] California Maximum Contaminant Level (as of 12/95)
[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
bgs = below ground surface
NA = Not analyzed

Table 4-13
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
MW5-03

Well ID			MW50310		MW50309	MW50308	MW50307	MW50306	MW50305	MW50304	MW50303	MW50302	MW50301	QC Samples MW50305	QC Samples MW50310
Sample Depth (ft bgs)			235-245		300-310	400-410	510-520	590-600	670-680	810-820	920-930	1015-1025	1150-1160	–	–
Sample Date			19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	18-Mar-96	18-Mar-96	18-Mar-96	18-Mar-96	18-Mar-96	18-Mar-96	19-Mar-96
Sample Type[1]			GW	K	GW	GW	GW	GW	GW	GW	GW	GW	GW	N	N
Metals	Method	MCL[2]													
Aluminum	6010	1	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	0.0907	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437
Arsenic	7060	0.05	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	0.00611	ND<0.00299	0.0114	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299
Barium	6010	1	0.438	0.462	0.549	0.119	0.0539	0.0964	0.0225	0.0337	0.0132	0.0306	0.0458	0.00188	0.00218
Cadmium	6010	0.005	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	6010	0.05	0.00187	0.00281	ND<0.0018	0.00353	0.00301	0.00200	0.00295	ND<0.0018	ND<0.0018	ND<0.0018	ND<0.0018	ND<0.0018	ND<0.0018
Copper	6010	1 [a]	0.00451	0.00379	0.00401	ND<0.0027	ND<0.0027	ND<0.0027	0.00629	0.00413	0.00397	0.00704	0.0777	0.00595	ND<0.0027
Iron	6010	0.30 [a]	0.0450	0.178	0.150	0.0378	0.115	0.0834	0.1220	0.0244	0.0283	0.0764	0.0267	0.0228	0.0458
Lead	7421	0.05	ND<0.000636	ND<0.000636	ND<0.000636	0.000770	0.000860	ND<0.000636	0.000810	0.000660	0.000690	0.000690	0.000740	0.000960	ND<0.000636
Manganese	6010	0.05 [a]	0.00698	0.0156	0.0369	0.00252	0.00972	0.00842	0.00540	0.0764	0.00995	0.0490	0.105	ND<0.002	0.00417
Mercury	7470	0.002	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173
Nickel	6010	0.1	0.00478	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	0.00294	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047
Zinc	6010	5 [a]	0.0249	0.0263	0.0343	0.0198	ND<0.0175	0.0179	0.0216	ND<0.0175	ND<0.0175	ND<0.0175	0.0130	ND<0.0175	0.0199
General Minerals															
Calcium	6010	–	172	184	241	80.2	29.8	52.6	11.8	19.6	8.15	14.5	20.9	0.0582	0.689
Magnesium	6010	–	36.1	38.2	53.5	19.9	15.0	14.5	6.10	5.53	2.24	4.04	5.44	0.209	0.184
Potassium	6010	–	7.00	7.49	7.87	6.02	5.60	4.70	5.58	5.92	4.89	5.55	5.7	ND<0.358	ND<0.358
Sodium	6010	–	40.6	42.9	33.4	25.5	30.3	18.9	89.6	142	102	148	126	0.748	0.758
Chloride	300.0	250 [a]	85	86	180	23	17	18	26	53	18	44	39	ND<0.25	ND<0.25
Nitrate (as N)	300.0	10	5.7	5.7	ND<0.25	4.9	1.8	7.8	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25
Nitrite (as N)	300.0	1	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25
Sulfate	300.0	250 [a]	38	38	40	32	27	30	46	49	58	40	31	ND<1.0	ND<1.0
Bicarbonate Alk.	310.1	–	530	520	590	260	150	150	190	310	160	300	320	3.4	3.9
Carbonate Alk.	310.1	–	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	15	ND<1.0	20	4.0	ND<1.0	ND<1.0	ND<1.0
TDS	160.1	500 [a,b]	800	790	1,100	360	230	270	520	500	370	550	470	360	ND<12
TSS	160.2	–	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	10	10	ND<10	ND<10
Hardness	130.2	–	610	550	350	280	140	190	67	91	32	63	87	3.9	12
Radon 222 (pCi/l)	913	300 [b,c]	119	141	209	130	94	118	46	44	64	42	63	NA	NA

Notes:
All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank
ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed

[2] California Maximum Contaminant Level (as of 12/95)
[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
bgs = below ground surface

Table 4-14

Baldwin Park Operable Unit

Summary of Groundwater Analytical Results - Metals and General Minerals

MW5-05

Well ID			MW50504	MW50503		MW50502	MW50501	QC Sample MW50504N
Sample Depth (feet bgs)			218 - 228	380 - 390		464 - 474	552 - 562	--
Sample Date			20-Mar-96	20-Mar-96	20-Mar-96	20-Mar-96	20-Mar-96	20-Mar-96
Sample Type[1]			GW	GW	K	GW	GW	N
Metals	**Method**	**MCL[2]**						
Aluminum	6010	1	**0.0587**	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437
Arsenic	7060	0.05	**0.00338**	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299
Barium	6010	1	**0.133**	**0.0894**	**0.0879**	**0.0629**	**0.0917**	**0.00168**
Cadmium	6010	0.005	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	6010	0.05	ND<0.0018	**0.00203**	ND<0.0018	ND<0.0018	**0.00221**	**0.00247**
Copper	6010	1 [a]	ND<0.0027	ND<0.0027	ND<0.0027	ND<0.0027	ND<0.0027	ND<0.0027
Iron	6010	0.30 [a]	**0.106**	**0.0323**	**0.0279**	**0.373**	**0.135**	ND<0.0225
Lead	7421	0.05	ND<0.000636	ND<0.000636	**0.000920**	**0.00102**	ND<0.000636	ND<0.000636
Manganese	6010	0.05 [a]	**0.00619**	**0.00367**	ND<0.002	**0.0300**	**0.0087**	**0.0164**
Mercury	7470	0.002	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173
Nickel	6010	0.1	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047
Zinc	6010	5 [a]	**0.0298**	**0.0229**	ND<0.0175	ND<0.0175	ND<0.0175	**0.0310**
General Minerals								
Calcium	6010	--	**73.3**	**55.1**	**52.7**	**23.0**	**50.4**	**0.435**
Magnesium	6010	--	**17.8**	**12.3**	**11.9**	**12.9**	**11.4**	**0.153**
Potassium	6010	--	**4.84**	**3.95**	**3.64**	**4.46**	**3.61**	**0.368**
Sodium	6010	--	**17.4**	**12.4**	**11.9**	**15.5**	**12.2**	**0.414**
Chloride	300.0	250 [a]	**22**	**14**	**14**	**16**	**17**	ND<0.25
Sulfate	300.0	250 [a]	**36**	**22**	**22**	**26**	**28**	ND<1.0
Bicarbonate Alk.	310.1	--	**190**	**160**	**150**	**88**	**140**	**1.7**
Carbonate Alk.	310.1	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Hydroxide Alk.	310.1	--	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0
TDS	160.1	500 [a,b]	**350**	**250**	**230**	**180**	**230**	ND<12
TSS	160.2	--	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
Hardness	130.2	--	**270**	**210**	**200**	**100**	**170**	ND<1.0
Radon ^{222} (pCi/l)	913	300 [b,c]	**137**	**278**	**92**	**88**	**100**	NA

Notes:

All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

[2] California Maximum Contaminant Level (as of 12/95)

ND = Not detected at a concentration greater than the limit indicated.

[a] Secondary MCL

[b] Federal MCL

[c] Proposed MCL

bgs = below ground surface

NA = Not analyzed

CDM Camp Dresser & McKee

2581-112\aprdahta\5_5ALL.XLS

11/25/96

Table 4-15
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results -Metals and General Minerals
MW5-08

Well ID			MW50804	MW50803	MW50802	MW50801	QC Sample MW50803N
Sample Depth (feet bgs)			380 - 390	554 - 564	670 - 680	795 - 805	--
Sample Date			24-Sep-96	24-Sep-96	24-Sep-96	24-Sep-96	24-Sep-96
Sample Type[1]			GW	GW	GW	GW	N
Metals	**Method**	**MCL[2]**					
Aluminum	6010	1	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20
Arsenic	7060	0.05	ND<0.010	ND<0.010	ND<0.010	ND<0.010	ND<0.010
Barium	6010	1	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20
Cadmium	6010	0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
Chromium	6010	0.05	ND<0.010	ND<0.010	ND<0.010	ND<0.010	ND<0.010
Copper	6010	1 [a]	ND<0.025	ND<0.025	ND<0.025	ND<0.025	ND<0.025
Iron	6010	0.30 [a]	ND<0.10	ND<0.10	ND<0.10	**0.22**	ND<0.10
Lead	7421	0.05	ND<0.0030	ND<0.0030	ND<0.0030	ND<0.0030	ND<0.0030
Manganese	6010	0.05 [a]	ND<0.015	ND<0.015	ND<0.015	ND<0.015	ND<0.015
Mercury	7470	0.002	ND<0.00020	ND<0.00020	ND<0.00020	ND<0.00020	ND<0.00020
Nickel	6010	0.1	ND<0.040	ND<0.040	ND<0.040	ND<0.040	ND<0.040
Zinc	6010	5 [a]	ND<0.020	ND<0.020	ND<0.020	ND<0.020	ND<0.020
General Minerals							
Calcium	6010	--	**55.4**	**66.8**	**45.7**	**64.7**	ND<5.0
Magnesium	6010	--	**10.9**	**10.7**	**10.8**	**12.6**	ND<5.0
Potassium	6010	--	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0
Sodium	6010	--	**10.4**	**10.8**	**13.2**	**12.1**	ND<5.0
Chloride	300.0	250 [a]	**8.8**	**14.8**	**11.0**	**21.6**	ND<0.10
Sulfate	300.0	250 [a]	**21.6**	**22.6**	**27.8**	**33.4**	ND<0.20
Nitrite	300.0	10	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050
Nitrate	300.0	1	**0.63**	**1.1**	**1.3**	**1.3**	ND<0.050
Bicarbonate Alk.	310.1	--	**162**	**164**	**144**	**160**	ND<4.0
Carbonate Alk.	310.1	--	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0
Hydroxide Alk.	310.1	--	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0
TDS	160.1	500 [a,b]	**256**	**239**	**227**	**274**	ND<10.0
TSS	160.2	--	ND<20.0	ND<10.0	ND<10.0	ND<10.0	ND<10.0
Hardness (as $CaCO_3$)	130.2	--	**192**	**188**	**171**	**255**	ND<2.0
Radon ^{222} (pCi/l)	913	300 [b,c]					

Notes:

All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed

[2] California Maximum Contaminant Level (as of 12/95)
[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
bgs = below ground surface

Table 4-16
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
MW5-11

Well ID			MW51103		MW51102	MW51101	QC Sample MW51103N
Sample Depth (feet bgs)			310 - 320		530 - 540	690 - 700	—
Sample Date			14-Mar-96	14-Mar-96	14-Mar-96	14-Mar-96	14-Mar-96
Sample Type[1]			GW	K	GW	GW	N
Metals	**Method**	**MCL[2]**					
Aluminum	6010	1	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437
Arsenic	7060	0.05	ND<0.00299	ND<0.00299	0.00370	ND<0.00299	ND<0.00299
Barium	6010	1	0.161	0.165	0.0240	0.0511	0.00198
Cadmium	6010	0.005	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	6010	0.05	0.00881	0.00526	ND<0.0018	ND<0.0018	ND<0.0018
Copper	6010	1 [a]	0.00694	0.00356	0.00615	0.00930	0.00495
Iron	6010	0.30 [a]	ND<0.0225	0.0299	0.0513	0.0447	0.0330
Lead	7421	0.05	0.00108	ND<0.00636	0.000870	0.000870	0.003840
Manganese	6010	0.05 [a]	0.00270	0.00303	0.00213	0.00737	0.00225
Mercury	7470	0.002	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173
Nickel	6010	0.1	0.00590	0.00644	ND<0.0047	ND<0.0047	ND<0.0047
Zinc	6010	5 [a]	0.0312	0.0178	ND<0.0175	ND<0.0175	ND<0.0175
General Minerals							
Calcium	6010	--	75.0	76.8	10.4	36.1	0.564
Magnesium	6010	--	16.3	16.6	9.75	12.6	0.183
Potassium	6010	--	4.06	4.08	5.50	4.37	ND<0.358
Sodium	6010	--	19.6	19.6	55.3	15.2	0.547
Chloride	300.0	250 [a]	21	21	19	13	ND<0.25
Nitrate (as N)	300.0	10	5.2	5.1	0.95	1.8	ND<0.25
Nitrite (as N)	300.0	1	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25
Sulfate	300.0	250 [a]	36	36	32	43	ND<1.0
Bicarbonate Alk.	310.1	--	240	240	100	120	4.0
Carbonate Alk.	310.1	--	ND<1.0	ND<1.0	39	ND<1.0	ND<1.0
TDS	160.1	500 [a,b]	410	410	280	250	16
TSS	160.2	--	ND<10	ND<10	ND<10	ND<10	ND<10
Hardness	130.2	--	290	300	80	160	12
Radon ^{222} (pCi/l)	913	300 [b,c]	284	312	65	94	NA

Notes:

All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

[2] California Maximum Contaminant Level (as of 12/95)

ND = Not detected at a concentration greater than the limit indicated.

[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
bgs = below ground surface
NA = Not analyzed

Table 4-17
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
MW5-13

Well ID			MW51303	MW51302	MW51301
Sample Depth (feet bgs)			340 - 350	520 - 530	684 - 694
Sample Date			14-Mar-96	14-Mar-96	14-Mar-96
Sample Type[1]			GW	GW	GW
Metals	**Method**	**MCL[2]**			
Aluminum	6010	1	ND<0.0437	ND<0.0437	ND<0.0437
Arsenic	7060	0.05	ND<0.00299	ND<0.00299	ND<0.00299
Barium	6010	1	**0.126**	**0.0608**	**0.0347**
Cadmium	6010	0.005	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	6010	0.05	**0.0119**	ND<0.0018	ND<0.0018
Copper	6010	1 [a]	**0.00275**	**0.00553**	**0.00278**
Iron	6010	0.30 [a]	**0.0258**	**0.0746**	**0.0399**
Lead	7421	0.05	**0.000750**	**0.000660**	**0.00163**
Manganese	6010	0.05 [a]	**0.00672**	**0.0145**	**0.00499**
Mercury	7470	0.002	ND<0.000173	ND<0.000173	ND<0.000173
Nickel	6010	0.1	ND<0.0047	**0.00486**	ND<0.0047
Zinc	6010	5 [a]	**0.0176**	ND<0.0175	ND<0.0175
General Minerals					
Calcium	6010	--	**60.9**	**53.9**	**17.5**
Magnesium	6010	--	**13.0**	**12.5**	**9.46**
Potassium	6010	--	**3.40**	**4.40**	**4.66**
Sodium	6010	--	**18.3**	**27.8**	**45.1**
Chloride	300.0	250 [a]	**13**	**31**	**20**
Nitrate (as N)	300.0	10	**5.3**	**4.4**	ND<0.25
Nitrite (as N)	300.0	1	ND<0.25	ND<0.25	ND<0.25
Sulfate	300.0	250 [a]	**24**	**41**	**41**
Bicarbonate Alk.	310.1	--	**200**	**170**	**120**
Carbonate Alk.	310.1	--	ND<1.0	ND<1.0	**5.0**
TDS	160.1	500 [a,b]	**350**	**350**	**270**
TSS	160.2	--	ND<10	ND<10	ND<10
Hardness	130.2	--	**170**	**200**	**100**
Radon [222] (pCi/l)	913	300 [b,c]	**177**	**127**	**69**

Notes:
All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] California Maximum Contaminant Level (as of 12/95)

ND = Not detected at a concentration greater than the limit indicated.

[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
bgs = below ground surface
NA = Not analyzed

Table 4-18
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
MW5-15

Well ID			MW51503		MW51502	MW51501	MW51502N
Port Depth (feet bgs)			235 - 245		450 - 460	670 - 680	--
Sample Date			23-Sep-96	23-Sep-96	23-Sep-96	23-Sep-96	23-Sep-96
Sample Type[1]			GW	K	GW	GW	N
Metals	**Method**	**MCL[2]**					
Aluminum	6010	1	ND<0.020	ND<0.020	ND<0.020	ND<0.020	ND<0.020
Arsenic	7060	0.05	ND<0.010	ND<0.010	ND<0.010	ND<0.010	ND<0.010
Barium	6010	1	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20
Cadmium	6010	0.005	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050
Chromium	6010	0.05	ND<0.010	ND<0.010	ND<0.010	ND<0.010	ND<0.010
Copper	6010	1 [a]	ND<0.025	ND<0.025	ND<0.025	ND<0.025	ND<0.025
Iron	6010	0.30 [a]	ND<0.10	0.11	ND<0.10	ND<0.10	ND<0.10
Lead	7421	0.05	ND<0.0030	ND<0.0030	ND<0.0030	0.0053	ND<0.0030
Manganese	6010	0.05 [a]	ND<0.015	ND<0.015	ND<0.015	ND<0.015	ND<0.015
Mercury	7470	0.002	ND<0.00020	ND<0.00020	ND<0.00020	0.0011	ND<0.00020
Nickel	6010	0.1	ND<0.040	ND<0.040	ND<0.040	ND<0.040	ND<0.040
Zinc	6010	5 [a]	ND<0.020	0.024	0.02	0.032	ND<0.020
General Minerals							
Calcium	6010	--	67	72.9	79.1	77.4	ND<5.0
Magnesium	6010	--	14.9	16.3	14.7	13.1	ND<5.0
Potassium	6010	--	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0
Sodium	6010	--	14.7	15.8	14	13.3	ND<5.0
Chloride	300.0	250 [a]	25.8	25.3	15	10	ND<0.10
Sulfate	300.0	250 [a]	40.7	40.6	46.2	58.2	ND<0.20
Nitrite	300.0	10	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050
Nitrate	300.0	1	3	3	3.8	3.3	ND<0.050
Bicarbonate Alk.	310.1	--	172	174	197	193	ND<4.0
Carbonate Alk.	310.1	--	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0
Hydroxide Alk.	310.1	--	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0
TDS	160.1	500 [a,b]	318	326	342	332	ND<10.0
TSS	160.2	--	ND<10.0	ND<10.0	ND<10.0	ND<10.0	ND<10.0
Hardness (as CaC	130.2	--	228	234	258	255	ND<2.0
Radon ^{222} (pCi/l)	913	300 [b,c]	100	160	99	234	42

Notes:

All concentrations are mg/l unless otherwise indicated.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- N = Equipment decontamination rinsate blank

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed

[2] California Maximum Contaminant Level (a

[a] Secondary MCL

[b] Federal MCL

[c] Proposed MCL

bgs = below ground surface

Table 4-19
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
MW5-17

Well ID			MW51703	MW51702	MW51701	QC Sample MW51703N
Sample Depth (feet bgs)			305 - 315	540 - 550	698 - 708	---
Sample Date			15-Mar-96	15-Mar-96	15-Mar-96	15-Mar-96
Sample Type[1]			GW	GW	GW	N
Metals	**Method**	**MCL[2]**				
Aluminum	6010	1	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437
Arsenic	7060	0.05	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299
Barium	6010	1	0.176	0.112	0.0722	0.00183
Cadmium	6010	0.005	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	6010	0.05	0.00321	ND<0.0018	ND<0.0018	ND<0.0018
Copper	6010	1 [a]	0.00610	0.00806	0.00493	0.00604
Iron	6010	0.30 [a]	0.0290	0.0748	0.0487	0.0243
Lead	7421	0.05	0.000690	0.000790	ND<0.000636	0.00071
Manganese	6010	0.05 [a]	0.00545	0.00881	0.00749	ND<0.002
Mercury	7470	0.002	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173
Nickel	6010	0.1	0.00633	0.00584	ND<0.0047	ND<0.0047
Zinc	6010	5 [a]	0.0176	0.0186	ND<0.0175	ND<0.0175
General Minerals						
Calcium	6010	--	72.9	59.8	40.7	0.601
Magnesium	6010	--	16.5	12.9	10.3	0.172
Potassium	6010	--	3.90	3.61	3.58	ND<0.358
Sodium	6010	--	30.8	25.7	32.0	0.519
Chloride	300.0	250 [a]	31	56	20	ND<0.25
Nitrate (as N)	300.0	10	7.6	2.8	1.5	ND<0.25
Nitrite (as N)	300.0	1	ND<0.25	ND<0.25	0.91	ND<0.25
Sulfate	300.0	250 [a]	35	47	41	ND<1.0
Bicarbonate Alk.	310.1	--	250	140	140	3.2
Carbonate Alk.	310.1	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0
TDS	160.1	500 [a,b]	440	360	320	13
TSS	160.2	--	ND<10	ND<10	ND<10	ND<10
Hardness	130.2	--	270	240	160	8.0
Radon [222] (pCi/l)	913	300 [b,c]	142	395	116	NA

Notes:
All concentrations are in mg/l unless otherwise indicated.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank
[2] California Maximum Contaminant Level (as of 12/95)
ND = Not detected at a concentration greater than the limit indicated.

[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
bgs = below ground surface
NA = Not analyzed

Table 4-20
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
MW5-18

Well ID			MW51803	MW51802	MW51801
Sample Depth (feet bgs)			500 - 510	630 - 640	780 -790
Sample Date			23-Sep-96	23-Sep-96	23-Sep-96
Sample Type[1]			GW	GW	GW
Metals	**Method**	**MCL[2]**			
Aluminum	6010	1	ND<0.20	ND<0.20	ND<0.20
Arsenic	7060	0.05	ND<0.010	ND<0.010	ND<0.010
Barium	6010	1	ND<0.20	ND<0.20	ND<0.20
Cadmium	6010	0.005	ND<0.0050	ND<0.0050	ND<0.0050
Chromium	6010	0.05	ND<0.010	ND<0.010	ND<0.010
Copper	6010	1 [a]	ND<0.025	ND<0.025	ND<0.025
Iron	6010	0.30 [a]	ND<0.10	ND<0.10	ND<0.10
Lead	7421	0.05	**0.003**	ND<0.0030	ND<0.0030
Manganese	6010	0.05 [a]	**0.086**	ND<0.015	ND<0.015
Mercury	7470	0.002	ND<0.00020	**0.0015**	ND<0.00020
Nickel	6010	0.1	ND<0.040	ND<0.040	ND<0.040
Zinc	6010	5 [a]	**0.024**	**0.02**	ND<0.020
General Minerals					
Calcium	6010	--	**117**	**79.5**	**52.8**
Magnesium	6010	--	**21.4**	**14.8**	**12.5**
Potassium	6010	--	**6.4**	ND<5.0	ND<5.0
Sodium	6010	--	**17.3**	**13.2**	**21.9**
Chloride	300.0	250 [a]	**28.5**	**13.8**	**8.2**
Nitrate (as N)	300.0	10	**2.2**	**7.7**	**3.0**
Nitrite (as N)	300.0	1	**0.66**	ND<0.050	ND<0.050
Sulfate	300.0	250 [a]	**38.6**	**33.6**	**34**
Bicarbonate Alk.	310.1	--	**318**	**205**	**205**
Carbonate Alk.	310.1	--	ND<4.0	ND<4.0	ND<4.0
Hydroxide Alk.	310.1	--	ND<4.0	ND<4.0	ND<4.0
TDS	160.1	500 [a,b]	**447**	**337**	**272**
TSS	160.2	--	ND<10.0	ND<10.0	ND<10.0
Hardness (as Ca	130.2	--	**389**	**274**	**198**
Radon ^{222} (pCi/l)	913	300 [b,c]	**120**	**161**	**141**

Notes:
All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
N = Equipment decontamination rinsate blank

[2] California Maximum Contaminant Level (as of 12/95)

ND = Not detected at a concentration greater than the limit indicated.

[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
bgs = below ground surface
NA = Not analyzed

Table 4-21

Baldwin Park Operable Unit

Summary of Groundwater Analytical Results - Metals and General Minerals

Additional Existing Wells

Well Owner		ALRC/TMC	CalMat Co.	Cov. Irr. Co.	Glendora	LA County	La Puente Valley County Water District			San Gabriel Valley Water Company		
Well Recordation No.		11900038	01902920	01900882	01900831	08000070	01901460	01902859	08000062	51902858	71903093	78000098
Well Status		Active	Active	Active	Inactive	Active	Active	Active	Active	Active	Active	Active
Well Name		MW-4/AZ-2	E-Durbin	Baldwin 3	7G	Santa Fe 1	2	3	4	B4B	B6C	B6D
Screen Interval (feet bgs)		350-614	238-314 366-484	198-251 278-484	252-474	290-435	600-947	620-770	550-725	920-940 950-1154	275-420, 440-465 480-506	760-1032
Sampler		GeoSyntec	CDM	CDM	GeoSyntec	CDM	CDM	CDM	CDM	CDM	CDM	CDM
Sample Date		12-Mar-96	10-Apr-96	17-Oct-96	27-Mar-96	15-Mar-96	10-Apr-96	10-Apr-96	10-Apr-96	2-Apr-96	2-Apr-96	2-Apr-96
Sample Type[1]		GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Metals	MCL[2]											
Aluminum	1	ND<0.1	ND<0.0437	ND<0.20	ND<0.1	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	0.0549
Arsenic	0.05	0.0019	ND<0.00299	ND<0.010	ND<0.001	0.00310	ND<0.00299	ND<0.00299	ND<0.00299	0.00329	0.00319	ND<0.00299
Barium	1	0.12	0.109	ND<0.20	0.08	0.122	0.0917	0.0872	0.0939	0.100	0.139	0.107
Cadmium	0.005	ND<0.0003	ND<0.0017	ND<0.0050	ND<0.0003	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	0.05	ND<0.03	ND<0.0018	ND<0.010	ND<0.03	ND<0.0018	0.00663	0.00420	0.00574	0.00329	0.00398	0.00448
Copper	1 [a]	ND<0.05	0.00420	ND<0.025	ND<0.05	0.01090	0.00862	0.00782	0.00799	0.00855	0.00531	0.00907
Iron	0.30 [a]	ND<0.1	ND<0.0225	ND<0.10	0.2	0.0238	0.0451	ND<0.0225	ND<0.0225	0.0326	0.0297	0.177
Lead	0.05	ND<0.005	0.000860	ND<0.0030	0.012	0.00279	0.00235	0.00222	0.00173	ND<0.000636	0.00136	ND<0.000636
Manganese	0.05 [a]	0.09	0.00201	ND<0.015	ND<0.01	ND<0.002	ND<0.002	ND<0.002	0.00305	ND<0.002	ND<0.002	ND<0.002
Mercury	0.002	ND<0.001	ND<0.000173	ND<0.00020	ND<0.001	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173
Nickel	0.1	ND<0.04	ND<0.00470	ND<0.040	ND<0.04	ND<0.00470	ND<0.00470	ND<0.00470	ND<0.00470	ND<0.0047	ND<0.0047	ND<0.0047
Zinc	5 [a]	0.03	0.0209	0.036	0.07	0.0281	0.0197	ND<0.0175	0.0236	ND<0.0175	ND<0.0175	0.0189
General Minerals												
Calcium	--	115	50.3	66	106	54.9	50.1	52.8	52.2	55.7	76.4	54.7
Magnesium	--	19.9	10.5	13.3	17.8	12.2	13.0	13.4	13.6	11.8	14.0	13.0
Potassium	--	4.0	2.99	ND<5.0	3.1	2.88	2.38	2.21	2.35	2.73	3.76	2.74
Sodium	--	18.1	9.00	19.6	17.2	15.5	21.4	20.3	20.4	16.5	18.3	21.2
Chloride	250 [a]	30	7.7	61.6	26	18	13	13	13	19	21	18
Sulfate	250 [a]	55	17	61.1	66	33	22	23	25	22	36	24
Bicarbonate Alk.	--	280	170	113	248	170	190	190	190	160	170	180
Carbonate Alk.	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Hydroxide Alk.	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
TDS	500 [a,b]	454	230	366	454	300	300	310	320	260	350	290
TSS	--	4	ND<10	ND<1.0	3	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
Hardness	--	328	180	241	336	210	190	210	220	220	250	200
Radon ^{222} (pCi/l)	300 [b,c]	334	238	---	237	271	280	222	208	138	189	162

Notes:

All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- NS = No sample collected

[2] California Maximum Contaminant Level (as of 12/95)
- [a] Secondary MCL
- [b] Federal MCL
- [c] Proposed MCL
- -- No Standard

ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed
bgs = below ground surface
Well Status:
- Active = Active Water Supply Well
- Inactive = Inactive Water Supply Well
- MW = Site Assessment Monitoring Well
- Obs = Observation Well

Table 4-21

Baldwin Park Operable Unit

Summary of Groundwater Analytical Results - Metals and General Minerals

Additional Existing Wells

Well Owner		Suburban Water Systems			Valley County Water District							
Well Recordation No.		01901598	08000069	08000095	01900028	01900029	01900031		01900035		08000060	08000039
Well Status		Active	Active	Active	Active	Inactive	Inactive		Inactive		Active	Inactive
Well Name		139W1	139W4	139W5	W. Maine (2)	Morada (3)	Paddy Ln (5)		B. Dalton (9)		Lante (10)	Palm (11)
Screen Interval (feet bgs)		120-349	566-642, 676-695 787-825	750-1060	250-580	275-585	300-585		250-582		275-577	540-582, 594-602
Sampler		CDM	CDM	CDM	CDM	GeoSyntec	CDM	CDM	CDM	CDM	CDM	CDM
Sample Date		12-Apr-96	12-Apr-96	12-Apr-96	11-Apr-96	26-Mar-96	12-Jul-96	12-Jul-96	22-Mar-96	22-Mar-96	11-Apr-96	10-Jul-96
Sample Type[1]		GW	GW	GW	GW	GW	GW	K	GW	K	GW	GW
Metals	MCL[2]											
Aluminum	1	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.0437	ND<0.1	ND<0.0437	0.0968	ND<0.0437	ND<0.0437	ND<0.0437	0.0721
Arsenic	0.05	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.00299	ND<0.001	ND<0.00299	ND<0.00299	0.00321	ND<0.00299	ND<0.00299	ND<0.00299
Barium	1	0.212	0.0784	0.0810	0.0842	0.18	0.130	0.131	0.114	0.114	0.193	0.0971
Cadmium	0.005	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0003	0.00276	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017	ND<0.0017
Chromium	0.05	ND<0.0018	0.00705	0.00524	ND<0.0018	ND<0.03	0.00194	0.00442	0.00484	0.00462	0.00380	ND<0.0018
Copper	1 [a]	0.00851	0.00948	0.00858	0.00492	ND<0.05	0.0129	0.0139	ND<0.0027	ND<0.0027	0.00760	0.0116
Iron	0.30 [a]	0.0320	ND<0.0225	ND<0.0225	ND<0.0225	ND<0.1	0.0552	0.195	0.920	2.07	0.0377	0.0944
Lead	0.05	0.00242	0.00320	0.00189	0.00170	0.005	0.00279	0.00251	0.00323	0.00476	0.00127	0.00232
Manganese	0.05 [a]	ND<0.002	0.00644	ND<0.002	0.00390	ND<0.01	0.00631	0.00445	0.00785	0.0160	ND<0.002	0.0169
Mercury	0.002	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.001	ND<0.000173	ND<0.000173	ND<0.000173	ND<0.000173	0.000230	0.000290
Nickel	0.1	ND<0.0047	ND<0.0047	0.00584	ND<0.0047	ND<0.04	0.00501	0.00631	ND<0.0047	ND<0.0047	ND<0.0047	ND<0.0047
Zinc	5 [a]	0.0177	ND<0.0175	ND<0.0175	0.0496	ND<0.03	0.0910	0.0699	0.0304	0.0265	ND<0.0175	0.0564
General Minerals												
Calcium	--	112	52.9	46.6	36.8	128	70.8	70.5	59.7	60.1	82.4	51.8
Magnesium	--	25.5	13.2	11.2	8.07	21.8	13.1	13.1	10.4	10.4	18.5	9.46
Potassium	--	4.36	2.02	2.43	2.66	3.8	4.02	3.96	3.44	3.51	4.23	3.00
Sodium	--	26.4	20.1	23.3	9.43	20.8	12.8	12.7	16.6	16.3	26.0	9.61
Chloride	250 [a]	50	13	12	3.2	49	21	21	44	45	37	14
Sulfate	250 [a]	54	24	21	12	76	37	37	34	34	34	30
Bicarbonate Alk.	--	280	170	190	140	294	210	200	130	130	260	150
Carbonate Alk.	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Hydroxide Alk.	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
TDS	500 [a,b]	600	320	290	190	508	340	360	280	300	450	250
TSS	--	ND<10	ND<10	ND<10	ND<10	ND<1	17	ND<10	ND<10	ND<10	ND<10	ND<10
Hardness	--	410	190	180	130	372	250	280	210	200	320	240
Radon ^{222} (pCi/l)	300 [b,c]	220	264	188	211	290	250	278	267	284	220	217

Notes:

All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
- GW = Groundwater sample
- K = Duplicate (split) sample
- NS = No sample collected

[2] California Maximum Contaminant Level (as of 12/95)

[a] Secondary MCL

[b] Federal MCL

[c] Proposed MCL

-- No Standard

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed

bgs = below ground surface

Well Status:
- Active = Active Water Supply Well
- Inactive = Inactive Water Supply Well
- MW = Site Assessment Monitoring Well
- Obs = Observation Well

Table 4-21
Baldwin Park Operable Unit
Summary of Groundwater Analytical Results - Metals and General Minerals
Additional Existing Wells

Well Owner		ALRC				LA County	Norac	Polopolus
Well Recordation No.		W11AZW01R	W11AZW03	W11AZW09		Z1000006	W10NCMW1	01902169
Well Status		MW	MW	MW		Obs. Well	MW	Inactive Irrig.
Well Name		MW-1R	MW-3	MW-9		Key Well	1	1
Screen Interval (feet bgs)		258-455	180-385	195-450		80-284	255-310	120-280
Sampler		GeoSyntec	GeoSyntec	GeoSyntec	CDM	CDM	GeoSyntec	CDM
Sample Date		14-Mar-96	13-Mar-96	13-Mar-96	13-Mar-96	19-Apr-96	15-Mar-96	27-Jun-96
Sample Type[1]		GW	GW	GW	K	GW	GW	GW
Metals	MCL[2]							
Aluminum	1	ND<0.1	ND<0.1	ND<0.1	ND<0.0437	ND<0.0437	ND<0.1	ND<0.0437
Arsenic	0.05	0.081	0.0018	0.0024	ND<0.00299	ND<0.00299	0.0014	ND<0.00299
Barium	1	1.01	0.10	0.08	0.116	0.168	0.16	0.174
Cadmium	0.005	ND<0.0003	ND<0.0003	ND<0.0003	ND<0.0017	ND<0.0017	ND<0.0003	ND<0.0017
Chromium	0.05	ND<0.03	ND<0.03	ND<0.03	0.00921	0.00215	0.06	ND<0.0018
Copper	1 [a]	ND<0.05	ND<0.05	ND<0.05	0.0133	0.00477	ND<0.05	0.0139
Iron	0.30 [a]	3.7	0.1	ND<0.1	0.0340	ND<0.0225	0.3	0.656
Lead	0.05	0.009	ND<0.005	ND<0.005	0.00739	ND<0.000636	ND<0.005	0.00482
Manganese	0.05 [a]	10.2	ND<0.01	ND<0.01	0.00590	ND<0.002	ND<0.01	0.0130
Mercury	0.002	ND<0.001	ND<0.001	ND<0.001	ND<0.000173	ND<0.000173	ND<0.001	ND<0.000173
Nickel	0.1	0.04	ND<0.04	ND<0.04	ND<0.0047	ND<0.0047	ND<0.04	ND<0.0047
Zinc	5 [a]	4.82	0.05	0.21	0.262	0.0180	ND<0.03	0.135
General Minerals								
Calcium	--	262	64.4	61.2	56.6	82.0	86.1	86.8
Magnesium	--	55.8	14.6	11.2	10.5	16.6	18.6	17.3
Potassium	--	8.2	3.8	3.7	3.35	3.60	5.1	4.09
Sodium	--	120	13.5	12.2	11.9	11.4	23.9	14.2
Chloride	250 [a]	258	9	19	20	28	34	34
Sulfate	250 [a]	31	16	37	38	33	31	28
Bicarbonate Alk.	--	708	204	130	130	220	240	230
Carbonate Alk.	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Hydroxide Alk.	--	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
TDS	500 [a,b]	1,280	264	258	260	390	438	380
TSS	--	15	ND<1	4	ND<10	ND<10	2	ND<10
Hardness	--	860	250	260	190	150	290	310
Radon ^{222} (pCi/l)	300 [b,c]	276	105	NA	116	274	318	193

Notes:
All concentrations are in mg/l unless otherwise indicated.

[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
NS = No sample collected

[2] California Maximum Contaminant Level (as of 12/95)
[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
-- No Standard

ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed
bgs = below ground surface
Well Status:
Active = Active Water Supply Well
Inactive = Inactive Water Supply Well
MW = Site Assessment Monitoring Well
Obs = Observation Well

Table 4-22
Baldwin Park Operable Unit
Summary of Metals & General Mineral Statistics

Constituent		SUBAREA 1						SUBAREA 3					
		Minimum Conc.	Maximum Conc.	Mean Conc. [2]	Total No. of Measurements	No. of Non-Detects	No. Exceeding MCL	Minimum Conc.	Maximum Conc.	Mean Conc. [2]	Total No. of Measurements	No. of Non-Detects	No. Exceeding MCL
Metals	MCL [1]												
Aluminum	1	<0.0437	0.0907	0.0366	34	33	0	<0.0437	0.129	0.0422	38	34	0
Arsenic	0.05	<0.00299	0.081	0.0047	34	25	1	<0.00299	0.0034	0.0023	38	34	0
Barium	1	<0.00134	1.01	0.145	34	3	1	<0.00134	0.212	0.113003	38	7	0
Cadmium	0.005	<0.0017	<0.0017	–	34	34	–	<0.0017	0.0028	0.001204	38	37	0
Chromium	0.05	<0.0018	0.06	0.007	34	23	1	<0.0018	0.0217	0.004499	38	18	0
Copper	1 [a]	<0.0027	0.0777	0.013	34	13	0	<0.0027	0.0842	0.0096	38	12	0
Iron	0.30 [a]	<0.0225	3.7	0.19	34	8	3	<0.0225	0.92	0.087	38	16	3
Lead	0.05	<0.0006	0.012	0.002	34	10	0	<0.0006	0.0053	0.001	38	18	0
Manganese	0.05 [a]	<0.002	10.2	0.32	34	9	5	<0.002	0.03	0.005	38	18	0
Mercury	0.002	<0.000173	0.0015	0.00022	34	32	0	<0.000173	0.0011	0.00014	38	33	0
Nickel	0.1	<0.0047	0.04	0.009	34	27	0	<0.0047	0.04	0.006	38	35	0
Zinc	5 [a]	<0.0175	4.82	0.178	34	13	0	<0.0175	0.0743	0.0252	38	13	0
General Minerals													
Calcium	–	8.15	262	72.6	34	0	–	23.0	112	57	38	0	–
Magnesium	–	2.24	55.8	16.2	34	0	–	9.46	25.5	13.3	38	0	–
Potassium	–	2.66	8.20	4.58	34	2	–	2.02	5.35	3.35	38	7	–
Sodium	–	9.43	148	40.7	34	0	–	9.00	41.9	18.9	38	0	–
Chloride	250 [a]	3.2	258	39	34	0	1	7.7	50	19	38	7	0
Sulfate	250 [a]	12	76	38	34	0	0	17	58.2	31	38	0	0
Nitrate	10	0.1	17.7	4.62	44	8	5	0.05	21	4.42	112	9	18
Nitrite	1	0.05	0.91	0.16	29	27	0	0.05	6.2	0.20	107	101	0
Bicarbonate Alk.	–	100	708	240	34	0	–	88	280	175	38	0	–
Carbonate Alk.	–	1	39	3.1	33	27	–	1	4	0.8	38	38	–
TDS	500 [a,b]	190	1280	427	34	0	6	180	600	302	38	0	1
TSS	–	1	15	5.0	34	28	–	10	20	5.7	38	36	–
Hardness (as $CaCO_3$)	–	32	860	244	34	0	–	100	410	210	38	0	–
Radon ^{222} (pCi/l)	300 [b,c]	42	395	163	33	0	3	39	280	14	38	0	0

Notes:
All concentrations are in mg/l unless otherwise indicated.
[1] California Maximum Contaminant Level (as of 12/95)
[a] Secondary MCL
[b] Federal MCL
[c] Proposed MCL
[2] One-half of the detection limit was used in the mean calculation for a non-detectable concentration.
ND = Not detected at a concentration greater than the limit indicated.
– = Not calculated or not applicable.

CDM Camp Dresser & McKee
2581-112\sprdshts\1
11/26/96

Table 4-23
Baldwin Park Operable Unit
Summary of Duplicate Sample Analytical Results
VOCs

Well Identification	Sample Date	Sampler	Sample Type [1]	VOCs [2,3]							
				CTC	Chloro-form	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	PCE	TCE
MW50310	4-Aug-95	CDM	GW	ND<1.1	1.4	13	ND<0.23	29	29	22	37
MW50310	4-Aug-95	CDM	K	ND<0.64	2.2	19	ND<0.14	44	37	30	43
			RPD	0	44	38	0	41	24	31	15
MW50504	16-Aug-95	CDM	GW	ND<0.64	ND<0.20	ND<0.32	ND<0.14	ND<0.77	ND<0.47	ND<0.41	ND<0.33
MW50504	16-Aug-95	CDM	K	ND<0.64	ND<0.20	ND<0.32	ND<0.14	ND<0.77	ND<0.47	ND<0.41	ND<0.33
			RPD	0	0	0	0	0	0	0	0
MW50310	27-Sep-95	CDM	GW	ND<0.64	3.5	17	0.53	39	29	24	43
MW50310	27-Sep-95	CDM	K	ND<0.64	2.4	10	0.44	17	20	12	30
			RPD	0	-37	-52	-19	-79	-37	-67	-36
MW50503	12-Oct-95	CDM	GW	1.7	0.85	0.47	0.53	21	15	90	130
MW50503	12-Oct-95	CDM	K	1.4	0.75	0.43	0.51	18	14	100	150
			RPD	-19	-13	-9	-4	-15	-7	11	14
MW51102	13-Nov-95	CDM	GW	ND<0.64	3.8	ND<0.32	1.9	1.4	30	580	450
MW51102	13-Nov-95	CDM	K	ND<0.64	4.2	ND<0.32	2.0	2.3	34	630	470
			RPD	0	10	0	5	48	13	8	4
MW51302	18-Jan-96	CDM	GW	0.79	1.0	ND<0.19	0.60	0.33	2.7	100	110
MW51302	18-Jan-96	CDM	K	0.74	0.88	ND<0.19	0.63	0.24	2.6	93	110
			RPD	-7	-13	0	5	-32	-4	-7	0
MW50113	13-Mar-96	CDM	GW	ND<0.46	0.68	1.0	ND<0.22	0.90	6.5	7.8	15
MW50113	13-Mar-96	CDM	K	ND<0.46	0.73	1.0	ND<0.22	0.95	6.0	7.7	15
			RPD	0	7	0	0	5	-8	-1	0
W11AZW09	13-Mar-96	GeoSyntec	GW	0.6	1.4	ND<0.5	ND<0.5	0.5	3.0	26.2	24.1
W11AZW09	13-Mar-96	CDM	K	0.65	1.7	ND<0.19	0.39	0.32	4.1	29	24
			RPD	8	19	0	–	-44	31	10	0
MW51103	14-Mar-96	CDM	GW	1.4	2.3	1.2	1.1	16	7.8	110	100
MW51103	14-Mar-96	CDM	K	1.6	2.6	1.2	1.2	18	8.6	110	100
			RPD	13	12	0	9	12	10	0	0
MW50310	19-Mar-96	CDM	GW	ND<0.46	2.7	18	0.55	29	31	22	41
MW50310	19-Mar-96	CDM	K	ND<0.46	3.1	19	0.58	35	34	24	42
			RPD	0	14	5	5	19	9	9	2
MW50503	20-Mar-96	CDM	GW	0.78	1.5	0.95	0.97	24	21	180	240
MW50503	20-Mar-96	CDM	K	0.56	1.3	0.71	0.80	18	17	160	200
			RPD	-29	-14	-29	-19	-29	-21	-12	-18
01900035	22-Mar-96	CDM	GW	0.86	1.9	0.86	2.0	0.41	1.9	4.3	26
01900035	22-Mar-96	CDM	K	0.82	1.9	0.83	2.0	0.42	2.0	6.6	25
			RPD	-5	0	-4	0	2	5	42	-4
W11AZW1R	13-Jun-96	GeoSyntec	GW	4.0	ND<0.5	7.3	ND<0.5	97.1	7.6	20.7	47.3
W11AZW1R	13-Jun-96	CDM	K	ND<0.28	0.47	6.2	0.35	130	6.4	20	52
			RPD	–	–	-16	–	29	-17	-3	9
MW50310	18-Jun-96	CDM	GW	ND<0.28	1.8	17	0.43	43	38	15	40
MW50310	18-Jun-96	CDM	K	ND<0.28	1.7	16	0.42	33	35	13	35
			RPD	0	-6	-6	-2	-26	-8	-14	-13
MW50109	20-Jun-96	CDM	GW	5.3	12	3.1	11	1.3	10	11	270
MW50109	20-Jun-96	CDM	K	5.8	13	3.6	12	1.6	11	13	310
			RPD	9	8	15	9	21	10	17	14
MW50503	21-Jun-96	CDM	GW	0.79	1.4	0.86	0.91	24	20	120	160
MW50503	21-Jun-96	CDM	K	0.92	1.5	0.99	0.97	26	22	140	180
			RPD	15	7	14	6	8	10	15	12
MW51303	21-Jun-96	CDM	GW	17	30	1.1	18	9.2	33	800	1,400
MW51303	21-Jun-96	CDM	K	16	29	1.0	16	8.3	31	720	1,300
			RPD	-6	-3	-10	-12	-10	-6	-11	-7
MW51103	24-Jun-96	CDM	GW	1.1	2.8	1.2	1.5	21	8.9	97	94
MW51103	24-Jun-96	CDM	K	1.0	2.6	1.1	1.4	19	8.5	86	83
			RPD	-10	-7	-9	-7	-10	-5	-12	-12
01900035	26-Jun-96	CDM	GW	0.63	1.4	0.43	1.7	ND<0.21	1.1	3.9	15
01900035	26-Jun-96	CDM	K	0.62	1.4	0.41	1.7	0.24	1.2	4.3	16
			RPD	-2	0	-5	0	–	9	10	6

Table 4-23
Baldwin Park Operable Unit
Summary of Duplicate Sample Analytical Results
VOCs

Well Identification	Sample Date	Sampler	Sample Type [1]	VOCs [2,3]							
				CTC	Chloro-form	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	PCE	TCE
MW51503	9-Jul-96	CDM	GW	0.33	1.0	0.57	ND<0.22	5.8	13	17	61
MW51503	9-Jul-96	CDM	K	0.33	0.93	0.50	ND<0.22	5.2	11	15	60
			RPD	0	-7	-13	0	-11	-17	-13	-2
01900031	12-Jul-96	CDM	GW	4.0	5.7	3.2	3.8	5.2	15	19	130
01900031	12-Jul-96	CDM	K	3.9	5.8	3.2	4.0	5.5	16	19	120
			RPD	-3	2	0	5	6	6	0	-8
MW51503	13-Aug-96	CDM	GW	0.23	0.76	0.47	ND<0.50	3.6	9.5	14	47
MW51503	13-Aug-96	CDM	K	0.3	0.92	0.54	0.32	4.4	12	17	59
			RPD	26	19	14	--	20	23	19	23
W11AZW1R	12-Sep-96	GeoSyntec	GW	8.0	ND<0.5	7.2	ND<0.5	177	8.5	16.5	70
W11AZW1R	12-Sep-96	CDM	K	ND<0.5	0.47	5.1	0.41	170	5.8	29	62
			RPD	--	--	-34	--	-4	-38	55	-12
MW50310	17-Sep-96	CDM	GW	ND<0.50	1.6	15	0.33	39	28	14	41
MW50310	17-Sep-96	CDM	K	ND<0.50	1.1	8.6	0.34	14	18	6.4	21
			RPD	0	-37	-54	3	-94	-43	-75	-65
MW50113	19-Sep-96	CDM	GW	ND<0.50	0.32	0.44	ND<1.0	0.17	2.6	2.6	7.8
MW50113	19-Sep-96	CDM	K	ND<0.50	0.3	0.4	ND<1.0	0.19	2.4	2.8	7.9
			RPD	0	-6	-10	0	11	-8	7	1
MW51101	20-Sep-96	CDM	GW	0.39	ND<1.0	ND<1.0	ND<0.50	ND<1.0	0.21	8.7	26
MW51101	20-Sep-96	CDM	K	0.44	0.1	ND<1.0	ND<0.50	ND<1.0	ND<1.0	9.8	28
			RPD	12	--	0	0	0	--	12	7
MW50502	23-Sep-96	CDM	GW	0.75	0.3	ND<1.0	ND<0.50	5	5	23	51
MW50502	23-Sep-96	CDM	K	0.97	0.38	ND<1.0	0.2	6.5	6	29	64
			RPD	26	24	0	--	26	18	23	23
MW51503	23-Sep-96	CDM	GW	0.45	1.4	0.78	0.39	8.4	15	26	82
MW51503	23-Sep-96	CDM	K	0.26	1.1	0.6	0.37	5.3	13	18	60
			RPD	-54	-24	-26	-5	-45	-14	-36	-31
08000062	11-Oct-96	CDM	GW	5.3	3.6	0.27	6.2	1.6	2.8	5.0	92
08000062	11-Oct-96	CDM	K	5.3	3.4	0.26	6.1	1.6	2.9	5.0	90
			RPD	0	-6	-4	-2	0	4	0	-2

Notes:

All VOC concentrations are in µg/l.

[1] GW = original sample; K = duplicate sample (split); and RPD = relative percent difference.

[2] Not all VOCs are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected by CDM prior to August 1996.
All other samples were analyzed for VOCs using EPA Method 8260.
For samples collected by GeoSyntec (for Azusa Land Reclamation Co.), VOCs were analyzed using EPA 8260.
J = Result is estimated; value lies between the method detection and reporting limits.
ND = Not detected at a concentration greater than the limit indicated.
-- = RPD not calculated.
CTC = Carbon tetrachloride; DCA = dichloroethane; DCE = dichloroethene; PCE = tetrachloroethene; and TCE = trichloroethene

Table 4-24
Baldwin Park Operable Unit
Summary of Duplicate Sample Analytical Results
Metals & General Minerals

Well Identification	MW50113			MW51103			MW50310			MW50503		
Sampler	CDM			CDM			CDM			CDM		
Sample Date	13-Mar-96			14-Mar-96			19-Mar-96			20-Mar-96		
Sample Type [1]	GW	K	RPD	GW	K	RPD	GW	K	RPD	GW	K	RPD
Metals												
Aluminum	ND<0.0437	ND<0.0437	0	ND<0.0437	ND<0.0437	0	ND<0.0437	ND<0.0437	0	0.0587	ND<0.0437	–
Arsenic	ND<0.00299	ND<0.00299	0	ND<0.00299	ND<0.00299	0	ND<0.00299	ND<0.00299	0	0.00338	ND<0.00299	–
Barium	0.0865	0.107	21	0.161	0.165	2	0.438	0.462	5	0.133	0.0894	-39
Cadmium	ND<0.0017	ND<0.0017	0	ND<0.0017	ND<0.0017	0	ND<0.0017	ND<0.0017	0	ND<0.0017	ND<0.0017	0
Chromium	ND<0.0018	ND<0.0018	0	0.00551	0.00526	-5	0.00187	0.00281	40	ND<0.0018	0.00203	–
Copper	0.00642	0.00551	-15	0.00694	0.00356	-64	0.00451	0.00379	-17	ND<0.0027	ND<0.0027	0
Iron	ND<0.0225	0.0260	–	ND<0.0225	0.0299	–	0.0450	0.178	119	0.106	0.0323	-107
Lead	ND<0.000636	0.000740	–	0.00108	ND<0.00636	–	ND<0.000636	ND<0.000636	0	ND<0.000636	ND<0.000636	0
Manganese	0.00250	0.00240	-4	0.00270	0.00303	12	0.00698	0.0156	76	0.00619	0.00367	-51
Mercury	ND<0.000173	ND<0.000173	0	ND<0.000173	ND<0.000173	0	ND<0.000173	ND<0.000173	0	ND<0.000173	ND<0.000173	0
Nickel	ND<0.0047	ND<0.0047	0	0.00690	0.00644	9	0.00478	ND<0.0047	–	ND<0.0047	ND<0.0047	0
Zinc	0.0196	0.0464	81	0.0312	0.0178	-55	0.0249	0.0263	5	0.0298	0.0229	-26
General Minerals												
Calcium	27.0	32.6	19	75.0	76.8	2	172	184	7	73.3	55.1	-28
Magnesium	11.6	12.6	8	16.3	16.6	2	36.1	38.2	6	17.8	12.3	-37
Potassium	5.35	5.16	-4	4.06	4.06	0	7.00	7.49	7	4.84	3.95	-20
Sodium	32.9	28.2	-15	19.6	19.8	1	40.6	42.9	6	17.4	12.4	-34
Chloride	36	36	0	21	21	0	85	86	1	22	14	-44
Nitrate (as N)	ND<0.25	ND<0.25	0	5.2	5.1	-2	5.7	5.7	0	3.7	3.7	0
Nitrite (as N)	ND<0.25	ND<0.25	0	ND<0.25	ND<0.25	0	ND<0.25	ND<0.25	0	ND<0.25	ND<0.25	0
Sulfate	38	38	0	36	36	0	38	38	0	36	22	-48
Bicarbonate Alk.	110	120	9	240	240	0	530	520	-2	190	160	-17
Carbonate Alk.	ND<1.0	ND<1.0	0	ND<1.0	ND<1.0	0	ND<1.0	ND<1.0	0	ND<1.0	ND<1.0	0
TDS	250	260	4	410	410	0	800	790	-1	350	250	-33
TSS	ND<10	ND<10	0	ND<10	ND<10	0	ND<10	ND<10	0	ND<10	ND<10	0
Hardness	180	180	0	290	300	3	610	550	-10	270	210	-25
Radon ^{222} (pCi/l)	39	57	38	284	312	9	119	141	17	137	278	68

Notes:
All concentrations are in mg/l unless otherwise indicated.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
RPD = Relative percent difference
NA = Not analyzed
ND = Not detected at a concentration greater than the limit indicated.

Table 4-24
Baldwin Park Operable Unit
Summary of Duplicate Sample Analytical Results
Metals & General Minerals

Well Identification	01900035			W11AZW1R			01900031			MW51503		
Sampler	CDM			GeoSyntec	CDM		CDM			CDM		
Sample Date	22-Mar-96			13-Jun-96	13-Jun-96		12-Jul-96			23-Sep-96		
Sample Type [1]	GW	K	RPD	GW	K	RPD	GW	K	RPD	GW	K	RPD
Metals												
Aluminum	ND<0.0437	ND<0.0437	0	ND<0.1	ND<0.0437	0	ND<0.0437	0.0968	–	ND<0.020	ND<0.020	0
Arsenic	0.00321	ND<0.00299	–	0.0024	ND<0.00299	–	ND<0.00299	ND<0.00299	0	ND<0.010	ND<0.010	0
Barium	0.114	0.114	0	0.08	0.116	37	0.130	0.131	1	ND<0.20	ND<0.20	0
Cadmium	ND<0.0017	ND<0.0017	0	ND<0.0003	ND<0.0017	0	0.00276	ND<0.0017	–	ND<0.0050	ND<0.0050	0
Chromium	0.00484	0.00462	-5	ND<0.03	0.00921	–	0.00194	0.00442	78	ND<0.010	ND<0.010	0
Copper	ND<0.0027	ND<0.0027	0	ND<0.05	0.0133	–	0.0129	0.0139	7	ND<0.025	ND<0.025	0
Iron	0.920	2.07	77	ND<0.1	0.0340	–	0.0552	0.195	112	ND<0.10	0.11	–
Lead	0.00323	0.00476	38	ND<0.005	0.00739	–	0.00279	0.00251	-11	ND<0.0030	ND<0.0030	0
Manganese	0.00785	0.0160	68	ND<0.01	0.00590	–	0.00631	0.00445	-35	ND<0.015	ND<0.015	0
Mercury	ND<0.000173	ND<0.000173	0	ND<0.001	ND<0.000173	0	ND<0.000173	ND<0.000173	0	ND<0.00020	ND<0.00020	0
Nickel	ND<0.0047	ND<0.0047	0	ND<0.04	ND<0.0047	0	0.00501	0.00631	23	ND<0.040	ND<0.040	0
Zinc	0.0304	0.0265	-14	0.21	0.262	22	0.0910	0.0699	-28	ND<0.020	0.024	–
General Minerals												
Calcium	59.7	60.1	1	61.2	56.6	-8	70.8	70.5	0	67	72.9	8
Magnesium	10.4	10.4	0	11.2	10.5	-6	13.1	13.1	0	14.9	16.3	9
Potassium	3.44	3.51	2	3.7	3.35	-10	4.02	3.96	-2	ND<5.0	ND<5.0	0
Sodium	16.6	16.3	-2	12.2	11.9	-2	12.8	12.7	-1	14.7	15.8	7
Chloride	44	45	2	19	20	5	21	21	0	25.8	25.3	-2
Nitrate (as N)	4.8	4.9	2	1.2	NA	–	6.7	6.7	0	40.7	40.6	0
Nitrite (as N)	ND<0.25	ND<0.25	0	NA	NA	–	ND<0.25	ND<0.25	0	ND<0.050	ND<0.050	0
Sulfate	34	34	0	37	38	3	37	37	0	3	3	0
Bicarbonate Alk.	130	130	0	130	130	0	210	200	-5	172	174	1
Carbonate Alk.	ND<1.0	ND<1.0	0	ND<1.0	ND<1.0	0	ND<1.0	ND<1.0	0	ND<4.0	ND<4.0	0
TDS	280	300	7	258	260	1	340	360	6	318	326	2
TSS	ND<10	ND<10	0	4	ND<10	–	17	ND<10	–	ND<10.0	ND<10.0	0
Hardness	210	200	-5	260	190	-31	250	280	11	228	234	3
Radon ^{222} (pCi/l)	267	284	6	NA	116	–	250	278	11	100	160	46

Notes:
All concentrations are in mg/l unless otherwise indicated.
[1] Sample Type:
GW = Groundwater sample
K = Duplicate (split) sample
RPD = Relative percent difference
NA = Not analyzed
ND = Not detected at a concentratio greater than the limit indicated.

Table 4-25
Baldwin Park Operable Unit
Summary of Equipment Blank Results - VOCs

Well Identification	Sample Type [1]	Sample Date	VOCs [2,3]														
			Benzene	n-Butyl-benzene	sec-Butyl-benzene	tert-Butyl-benzene	Chloroform	Chloro-methane	1,4-Dichloro-benzene	Methylene chloride	Methyl tert-butyl ether	Naphtha-lene	Styrene	Toluene	TCE	o-Xylene	p,m-Xylenes
MW50310	N	4-Aug-95	ND<0.20	ND<0.15	ND<0.26	ND<0.24	ND<0.20	ND<0.25	ND<0.27	2.9	NA	0.56 B	ND<0.33	1.4	ND<0.33	ND<0.33	ND<0.44
MW50504	N	16-Aug-95	ND<0.20	ND<0.15	ND<0.26	ND<0.24	ND<0.20	ND<0.25	ND<0.27	3.5	NA	ND<0.29	0.53	ND<0.22	ND<0.33	ND<0.33	ND<0.44
MW50302	N	25-Sep-95	ND<0.20	ND<0.15	ND<0.26	ND<0.24	ND<0.20	ND<0.25	ND<0.27	0.91	NA	ND<0.29	ND<0.33	0.74	ND<0.33	ND<0.33	ND<0.44
MW50308	N	26-Sep-95	0.42	ND<0.15	ND<0.26	ND<0.24	ND<0.20	ND<0.25	0.70	ND<0.46	NA	ND<0.29	ND<0.33	2.2	ND<0.33	2.1	1.0
MW50310	N	27-Sep-95	0.23	ND<0.15	ND<0.26	ND<0.24	ND<0.20	ND<0.25	ND<0.27	0.73	NA	ND<0.29	ND<0.33	1.4	ND<0.33	ND<0.33	ND<0.44
MW51103	N	10-Oct-95	ND<0.20	ND<0.15	ND<0.26	ND<0.24	ND<0.20	ND<0.25	ND<0.27	ND<0.46	NA	ND<0.29	ND<0.33	0.31	ND<0.33	ND<0.33	0.74
MW50504	N	13-Oct-95	ND<0.20	ND<0.15	ND<0.26	ND<0.24	0.37	0.89	ND<0.27	1.5	NA	ND<0.29	ND<0.33	0.81	ND<0.33	ND<0.33	ND<0.44
MW51703	N	30-Oct-95	ND<0.20	ND<0.15	ND<0.26	ND<0.24	ND<0.20	ND<0.37	ND<0.27	ND<0.46	NA	ND<0.29	ND<0.33	ND<0.22	ND<0.33	ND<0.33	0.57
MW51103	N	13-Nov-95	ND<0.20	0.19	ND<0.26	ND<0.24	ND<0.20	ND<0.37	ND<0.27	ND<0.46	NA	ND<0.29	ND<0.33	0.31	ND<0.33	ND<0.33	ND<0.44
MW51703	N	30-Nov-95	ND<0.20	ND<0.15	ND<0.26	ND<0.24	ND<0.20	ND<0.37	ND<0.27	ND<0.46	NA	ND<0.29	ND<0.33	ND<0.22	ND<0.33	ND<0.33	ND<0.44
MW51303	N	18-Jan-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	0.23B	ND<0.13	ND<0.21	ND<0.13	ND<0.35
MW51303	N	15-Feb-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	ND<0.13	ND<0.21	ND<0.13	ND<0.35
MW50102	N	11-Mar-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	ND<0.13	ND<0.21	ND<0.13	ND<0.35
MW50106	N	12-Mar-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	0.18	ND<0.21	0.16	ND<0.35
MW50113	N	13-Mar-96	ND<0.09	ND<0.16	0.26	0.63	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	0.18	ND<0.21	ND<0.13	ND<0.35
MW51103	N	14-Mar-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	0.17	ND<0.21	ND<0.13	ND<0.35
MW51703	N	15-Mar-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	0.15	ND<0.21	ND<0.13	ND<0.35
MW50305	N	18-Mar-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	ND<0.13	ND<0.21	ND<0.13	ND<0.35
MW50310	N	19-Mar-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	0.26	ND<0.21	ND<0.13	ND<0.35
MW50504	N	20-Mar-96	ND<0.09	ND<0.16	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	NA	ND<0.37	ND<0.13	ND<0.13	0.51	ND<0.13	ND<0.35
MW51803	N	3-Jun-96	ND<0.09	ND<0.11	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	ND<0.15	ND<0.37	ND<0.11	ND<0.13	ND<0.22	ND<0.11	ND<0.35
MW50303	N	17-Jun-96	ND<0.09	ND<0.11	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	ND<0.15	ND<0.37	ND<0.11	ND<0.13	ND<0.21	ND<0.11	ND<0.35
MW50310	N	18-Jun-96	ND<0.09	ND<0.11	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	ND<0.15	ND<0.37	ND<0.11	ND<0.13	ND<0.21	ND<0.11	ND<0.35
MW50104	N	19-Jun-96	ND<0.09	ND<0.11	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	ND<0.15	ND<0.37	ND<0.11	ND<0.13	ND<0.21	ND<0.11	ND<0.35
MW50109	N	20-Jun-96	ND<0.09	ND<0.11	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	ND<0.15	ND<0.37	ND<0.11	ND<0.13	ND<0.21	ND<0.11	ND<0.35
MW50504	N	21-Jun-96	ND<0.09	ND<0.11	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	ND<0.15	ND<0.37	ND<0.11	ND<0.13	ND<0.21	ND<0.11	ND<0.35
MW51102	N	24-Jun-96	ND<0.09	ND<0.11	ND<0.11	0.43	ND<0.24	ND<0.37	ND<0.27	ND<0.29	ND<0.15	1.1	ND<0.11	ND<0.13	ND<0.21	ND<0.11	ND<0.35
MW51502	N	9-Jul-96	ND<0.09	ND<0.11	ND<0.11	ND<0.15	ND<0.24	ND<0.37	ND<0.27	ND<0.29	ND<0.15	ND<0.37	ND<0.11	0.15	ND<0.21	ND<0.11	ND<0.35
MW51502	N	13-Aug-96	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<0.37	ND<1.0	ND<2.0	ND<5.0	ND<1.0	ND<1.0	ND<1.0	0.35 J	ND<1.0	ND<1.0
MW50304	N	16-Sep-96	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<5.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
MW50310	N	17-Sep-96	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	0.22 J	ND<5.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
MW50104	N	18-Sep-96	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	0.35 J	ND<5.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
MW50111	N	19-Sep-96	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.4 J	ND<5.0	ND<1.0	ND<1.0	ND<1.0	0.60 J	ND<1.0	ND<1.0
MW51102	N	20-Sep-96	0.12 J	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	0.72 J	ND<5.0	ND<1.0	ND<1.0	ND<1.0	0.24 J	ND<1.0	ND<1.0
MW51502	N	23-Sep-96	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.3 J	ND<5.0	ND<1.0	ND<1.0	ND<1.0	0.63 J	ND<1.0	ND<1.0
MW50504	N	23-Sep-96	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<5.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
MW50803	N	24-Sep-96	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.8 J	1.0 J	ND<1.0	ND<1.0	ND<1.0	0.61 J	ND<1.0	ND<1.0

Notes:

All VOC concentrations are in µg/l.

[1] N = Equipment decontamination rinsate blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to August 1996.

All other samples were analyzed for VOCs using EPA Method 8260.

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

NA = Not analyzed.

B = Detected in laboratory's method blank.

Table 4-26
Baldwin Park Operable Unit
Summary of Field Blank Analytical Results - VOCs

Well Identification	Well Name	Sample Type[1]	Sample Date	VOCs[2,3] 1,2-Dichloro-ethane	Chloro-form	Methylene chloride	Naphtha-lene	PCE	TCE	Toluene
51902858	SGVWC B4B	F	2-Apr-96	**0.85**	ND<0.24	**0.97**	ND<0.37	ND<0.29	ND<0.21	ND<0.13
01902859	LPVCWD 3	F	10-Apr-96	ND<0.22	ND<0.24	**1.0 B**	ND<0.37	ND<0.29	ND<0.21	ND<0.13
08000060	VCWD Lante	F	11-Apr-96	ND<0.22	ND<0.24	**0.74 B**	**0.37**	**0.36**	ND<0.21	ND<0.13
08000095	SWS 139W5	F	12-Apr-96	ND<0.22	ND<0.24	**0.55**	ND<0.37	ND<0.29	ND<0.21	ND<0.13
Z1000006	Key Well	F	19-Apr-96	ND<0.22	ND<0.24	ND<0.29	ND<0.37	ND<0.29	ND<0.21	ND<0.13
Z1000006	Key Well	F	25-Jun-96	ND<0.22	ND<0.24	ND<0.29	ND<0.37	**0.44**	**0.68**	ND<0.13
08000070	Santa Fe 1	F	27-Jun-96	ND<0.22	ND<0.24	ND<0.29	ND<0.37	ND<0.29	ND<0.21	ND<0.13
01900029	VCWD Morada	F	1-Jul-96	ND<0.22	ND<0.24	ND<0.29	ND<0.37	ND<0.29	ND<0.21	**0.18**
01900831	VCWD Glendora	F	2-Jul-96	ND<0.22	ND<0.24	ND<0.29	ND<0.37	ND<0.29	ND<0.21	ND<0.13
08000039	VCWD Palm	F	10-Jul-96	ND<0.22	ND<0.24	ND<0.29	ND<0.37	**0.48**	ND<0.21	ND<0.13
01900031	VCWD Paddy Lane	F	12-Jul-96	ND<0.22	ND<0.24	ND<0.29	ND<0.37	ND<0.29	ND<0.21	**0.16**
Z1000006	Key Well	F	25-Sep-96	ND<0.5	ND<1.0	**0.82 J**	ND<1.0	ND<1.0	**0.26 J**	ND<1.0
01900031	VCWD Paddy Lane	F	26-Sep-96	ND<0.5	**0.054 J**	**0.51 J**	ND<1.0	ND<1.0	**0.52 J**	ND<1.0
W10NCMW1	Norac 1	F	27-Sep-96	ND<0.5	ND<1.0	**3.9**	ND<1.0	ND<1.0	**1.8**	ND<1.0
01902169	Polopolus	F	1-Oct-96	ND<0.5	ND<1.0	**2.5**	ND<1.0	ND<1.0	**1.2**	**0.24 J**
08000095	SWS 139W5	F	7-Oct-96	ND<0.5	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
78000098	SGVWC B6D	F	8-Oct-96	ND<0.5	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	**0.087 J**
51902858	SGVWC B4B	F	9-Oct-96	ND<0.5	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
01902859	LPVCWD 3	F	11-Oct-96	ND<0.5	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	**0.079 J**

Notes:

All VOC concentrations are in µg/l.

[1] F = Field blank

[2] Only VOCs with detectable concentrations in one or more samples are listed.

[3] VOCs were analyzed using EPA Method 8021 for samples collected prior to August 1996.

All other samples were analyzed for VOCs using EPA Method 8260.

J = Result is estimated; value lies between the method detection and reporting limits.

ND = Not detected at a concentration greater than the limit indicated.

B = Detected in laboratory's method blank.

Table 4-27
Baldwin Park Operable Unit
Quality Assurance Samples
Performance Evaluation Standard

		PE Standard Oct-95		MW51703P 30-Oct-95	PE Standard Apr-96		08000095P 12-Apr-96	PE Standard 26-Sep-96		01900030 26-Sep-96
		Certified Value	Advisory Range	Analytical Results	Certified Value	Advisory Range	Analytical Results	Certified Value	Advisory Range	Analytical Results
VOCs (µg/l)	**Method**									
Carbon tetrachloride	#	–	–	ND<0.64	211	154 - 266	210	4.22	3.08-5.32	**3.0**
Chloroform	#	–	–	ND<0.20	–	–	**2.9**	–	–	ND<1.0
1,2-Dichloroethane	#	–	–	ND<0.14	169	130 - 211	190	3.38	2.60-4.22	2.8
1,1-Dichloroethene	#	15.5	10.2 - 19.4	**11**	–	–	ND<0.21	–	–	ND<1.0
cis-1,2-Dichloroethene	#	3.99	2.45 - 5.47	**3.3**	225	138 - 308	250	4.50	2.76-6.16	4.8
trans-1,2-Dichloroethene	#	–	–	ND<0.49	–	–	**0.73**	–	–	ND<1.0
Methylene chloride	#	–	–	ND<0.46	–	–	**0.43**	–	–	**0.19J**
Tetrachloroethene	#	100	73.6 - 122	**65**	186	137 - 227	180	3.72	2.74-4.54	3.0
1,1,1-Trichloroethane	#	3.14	2.22 - 3.77	**2.4**	–	–	ND<0.26	–	–	ND<1.0
Trichloroethene	#	20.1	15.0 - 24.3	**13**	131	97.5 - 159	130	2.62	1.95-3.18	2.3
Trichlorofluoromethane	#	3.05	*	**2.4**	–	–	ND<0.32	–	–	ND<1.0
Metals (mg/l)										
Aluminum	6010	–	–	NA	0.229	0.188 - 0.270	**ND<0.0437**	–	–	NA
Arsenic	7060	–	–	NA	0.0765	0.0574 - 0.0903	0.0801	–	–	NA
Barium	6010	–	–	NA	0.388	0.318 - 0.458	0.361	–	–	NA
Cadmium	6010	–	–	NA	0.0959	0.0786 - 0.113	0.0874	–	–	NA
Chromium	6010	–	–	NA	0.241	0.198 - 0.284	**0.334**	–	–	NA
Copper	6010	–	–	NA	0.118	0.0968 - 0.139	0.110	–	–	NA
Iron	6010	–	–	NA	0.471	0.386 - 0.556	0.463	–	–	NA
Lead	7421	–	–	NA	0.132	0.108 - 0.156	0.134	–	–	NA
Manganese	6010	–	–	NA	0.188	0.154 - 0.222	0.185	–	–	NA
Mercury	7470	–	–	NA	0.0106	0.00795 - 0.0133	0.0105	–	–	NA
Nickel	6010	–	–	NA	0.406	0.333 - 0.479	0.392	–	–	NA
Zinc	6010	–	–	NA	0.221	0.181 - 0.261	0.206	–	–	NA
General Minerals (mg/l)										
Calcium	6010	–	–	NA	60.6	52.1 - 69.1	53.8	–	–	NA
Magnesium	6010	–	–	NA	30.8	26.5 - 35.1	28.9	–	–	NA
Potassium	6010	–	–	NA	123	105 - 141	107	–	–	NA
Sodium	6010	–	–	NA	173	147 - 199	152	–	–	NA
Chloride	300.0	–	–	NA	138	128 - 148	140	–	–	NA
Nitrate (as N)	300.0	–	–	NA	–	–	ND<0.25	–	–	NA
Nitrite (as N)	300.0	–	–	NA	–	–	ND<0.25	–	–	NA
Sulfate	300.0	–	–	NA	124	107 - 141	**94**	–	–	NA
Bicarbonate Alk.	310.1	–	–	NA	180	160 - 200	**190**	–	–	NA
Carbonate Alk.	310.1	–	–	NA	–	–	ND<1.0	–	–	NA
TDS	160.1	–	–	NA	913	794 - 1030	890	–	–	NA
TSS	160.2	–	–	NA	109	92.7 - 125	ND<10	–	–	NA
Hardness	130.2	–	–	NA	278	239 - 317	12	–	–	NA

Notes:
* = Advisory range not currently available
– = Constituent not added to performance evaluation sample.
For PE samples submitted prior to September 1996, VOCs were analyzed by Thermo Analytical using EPA Method 8021;
For the PE sample submitted in September 1996, VOCs were analyzed by Quanterra Environmental Services using EPA Method 8260..
Results shown in bold type are not within advisory range.
ND = Not detected at a concentration greater than the limit indicated.
NA = Not analyzed

Table 4-28
Baldwin Park Operable Unit
Summary of Well Survey Data

Multiport (MP) Well No.	4-inch Steel Casing Total Depth (ft bgs)	Surveyed Horizontal Coordinates				Surveyed Elevation (feet MSL)			
		(Calif. Coordinate NAD 27)		(UTM NAD 83)		Top of MP PVC Casing	Top of 4-inch Steel Casing	Well Cover	Ground Surface
		Northing (feet)	Easting (feet)	Northing (meters)	Easting (meters)				
MW5-03	1185	4152488.94	4306731.94	3774695.70	413516.73	473.83	NM	474.41	474.41
MW5-05	587	4142317.46	4295160.11	3771642.65	409950.45	342.18	NM	342.52	342.52
MW5-08	725	4143055.70	4293724.69	3771873.29	409516.03	338.48	338.99	339.25	339.20
MW5-11	719	4154266.96	4306961.38	3775236.52	413593.72	495.41	495.72	495.74	493.6
MW5-13	733	4156841.29	4308300.04	3773015.54	414011.84	533.74	534.14	534.16	530.8
MW5-15	815	4142854.23	4298272.52	3771793.82	410900.91	359.06	359.53	359.98	359.99
MW5-17	705	4155574.68	4306621.78	3775636.31	413495.45	511.15	511.60	511.62	509.4
MW5-18	830	4153886.97	4307907.38	3775116.98	413880.44	494.07	494.05	494.61	494.36

Notes:
bgs = below ground surface
MSL = mean sea level

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
MW5-03 (Zone 10)	BPW50310	235-245	473.83	08/03/95	274.77
				09/25/95	271.05
				03/18/96	256.83
				04/30/96	256.02
				05/29/96	257.48
				06/17/96	257.47
				08/01/96	256.45
				09/03/96	257.58
				09/16/96	257.00
MW5-03 (Zone 9)	BPW50309	300-310	473.83	08/03/95	274.93
				09/25/95	271.10
				03/18/96	256.88
				04/30/96	256.14
				05/29/96	257.56
				06/17/96	257.55
				08/01/96	256.51
				09/03/96	257.78
				09/16/96	257.35
MW5-03 (Zone 8)	BPW50308	400-410	473.83	08/03/95	274.96
				09/25/95	270.99
				03/18/96	256.78
				04/30/96	256.02
				05/29/96	257.73
				06/17/96	257.62
				08/01/96	256.51
				09/03/96	257.74
				09/16/96	257.38
MW5-03 (Zone 7)	BPW50307	510-520	473.83	08/03/95	275.01
				09/25/95	270.95
				03/18/96	256.64
				04/30/96	255.93
				05/29/96	257.83
				06/17/96	257.58
				08/01/96	256.38
				09/03/96	257.78
				09/16/96	257.45
MW5-03 (Zone 6)	BPW50306	590-600	473.83	08/03/95	275.06
				09/25/95	270.86
				03/18/96	256.54
				04/30/96	255.83
				05/29/96	257.72
				06/17/96	257.47
				08/01/96	256.36
				09/03/96	257.83
				09/16/96	257.41
MW5-03 (Zone 5)	BPW50305	670-680	473.83	08/03/95	275.08
				09/25/95	270.68
				03/18/96	256.57
				04/30/96	255.81
				05/29/96	257.75
				06/17/96	257.38
				08/01/96	256.30
				09/03/96	257.79
				09/16/96	257.49

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
MW5-03 (Zone 4)	BPW50304	810-820	473.83	08/03/95	274.99
				09/25/95	270.49
				03/18/96	256.38
				04/30/96	255.65
				05/29/96	257.84
				06/17/96	257.28
				08/01/96	256.17
				09/03/96	257.73
				09/16/96	257.50
MW5-03 (Zone 3)	BPW50303	920-930	473.83	08/03/95	274.54
				09/25/95	269.88
				03/18/96	256.13
				04/30/96	255.28
				05/29/96	257.67
				06/17/96	257.09
				08/01/96	255.86
				09/03/96	257.55
				09/16/96	257.34
MW5-03 (Zone 2)	BPW50302	1015-1025	473.83	08/03/95	274.42
				09/25/95	269.69
				03/18/96	255.90
				04/30/96	255.03
				05/29/96	257.56
				06/17/96	256.84
				08/01/96	255.62
				09/03/96	257.40
				09/16/96	257.19
MW5-03 (Zone 1)	BPW50301	1150-1160	473.83	08/03/95	273.81
				09/25/95	268.85
				03/18/96	255.43
				04/30/96	254.46
				05/29/96	257.21
				06/17/96	256.19
				08/01/96	255.02
				09/03/96	256.93
				09/16/96	256.89
MW5-05 (Zone 4)	BPW50504	218 - 228	342.18	08/16/95	263.14
				10/12/95	257.56
				10/30/95	256.25
				03/20/96	248.52
				04/30/96	246.86
				05/30/96	246.29
				06/21/96	245.41
				08/02/96	243.65
				09/04/96	243.52
				09/23/96	243.73

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
MW5-05 (Zone 3)	BPW50503	380 - 390	342.18	08/16/95	261.72
				10/12/95	255.88
				10/30/95	254.89
				03/20/96	247.66
				04/30/96	245.35
				05/30/96	245.57
				06/21/96	244.33
				08/02/96	242.28
				09/04/96	242.85
				09/23/96	243.25
MW5-05 (Zone 2)	BPW50502	464 - 474	342.18	08/16/95	261.83
				10/12/95	255.99
				10/30/95	255.00
				03/20/96	247.65
				04/30/96	245.35
				05/30/96	245.49
				06/21/96	244.26
				08/02/96	242.23
				09/04/96	242.81
				09/23/96	243.14
MW5-05 (Zone 1)	BPW50501	552 - 562	342.18	08/16/95	260.10
				10/12/95	254.03
				10/30/95	253.23
				03/20/96	246.09
				04/30/96	243.14
				05/30/96	244.13
				06/21/96	242.81
				08/02/96	240.71
				09/04/96	241.74
				09/23/96	242.21
MW5-08 (Zone 4)	BPW50804	380 - 390	338.48	08/02/96	241.44
				08/13/96	241.49
				09/04/96	241.75
				09/24/96	242.08
MW5-08 (Zone 3)	BPW50803	554 - 564	338.48	08/02/96	240.07
				08/13/96	240.55
				09/04/96	241.05
				09/24/96	241.56
MW5-08 (Zone 2)	BPW50802	670 - 680	338.48	08/02/96	239.70
				08/13/96	240.40
				09/04/96	241.02
				09/24/96	241.52
MW5-08 (Zone 1)	BPW50801	795 - 805	338.48	08/02/96	239.54
				08/13/96	239.86
				09/04/96	240.88
				09/24/96	241.47

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
MW5-11 (Zone 3)	BPW51103	310 - 320	495.41	10/10/95	269.92
				11/13/95	267.43
				03/14/96	256.94
				05/01/96	256.31
				05/30/96	258.74
				06/24/96	258.65
				08/01/96	257.37
				09/03/96	259.55
				09/20/96	259.39
MW5-11 (Zone 2)	BPW51102	530 - 540	495.41	10/10/95	269.37
				11/13/95	267.17
				03/14/96	256.74
				05/01/96	256.14
				05/30/96	258.79
				06/24/96	258.64
				08/01/96	257.32
				09/03/96	259.65
				09/20/96	259.30
MW5-11 (Zone 1)	BPW51101	690 - 700	495.41	10/10/95	269.07
				11/13/95	267.04
				03/14/96	256.55
				05/01/96	256.04
				05/30/96	258.85
				06/24/96	258.50
				08/01/96	257.19
				09/03/96	259.64
				09/20/96	258.21
MW5-13 (Zone 3)	BPW51303	340 - 350	533.74	01/18/96	262.87
				02/15/96	260.38
				03/14/96	258.79
				05/01/96	258.49
				05/29/96	261.50
				06/21/96	261.29
				08/02/96	260.11
				09/03/96	263.03
				09/19/96	262.74
MW5-13 (Zone 2)	BPW51302	520 - 530	533.74	01/18/96	262.69
				02/15/96	260.08
				03/14/96	258.56
				05/01/96	258.42
				05/29/96	261.73
				06/21/96	261.40
				08/02/96	260.14
				09/03/96	263.14
				09/19/96	262.91
MW5-13 (Zone 1)	BPW51301	684 - 694	533.74	01/18/96	262.40
				02/15/96	259.79
				03/14/96	258.27
				05/01/96	258.28
				05/29/96	261.77
				06/21/96	261.15
				08/02/96	260.05
				09/03/96	263.13
				09/19/96	262.85

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
MW5-15 (Zone 3)	BPW51503	235 - 245	359.06	07/09/96	246.13
				08/02/96	244.78
				08/13/96	244.99
				09/04/96	245.23
				09/23/96	245.45
MW5-15 (Zone 2)	BPW51502	450-460	359.06	07/09/96	245.77
				08/02/96	244.40
				08/13/96	244.74
				09/04/96	245.03
				09/23/96	245.32
MW5-15 (Zone 1)	BPW51501	670 - 680	359.06	07/09/96	244.72
				08/02/96	243.35
				08/13/96	243.99
				09/04/96	244.43
				09/23/96	244.87
MW5-17 (Zone 3)	BPW51703	305 - 315	511.15	10/30/95	268.07
				11/30/95	265.58
				03/15/96	255.89
				04/30/96	256.07
				05/30/96	259.30
				06/24/96	258.87
				08/02/96	257.46
				09/04/96	260.69
				09/20/96	260.58
MW5-17 (Zone 2)	BPW51702	540 - 550	511.15	10/30/95	267.95
				11/30/95	265.09
				03/15/96	255.53
				04/30/96	255.96
				05/30/96	259.46
				06/24/96	258.92
				08/02/96	257.58
				09/04/96	260.63
				09/20/96	260.39
MW5-17 (Zone 1)	BPW51701	698 - 708	511.15	10/30/95	267.74
				11/30/95	264.79
				03/15/96	255.45
				04/30/96	255.99
				05/30/96	259.57
				06/24/96	258.87
				08/02/96	257.54
				09/04/96	260.55
				09/20/96	260.43
MW5-18 (Zone 3)	BPW51803	500 - 510	494.07	06/03/96	259.33
				07/09/96	259.03
				08/01/96	259.10
				09/03/96	259.76
				09/23/96	259.66
MW5-18 (Zone 2)	BPW51802	630 - 640	494.07	06/03/96	259.18
				07/09/96	258.92
				08/01/96	258.05
				09/03/96	259.77
				09/23/96	259.70

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
MW5-18 (Zone 1)	BPW51801	780 - 790	494.07	06/03/96	259.09
				07/09/96	258.61
				08/01/96	257.87
				09/03/96	259.74
				09/23/96	259.69
EPA MW5-1 (Zone 13)	EPAW5113	216-226	402.70	05/01/96	251.18
				05/29/96	251.73
				06/19/96	251.64
				08/01/96	249.66
				09/03/96	250.12
				09/17/96	250.22
EPA MW5-1 (Zone 12)	EPAW5112	287-297	402.70	03/11/96	252.94
				05/01/96	251.07
				05/29/96	251.73
				06/19/96	251.57
				08/01/96	249.61
				09/03/96	250.17
				09/17/96	250.28
EPA MW5-1 (Zone 11)	EPAW5111	335-345	402.70	03/11/96	252.82
				05/01/96	251.12
				05/29/96	251.80
				06/19/96	251.50
				08/01/96	249.58
				09/03/96	250.19
				09/17/96	250.24
EPA MW5-1 (Zone 10)	EPAW5110	430-440	402.70	03/11/96	252.90
				05/01/96	251.06
				05/29/96	251.86
				06/19/96	251.56
				08/01/96	249.61
				09/03/96	250.38
				09/17/96	250.37
EPA MW5-1 (Zone 9)	EPAW5109	523-533	402.70	03/11/96	252.81
				05/01/96	250.93
				05/29/96	251.90
				06/19/96	251.44
				08/01/96	249.61
				09/03/96	250.38
				09/17/96	250.44
EPA MW5-1 (Zone 8)	EPAW5108	640-650	402.70	03/11/96	252.69
				05/01/96	250.75
				05/29/96	251.84
				06/19/96	251.40
				08/01/96	249.62
				09/03/96	250.42
				09/17/96	250.56
EPA MW5-1 (Zone 7)	EPAW5107	765-775	402.70	03/11/96	252.62
				05/01/96	250.63
				05/29/96	251.83
				06/19/96	251.33
				08/01/96	249.50
				09/03/96	250.47
				09/17/96	250.55

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
EPA MW5-1 (Zone 6)	EPAW5106	875-885	402.70	03/11/96	252.50
				05/01/96	250.45
				05/29/96	251.76
				06/19/96	251.23
				08/01/96	249.38
				09/03/96	250.42
				09/17/96	250.53
EPA MW5-1 (Zone 5)	EPAW5105	1030-1040	402.70	03/11/96	251.63
				05/01/96	249.33
				05/29/96	251.38
				06/19/96	250.50
				08/01/96	248.71
				09/03/96	250.08
				09/17/96	250.32
EPA MW5-1 (Zone 4)	EPAW5105	1123-1133	402.70	03/11/96	251.54
				05/01/96	249.24
				05/29/96	251.22
				06/19/96	250.34
				08/01/96	248.63
				09/03/96	250.07
				09/17/96	250.23
EPA MW5-1 (Zone 3)	EPAW5103	1256-1266	402.70	03/11/96	251.25
				05/01/96	248.99
				05/29/96	251.14
				06/19/96	250.19
				08/01/96	248.46
				09/03/96	250.01
				09/17/96	250.14
EPA MW5-1 (Zone 2)	EPAW5102	1387-1397	402.70	03/11/96	251.19
				05/01/96	248.86
				05/29/96	251.11
				06/19/96	250.18
				08/01/96	248.40
				09/03/96	249.98
				09/17/96	250.17
EPA MW5-1 (Zone 1)	EPAW5101	1495-1505	402.70	03/11/96	250.81
				05/01/96	248.69
				05/29/96	250.94
				06/19/96	249.90
				08/01/96	248.19
				09/03/96	249.96
				09/17/96	250.08
ALRC MW-1R	W11AZW1R	258-455	503.73	03/14/96	259.48
				03/29/96	259.12
				04/26/96	258.71
				05/31/96	259.98
				06/13/96	260.31
				07/29/96	259.56
				08/30/96	260.31
				10/04/96	261.46
				10/29/96	260.15

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
ALRC MW-3	W11AZW03	180-385	551.41	03/13/96	259.31
				03/29/96	259.26
				04/26/96	258.93
				06/11/96	262.49
				07/29/96	261.24
				08/30/96	264.06
				10/04/96	265.99
				10/29/96	263.28
ALRC MW-9	W11AZW09	195-450	554.75	03/13/96	261.46
				03/29/96	261.14
				04/26/96	260.55
				05/31/96	263.17
				06/11/96	263.40
				07/29/96	262.71
				08/30/96	264.31
				10/04/96	266.00
				10/29/96	264.40
Norac MW-1	W10NCMW1	255-310	503.12	01/31/96	259.17
				03/05/96	257.15
				03/15/96	257.04
				05/01/96	256.76
				06/03/96	259.47
				06/27/96	259.32
				08/08/96	258.50
				09/27/96	260.87
LA County 3030F (Key Well)	Z1000006	80-284	387.70	01/25/96	252.34
				02/29/96	250.51
				03/28/96	250.42
				04/25/96	249.10
				05/30/96	249.57
				06/27/96	248.98
				07/25/96	247.61
				08/30/96	248.10
				09/27/96	248.70
				10/25/96	248.80
LPVCWD 02	1901460	600-947	336.78	07/10/96	227.21#
				09/26/96	226.78#
Glendora 07G	01900831	252-474	533.01	07/08/96	265.95
				09/24/96	266.51
LA County Santa Fe 1	08000070	290-435	516.67	04/30/96	255.13
				08/02/96	258.95
				09/04/96	264.18
				09/04/96	264.18
Polopolus 01	01902169	120-280	417.48	10/01/96	252.48
				07/01/96	251.28
SGVWC B4B	51902858	920-1154	317.6	03/01/96	236.60
				04/01/96	228.60
				05/01/96	229.60
				06/01/96	228.60
				07/01/96	227.60
SGVWC B6C	71903093	275-506	332.99	03/01/96	244.99
				04/01/96	243.99
				05/01/96	242.99
				06/01/96	241.99
				07/01/96	239.99

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Table 4-29
Baldwin Park Operable Unit
Groundwater Elevation Data

Well Name	Well Recordation Number	Screened Interval (feet bgs)	Reference Point Elevation (feet MSL)[1]	Date	Groundwater Elevation (feet MSL)
SWS 139W1	01901598	120-349	368.90	06/27/96	244.90
				09/23/96	243.90
VCWD 2 (WEST MAINE)	01900028	250-580	425.74	09/30/96	252.74
				07/31/96	247.74
				08/30/96	251.24
VCWD 3 (MORADA)	01900029	275-585	484.45	03/29/96	265.45
				04/30/96	264.45
				05/31/96	261.95
				06/27/96	262.95
				07/31/96	262.45
				08/30/96	258.95
				09/24/96	263.45
				09/30/96	264.45
				10/31/96	263.45
VCWD 5 (PADDY LANE)	01900031	300-585	347.19	03/29/96	246.69
				04/30/96	243.69
				05/31/96	244.19
				06/27/96	243.19
				07/31/96	241.69
				08/30/96	241.69
				09/26/96	242.19
				09/30/96	240.69
				10/31/96	240.19
VCWD 9 (BIG DALTON)	01900035	250-582	367.67	03/29/96	244.17
				05/31/96	248.67
				06/27/96	248.17
				07/31/96	246.67
				08/30/96	246.67
				09/23/96	244.67
				09/30/96	247.17
VCWD 10 (LANTE)	08000060	275-577	455.93	01/28/96	253.93
				01/31/96	254.43
				03/31/96	250.93
				04/30/96	251.93
				05/31/96	251.93
				06/29/96	251.93
				06/30/96	251.93
				07/31/96	250.93
				08/30/96	251.96
				09/30/96	253.93
				10/31/96	252.93
VCWD 11 (PALM AVE)	08000039	540-602	363.49	03/29/96	247.49
				04/30/96	245.49
				05/31/96	246.49
				06/27/96	245.49
				07/31/96	243.49
				08/30/96	244.99
				09/25/96	246.49
				09/30/96	244.49
				10/31/96	243.49

Notes:
bgs = below ground surface
MSL = Mean Sea Level
[1] For wells other than MP wells, reference point elevations were provided by owner or watermaster.
#Elevation provided by purveyor appears to be pumping, rather than static, elevations.

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Table 4-30
Table of Calculated Specific Capacities and Estimated Transmissivities

STEP	*Discharge (gpm)*	*Drawdown (ft)*	*Specific Capacity (gpm/ft)*	*Transmissivity (gpd/ft)*	*Transmissivity (ft^2/day)*
1	750	1.8	416.7	833,333	111,408
2	1,500	3.8	394.7	789,474	105,545
3	2,250	5.97	376.9	753,769	100,771
4	3,040	8.52	356.8	713,615	95,403

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Table 4-31
Baldwin Park Operable Unit
Summary of Aquifer Test Results

Pumping Well	Test Type	Observation Well	Drawdown Data Transmissivity ft^2/day	Drawdown Data Storage Coefficient	Recovery Data Transmissivity ft^2/day	Recovery Data Storage Coefficient
Arrow	Arrow 72 Hour Constant Rate Discharge	Arrow	No Calculation	NA	299,480	NA
		Lante	323,672	0.0014	598,960	NA
Arrow	Arrow 35 Minute Restart	Arrow	No Calculation	NA	434,900	NA
		Lante	No Calculation	No Calculation	652,337	NA
Santa Fe #1	Santa Fe 72 Hour Constant Rate Discharge	Santa Fe #1	158,548	NA	136,195	NA
		Osco MW-4	172,961	0.063	No Calculation	NA
AZ-2	AZ-2 Pump Test #1	AZ-2	408,500	NA	510,600	NA
		ALR/TMC MW-10	785,500	0.0011	720,800	NA
AZ-2	AZ-2 Pump Test #2	AZ-2	467,000	NA	809,400	NA
		ALR/TMC MW-10	699,000	0.00109	894,300	NA
AZ-2	AZ-2 Pump Test #3	AZ-2	514,400	NA	561,000	NA
		ALR/TMC MW-10	727,500	0.00113	687,100	NA
Big Dalton	Big Dalton Step Test					
	Step #1	Big Dalton	111,408	NA	NA	NA
	Step #2	Big Dalton	105,545	NA	NA	NA
	Step #3	Big Dalton	100,771	NA	NA	NA
	Step #4	Big Dalton	95,403	NA	No Calculation	NA

NA: Not Applicable

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Section 5
Groundwater Modeling

5.1 Introduction

The purpose of the groundwater modeling presented in this report is to evaluate the groundwater containment systems proposed for the BPOU Pre-Remedial Design. The San Gabriel Basin is located in the eastern portion of Los Angeles County, and is shown on Figure 5-1. The BPOU Water Delivery Plan prepared for Three Valleys Municipal Water District is included in the simulation of the groundwater extraction and containment scenarios. The remedial extraction schemes are to be undertaken in Subarea 1 and Subarea 3 of the BPOU.

The principal goal of this study was to develop and calibrate a three-dimensional regional groundwater flow model of the main San Gabriel Basin, and to apply this model to evaluated the effectiveness of proposed extraction schemes in the BPOU. This model is capable of simulating the impact of recharge and pumping operations throughout the basin, and be of sufficient detail to allow assessment of the proposed extraction scheme designed to control migration of volatile organic compounds, primarily TCE, PCE and carbon tetrachloride, in the BPOU.

The groundwater flow model presented herein has been modified, as described below, since its application to evaluate the operation of the proposed Baldwin Park OU Water Delivery Project for Three Valleys Municipal Water District (CDM, 1996).

Because of the large number, all figures and tables have been grouped together and are included at the end of this section.

5.2 Groundwater Flow Model

The San Gabriel Basin regional groundwater flow model applied to the BPOU Pre-Remedial Design project is a five layer model defined by 6 levels of nodes, with over 1800 nodes per level. The areal extent of the model includes all of the Main San Gabriel Basin, and is of sufficient detail to evaluate the responses of the groundwater flow system to the proposed Baldwin Park Operable Unit extraction pumping. The development, calibration and application of the groundwater flow model is presented in the following sections.

5.2.1 DYNFLOW Computational Code

The groundwater flow computer code used in this study is the fully three-dimensional, finite element groundwater flow model, DYNFLOW. This model has been developed over the past 15 years by CDM engineering staff, and is in general use for such large scale basin modeling projects. It has recently been applied to portions of the San Fernando Basin, to early versions of the San Gabriel Basin model, to a detailed model of the Puente Basin, and to several studies in the West Coast Basin.

The governing equation for three-dimensional groundwater flow that is solved by DYNFLOW is:

$$S_s \frac{\partial \phi}{\partial t} = \frac{\partial}{\partial x_i} K_{ij} \frac{\partial \phi}{\partial x_j}; i,j = 1,2,3$$

where the state variable ϕ represents the potentiometric head [L]; K_{ij} represents the hydraulic conductivity [LT^{-1}] tensor; S_s is the specific storativity (volume/volume/length), [L^{-1}]; x_j is a cartesian coordinate and t is time.

DYNFLOW uses a grid built with a large number of tetrahedral elements. These elements are triangular in plan view, and give a wide flexibility in grid variation over the area of study. An identical grid is used for each level of the model, but the thickness of each model layer (the vertical distance between levels in the model) can vary at each point in the grid. In addition, 2-dimensional elements can be inserted into the basic 3-dimensional grid to simulate thin features such as faults. One-dimensional elements can be used to simulate the performance of wells which are perforated in several model layers.

DYNFLOW accepts various types of boundary conditions on the groundwater flow system including:

- Specified head boundaries (where the piezometric head is known, such as at rivers, lakes, or other points of known head)
- Specified flux boundaries (such as rainfall infiltration, well pumpage, and no-flow "streamline" boundaries)
- Rising water boundaries; these are hybrid boundaries (specified head or specified flux boundary) depending on the system status at any given time.

The DYNFLOW code has been reviewed and tested by the International Groundwater Modeling Center (van de Heijde 1985), and has been extensively tested and documented by CDM.

5.2.2 Finite-Element Grid

Figure 5-2 depicts the numerical grid of the regional model. The entire Puente Valley is not included in the regional model; a separate sub-model for that basin exists. The regional grid contains more than 1800 nodes, and has over 3500 elements in plan view. The model has been discretized vertically into six levels, and thus includes five model layers to represent the response of the aquifer in the basin. The DYNFLOW convention is to begin numbering levels and layers from the bottom of the model; thus level 1 in the model represents the elevation of the top of the bedrock, and level 6 represents the top of the model. The bedrock elevation is based upon lines of equal elevation of the effective base of the aquifer as shown in the California Department of Water Resourses, Bulletin No. 104-2, 1966, which have been digitized and are contained in the CH2M Hill/EPA San Gabriel Basin GIS. The elevation of the level 6 nodes are specified at the ground surface.

Layer 1 is the lowest layer of the model and is used to represent the lower portions of the aquifer. In the central portion of the basin, the top of layer 1 is generally below elevation -400 feet MSL, and the layer has a maximum thickness of approximately 2,000 feet. Layers 2 through 5 represent the uppermost section of the aquifer; these layers extend from -400 feet MSL to about +400 feet MSL in the central section of the basin. Each of these upper layers is of similar thickness, and each is approximately 200 feet thick in the central section of the basin. The layers decrease in thickness towards the western and eastern boundaries of the basin, and along the edges of the basin some of the upper layers are pinched out. These layers effectively separate the upper aquifer into several depth zones, which are used to more effectively represent the distribution of pumping at varying depths in the basin.

Important fault structures within the basin model area are modeled with two-dimensional elements superimposed on the three-dimensional grid. These 2-dimensional elements can be used to control horizontal flow across the element. The Duarte Fault and the One Hill-Way Hill Fault, which are believed to have an impact on the groundwater flow system are explicitly modeled in this manner. These fault regions can be identified as long thin series of elements on Figure 5-2. All other areas in the basin are modeled with three-dimensional elements.

Grid density varies across the basin. Near the edges of the basin, the nodes are spaced farther apart and elements are larger; nodal spacing in this region is about 2,000 feet. In the Baldwin Park Operable Unit study area the nodal spacing is much closer and the grid discretization is much finer; here nodal spacing is typically 600 to 1000 feet. The finer grid discretization is needed to reproduce the impacts of proposed remedial pumping and recharge in the Baldwin Park area. Figure 5-3 presents this area of the numerical grid in detail.

Figures 5-4 and 5-5 show typical cross-sections through the modeled area, and illustrate the dramatic changes in basin depth across the valley. Figure 5-4 presents a basic west-east cross section (located to intersect the junction of the I-10 with the San Gabriel River at its middle), while Figure 5-5 shows a section running from north to south along the San Gabriel River from the mouth of the San Gabriel Canyon to Whittier Narrows. The cross-sections also show assigned hydraulic conductivity zones in the model. These are discussed in Section 5.2.5.

5.2.3 Model Boundary Conditions

The San Gabriel Basin Regional Groundwater Model uses three types of boundary conditions. These include no flow boundaries, specified flux boundaries, and specified head boundaries.

- No-Flow Boundaries: The western, southwestern, and southeastern boundaries of the model, with the exception of the outlet at Whittier Narrows and the boundary with Puente Valley, are defined as no-flow boundaries.

- Specified Flux Boundaries: There are three distinct sections which are modeled with specified fluxes. In the San Dimas area, in the northeast corner of the basin, a specified flux is used to define inflow to the San Gabriel Basin from the Chino Basin. This flux is set at 6,900 acre-feet per year (ac-ft/yr), and is evenly distributed across the 3 nodes which define the boundary with the Chino Basin. Along the Raymond Fault a flux of 6,200 ac-ft/yr is specified. This flux

is concentrated at nodes along the northeastern one-third of the boundary, approaching the San Gabriel Mountains. The third area of specified flux is along the base of the San Gabriel Mountains. Here, 5,000 ac-ft/yr are evenly distributed at the nodes along this boundary.

- The specified boundary fluxes are listed in Table 5-1. All of the specified flux amounts used in the model are based upon the 27-year average of subsurface inflow presented in Bulletin No. 104-2, Planned Utilization of Ground Water Basins, San Gabriel Valley, California Department of Water Resources, 1966. These specified fluxes are not varied in any of the simulations.

- Fixed-Head Boundaries: Three boundaries are governed by fixed heads. Two of these are at the boundary with Puente Valley, and at the basin outlet at Whittier Narrows. Specified head levels in these areas are based upon water level observations in the CH2M Hill/EPA San Gabriel Basin Geographic Information System (GIS), and the Los Angeles County Department of Public Works water level database. These heads are varied on a quarterly basis in the transient simulations. The third fixed head boundary is at the northern extent of the model representation of the San Gabriel Canyon, south of the Morris Dam. The heads specified at this boundary are held fixed throughout the transient simulations.

- Invoked Boundary Conditions: Fixed head boundary conditions may be invoked at the top and bottom levels of the model during a simulation. If these boundary conditions are invoked, fluxes into or out of the model may be generated. These fluxes are identified as the Rising/Dry model generated fluxes in the steady-state and transient water balance tables.

5.2.4 External Model Stresses

The San Gabriel Basin Regional Groundwater Model includes three types of external stresses to represent the climatic conditions and water supply activities which occur in the basin. These stresses are production pumping, water recharged at spreading basins, and areal recharge resulting from precipitation and returned water.

5.2.4.1 Pumping Fluxes

The pumping fluxes applied in the regional model are taken directly from the pumping flux data compiled in the CH2M Hill/EPA San Gabriel Basin GIS. The steady-state calibration simulations used the average annual pumping flux for the Water Year October 1, 1981 to September 30, 1982. Figure 5-6 illustrates the average groundwater pumping applied for the steady state calibration. Figure 5-7 illustrates the magnitude and location of the total average pumping for the period from Water Year 1981-1982 through Water Year 1992-1993. These appear to be very similar, indicating no major change in pumping operations during this period. Seasonal and annual variations in overall basin pumping are presented in Section 5.2.7. The actual pumping fluxes applied to the model during the transient simulations were varied on a quarterly basis.

5.2.4.2 Recharge

Two types of recharge are applied in the regional model. Rainfall recharge, and returned water from irrigation and distribution system leakage, are applied on an element basis throughout the basin. A total areal recharge of 7.5 inches per year (in/yr) is applied in this manner. This recharge

quantity was estimated based upon a 3.4 in/yr of recharge from precipitation (this is approximately 18.5% of the average annual precipitation of 18.2 inches for the 1933-1960 period, CDWR, 1966) and 4.1 in/yr of recharge from returned water. This rate for returned water is consistent with estimates used in other regional modeling studies in large basins in the Los Angeles Basin area. The areal recharge was applied uniformly across the basin, and was maintained at a constant rate for all simulation runs (both steady state and transient).

In addition to the areal recharge, recharge is also introduced into the model on a nodal basis; this nodal recharge is used to represent all concentrated inflows to the groundwater system. Water recharged at spreading basins and along the San Gabriel River is modeled as nodal point recharge. The locations of the spreading facilities are shown on Figure 5-8. At each spreading basin the recharge is applied equally to the nodes used to represent that spreading facility. Recharge amounts are generally taken from Water Recharge Study For TVMWD Proposed Project, Stetson Engineers Inc., 1995. Recharge amounts at selected spreading sites for the period of October, 1982 - September, 1987 are taken from data supplied by Harding Lawson Associates (as reported by Los Angeles Department of Public Works). The recharge flux at the spreading basins and along the San Gabriel River is varied on a quarterly basis during the transient simulations.

The amount of nodal recharge applied during the 1981-1982 calibration period is listed in Table 5-2. Similar data were input to the model for each of the 47 quarterly periods of the transient simulations. These input data are included in Appendix G.

5.2.5 Aquifer Hydraulic Properties

The following aquifer properties are specified in each of the three-dimensional elements of the model; horizontal hydraulic conductivity, vertical hydraulic conductivity, specific yield and specific storativity. The only property specified for the two-dimensional elements used to represent the fault zones is horizontal hydraulic conductivity.

5.2.5.1 Horizontal Hydraulic Conductivity

The horizontal hydraulic conductivities used in the model are presented on Figures 5-9 and 5-10. The DYNFLOW numbering convention is to number layers from the bottom to the top. The configuration of horizontal hydraulic conductivity in model layer 1, the bottom layer is shown on Figure 5-9. The configuration of horizontal hydraulic conductivity for model layers 2, 3, 4 and 5 is shown on Figure 5-10. The alluvial materials of the aquifer become much thinner at the edges of the basin, and the upper layers of the model were pinched out to represent the thinning aquifer.

Hydraulic conductivities were initially estimated based upon the examination of boring logs, pump test data at several locations, and from estimates developed in prior regional modeling work by EPA. Plots showing the hydraulic conductivity data from these studies are included on Figures 5-11 through 5-14.

Examination of boring logs for various wells in the basin did not indicate a distinct regional-scale stratification of aquifer materials. Therefore the hydraulic conductivities of the model for layers 2 through 5, are the same for any element (i.e. a vertical column at that element would have the same properties for every layer in the model). In layer 1 a different conductivity from that used in the

overlying layers is used in a few locations; these are in the vicinity of Whittier Narrows and in the center of the basin. In other regions the conductivity in layer 1 is the same as in the overlying layers 2 through 5.

In general, the initial set of values for hydraulic conductivities in the model were selected to be consistent with a geological depositional sequence which would result in higher conductivity materials along the San Gabriel River and Rio Hondo channels, and finer, lower conductivity materials at the edges of the basin. This distribution of properties was applied to the initial model, and these values were then adjusted during the calibration process (see Sections 5.2.6 and 5.2.7). The hydraulic conductivities shown on Figures 5-9 and 5-10 are those which were selected based on the calibration studies.

As shown on Figures 5-9 and 5-10 the horizontal conductivities specified along the outer portions of the basin generally range from 7 to 50 feet/day. Just upgradient of Whittier Narrows the conductivities used are 40 feet/day in layer 1, and 175 feet/day in the upper layers (2-5) of the model. In the central portion of the basin, south of the Duarte Fault, conductivities range from 250 to 350 feet/day. Through the San Gabriel Canyon, north of the Duarte Fault the hydraulic conductivity used is 105 feet/day.

The Duarte Fault was simulated with a very low horizontal hydraulic conductivity, ranging from 0.15 to 1 feet/day, except for a small section in the area of the San Gabriel River, which is identified in Figure 5-15. This section, shown on Figure 5-16, located in the upper two active layers of the model, was simulated with a horizontal conductivity of 125 feet/day, and represents a "notch" in the fault, which permits flux to pass from the San Gabriel Canyon into the main portion of the basin, provided the water level north of the fault is above an elevation of 375 feet MSL.

5.2.5.2 Vertical Anisotropy

The vertical anisotropy ratio (horizontal conductivity/vertical conductivity) is used to represent the interbedding of silts and clays within the sand and gravel deposits of the basin. Anisotropy ratios of 10, 30 and 100 are used throughout the basin. Areas in the center of the basin which are characterized primarily by gravel deposits are modeled with a vertical anisotropy ratio of 30. Use of this anisotropy ratio yielded a variation in head with depth in the central area of the basin, which closely reflected the observed variation at the multi-port monitoring wells. This data, as reported in Section 4, indicated that the vertical difference in head is typically less than one foot over the full range of the monitoring wells. Some areas of the model in which spreading basins are located were modeled with a vertical anisotropy ratio of 10. This ratio was chosen based upon modeling judgement, to implement the historical applied spreading while avoiding the creation of significant groundwater mounds. Other areas are modeled with a nominal ratio of 100. The vertical anisotropy ratio for the model is presented on Figure 5-17. The vertical anisotropy ratio is not varied by layer.

5.2.5.3 Specific Yield and Storativity

The modeled specific yield values for each model layer are presented on Figures 5-18. The modeled specific yield is set at values ranging from 0.05 to 0.12. The majority of the basin is modeled with a specific yield of 0.10 or 0.12. Only those areas located some distance from either the San Gabriel

River, or the Rio Honda are modeled with a specific yield of 0.05. These are areas of low-energy deposition, and are comprised primarily of interbedded sands and clays. A constant value of 0.000001 for storativity was used for all elements throughout the basin.

5.2.6 Steady-State Calibration

The regional groundwater flow model was calibrated to observed water levels throughout the San Gabriel Basin. Water level data was taken from the CH2M Hill/EPA San Gabriel Basin GIS, the LA County water level database, and water level data provided by the Main San Gabriel Basin Watermaster. In the development of the regional model the initial estimates of aquifer properties were varied systematically throughout the basin, until the model could better reproduce the observed variation in piezometric heads across the basin. The properties which were varied include the horizontal hydraulic conductivity, and the vertical anisotropy ratio.

5.2.6.1 Steady-State Calibration Process

Calibration of the model took place in two phases. Heads in the San Gabriel Basin vary significantly during normal climatic conditions. A time history of the head at the Baldwin Park Key Well from January, 1980 through October, 1995 is shown on Figure 5-19. As shown in this figure, the water elevation at the Key Well fluctuated from a high of approximately 295 feet MSL through a low of approximately 200 feet MSL during this period. Such variation in head is typical of the aquifer response in the basin to wet and dry climatic cycles, including the impact of pumping and recharge operations in the basin.

The water level at the Key Well, and water levels throughout the central portion of the basin, are impacted by the amount of recharge to the basin; both recharge from precipitation, and recharge applied at spreading facilities and along the San Gabriel River channel. These recharge amounts fluctuate with the climatic cycles. Therefore wet climatic periods will produce greater amounts of recharge and higher heads in the basin, while dry periods will produce less recharge and lower heads in the basin. Recharge variations during this period are shown on Figure 5-20.

Since the period of October, 1981 through September, 1982 was one of relatively small (generally less than 5 feet) variation in head in the basin, this period was selected for an initial "pseudo" steady state calibration; the first phase of calibration. Applied recharge and pumping fluxes were averaged over this 12-month period. Boundary fluxes were specified as described in Section 4; these values are the 27-year long term averages (CDWR, Bulletin 104) and were not modified specifically for the 1981-1982 Water Year. The model simulated heads were compared to the average of the observed water levels at each of the approximately 150 wells where data were available for the 1981-1982 Water Year.

The average observed water levels for the 1981- 1982 Water Year are plotted on Figure 5-21. Observed water levels in the center of the basin are approximately 250 feet above mean sea level, and the gradient in this area is quite flat. North of the Duarte Fault, the water levels are generally well above 500 feet MSL. The highest observed water levels occur at the eastern edge of the basin, in the area of San Dimas, where heads of over 1000 feet MSL are measured. This eastern sector also displays some of the steepest gradients in the groundwater flow system. Heads at the Whittier Narrows area were about 195 feet MSL during the year.

During the calibration process the horizontal hydraulic conductivities in the model were varied until the model generally replicated the average observed water levels for the 1981-1982 Water Year. Typical ranges over which the model properties were varied were:

- In areas close to the basin boundaries, hydraulic conductivities ranging from 5 to 50 feet/day were used.
- In the region just upgradient of Whittier Narrows, conductivities in layer 1 were varied from 10 to 150 feet/day. In the upper layers in this area modeled conductivities were simulated at 100 to 300 feet/day.
- The central portion of the basin, south of the Duarte Fault, was simulated at the highest conductivities in the basin. This region encompasses the San Gabriel River deposits. Hydraulic conductivities were modeled at values ranging from 200 to 500 feet/day.
- North of the Duarte Fault through the San Gabriel Canyon, conductivities from 50 to 150 feet/day were simulated.
- The two faults, Duarte and Lone Hill-Way Hill, which were explicitly modeled with two-dimensional elements were simulated with horizontal hydraulic conductivities ranging from 0.1 to 5 feet/day. The one exception to this is the small section of the Duarte Fault which serves as an opening for flux to pass into the central portion of the basin. Conductivities in this "notch" were varied from 50 to 150 feet/day.

5.2.6.2 Steady-State Calibration Results

Figure 5-22 depicts contours of the simulated water table for the "pseudo" steady-state calibration period. These contours depict the direction of groundwater flow which in the center of the basin is generally toward the southwest, toward Whittier Narrows. Flow in the eastern section of the basin is predominately to the west, and feeds the central section of the basin. In the western section of the basin flow is generally toward the pumping centers in Alhambra and Monterey Park. These flow directions agree well with observed behavior in the basin.

A comparison between the simulated and observed water levels is presented on Figures 5-23 and 5-24. Figure 5-23 presents the numerical differences between observed and simulated water levels at 147 wells in the basin. These 147 wells are all the wells where consistent data for the 1981-1982 Water Year were available. Table 5-3 presents the comparison between observed and simulated heads for each of these wells in tabular form. As shown in the table, the mean difference between simulated and observed heads is 1.9 feet and the standard deviation is 7.3 feet. Calibration in the central portion of the basin (including the BPOU area) is very good; the differences in observed and calculated head in this area are generally no more than 5 feet at any well. This five foot difference is small relative to the head change over the central portion of the basin, from just north of Whittier Narrows to the Duarte Fault, which is 75 to 85 feet. The head change across the entire San Gabriel Basin is approximately 800 feet, from a high of 1,000 feet MSL to less than 200 feet in the Alhambra and Whittier Narrows areas. Figure 5-24 presents a symbol plot of ranges of differences between

observed and simulated water levels. A review of this plot indicates that there is little spatial bias in the variation of the model results from the observed data.

The mass balance of the steady state calibration simulation is presented in Table 5-4. Note that the values shown in the table for boundary fluxes across the Raymond Fault, from the San Gabriel Mountains, and from the Chino Basin, are specified as input to the model. The fluxes from Puente Valley and across Whittier Narrows are computed by the model. At the boundary with Puente Valley, the model estimates 998 ac-ft flowing into the main San Gabriel Basin from the Puente Basin. The simulated discharge from the basin at Whittier Narrows was 13,457 ac-ft during the 1981-1982 Water Year.

5.2.7 Transient Calibration

Once the preliminary steady state calibration had been completed, the model was applied to simulate the 12 year period from 10/82 through 6/94. During this period the water levels at the Key Well experienced a fluctuation of approximately 100 feet, while smaller variations were observed in the eastern and western sections of the basin.

5.2.7.1 Variation of Model Properties

During the transient simulation the pumping fluxes, spreading basin recharge fluxes, and specified boundary heads (at Puente Valley and Whittier Narrows) were varied on a quarterly basis. The quarterly spreading basin recharge and pumping fluxes are presented in Figure 5-25. Over the transient simulation period the total volume of production pumping within the basin is relatively constant, however the recharge applied at spreading basins fluctuates much more greatly. Specified boundary fluxes, and recharge from precipitation and returned water were held constant at their long term (27-year) average (CDWR, Bulletin 104), throughout the transient simulation.
During this second phase of the calibration process the horizontal hydraulic conductivities of the model were varied only in the central portion of the basin. The vertical anisotropy ratio was also varied in some simulations, with values ranging from 10 to 100 being used in the basin. Properties related to the storage characteristics of the basin were also varied. The specific yield was varied over a range of 0.05 to 0.2 to better reproduce the aquifer behavior in some sectors of the basin. A number of different representations of the Duarte Fault 'notch' were also tested.

5.2.7.2 Transient Calibration Results

Sixteen wells, chosen to provide comprehensive spatial coverage of the basin, were used as indicator wells during the transient calibration. The location of these wells are plotted on Figure 5-26. Hydrographs for these wells depicting the observed and simulated water levels for the transient calibration period are shown on Figures 5-27 through 5-42. These figures indicate that the model reasonably reproduces the transient behavior of the San Gabriel Basin during the wet and dry cycles experienced during the simulation period. The model is particularly good at simulating the behavior of the central portion (BPOU area) of the basin. The very different behavior in the El Monte area and in the vicinity of San Dimas are also simulated quite well. At San Dimas the relatively small variation of only about 20 feet, which the model reproduces during this period, is very different from the 100 foot variation in the central basin area. North of the Duarte Fault, at Fish Canyon, the model reproduces the oscillating nature of the observed head. Importantly, the model

preserves the 150 to 200 foot head difference observed across the Duarte Fault, indicating that the hydraulic impact of the Duarte Fault is represented in the model.

The model is somewhat less successful at simulating hydrographs in the Glendora area. This area is heavily influenced by the boundary fluxes, which, as noted, were maintained at their long term average values (CDWR, Bulletin 104) during the transient simulation. No data on short term variation in these fluxes was available. The transient calibration could likely be improved by varying the specified boundary fluxes in this area.

5.2.7.3 Transient Fluxes

A summary of the boundary and applied fluxes during the transient simulation is presented in Table 5-5. These fluxes are computed on a Water Year basis for each of the complete Water Years in the simulated period. Note that only three quarters in the 1993-94 Water Year were included in the simulation, and annual fluxes for 1993-94 are not included in Table 5-5. The specified boundary fluxes from the Raymond Basin, the Chino Basin and the San Gabriel Mountains were held constant throughout the transient simulation period. Recharge from precipitation and applied water was also held constant.

The computed fluxes at the Puente Valley boundary and at Whittier Narrows are presented in Table 5-5 for each complete Water Year simulated. The fluxes from Puente Valley into the main San Gabriel Basin range from 350 to 2,000 ac-ft/yr. At the Whittier Narrows boundary 2,000 to 22,000 ac-ft/yr are discharged to the Central Basin.

The "storage flux" in Table 5-5 represents water which is either released from or placed into storage in the aquifer during any given water year. There are 7 years during which water is released from storage (a negative flux value in Table 5-5)as a result of the long drought period from 1984 through 1990. In addition, water was added to storage in 4 years of the 12 year transient simulation.

5.2.8 Flow Model Sensitivity Analysis

Two series of flow model sensitivity analyses were conducted. In the first series aquifer hydraulic properties were varied in the BPOU area to assess their effect on the calibrated model. The second series was designed to assess the impact of the Duarte Fault notch representation on the simulated steady state and transient flow fields. Table 5-6 summarizes the sensitivity analyses simulations.

5.2.8.1 Aquifer Hydraulic Property Sensitivity Analysis

The sensitivity simulations which varied hydraulic conductivities focused on the central portion of the basin, in the area of the Baldwin Park Operable Unit. Model properties which were altered cover the area south of the Duarte fault and north of the I-10 in the center of the basin. These properties have an original horizontal conductivity of 250 and 350 feet/day, as presented in Figures 5-9 and 5-10.

- Sensitivity Analysis Case 1 - Horizontal hydraulic conductivities are increased to 300 and 400 feet/day in the center of the basin. The vertical anisotropy ratio is 10 to 1 for these areas. A plot of the calculated minus observed water levels is presented in Figure 5-43. The "pseudo" steady state calibration statistics are similar to the calibrated model (Table 5-7).

- Sensitivity Analysis Case 2 - Horizontal hydraulic conductivities are decreased to 200 and 300 feet/day in the center of the basin. The vertical anisotropy ratio is 30 to 1 for these areas. Figure 5-44 presents calculated minus observed water levels. Calibration statistics are degraded from the calibrated model.

- Sensitivity Analysis Case 3 - Horizontal hydraulic conductivities are decreased to 150 and 250 feet/day in the center of the basin. The vertical anisotropy ratio is maintained at 30 to 1 in these areas. The calculated minus observed water levels are presented in Figure 5-45. Calibration statistics are significantly degraded from the calibrated model.

5.2.8.2 Duarte Fault Sensitivity Analysis

Three different sensitivity analysis simulations were run to evaluate the impact of the Duarte Fault notch. As illustrated on Figures 5-15 and 5-16, the notch in the Duarte Fault is located just to the west of the San Gabriel river, and is a V-shaped area of high horizontal conductivity.

- Sensitivity Analysis Case 4 - The notch is moved slightly to the east, and is centered over the San Gabriel River. The shape and horizontal conductivity of the notch is maintained as in the calibrated model. A plot of calculated minus observed water levels is presented in Figure 5-46. The calibration statistics are very similar to the calibrated model, which does not appear to be sensitive to this change.

- Sensitivity Analysis Case 5 - The gap in the fault is extended along the entire width of the San Gabriel Canyon opening. The upper two active layers of the model in the gap are modeled with a high horizontal conductivity. Figure 5-47 displays the calculated minus observed water levels. Again the calibration statistics are relatively insensitive to this change.

- Sensitivity Analysis Case 6 - The notch is moved to the east to be centered over the high concentration area of the VOC plume located in the BPOU. The notch shape and horizontal conductivity is the same as in the calibrated model. The calculated minus observed water levels for this simulation are presented in Figure 5-48. From this figure it is apparent that less water is passing through the fault into the central basin. Water levels south of the Duarte Fault are lower, and north of the Duarte Fault are higher than those simulated with the calibrated model. The calibration statistics are also slightly degraded.

A summary of the calibration statistics for the sensitivity analysis is presented in Table 5-7(a). Although the steady state calibration statistics for Cases 1, 4, and 5 are comparable to, or even slightly better, than those of the base case model, the base case calibrated model is considered to better represent the behavior of the basin based upon the transient calibration simulations (Table 5-7(b)).

5.3 Simulation of Containment/Extraction Alternatives

The performance of a range of proposed extraction alternatives was evaluated by simulating the containment that would be achieved by each of the alternatives over a 12-year time period. The simulations were performed using the calibrated flow model presented in Section 5.2, in

conjunction with a particle tracking approach to illustrate the effective capture area of each extraction well.

The goal of the extraction alternatives is to inhibit migration of the VOC plume in the Baldwin Park Operable Unit. The horizontal extent of the plume to be contained is illustrated in Figure 5-49 which shows a plan view map of the generalized distribution of TCE concentrations greater than 50 µg/l as determined from the VOC data obtained in September 1996 from the multi-port wells, and from the October 1996 sampling of the production wells. This distribution is being used to represent the horizontal and vertical extent of groundwater contamination targeted for containment. TCE concentrations are used to represent the extent of the VOC plume because :

1. TCE is the most commonly occurring VOC with the highest concentrations in the vicinity of the proposed extraction locations, and

2. The horizontal extent of TCE is slightly greater than PCE. Combined these two VOCs represent the majority of VOC mass in the groundwater within the BPOU.

The vertical distribution of TCE is shown in Figure 5-50, a cross-section running along the center of the plume.

The performance of each of the extraction alternatives was evaluated by simulating the capture attained for a 12-year period of transient flow, with the pumping for the proposed alternative superimposed on the historic 1982-1994 recharge and pumping conditions. This transient period incorporates a wide range of pumping and recharge conditions in the basin.

The historic pumping, varied on a quarterly basis, was maintained at all wells in the San Gabriel Basin with the following exceptions:

- Pumping at municipal well Glendora 07G, which lies in the core of Subarea 1, was assumed to be zero.

- Pumping at the Arrow/Lante wells was also assumed to be zero.

The shutdown of each of these wells is consistent with present plans for future operation at these locations.

Pumping rates at the SGVWC B6 wellfield and Big Dalton were also maintained at their historic levels, except for those simulations where they are included in the proposed extraction scheme.

For each of the alternatives, the recharge water imported to fulfill the requirements of the Main San Gabriel Watermaster requirements was spread at various spreading basins as defined in the Baldwin Park Water Delivery Plan (Three Valleys Municipal Water District, January 1996). In this plan, 19,000 gpm was spread at the Santa Fe Spreading grounds when the water level at the Key Well was less than 250 feet, and spreading occurred at the eastern spreading grounds (Little Dalton, San Dimas and Citrus) when water levels at the key well were above 250 feet. During these periods of spreading in the eastern basin, recharge rates are generally less than 19,000 gpm, and the 'banked'

recharge water is spread at Santa Fe Spreading Grounds once the water level at the Key Well drops. Full details of the recharge allocations are included in the EIR for the Baldwin Park Water Delivery Plan (Three Valleys Municipal Water District, January 1996).

5.3.1 Containment Scenarios

The following five extraction alternatives were evaluated.

Case 1: This is a modification to the basic ROD defined extraction alternative with the following characteristics:

Subarea 1: Cluster 10 - 4,500 gpm, Cluster 13 - 4,000 gpm
Total Subarea 1 pumping: 8,500 gpm

Subarea 3: Cluster 5 - 3,500 gpm, Paddy Lane - 3,500 gpm
Big Dalton - 3,500 gpm
Total Subarea 3 pumping: 10,500 gpm

Total Extraction Pumping: 19,000 gpm

Case 2: This is a modification to the basic ROD defined extraction alternative with the following characteristics:

Subarea 1: Cluster 10 - 4,500 gpm, Cluster 13 - 4,000 gpm
Total Subarea 1 pumping: 8,500 gpm

Subarea 3: Paddy Lane - 3,500 gpm, Big Dalton - 3,500 gpm
B6 - 3,500 gpm, B6C at 1,000 gpm, and B6D at 2,500 gpm
Total Subarea 3 pumping: 10,500 gpm

Total Extraction Pumping: 19,000 gpm

Case 3: This is another modification to the basic ROD defined extraction alternative with the following characteristics:

Subarea 1: Cluster 10 - 4,500 gpm, Cluster 13 - 4,000 gpm
Total Subarea 1 pumping: 8,500 gpm

Subarea 3: Cluster 5 - 3,500 gpm, Paddy Lane - 3,500 gpm
B6 3,500 gpm - B6C at 1,000 gpm, and B6D at 2,500 gpm
Total Subarea 3 pumping: 10,500 gpm

Total Extraction Pumping: 19,000 gpm

Case 4: In this alternative, Cluster 5 is relocated to the south and west to better contain the southern extent of the VOC plume. Cluster 13 is moved to the south, to be aligned with Cluster 10. In addition, total extraction pumping in Subarea 3 is increased to provide better control of migration across the width of the plume on an alignment running through

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Cluster 5 and Paddy lane. Iterative simulations indicated that pumping of 13,000 gpm is required to provide containment in Subarea 3. For this alternative, there is a commensurate reduction in pumping in Subarea 1 to maintain overall extraction at the 19,000 gpm limit. The alternative has the following characteristics:

Subarea 1: Cluster 10 - 4,500 gpm, Cluster 13 - 1,000 gpm
Total Subarea 1 pumping: 5,500 gpm

Subarea 3: Cluster 5 (relocated) - 5,000 gpm, Paddy Lane - 5,500 gpm
B6 - 3,000 gpm - B6C at 1,000 gpm, and B6D at 2,000 gpm
Total Subarea 3 pumping: 13,500 gpm

Total Extraction Pumping: 19,000 gpm

Case 5: The objective of Case 5 is to increase the width of containment in Subarea 3. This was achieved by relocating Cluster 5 further west, and the addition of a new extraction cluster (named 5B) located between Paddy Lane and Cluster 5. B6 is not a part of the remedial scheme in this case. Overall extraction pumping remains at 19,000 gpm. The alternative has the following characteristics:

Subarea 1: Cluster 10 - 4,500 gpm, Cluster 13 - 1,000 gpm
Total Subarea 1 pumping: 5,500 gpm

Subarea 3: Cluster 5 (relocated) - 4,000 gpm,
Cluster 5B - 5,500 gpm, Paddy Lane - 4,000 gpm
Total Subarea 3 pumping: 13,500 gpm

Total Extraction Pumping: 19,000 gpm

5.3.2 Results of Simulation of Extraction Alternatives

For each of the above alternatives, the capture to be achieved during the 12-year transient was simulated by evaluating the ability of the alternative to capture 'particles' (representing VOCs) which were started at an elevation of +50 feet (MSL) throughout the BPOU area. The starting locations of the particles which were removed from the system at an extraction well during the simulation period are shown on the capture plots presented in Figures 5-51 through 5-55. The extraction wells used in each alternative are also shown on these figures. In each of these plots, the containment achieved by the extraction scheme is clearly defined. These figures also include the limits (defined as 50 ppb) of the TCE plume based on the September/October 1996 data.

The following characteristics of the extraction alternatives are observed by reviewing these capture plots:

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Subarea 1:

- The alternatives using the modified ROD pumping of 8,500 gpm at Cluster 10 and 13 (Cases 1, 2 and 3) achieve good containment in Subarea 1. Gaps in the capture in Subarea 1 are a result of production pumping at AZ-Two 2, Miller 1 and Santa Fe 1. (These wells are displayed on Figure 5-49.)

- Pumping at the reduced rates of 5,500 gpm total in Subarea 1 (Cases 4, and 5) also contains the plume in this area.

Subarea 3:

- None of the extraction alternatives evaluated provides full containment in Subarea 3.

- The relocated Cluster 5, shown in Cases 4 and 5 (see Figures 5-54 and 5-55 provides better containment to the south than the initial location for this proposed cluster shown in Cases 1,2 and 3 (see Figures 5-51 through 5-53).

- Use of the B6 cluster is not an effective alternative to use of Paddy Lane and Big Dalton. This is shown on the capture plots for Cases 2 through 4 (Figures 5-52 through 5-54). In particular, the need to pump approximately 70% of the water from the deep screens in B6D (screened at 800-1000 feet bgs), significantly reduces the effectiveness of this location in controlling the higher concentration zones in the plume, which are located generally 500-700 feet bgs in this vicinity.

Figure 5-56 is a cross-section showing the flowlines entering the extraction wells based on 12-year average conditions, and the Case 1 extraction scheme. The observed TCE distribution is superimposed on this plot also. This plot indicates that the proposed extraction wells vertically contain the higher TCE concentrations, those greater than 50 µg/l observed in the BPOU.

Evaluation of these extraction scenarios indicated that Case 5 best achieves the remedial action objectives described above. Specifically, the Case 5 extraction scenario effectively demonstrates containment of TCE at concentrations greater than 50 µg/l in Subareas 1 and 3, and based on our judgement of existing data, we further believe that we have containment of TCE greater than 5 µg/l in Subarea 1 and Subarea 3.

5.4 Sensitivity Simulations of the Case 5 Extraction Scheme

The Case 5 extraction scheme was chosen as the baseline extraction scheme for the sensitivity simulations. The following simulations were made to evaluate the sensitivity of the 12 year capture zone to changes in hydraulic conductivities and pumping. These simulations were:

Extraction Sensitivity Case 1: The remedial extraction rates are decreased uniformly by 10%. All applied recharge was unchanged.

Extraction Sensitivity Case 2: The remedial extraction rates are decreased uniformly by 20%. All applied recharge was unchanged.

Extraction Sensitivity Case 3: The horizontal hydraulic conductivities in the BPOU area are increased by 10% to 385 feet/day in layers 2, 3, 4 and 5 of the model (approximately the upper 800 feet of the aquifer). The vertical anisotropy ratio of 30:1 is maintained.

Extraction Sensitivity Case 4: The horizontal hydraulic conductivities in the BPOU area are decreased by 10% to 315 feet/day in layers 2, 3, 4 and 5 of the model. The vertical anisotropy ratio of 30:1 is maintained.

Extraction Sensitivity Case 5: Water supply production well pumping at BPOU wells is simulated at the maximum of the projected pumping presented in the Watermaster Five-Year Water Quality and Supply Plan (November, 1995). The wells include: Suburban 139, B4 and B6, AZ-2, Arrow/Lante, La Puente, Covina Irrigating Co. and Conrock East and West Durbin. Glendora 07G which was projected to have zero production is simulated at its historical pumping rates. The average historical rates (for the 12 year transient period) and the projected rates for these wells are tabulated in Table 5-8..

Extraction Sensitivity Case 6: Remedial extraction at Paddy Lane is simulated to a depth of 700 feet bgs (similar to the extraction depths simulated at the proposed Cluster 5 and 5B wells).

The resulting containment zones for each of these cases are presented in Figures 5-57 through 5-62. The following observations are made:

- In Sensitivity Case 1 the capture zone presented in Figure 5-57, is slightly degraded from the Case 5 Extraction Simulation (Figure 5-55). This is particularly apparent in Subarea 3.
- In Sensitivity Case 2 (Figure 5-58) the capture zone is slightly more degraded as a result of the additional 10% reduction in remedial pumping, now a total of 20% less pumping than in Extraction Simulation Case 5. Nearly a complete gap has been created between extraction wells Cluster 5 and Cluster 5B.
- Increasing the horizontal hydraulic conductivities by 10% in the central portion of the basin has little effect upon the capture zone. There is virtually no difference between the capture zones presented in Figures 5-55 and 5-59.
- A decrease in horizontal hydraulic conductivities of 10% in Sensitivity Case 4 has no apparent impact upon the 12 year capture zone. This can be seen by comparing Figures 5-55 and 5-60.

- In Sensitivity Case 5 pumping rates at selected production wells are simulated at the maximum of the Watermaster 5 year projection. The capture zone shown in Figure 5-61 depicts some noticeable differences from the Case 5 Extraction Simulation (Figure 5-55). In Subarea 1 capture is reduced because some areas which had been captured by Cluster 10 are now captured by AZ-Two2. Subarea 3 shows a shifting of the capture zone to the west. Because of reduced pumping at B-4 (relative to historical rates) particles which had been passing to the west of Cluster 5 are now captured by that well. Areas just to the east of the capture zone are being contained by pumping at Big Dalton and B6 which are not considered part of the scheme, and whose Watermaster projected pumping is greater than their historical pumping.

- In Sensitivity Case 6 the pumping allocated to Paddy Lane is distributed over a depth of 700 feet. The resulting capture zone for the particles started at plus 50 feet MSL shown in Figure 5-62, is not significantly different from the Case 5 Extraction Simulation.

Summary

The 12 year simulated capture zone is somewhat sensitive to the pumping rate of the remedial extraction wells, and other production wells in the BPOU area. The capture zone does not appear to be sensitive to minor adjustments to the horizontal hydraulic conductivities.

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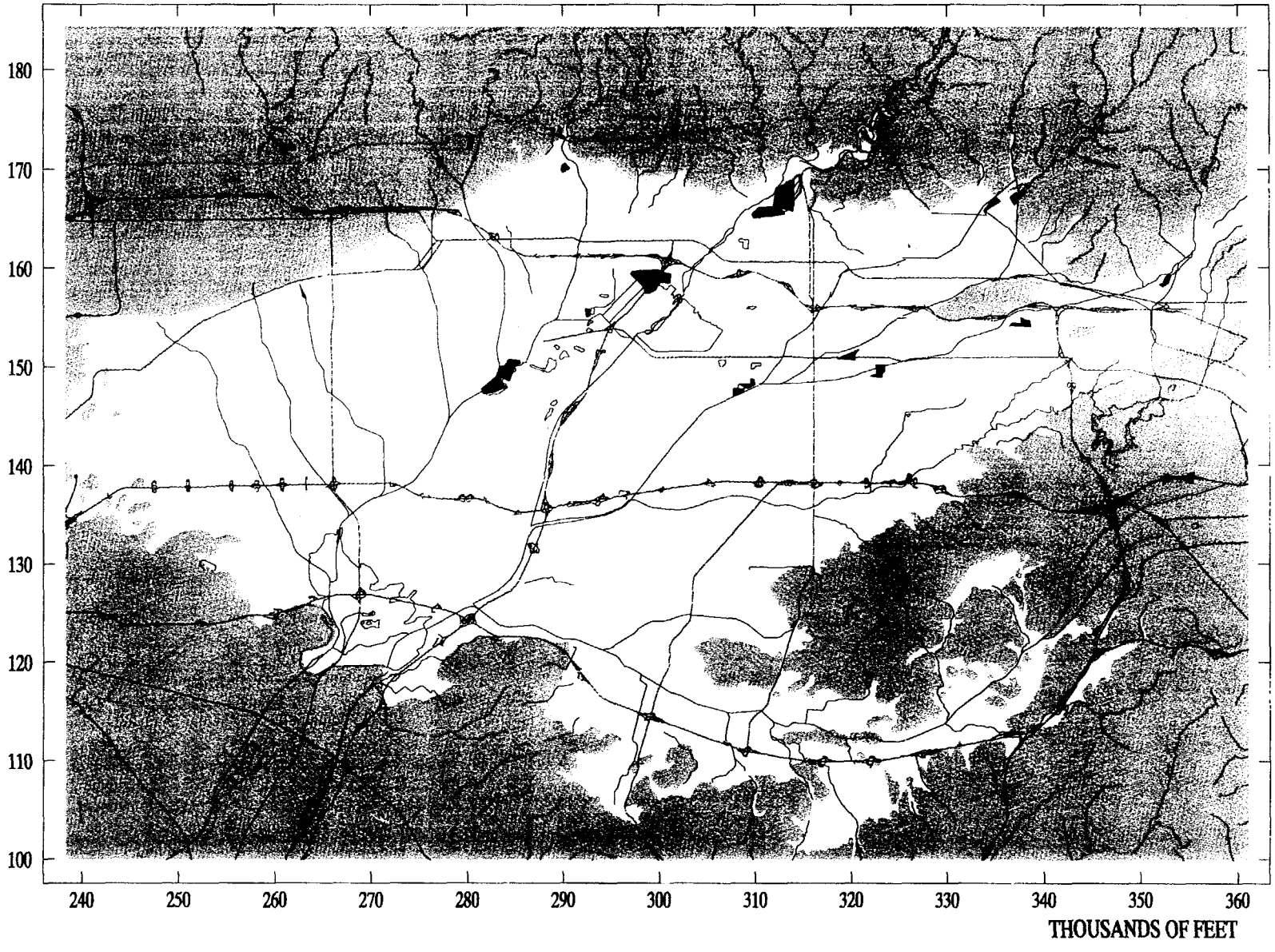

FIGURE 5-1

San Gabriel Basin
Primary Roads, Streams, and Spreading Basins

Baldwin Park Operable Unit Pre-Remedial Design

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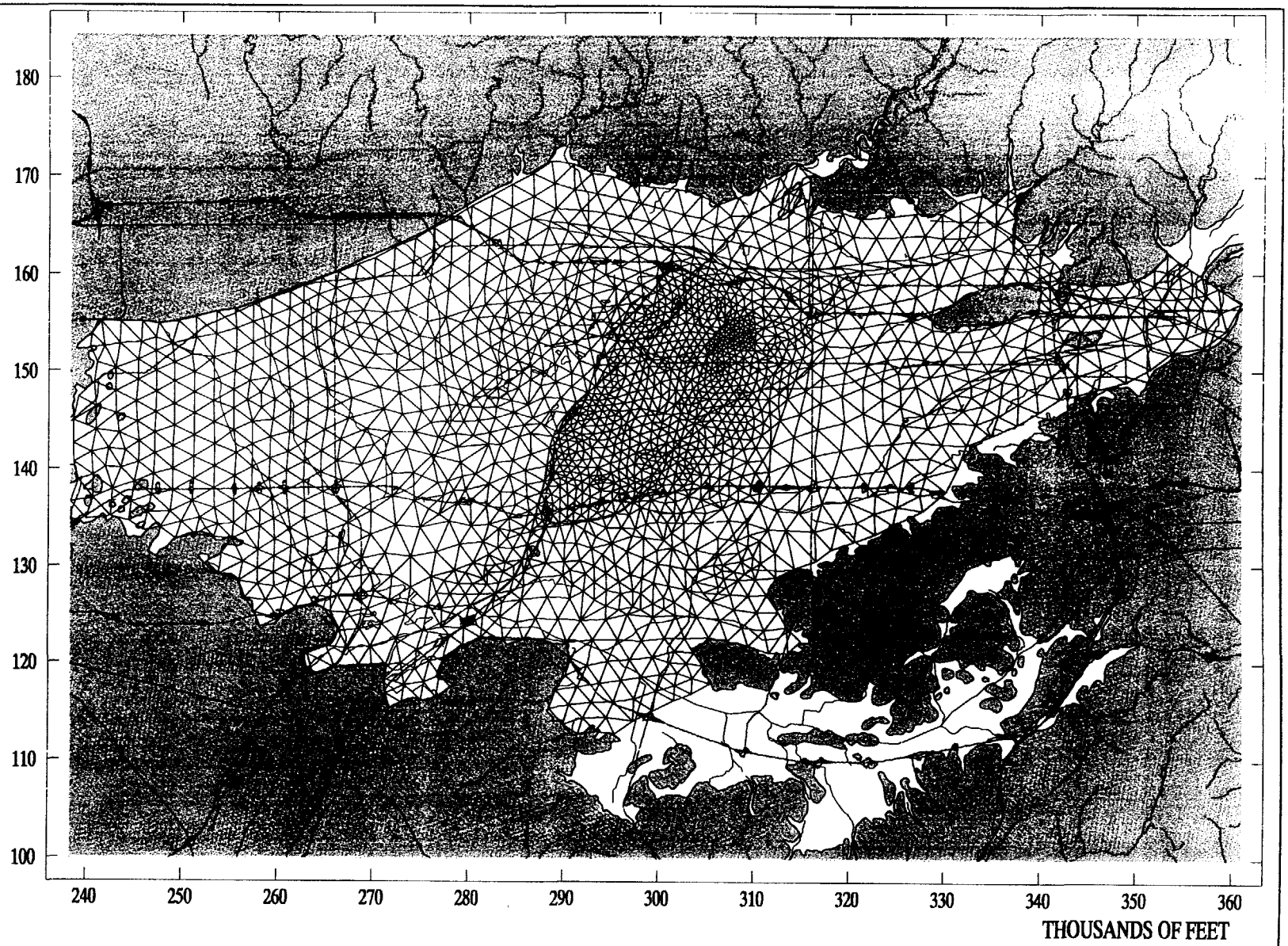

FIGURE 5-2

Finite Element Grid

Regional Model - Subject to Further Calibration
Baldwin Park Operable Unit Pre-Remedial Design

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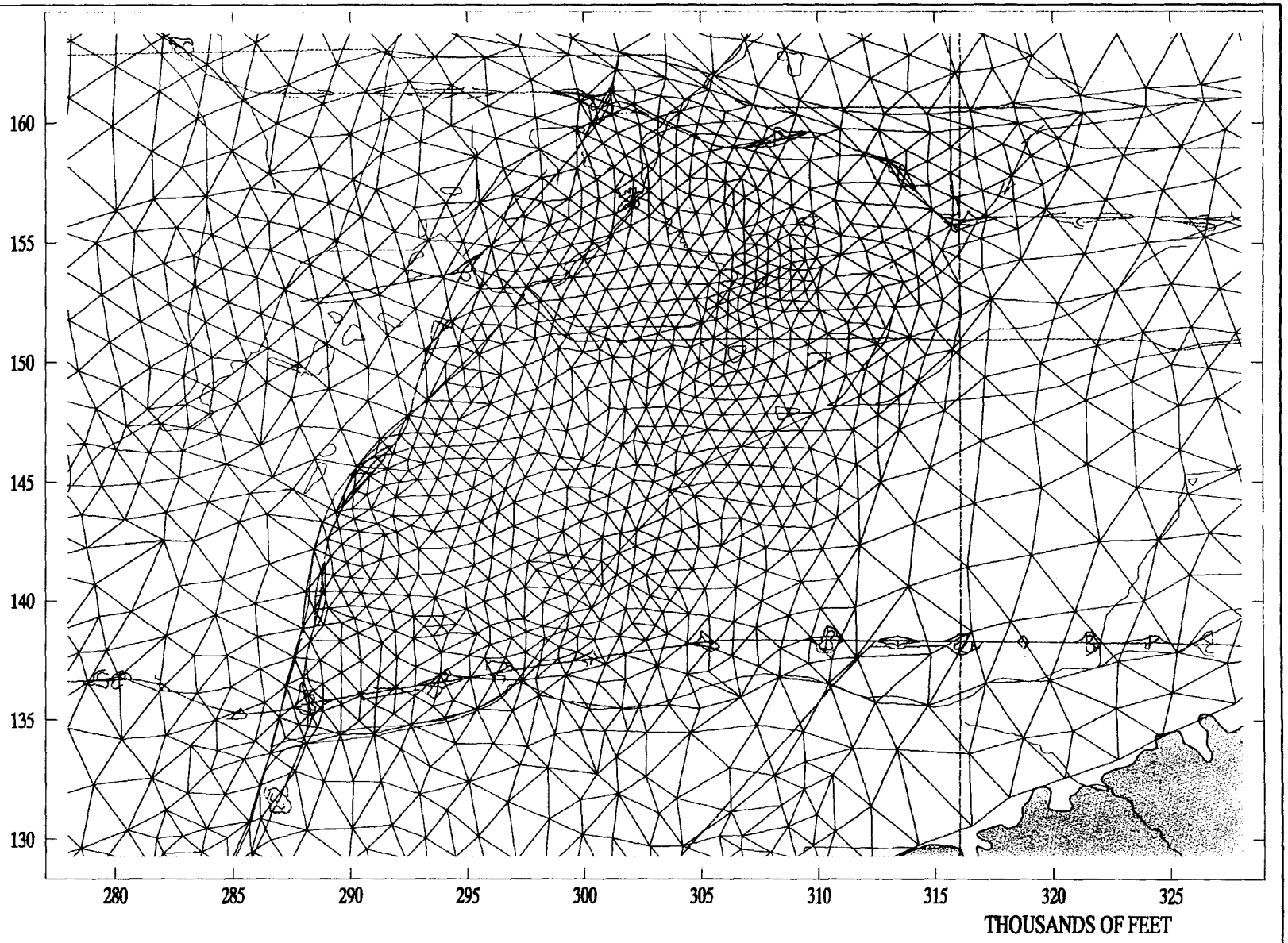
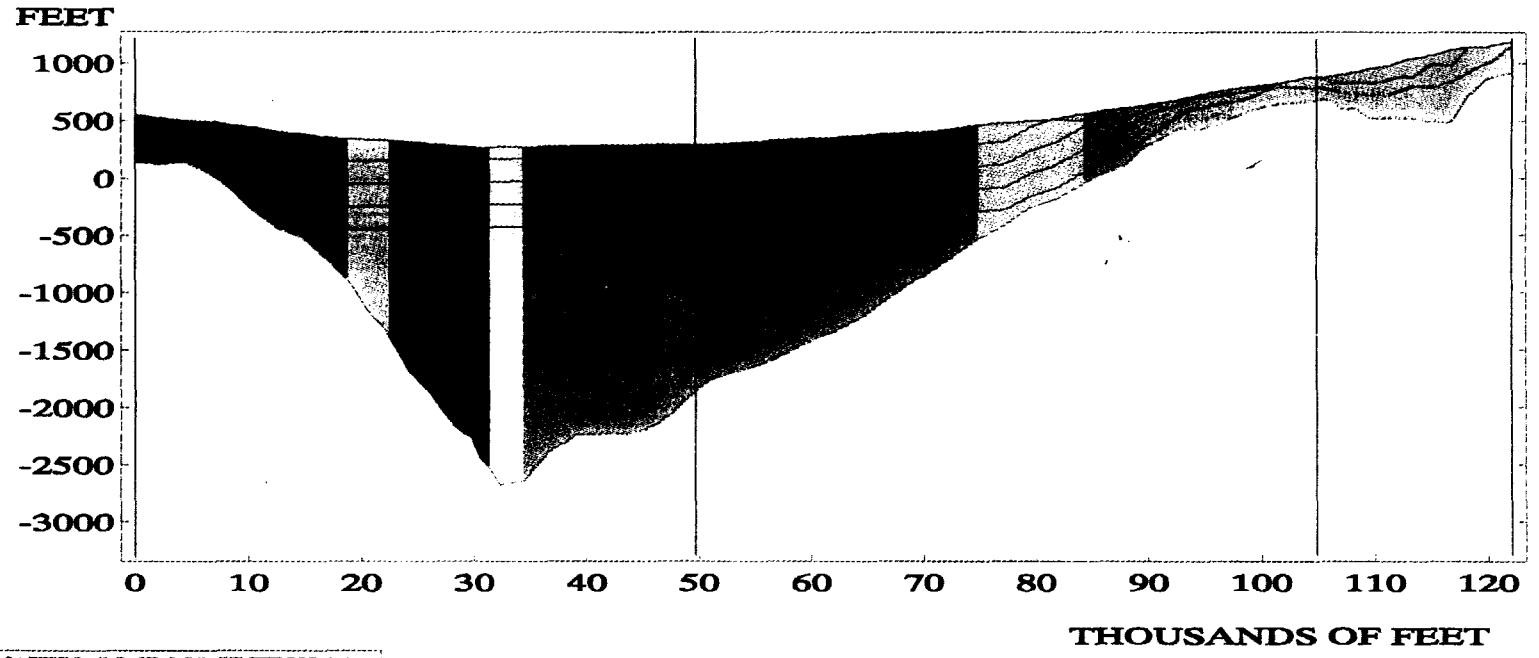


FIGURE 5-3	**Finite Element Grid - Local Scale** **Regional Model - Subject to Further Calibration** **Baldwin Park Operable Unit Pre-Remedial Design**	CDM *environmental engineers, scientists, planners, & management consultants*

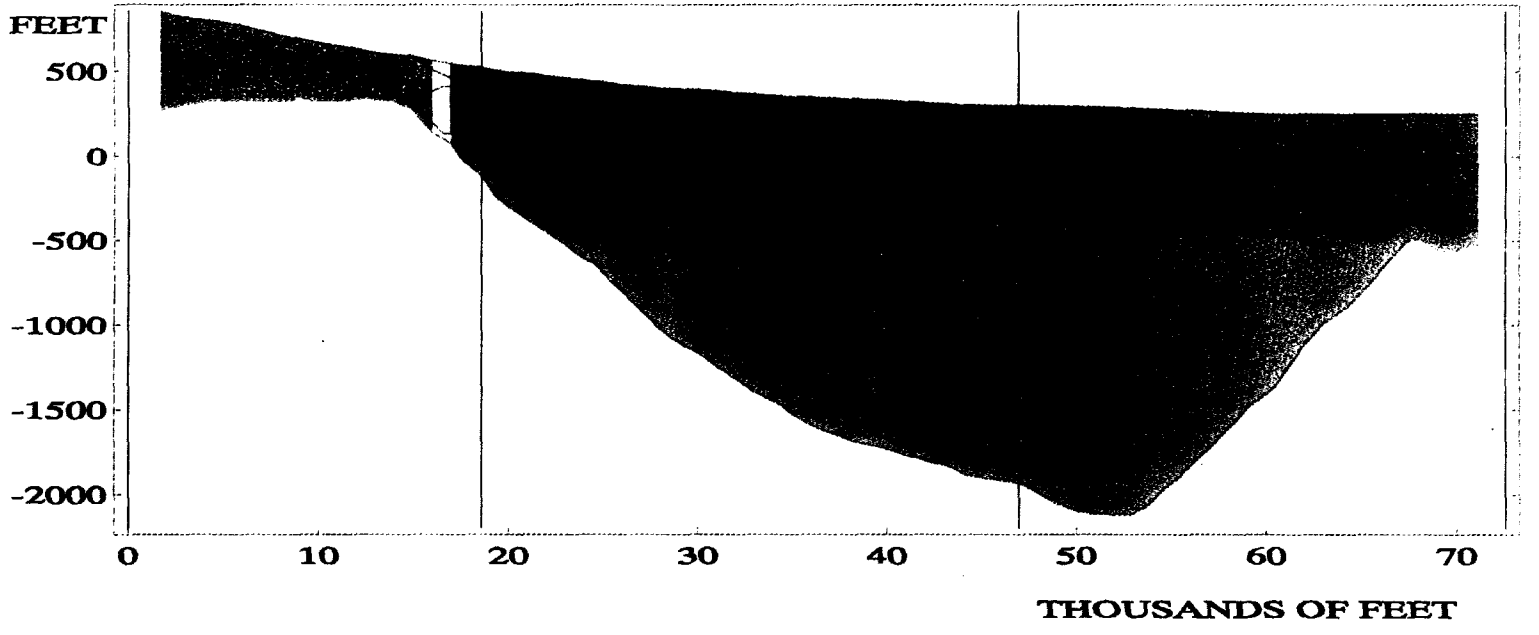


MATERIALS CROSS-SECTION AA

- K = 25.0 ft/day
- K = 40.0 ft/day
- K = 60.00 ft/day
- K = 350.0 ft/day
- K = 250.0 ft/day
- K = 30.0 ft/day
- K = 10 ft/day
- K = 15.0 ft/day
- K = 50.0 ft/day

CROSS SECTION AA

FIGURE 5-4	West to East Cross Section Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants



MATERIALS CROSS-SECTION AA

- K = 175.0 ft/day
- K = 40.0 ft/day
- K = 350.0 ft/day
- K = 250.0 ft/day
- K = 105.0 ft/day

CROSS SECTION AA

FIGURE 5-5

North To South Cross Section

Baldwin Park Operable Unit Pre-Remedial Design

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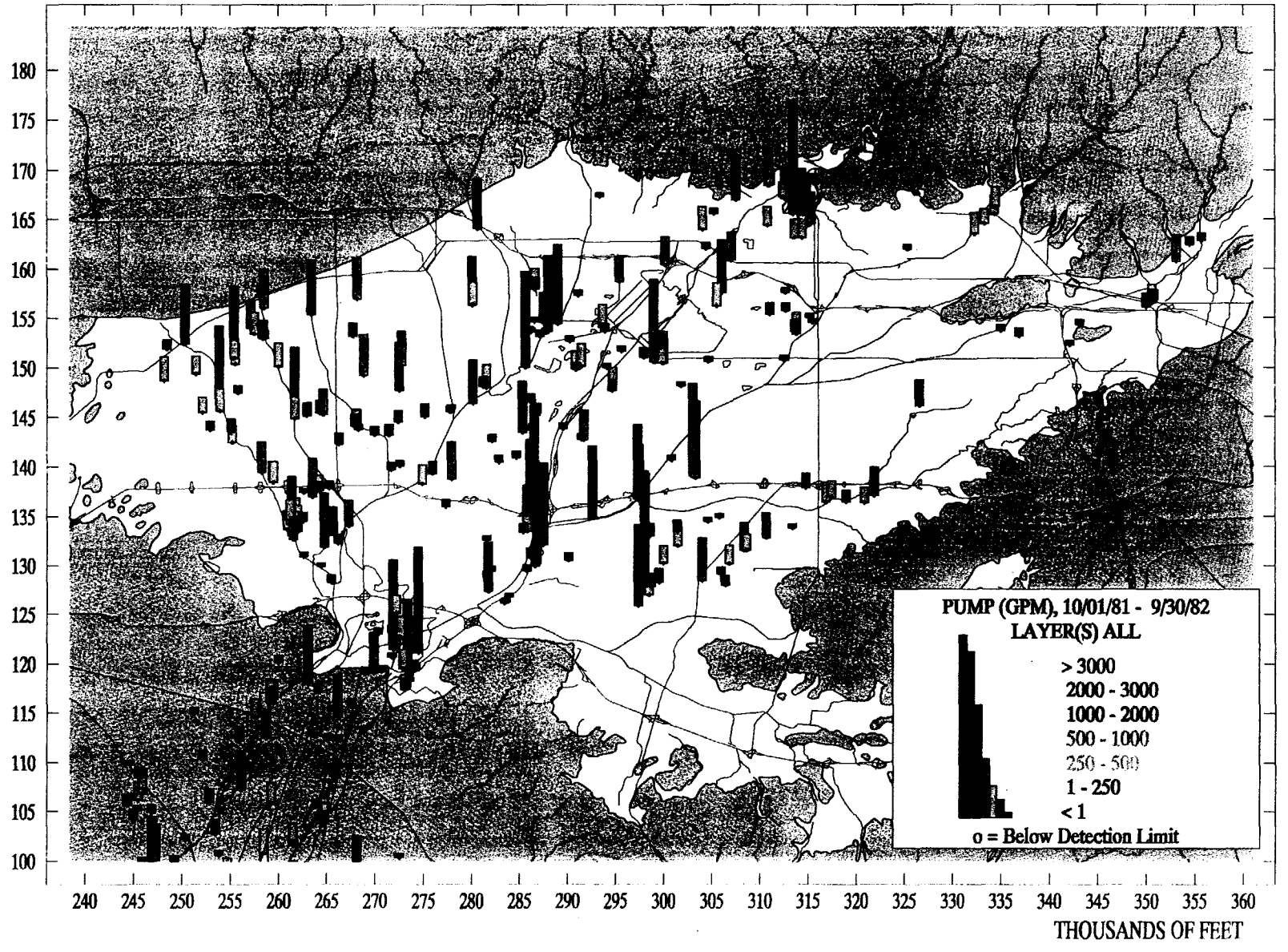

FIGURE 5-6	1981 - 1982 Water Year Pumping Fluxes Steady State Calibration Period EPA - CH2M HILL Database Baldwin Park Operable Unit Pre-Remedial Design	environmental engineers, scientists, planners, & management consultants

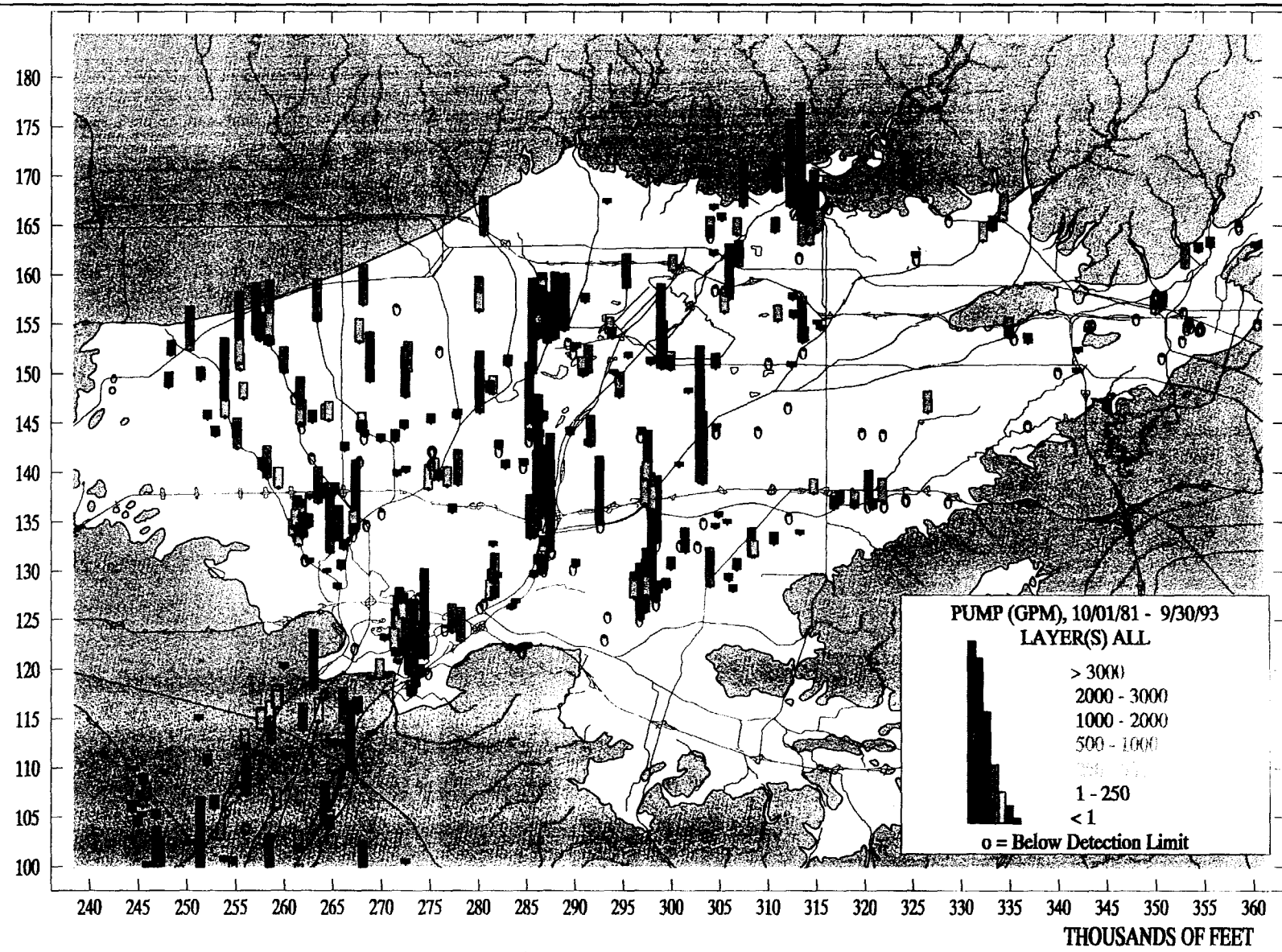

FIGURE 5-7	Average Annual Pumping Fluxes 10/1/81 - 9/30/93 EPA - CH2M HILL Database Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

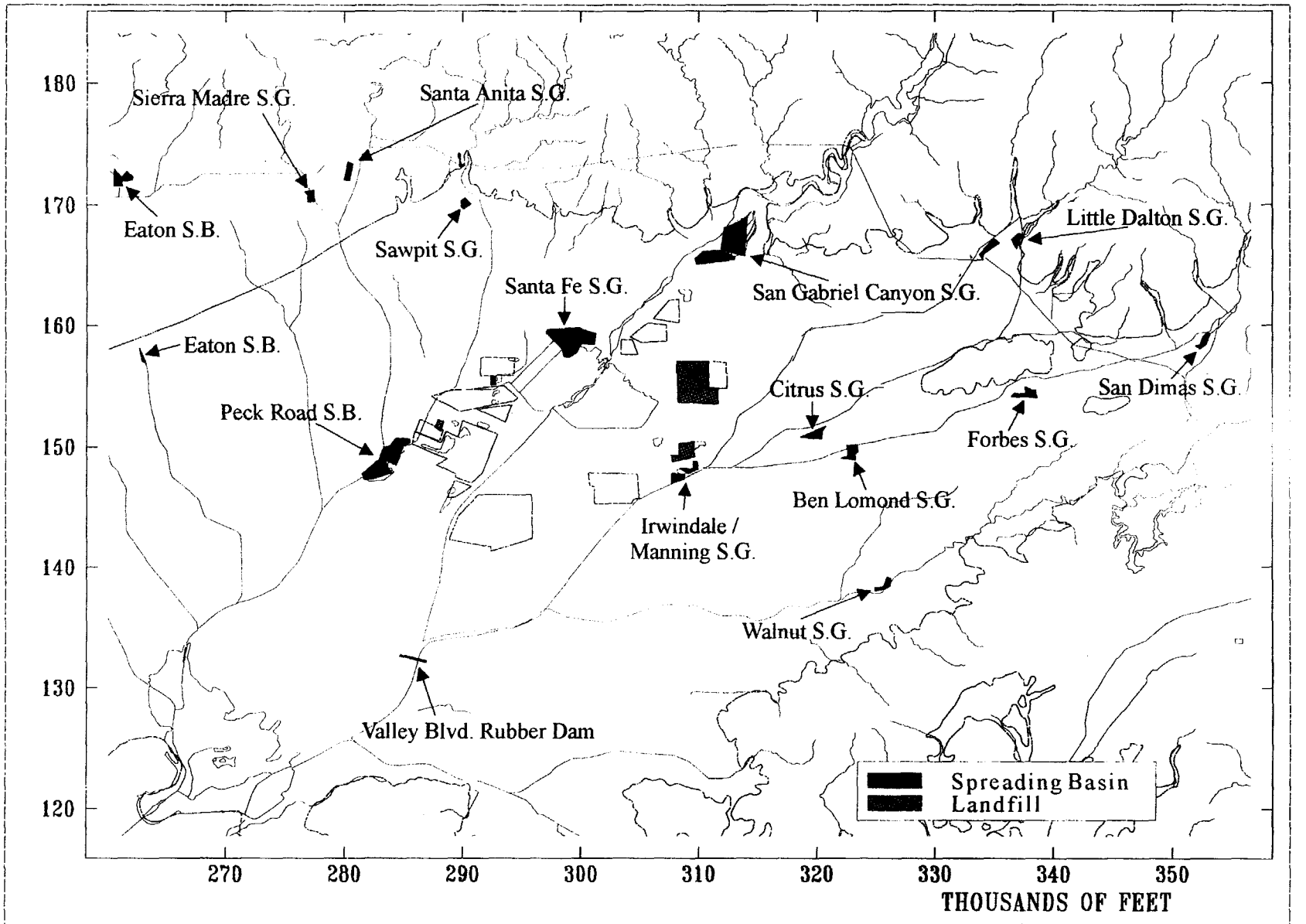

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Figure 5-8
Primary Spreading Facilities

Baldwin Park Operable Unit Pre-Remedial Design

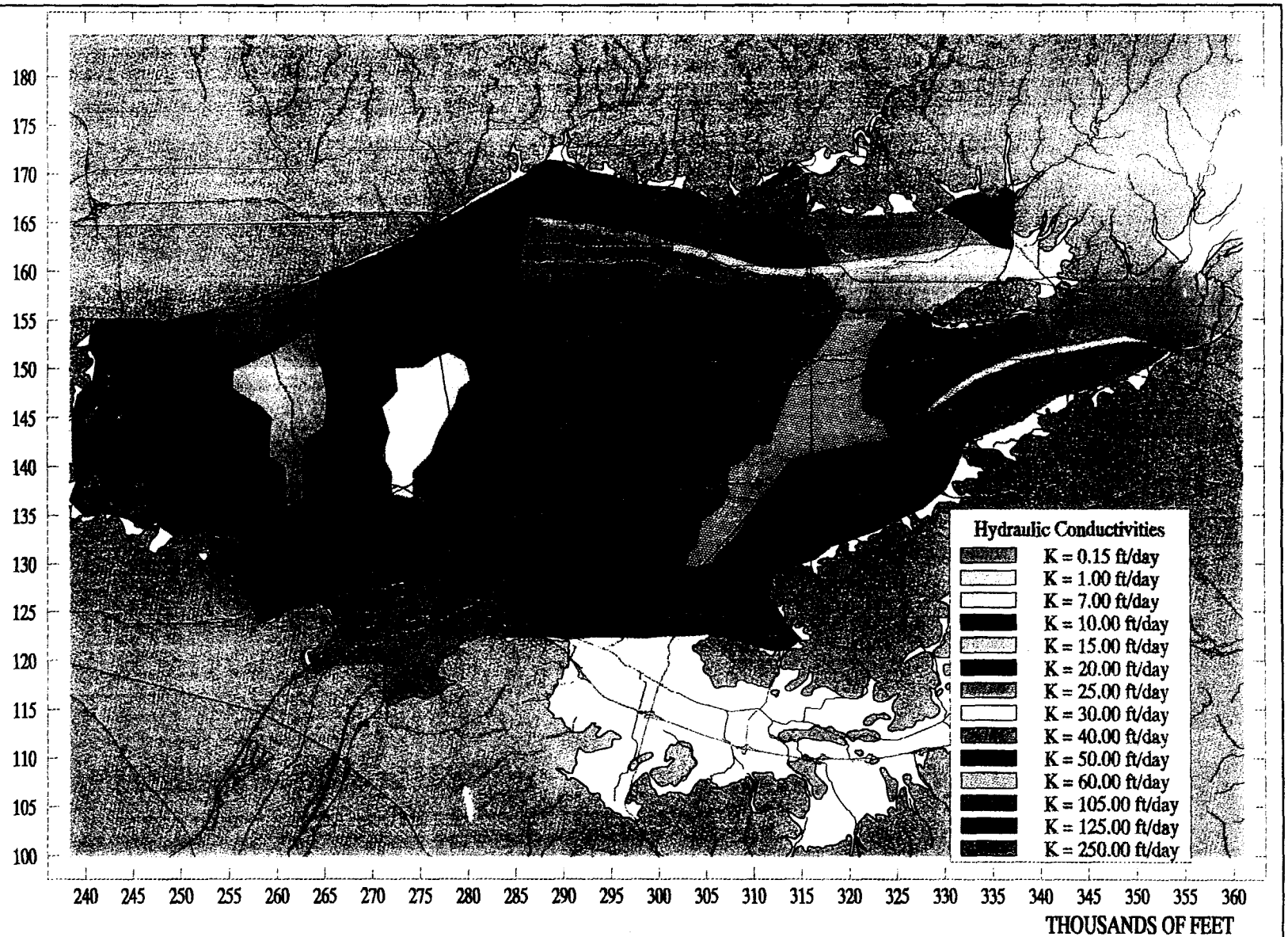

FIGURE 5-9

Model Hydraulic Conductivities
Bottom of Model - Layer 1

Baldwin Park Operable Unit Pre-Remedial Design

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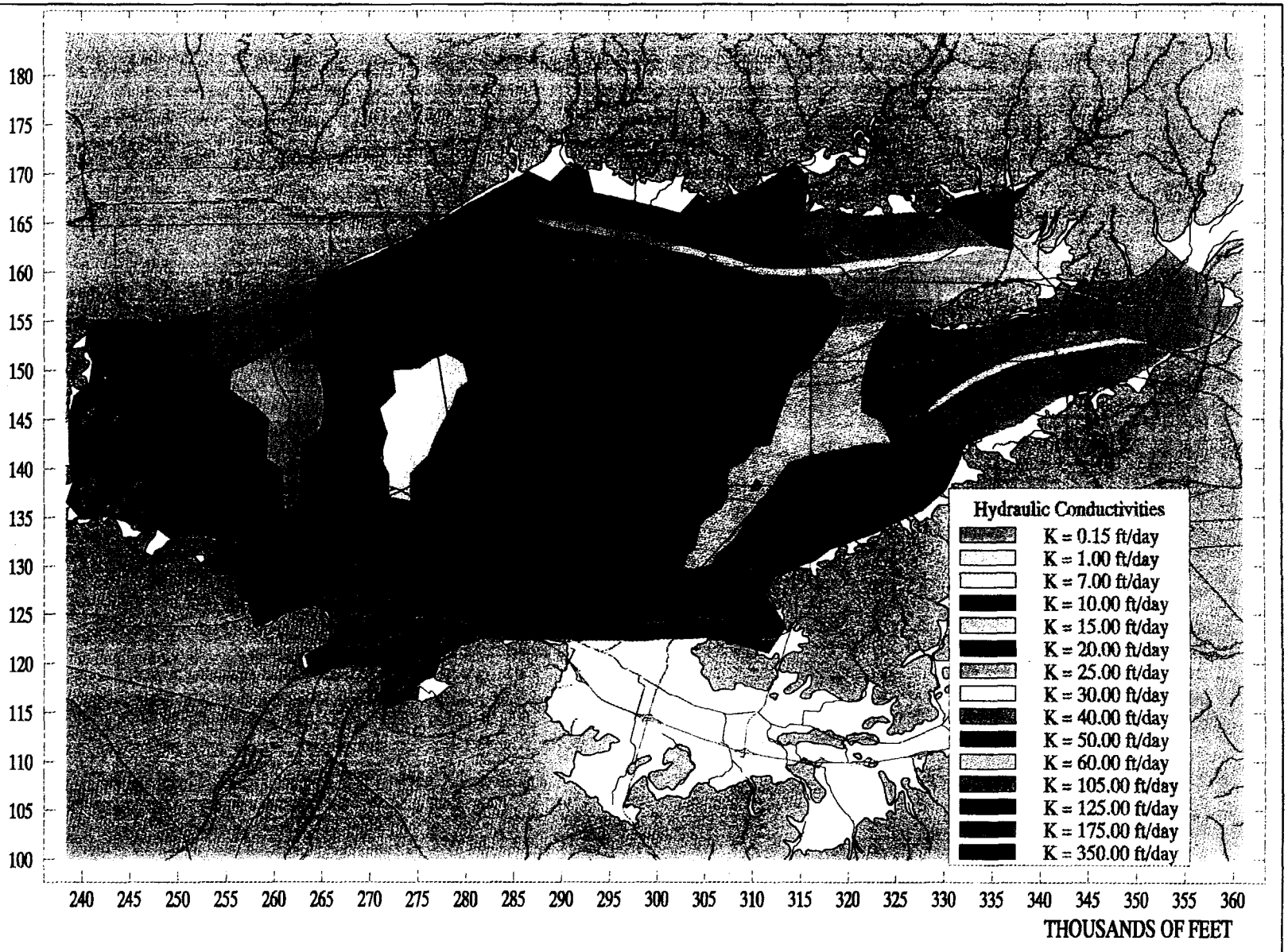

FIGURE 5-10

Model Hydraulic Conductivities
Layers 2 through 5

Baldwin Park Operable Unit Pre-Remedial Design

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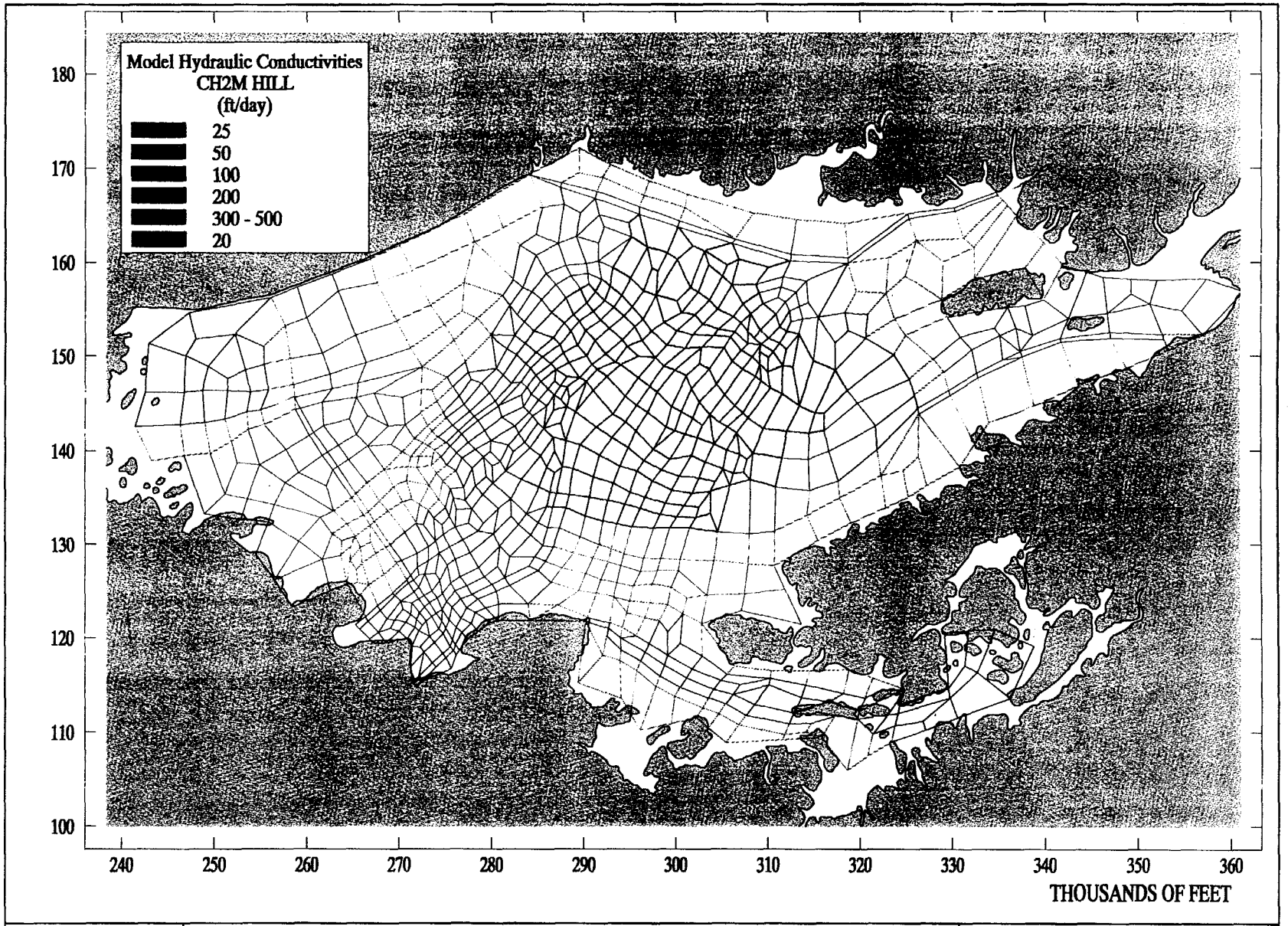

FIGURE
5-11

Model Hydraulic Conductivities

EPA / CH2M Hill San Gabriel Basin Model

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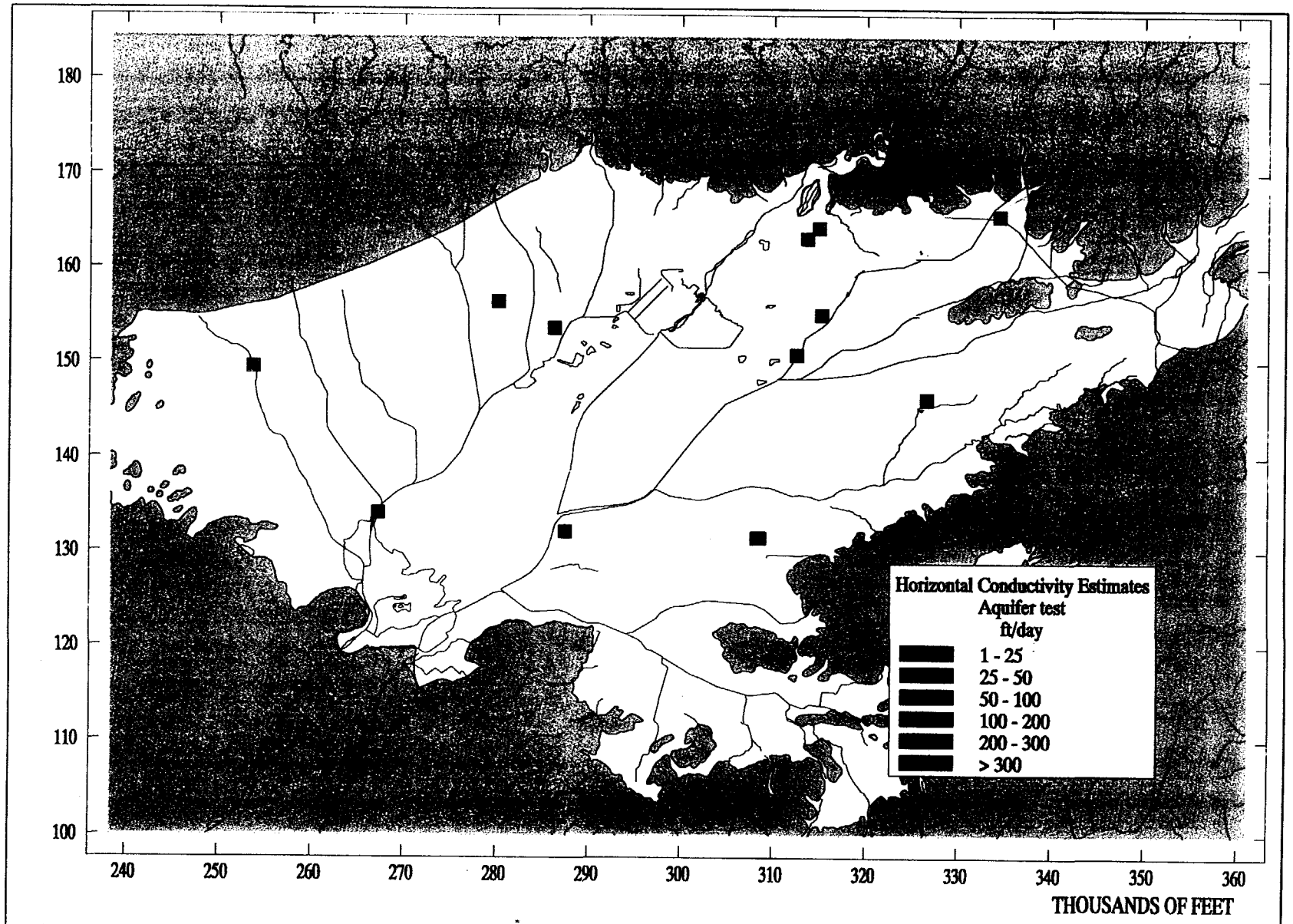

FIGURE 5-12

Horizontal Conductivity Estimates
Based on Aquifer Tests
Source: EPA San Gabriel Basin GIS
Baldwin Park Operable Unit Pre-Remedial Design

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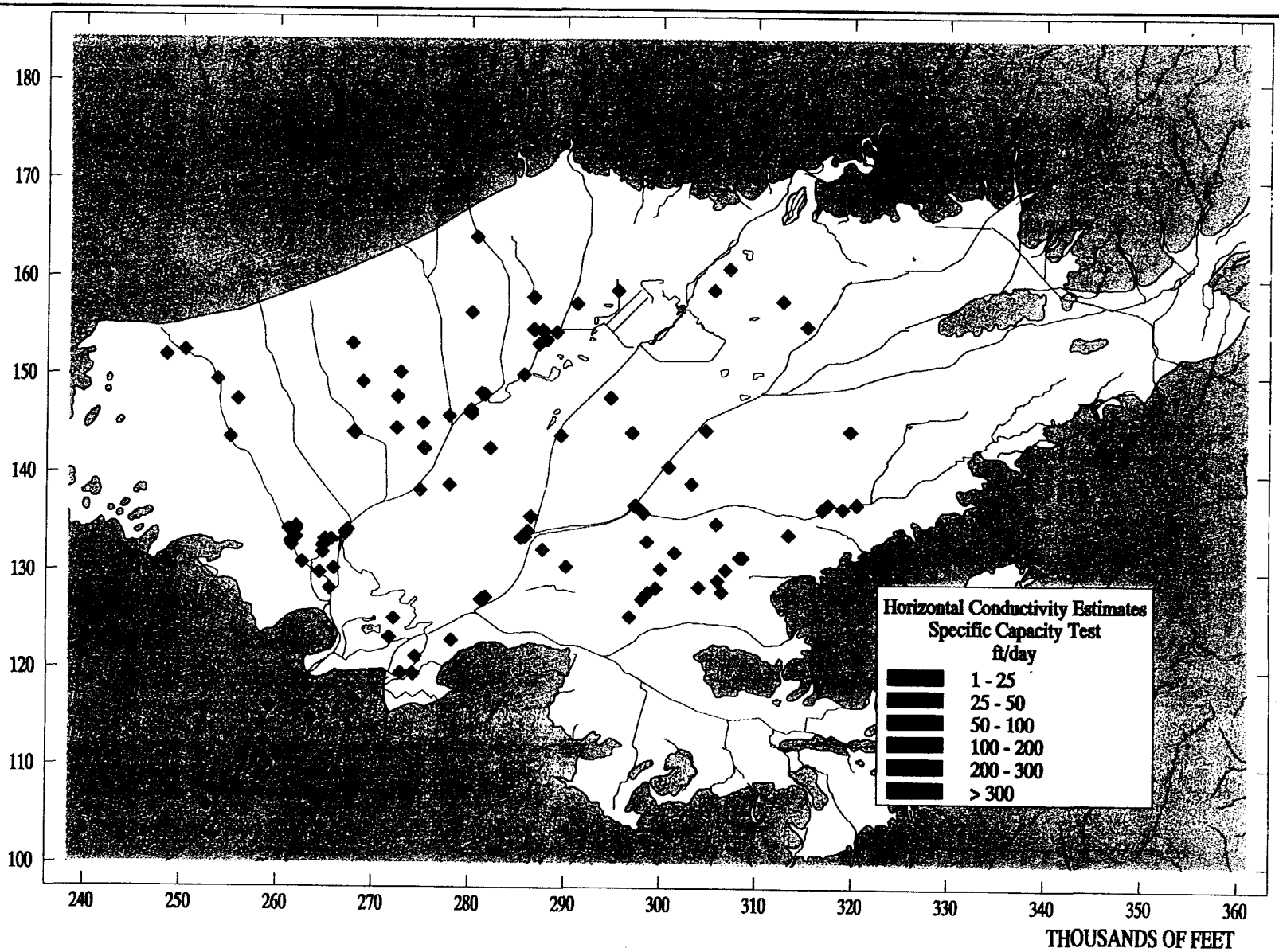

FIGURE 5-13

Horizontal Conductivity Estimates
Based on Specific Capacity Tests
Source: EPA San Gabriel Basin GIS
Baldwin Park Operable Unit Pre-Remedial Design

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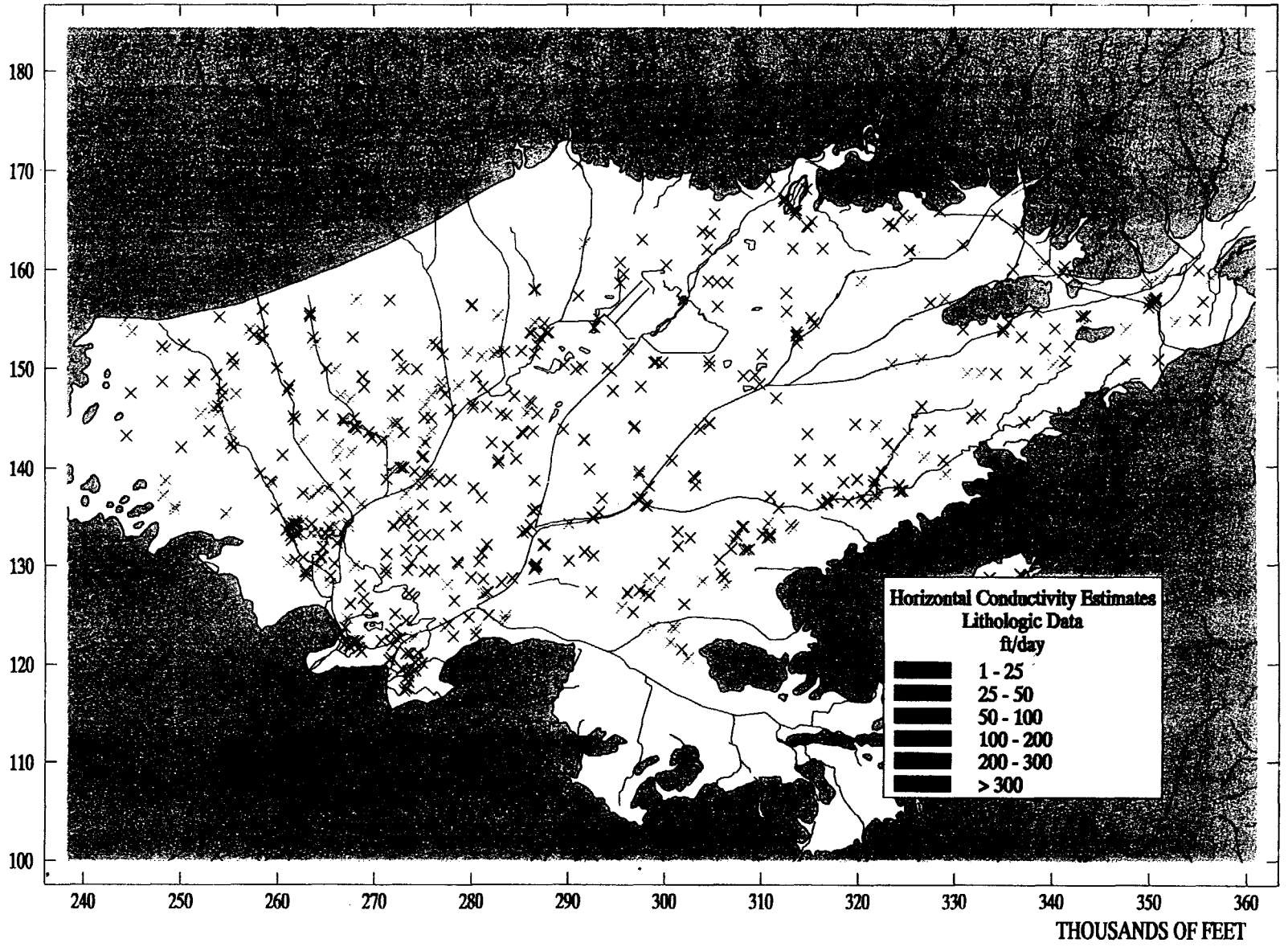

FIGURE
5-14

Horizontal Conductivity Estimates
Based on Lithologic Data
Source: EPA San Gabriel Basin GIS
Baldwin Park Operable Unit Pre-Remedial Design

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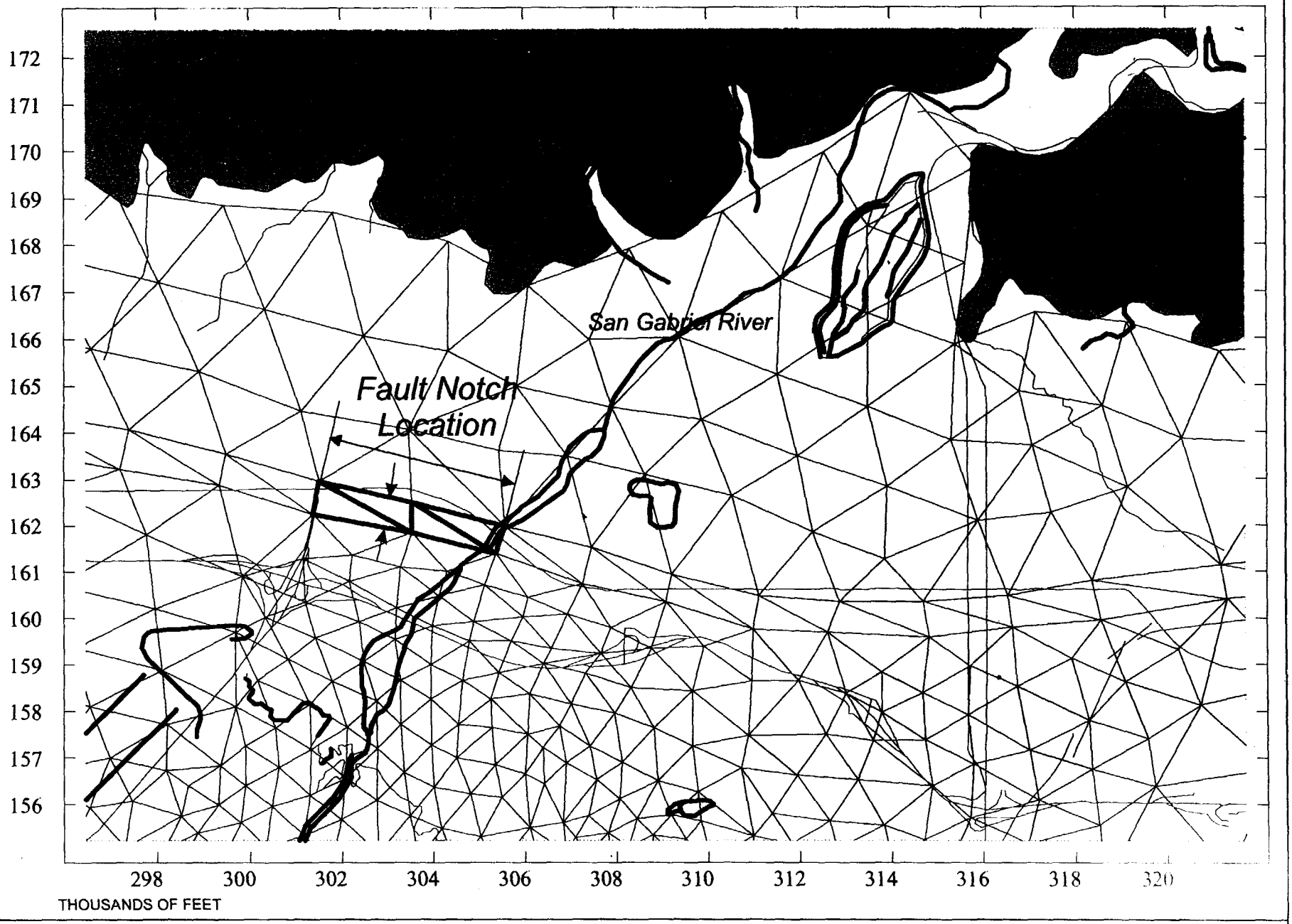

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Figure 5-15
Location of Duarte Fault Notch

Baldwin Park Operable Unit Pre-Remedial Design

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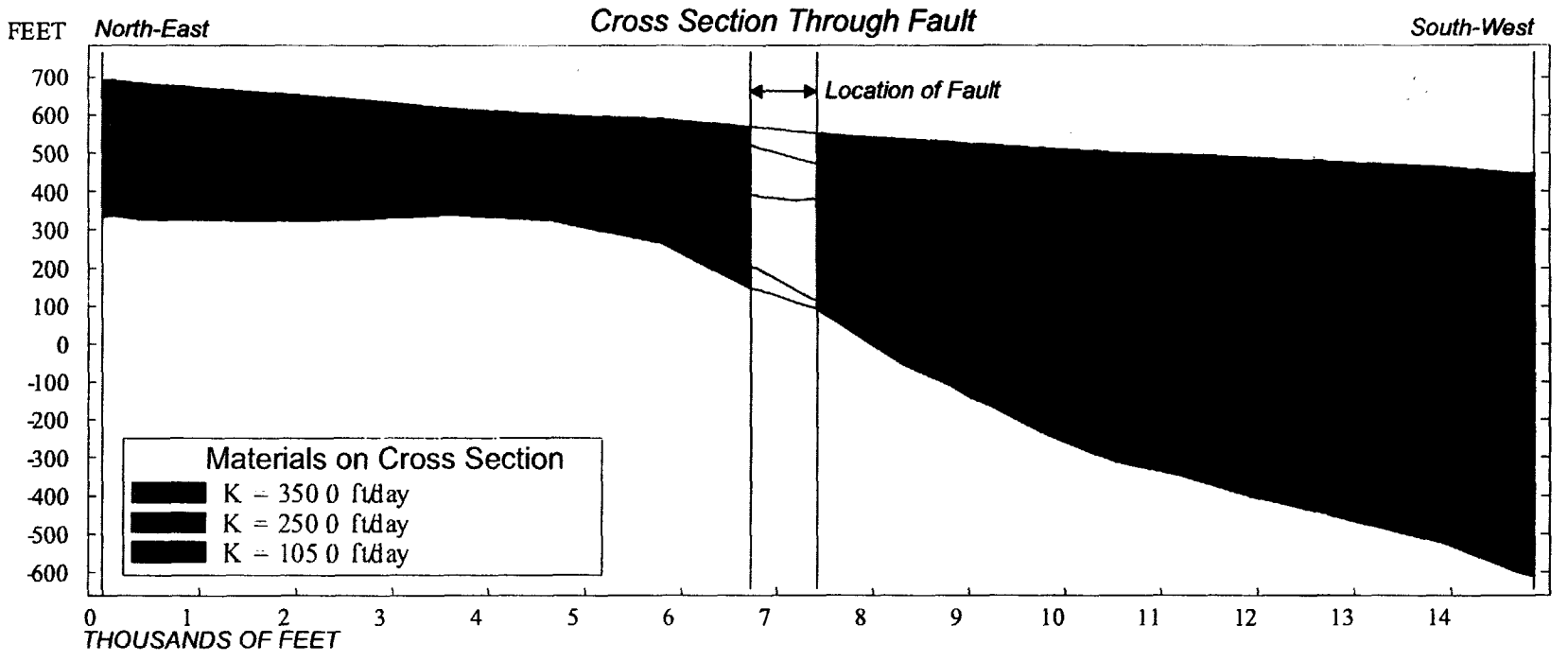

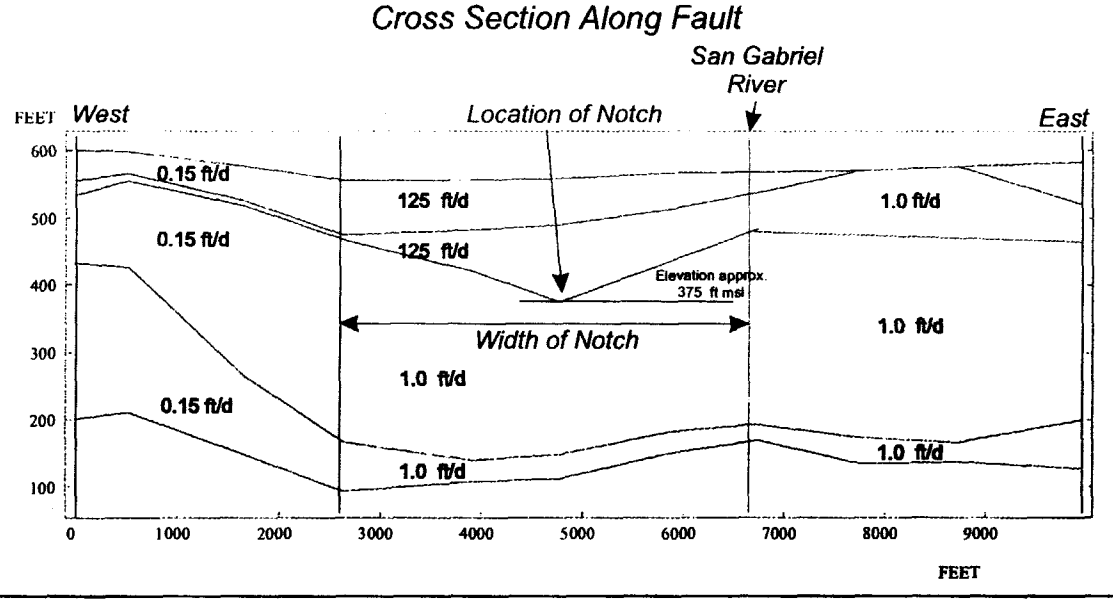

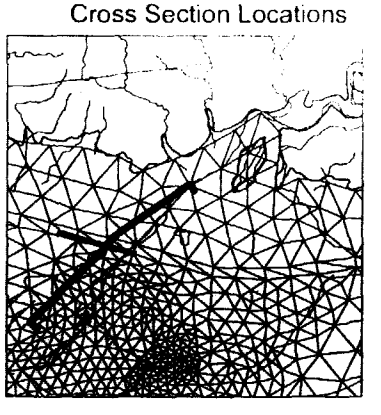

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Figure 5-16
Cross Sections Through Duarte Fault at Notch Location

Baldwin Park Operable Unit Pre-Remedial Design

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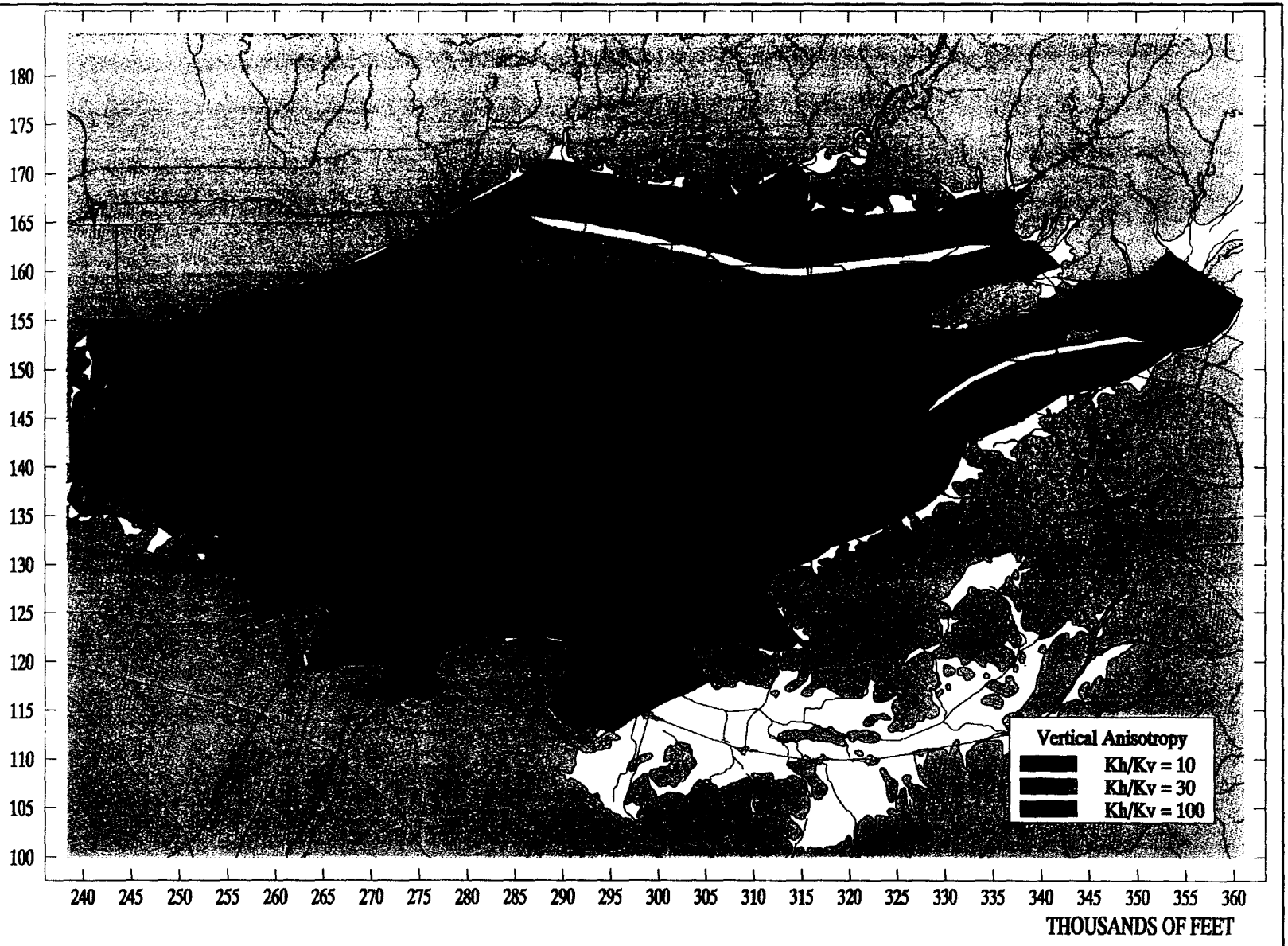


FIGURE 5-17	Model Hydraulic Properties - Vertical Anisotropy All Model Layers Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

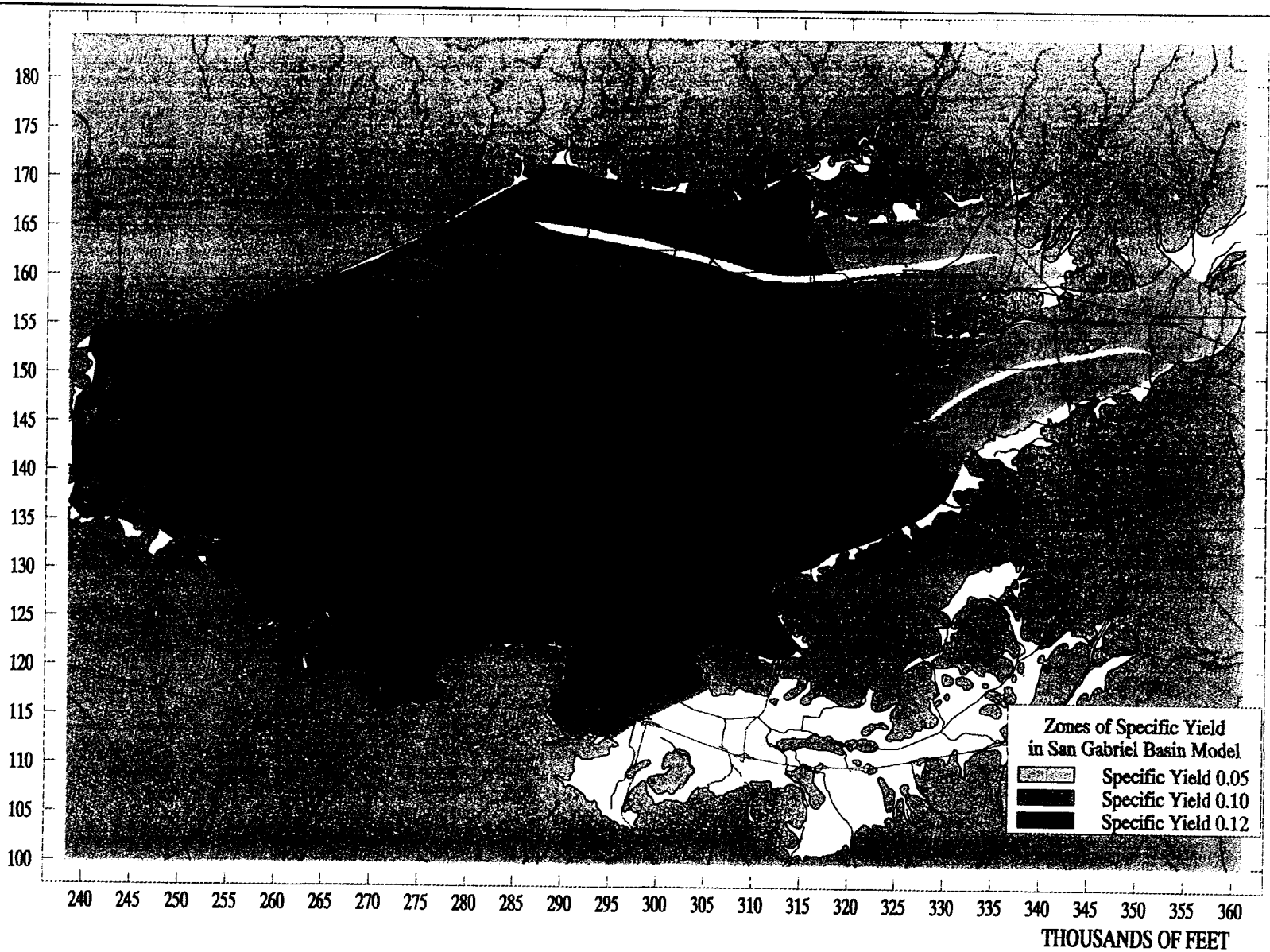


FIGURE 5-18

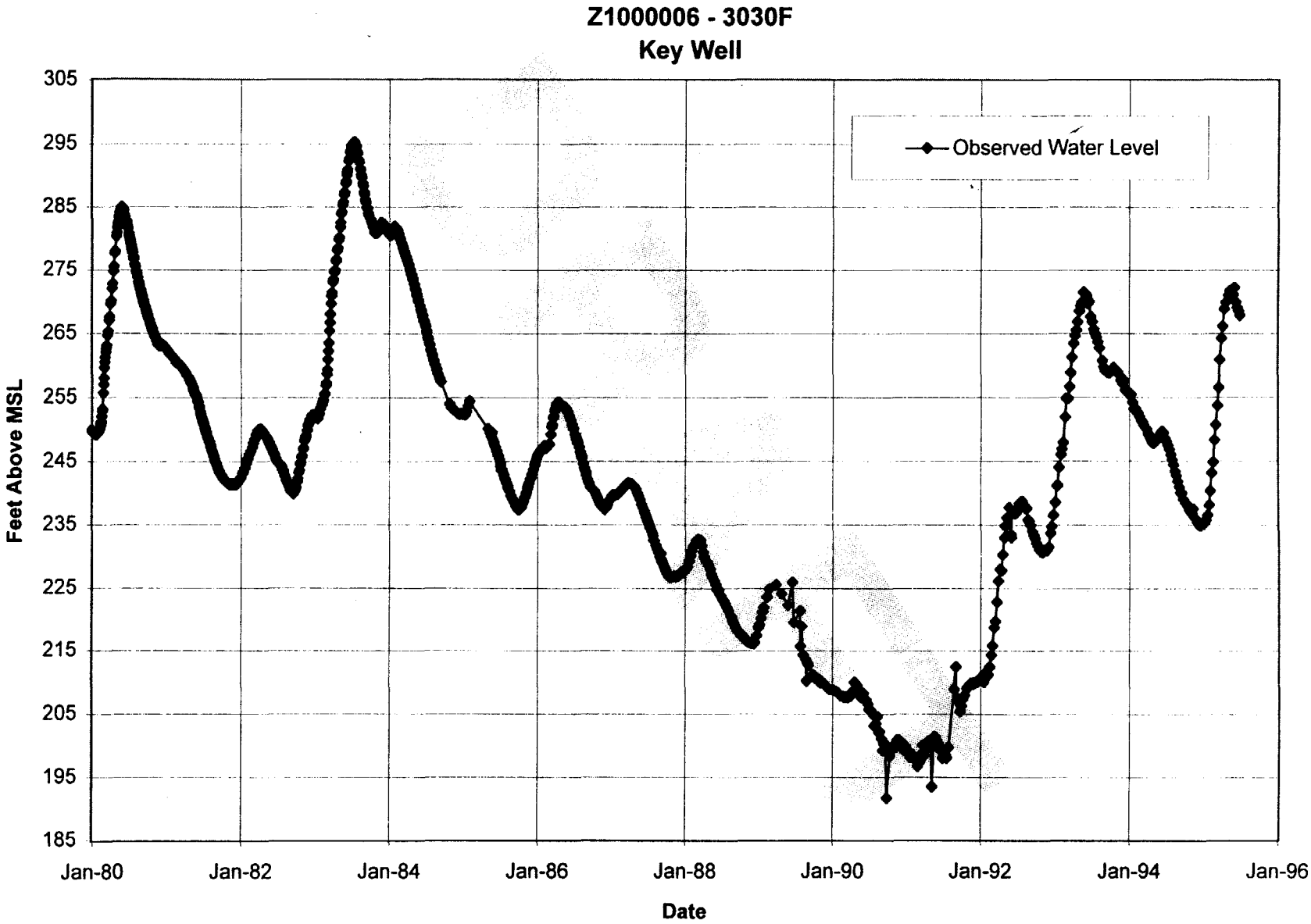
Model Hydraulic Properties - Specific Yield

Baldwin Park Operable Unit Pre-Remedial Design

CDM

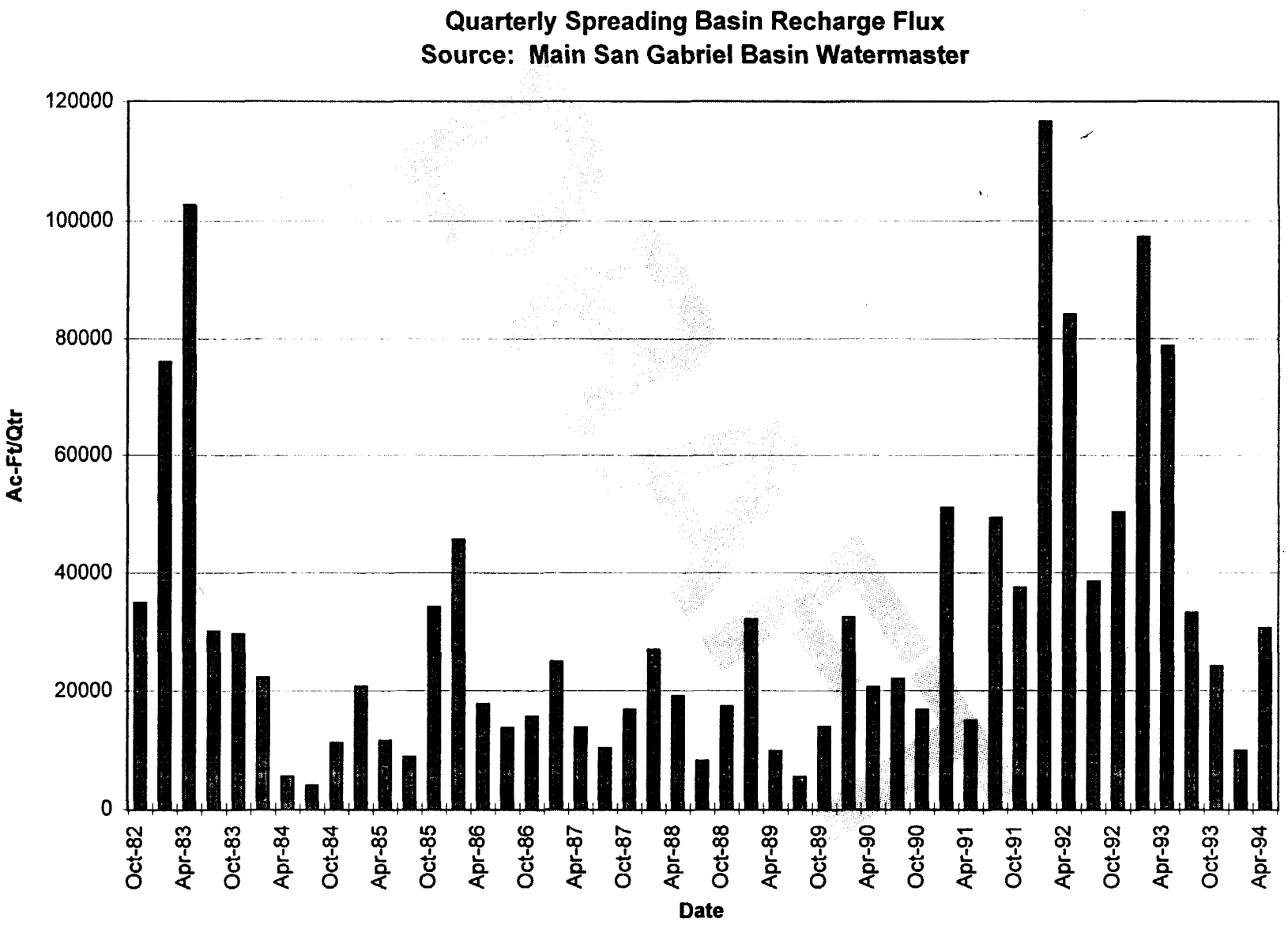
environmental engineers, scientists, planners, & management consultants

Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
TMHST29.XLS

Figure 5-19



CDM Camp Dresser & McKee Inc.
PUMPRECH.XLS-Chart3

Figure 5-20

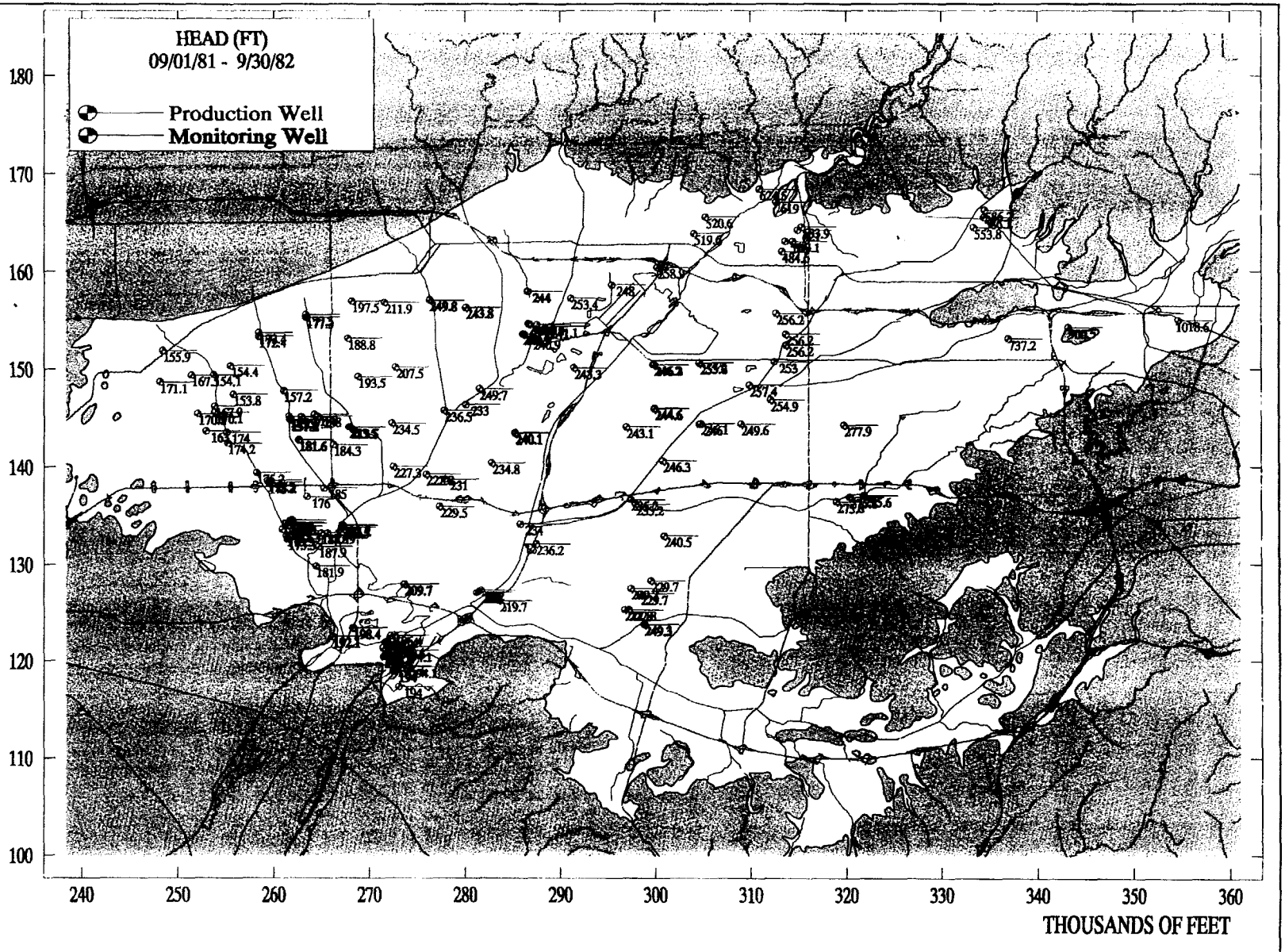


FIGURE 5-21

Observed Water Levels 1981 - 1982 Water Year
Source: EPA San Gabriel Basin GIS

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

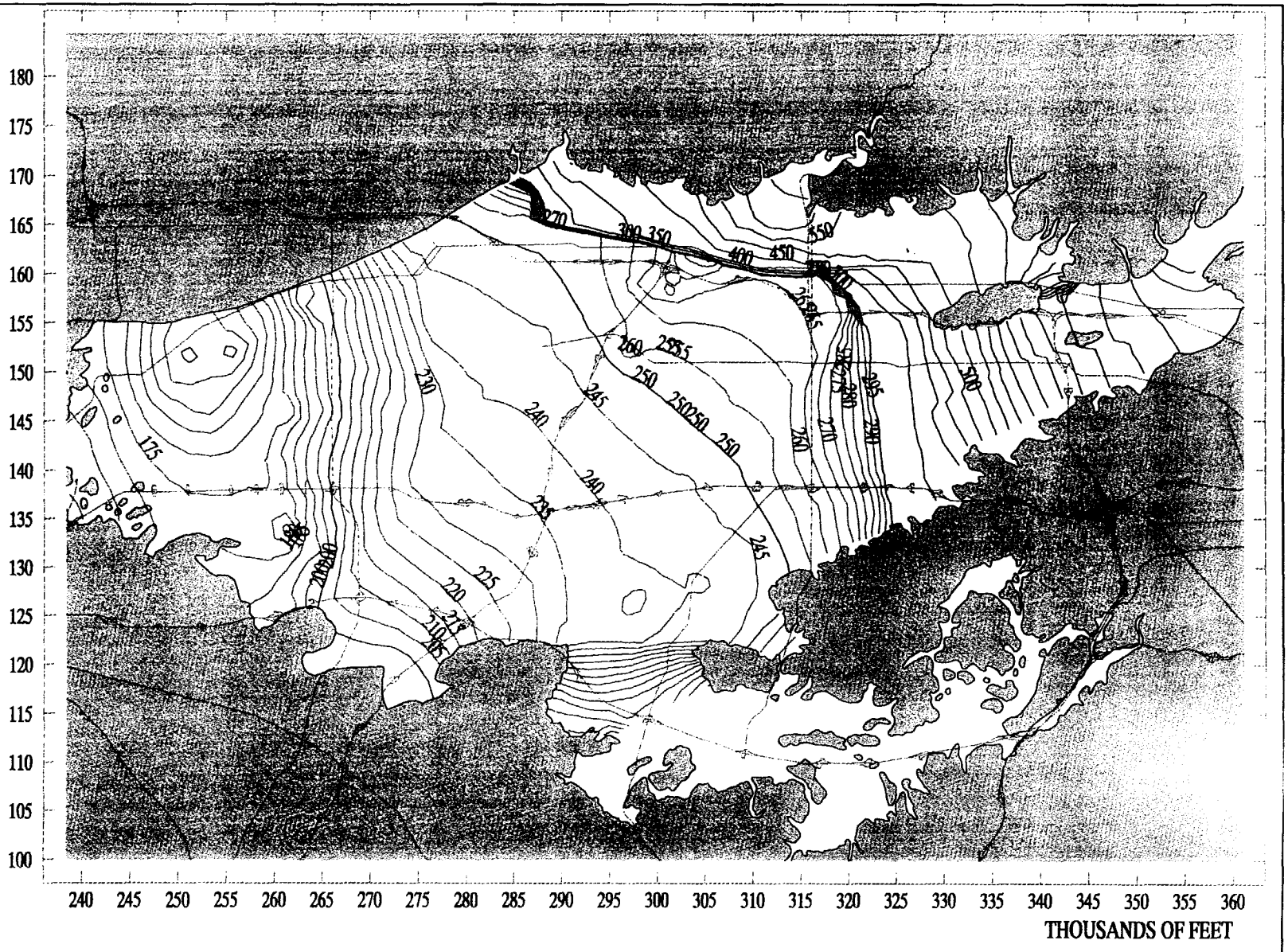


FIGURE 5-22	Simulated Steady State Water Level Contours 1981 - 1982 Water Year Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

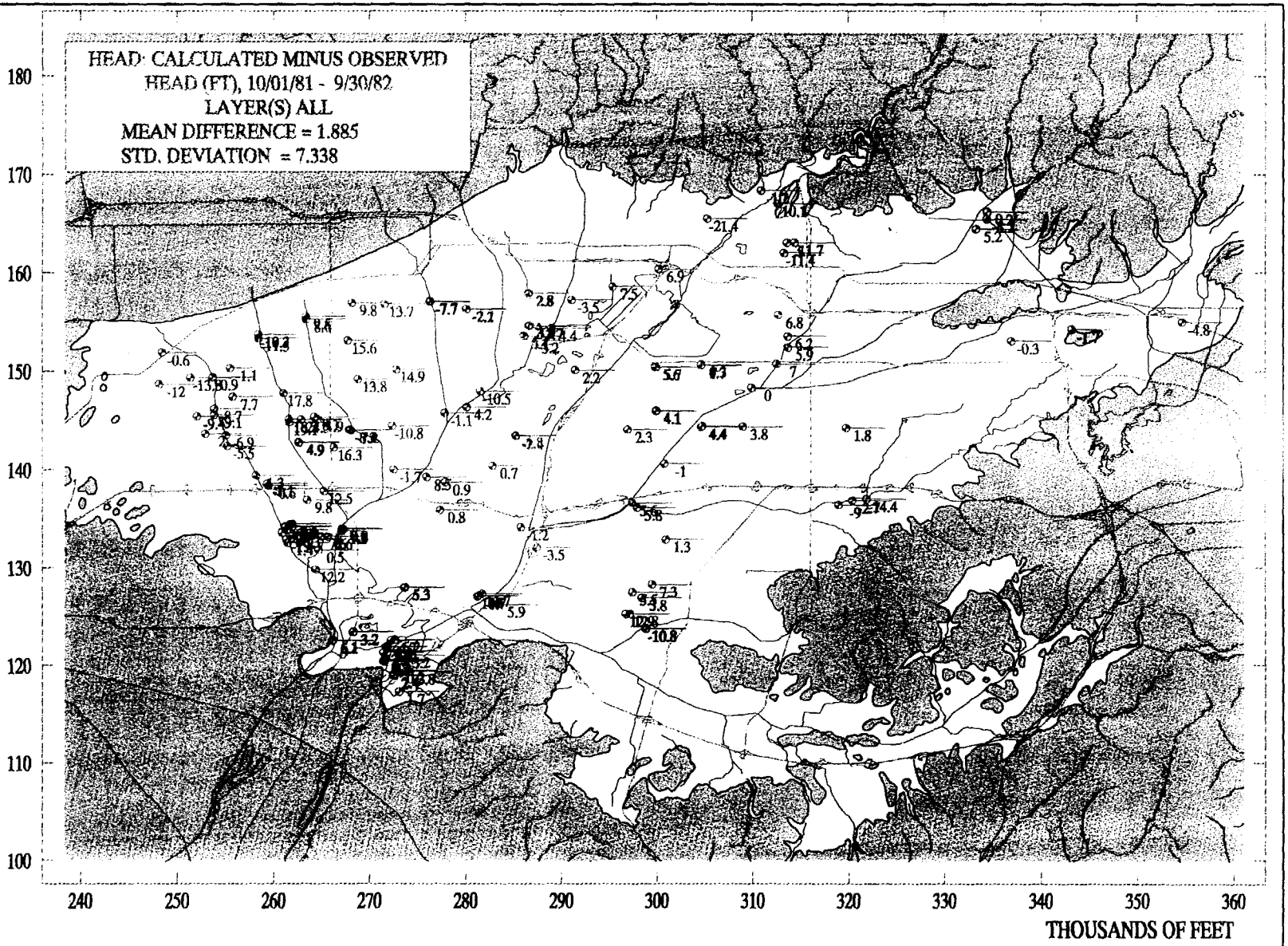


FIGURE 5-23

Calculated Minus Observed Water Levels
Steady State Calibration 1981 - 1982 Water Year

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

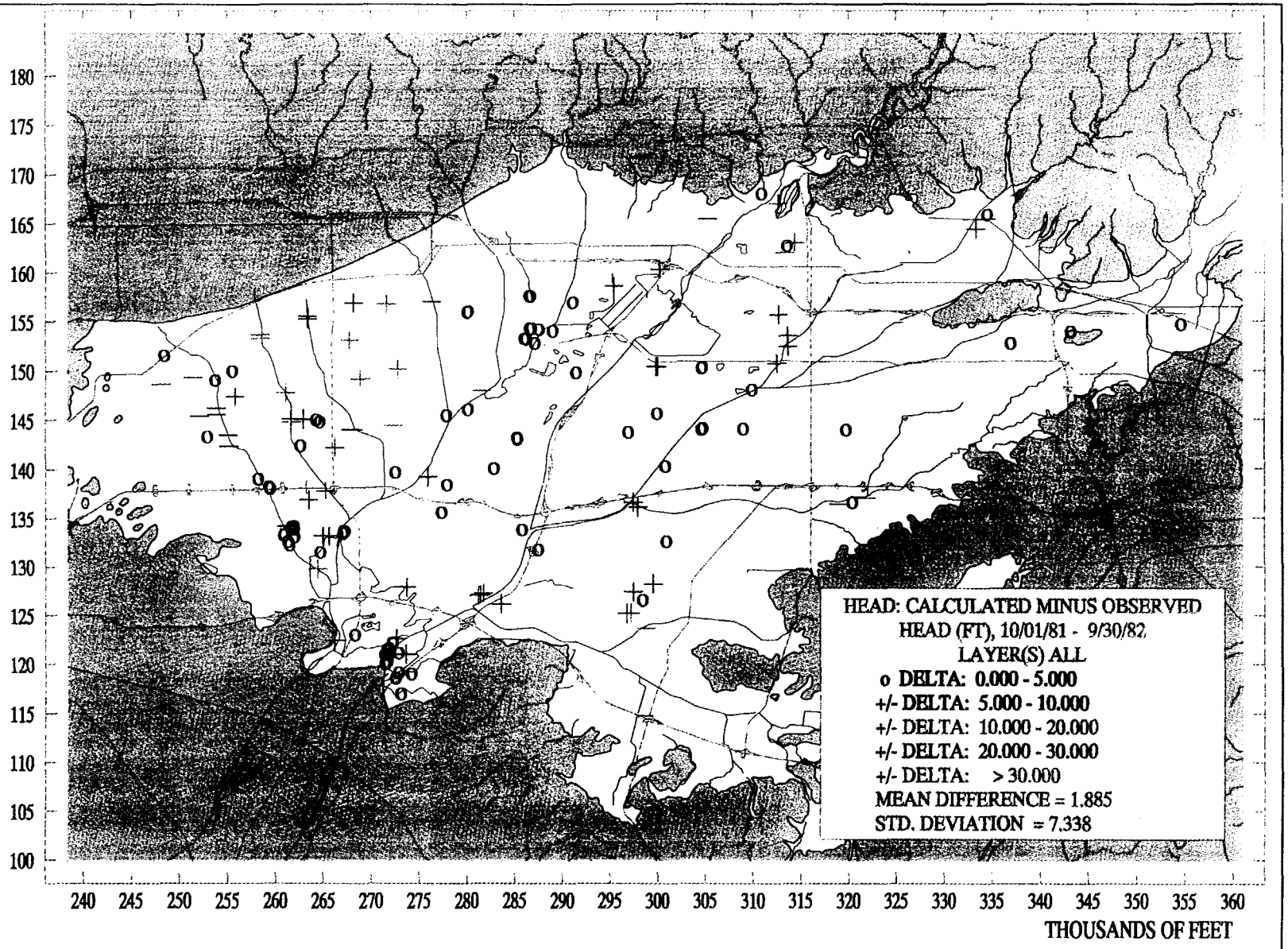
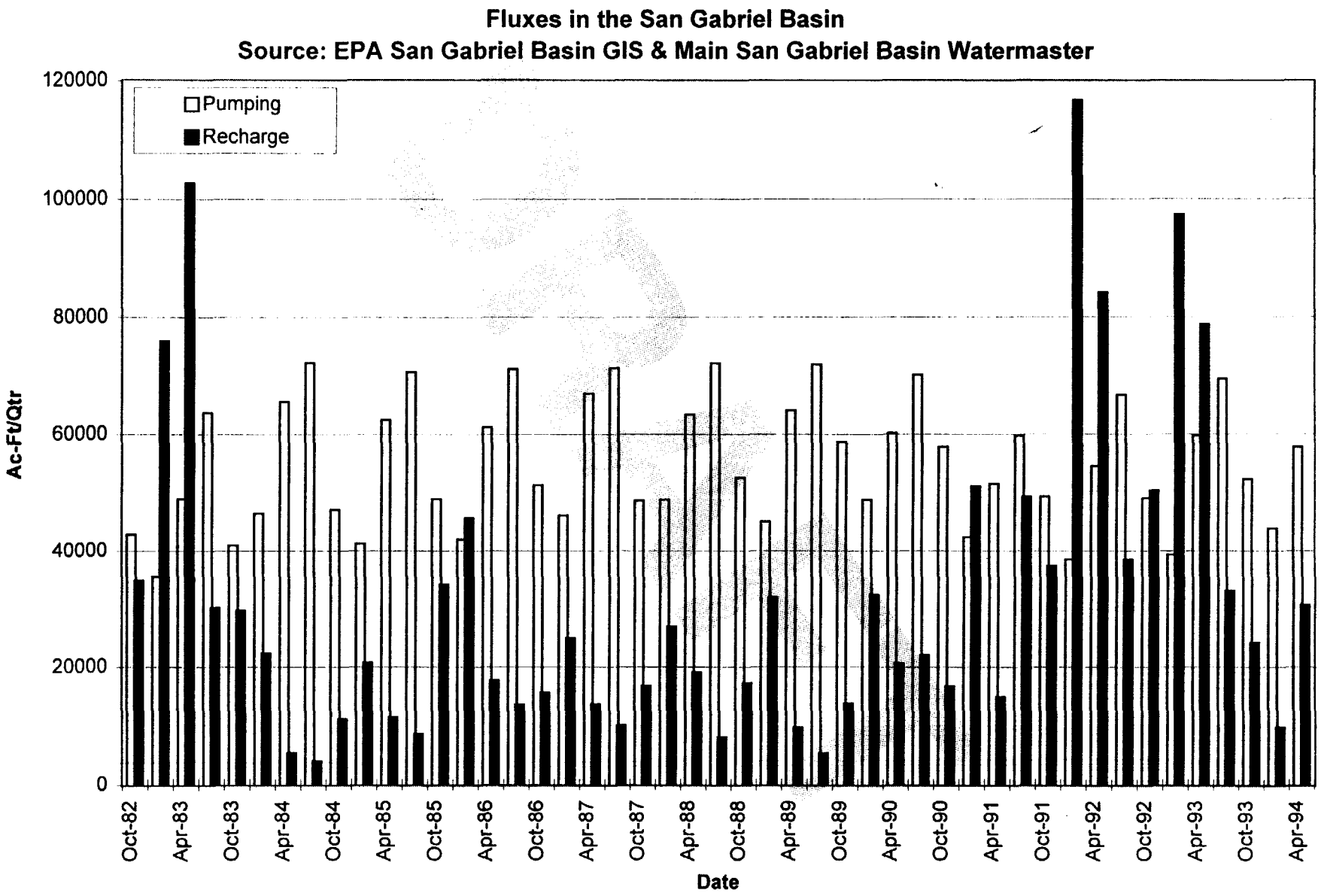


FIGURE 5-24

Calculated Minus Observed Water Levels
Steady State Calibration 1981 - 1982 Water Year

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants



CDM Camp Dresser & McKee Inc.
PUMPRECH.XLS-Chart1

Figure 5-25

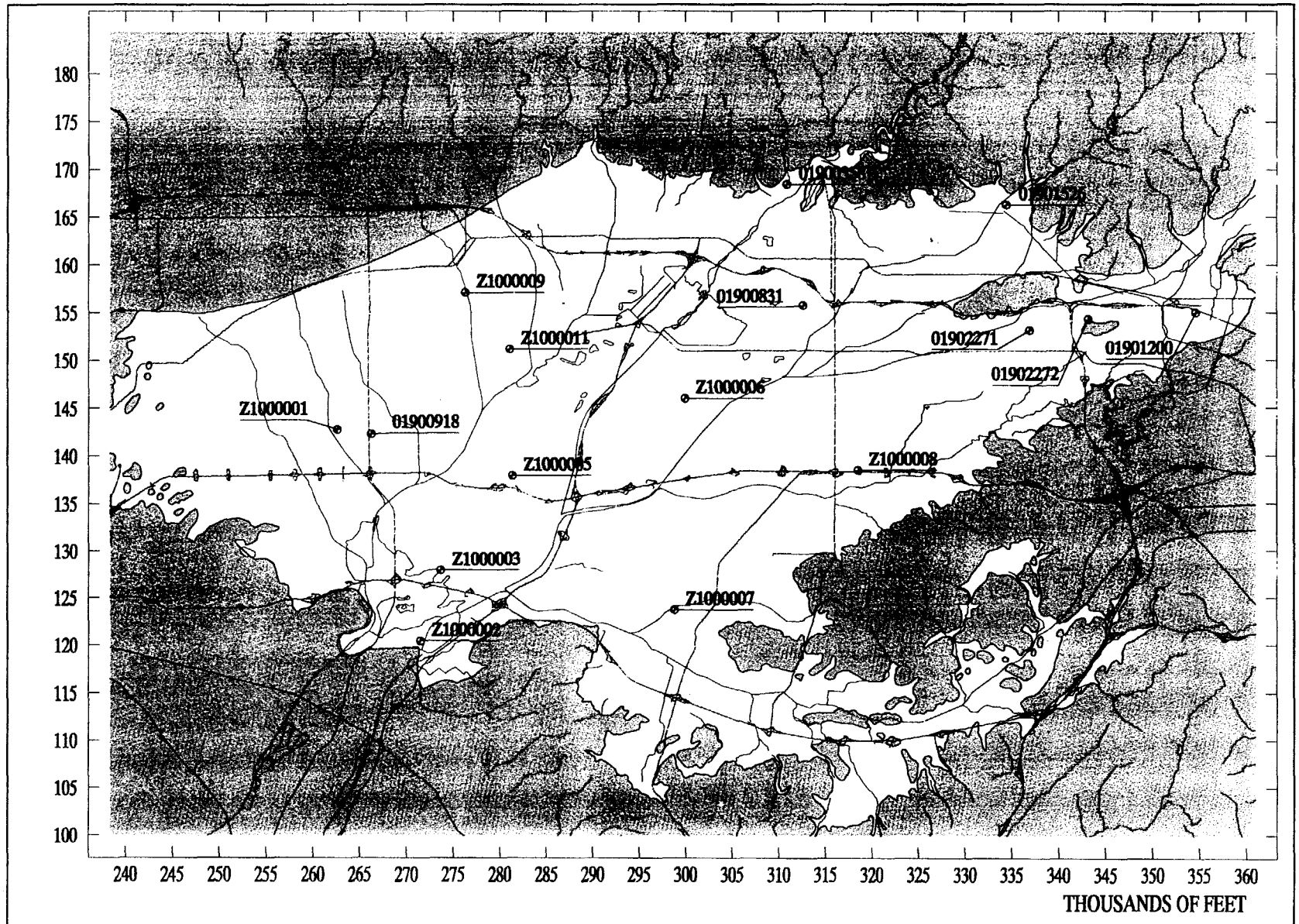


FIGURE 5-26

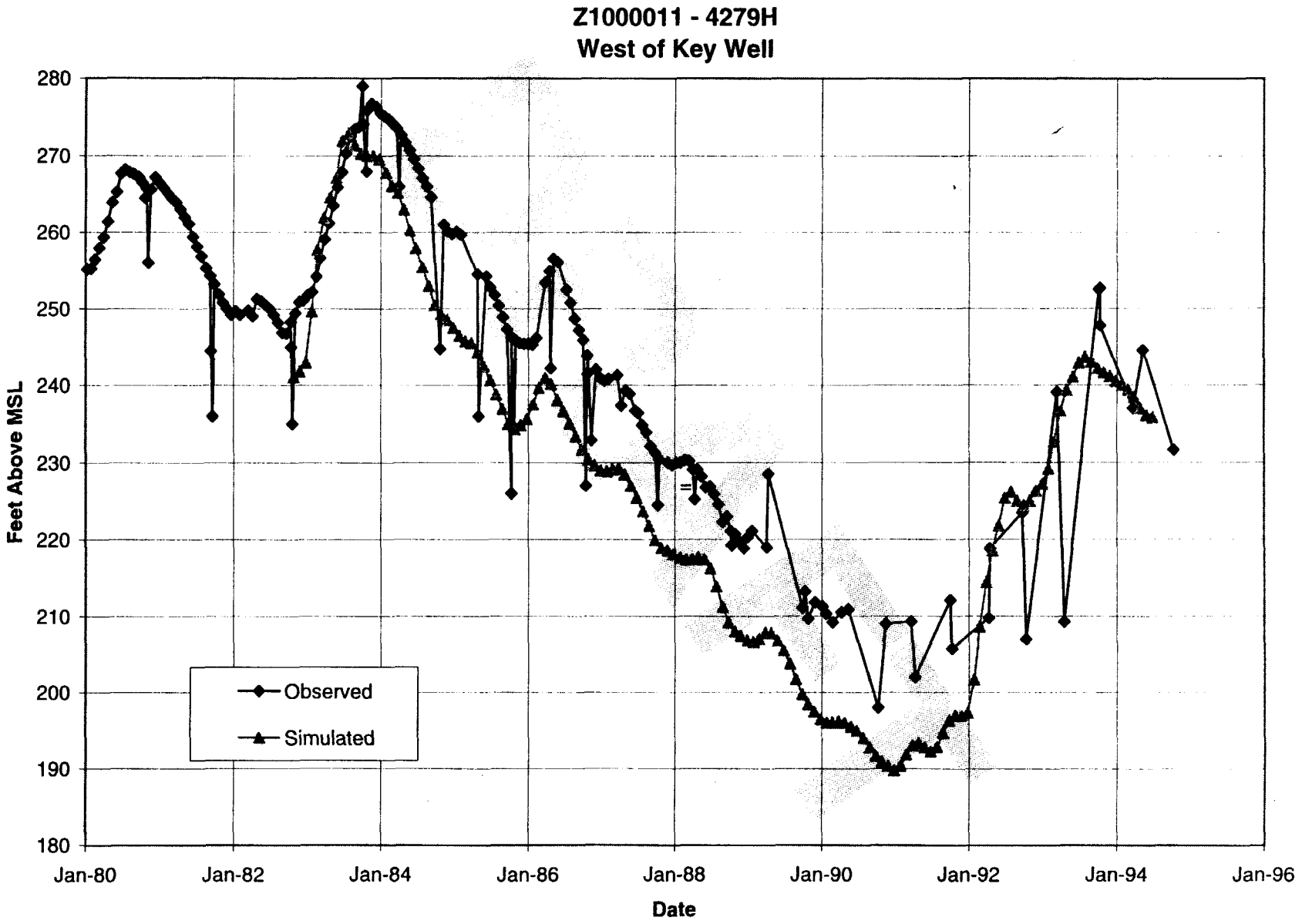
Location of Transient Calibration Wells

Baldwin Park Operable Unit Pre-Remedial Design

CDM

environmental engineers, scientists, planners, & management consultants

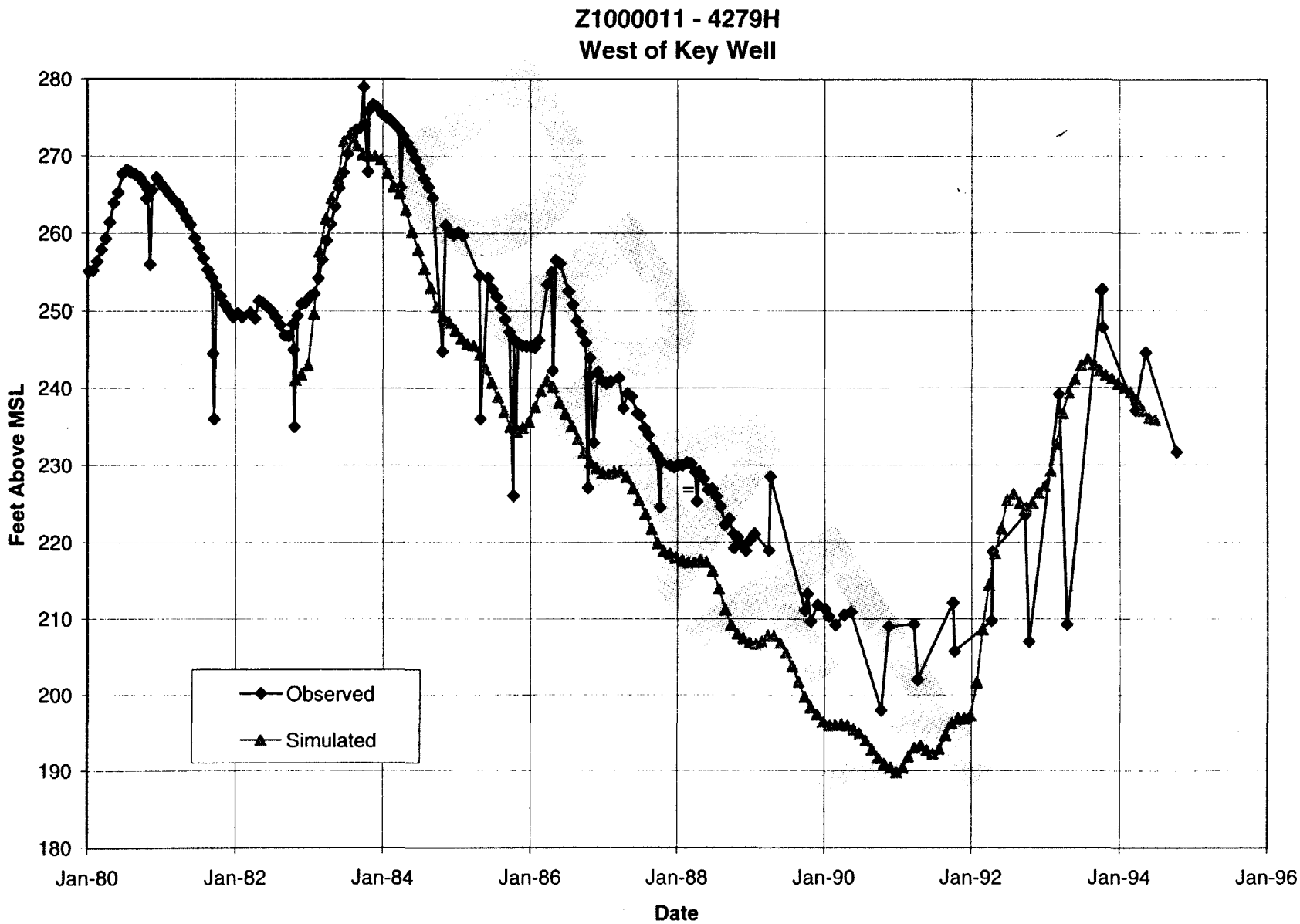
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000011
8/27/97

Figure 5-27

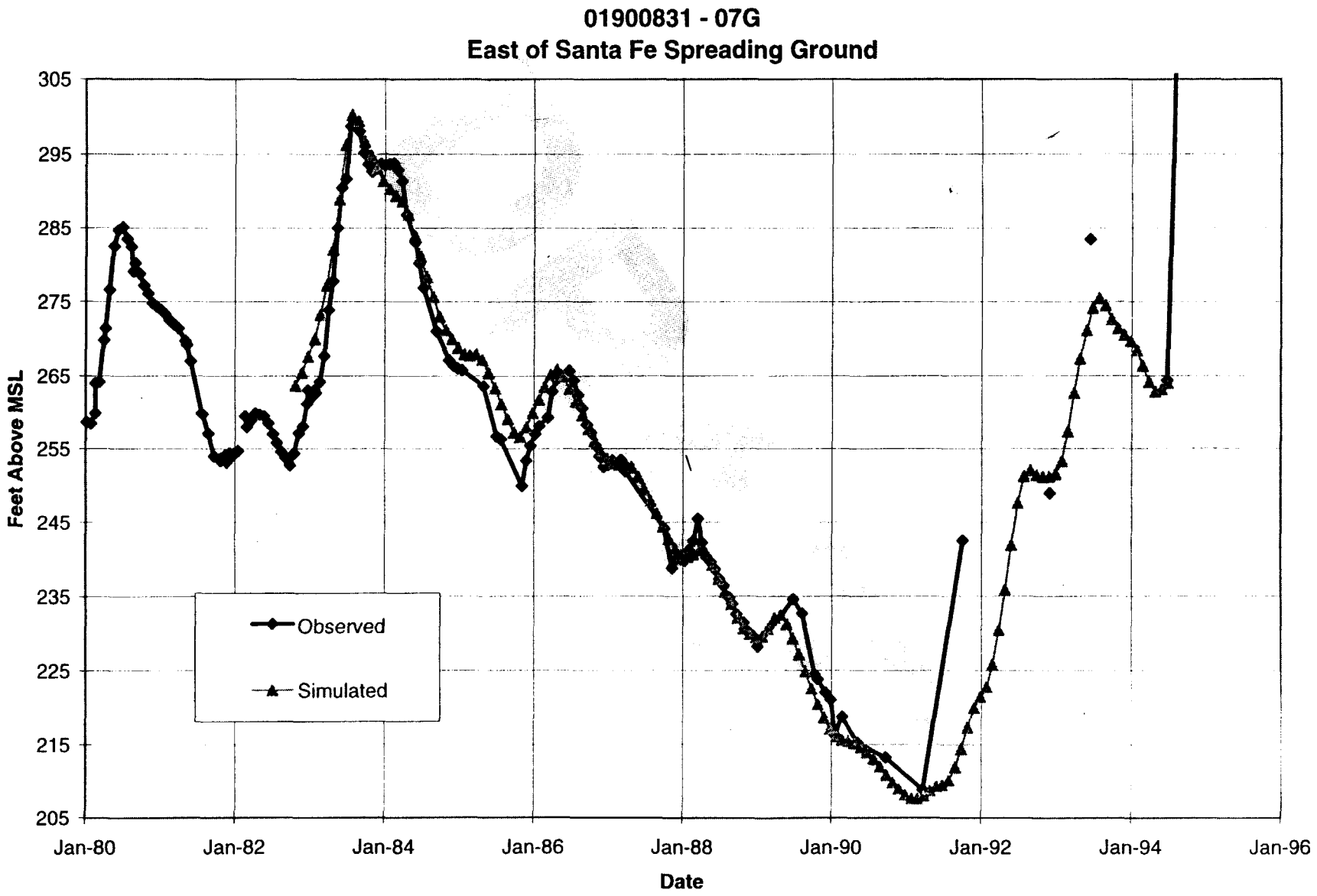
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000011
8/27/97

Figure 5-28

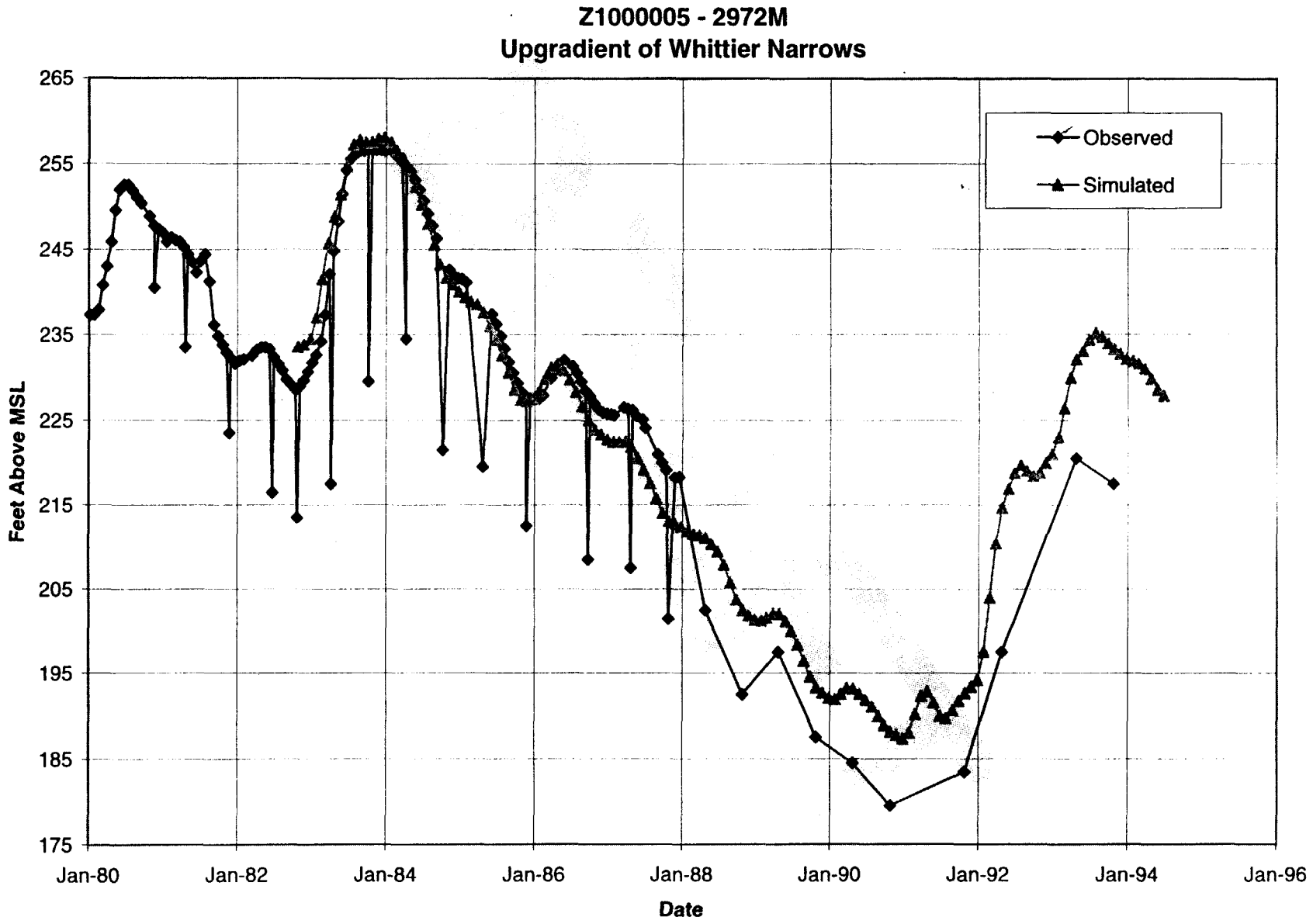
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-01900831
8/27/97

Figure 5-29

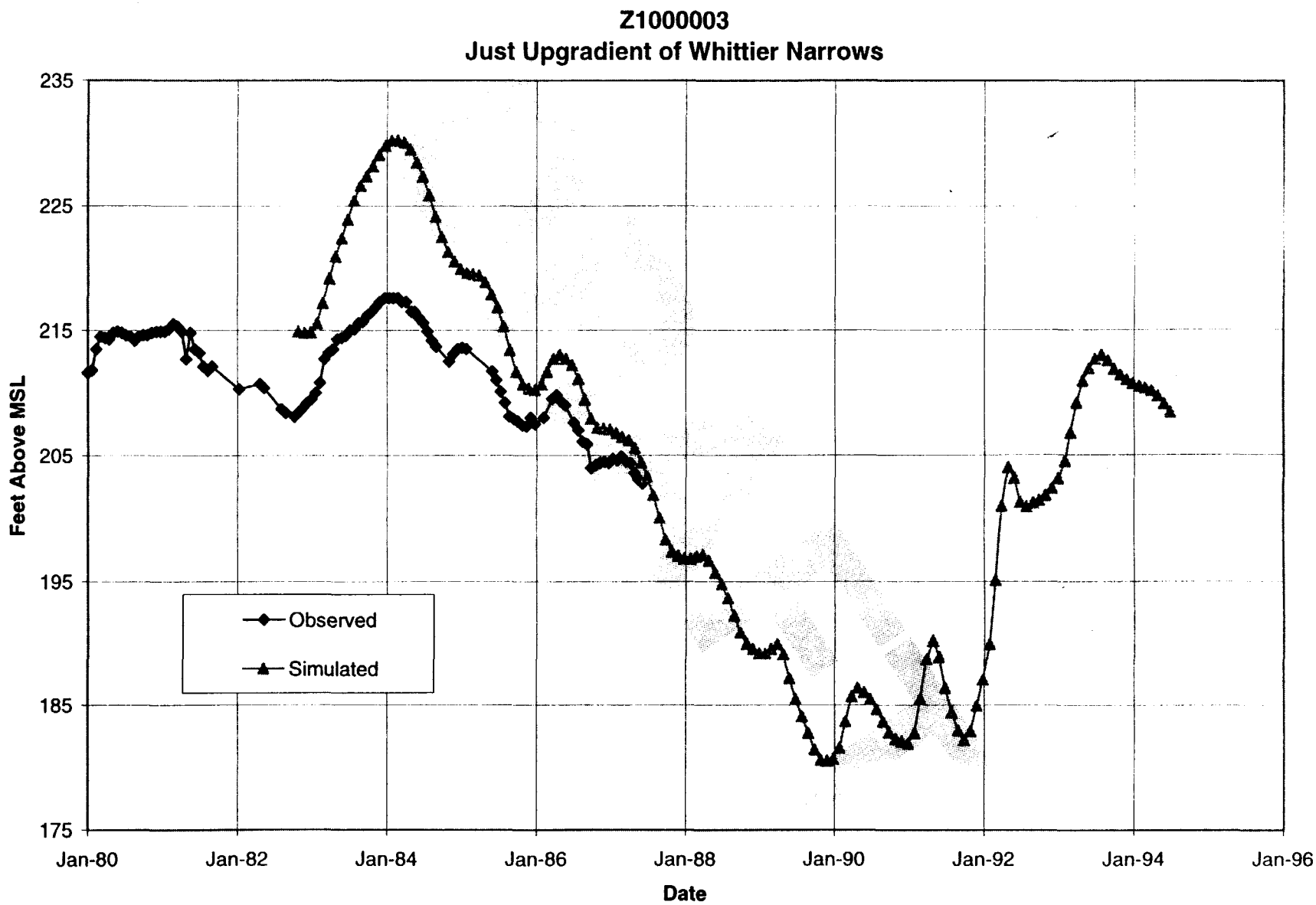
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000005
8/27/97

Figure 5-30

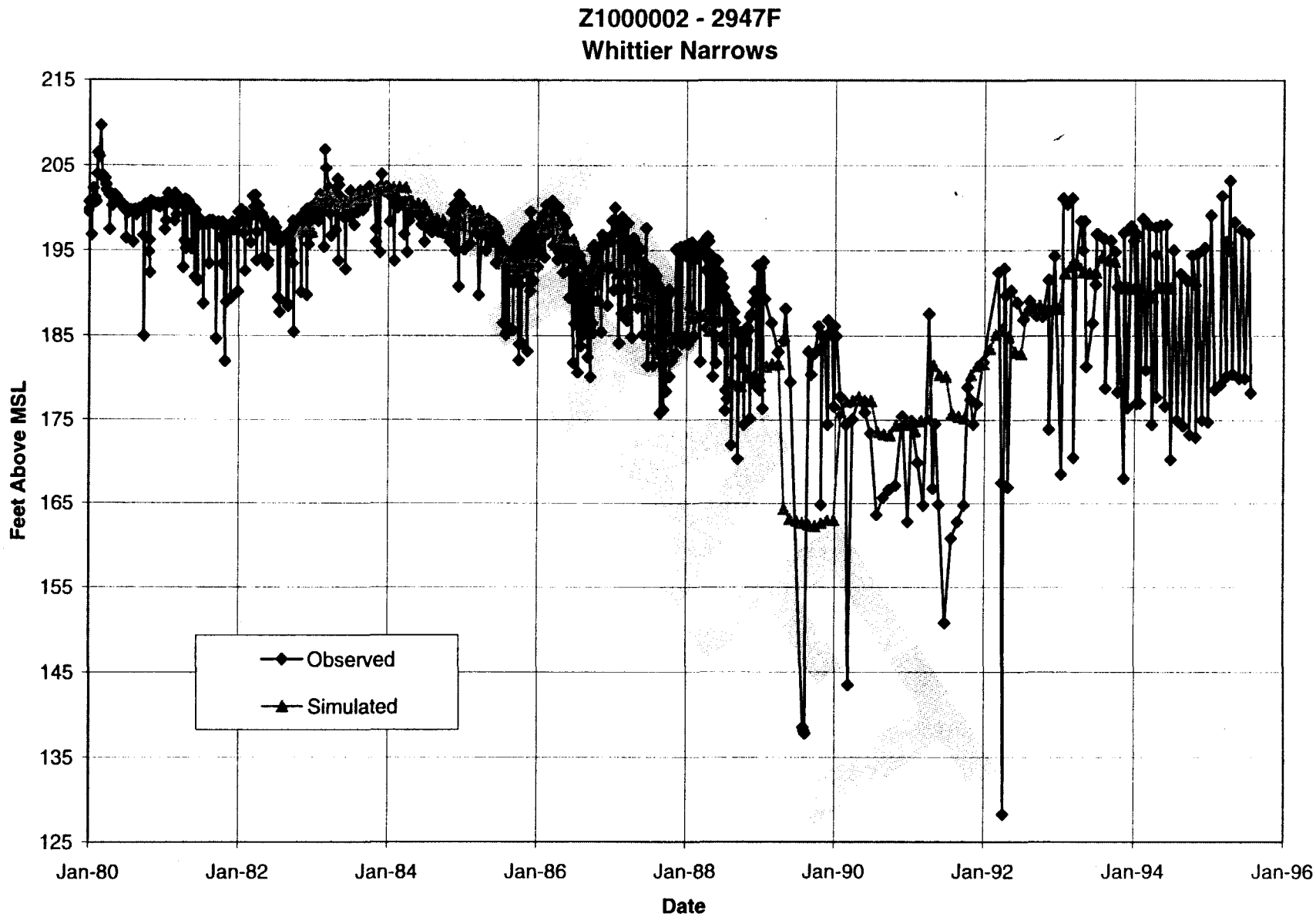
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000003
8/27/97

Figure 5-31

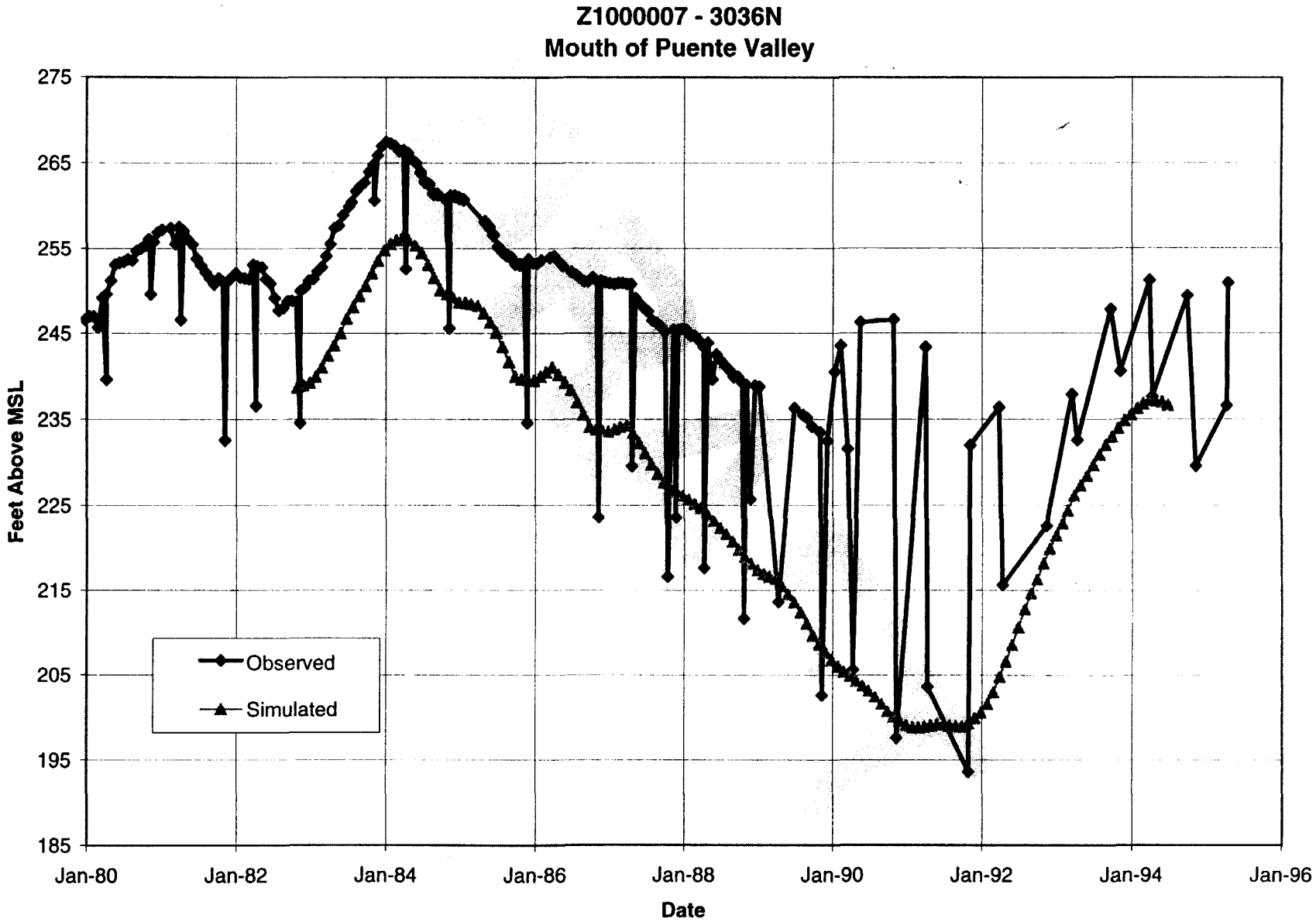
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000002
8/27/97

Figure 5-32

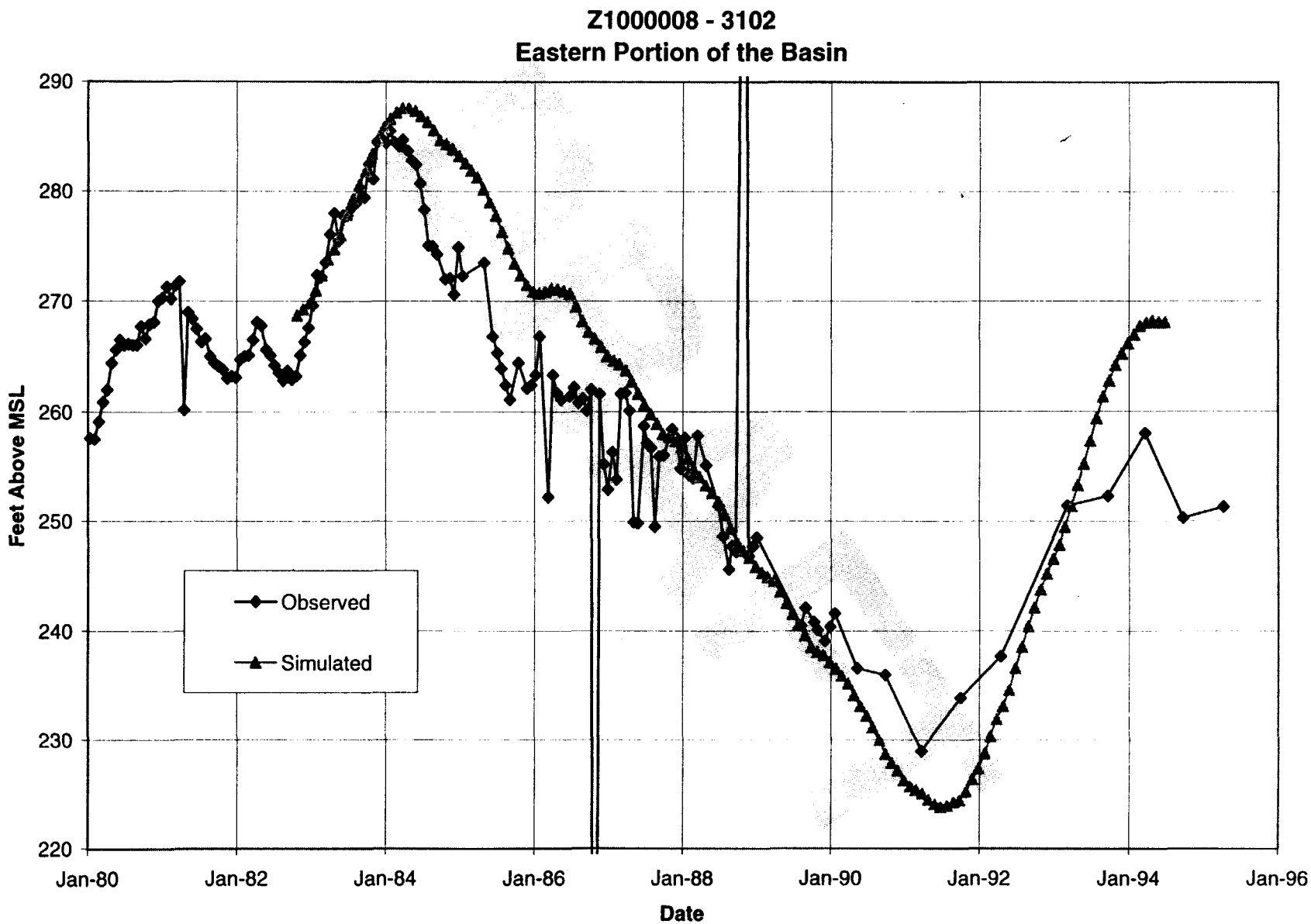
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000007
8/27/97

Figure 5-33

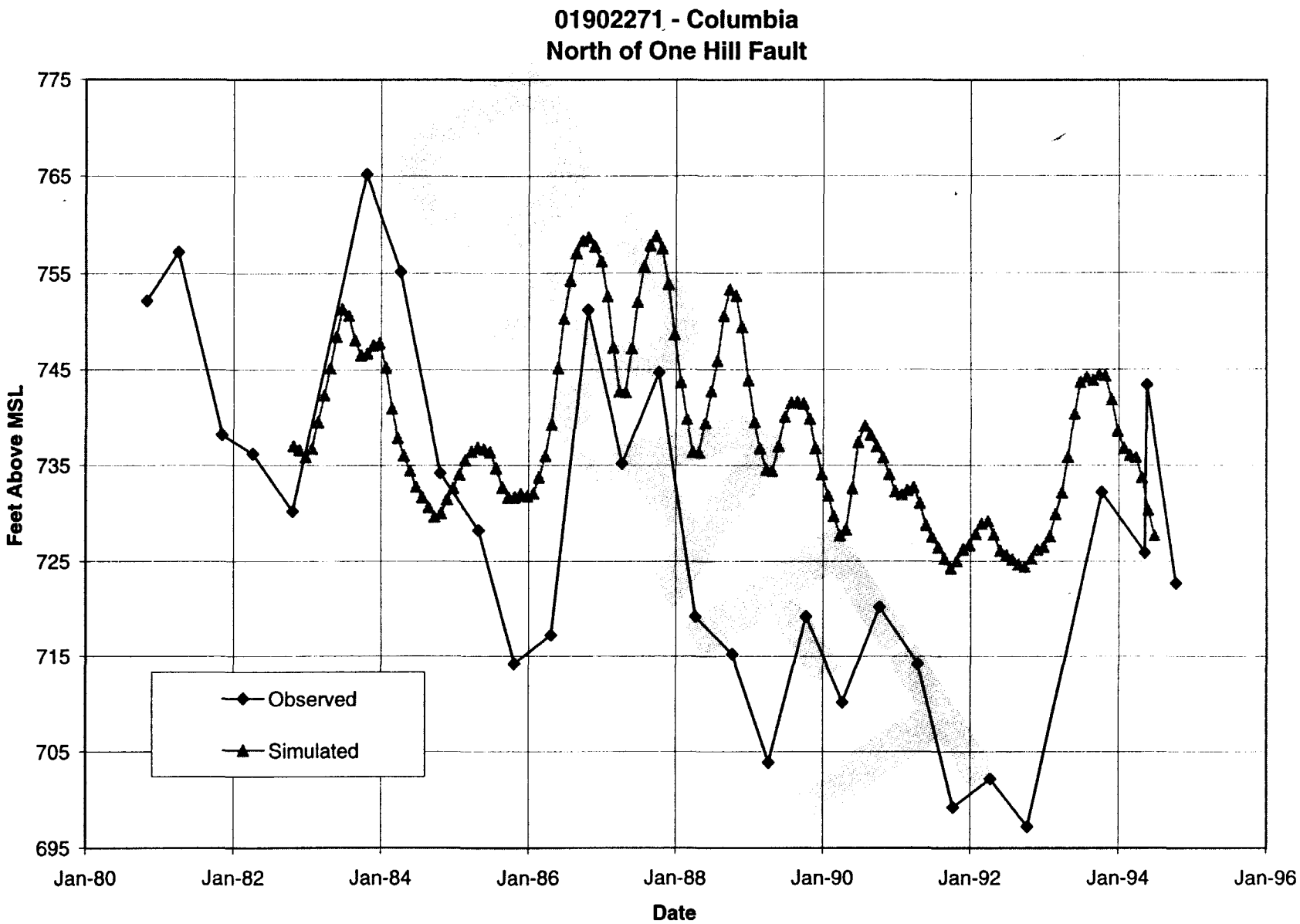
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000008
8/27/97

Figure 5-34

Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
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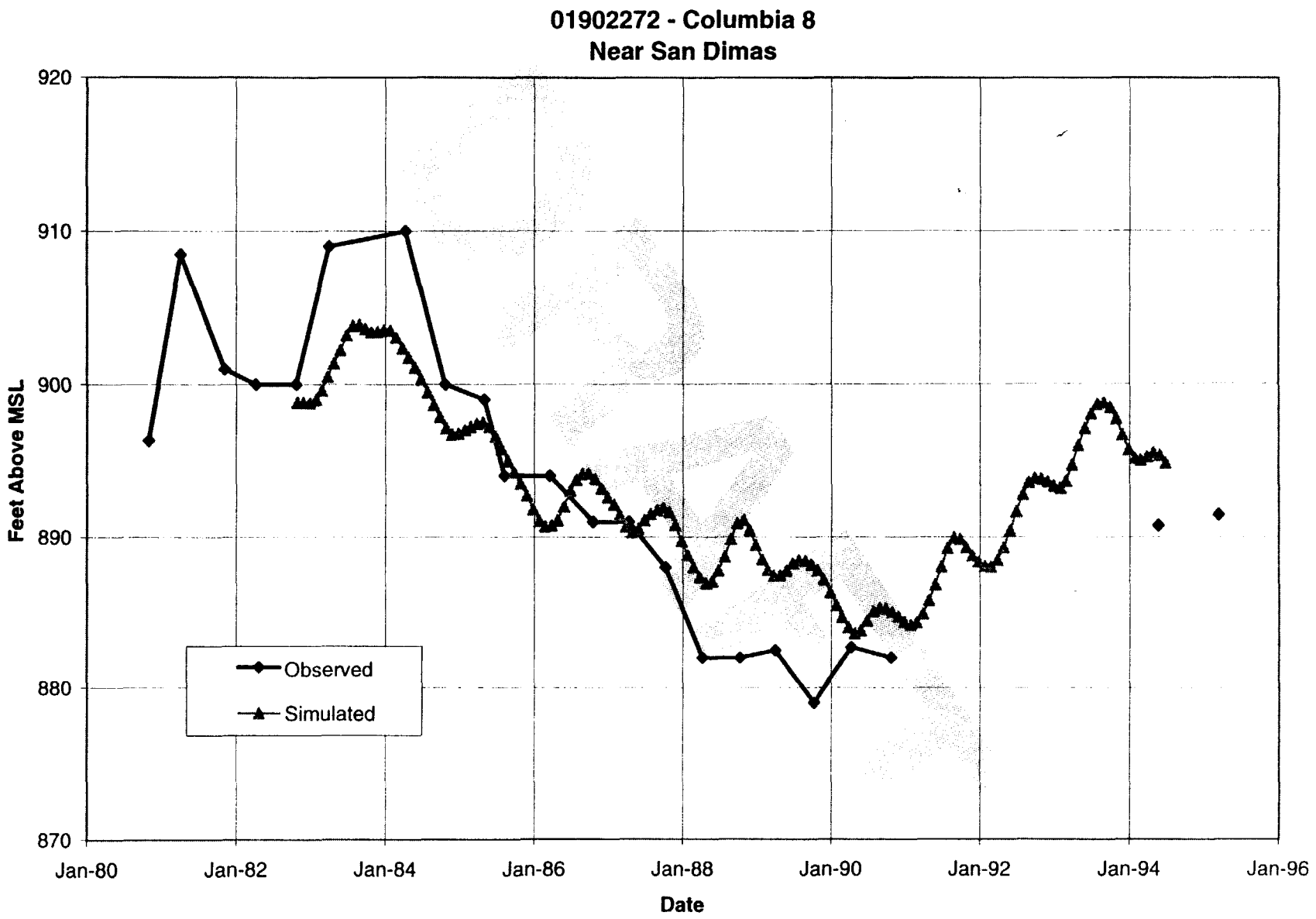
8/27/97

Figure 5-35

Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
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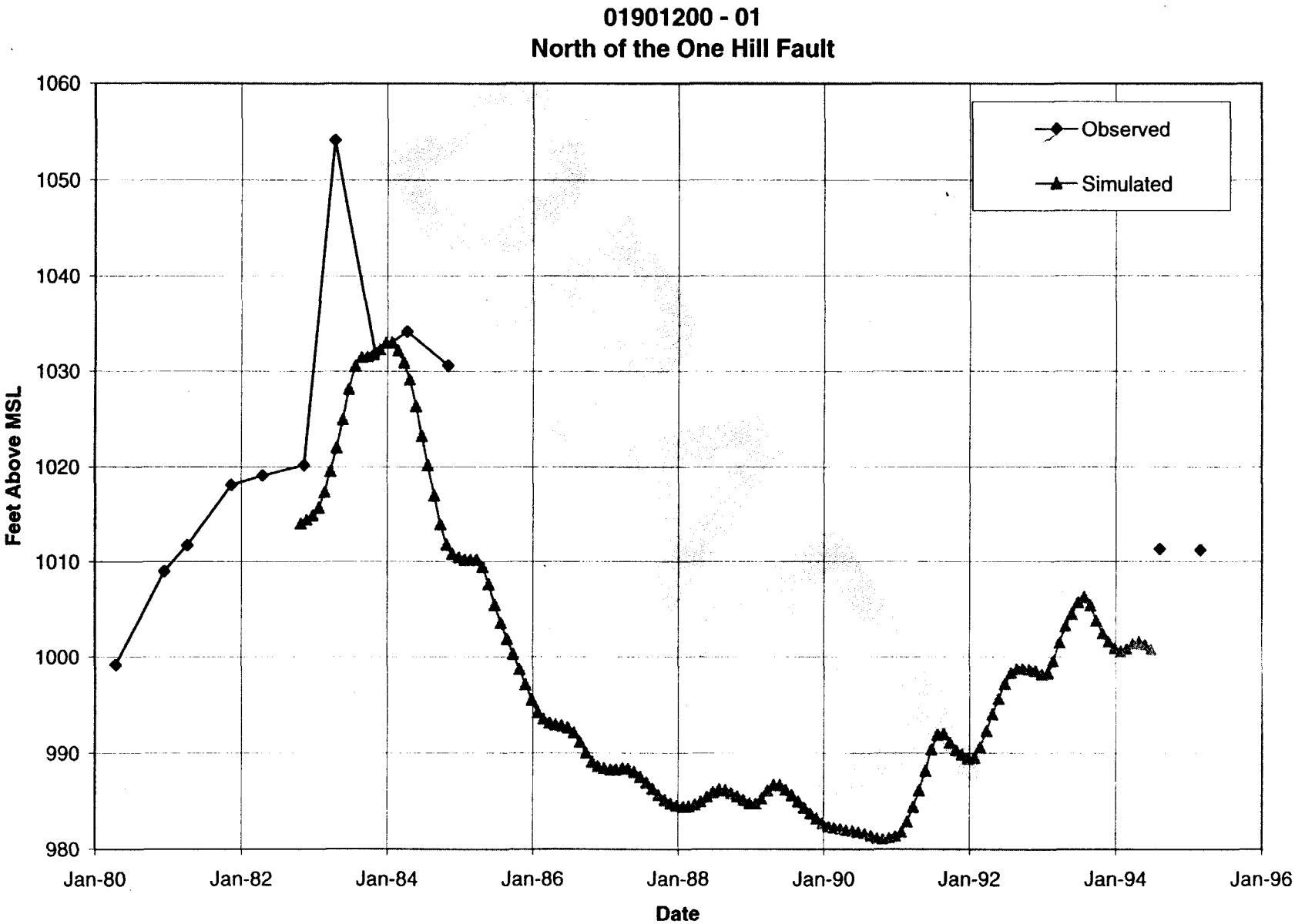
8/27/97

Figure 5-36

Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
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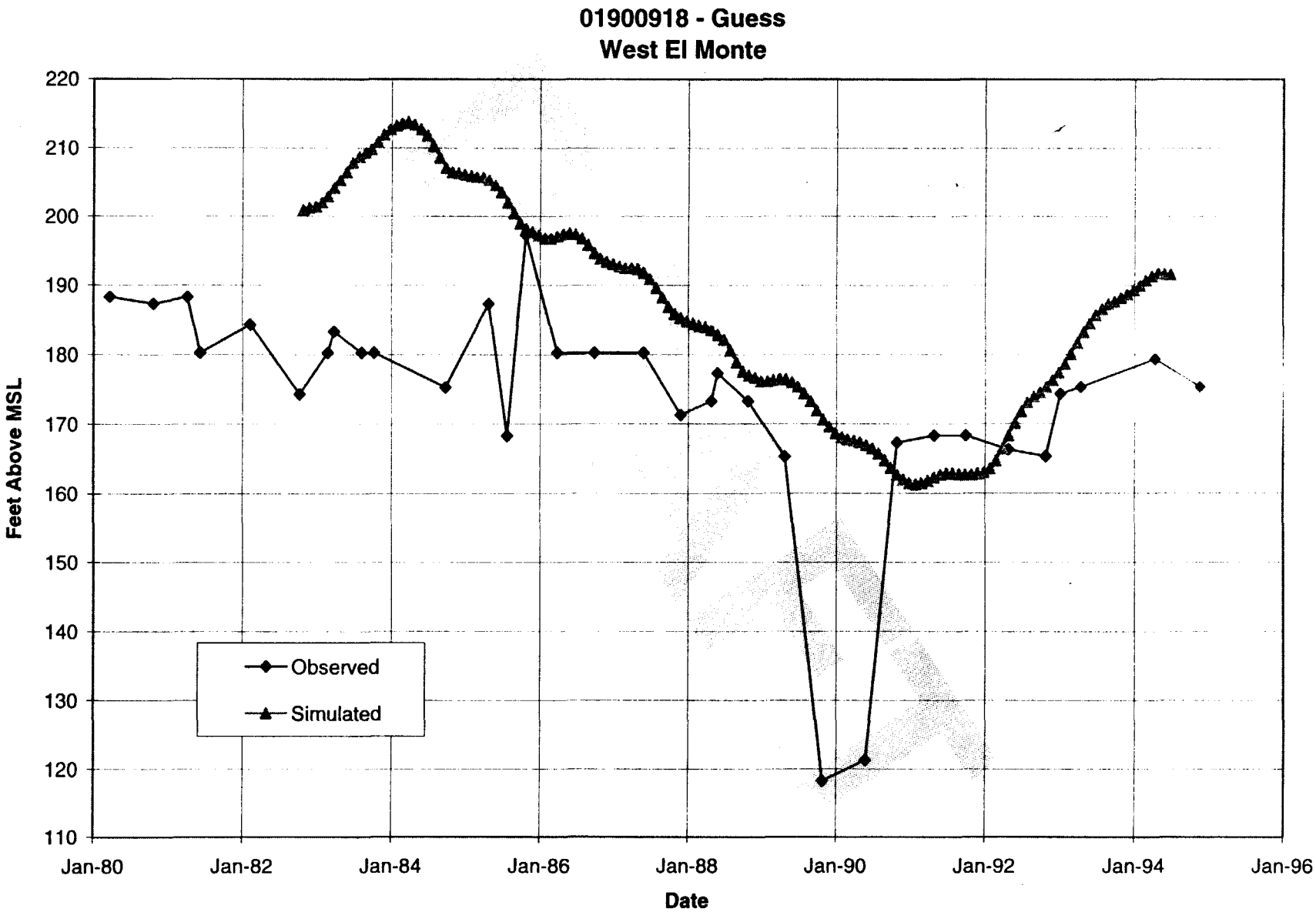
8/27/97

Figure 5-37

Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
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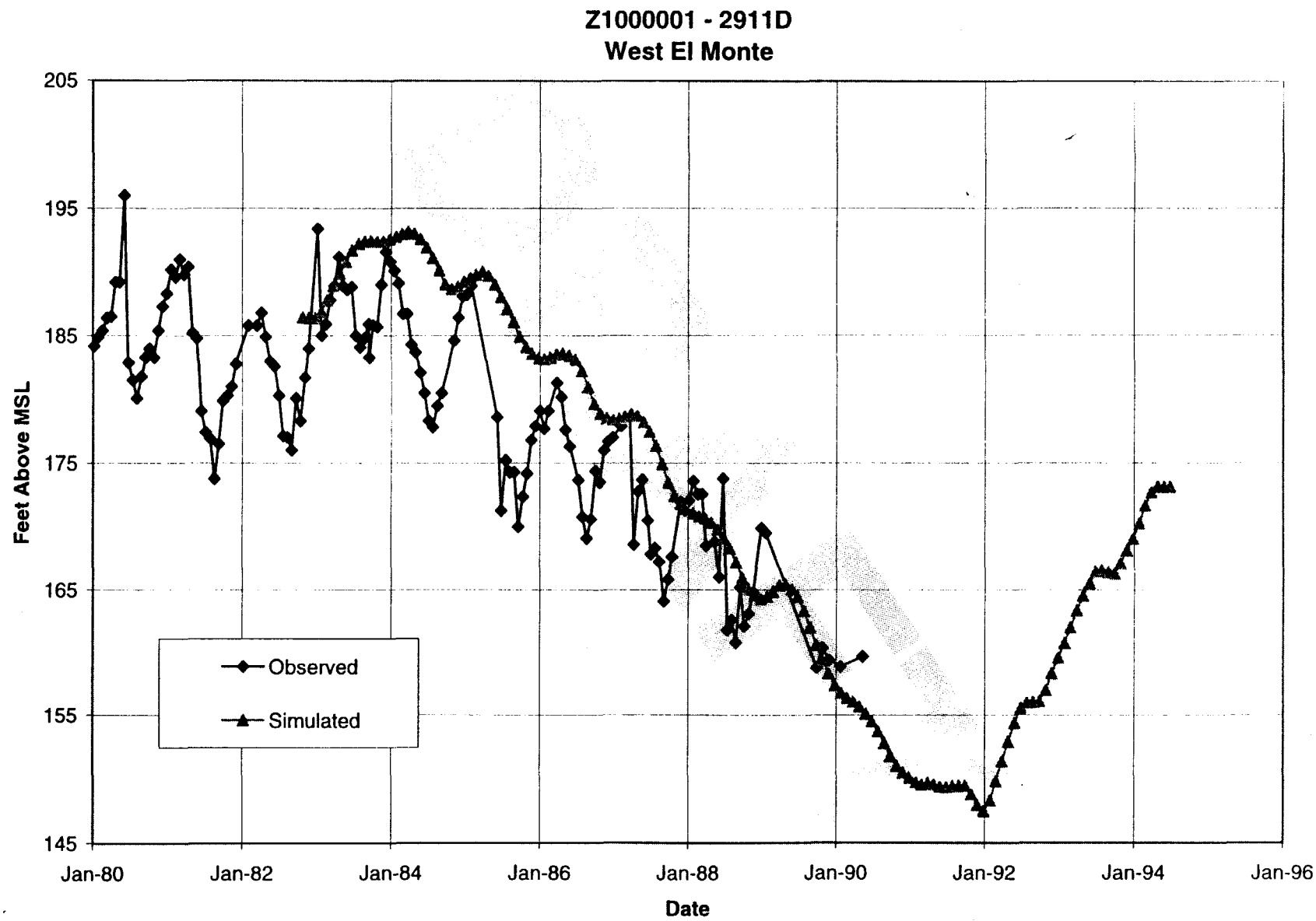
8/27/97

Figure 5-38

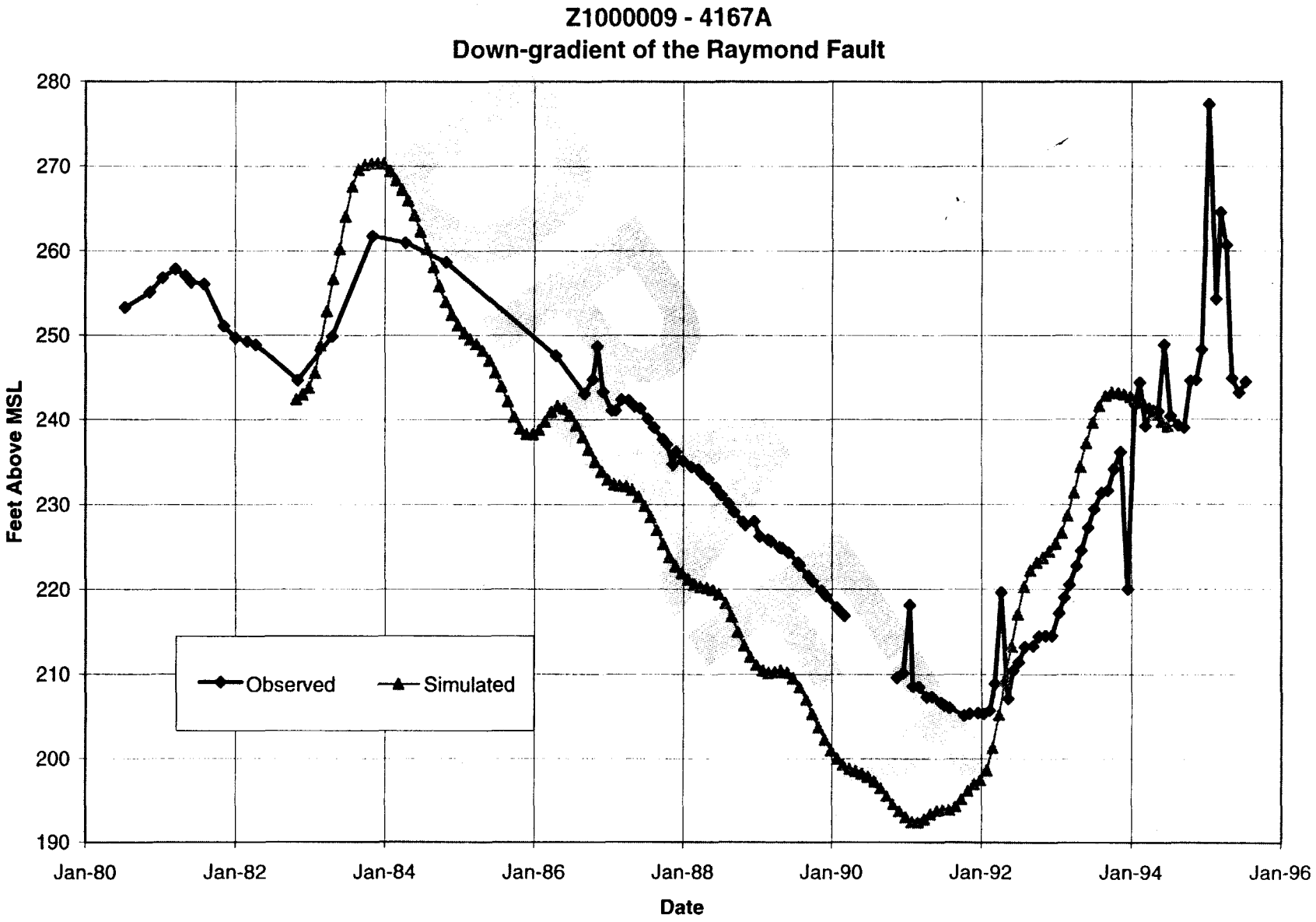
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000001
8/27/97

Figure 5-39

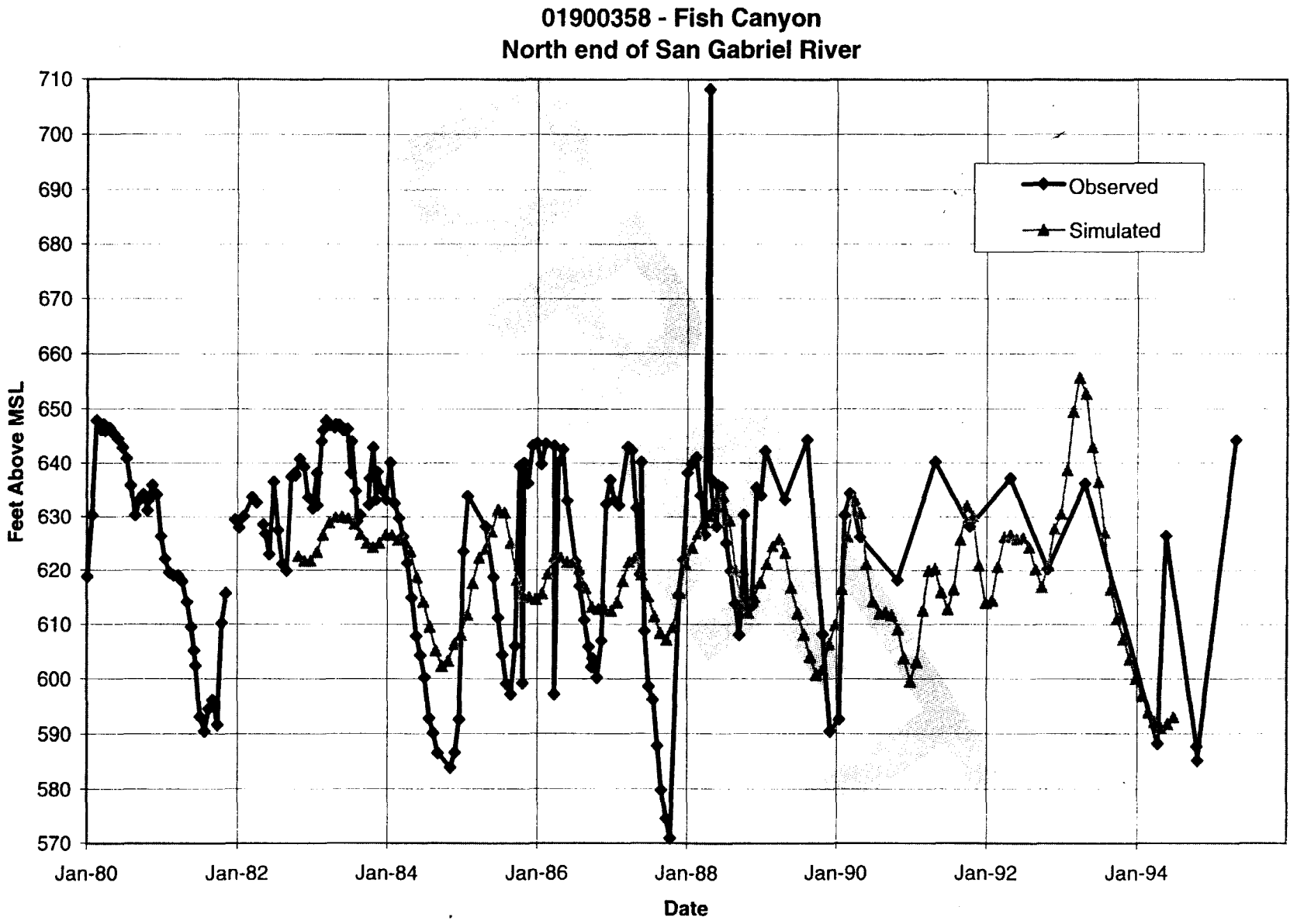
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-Z1000009
8/27/97

Figure 5-40

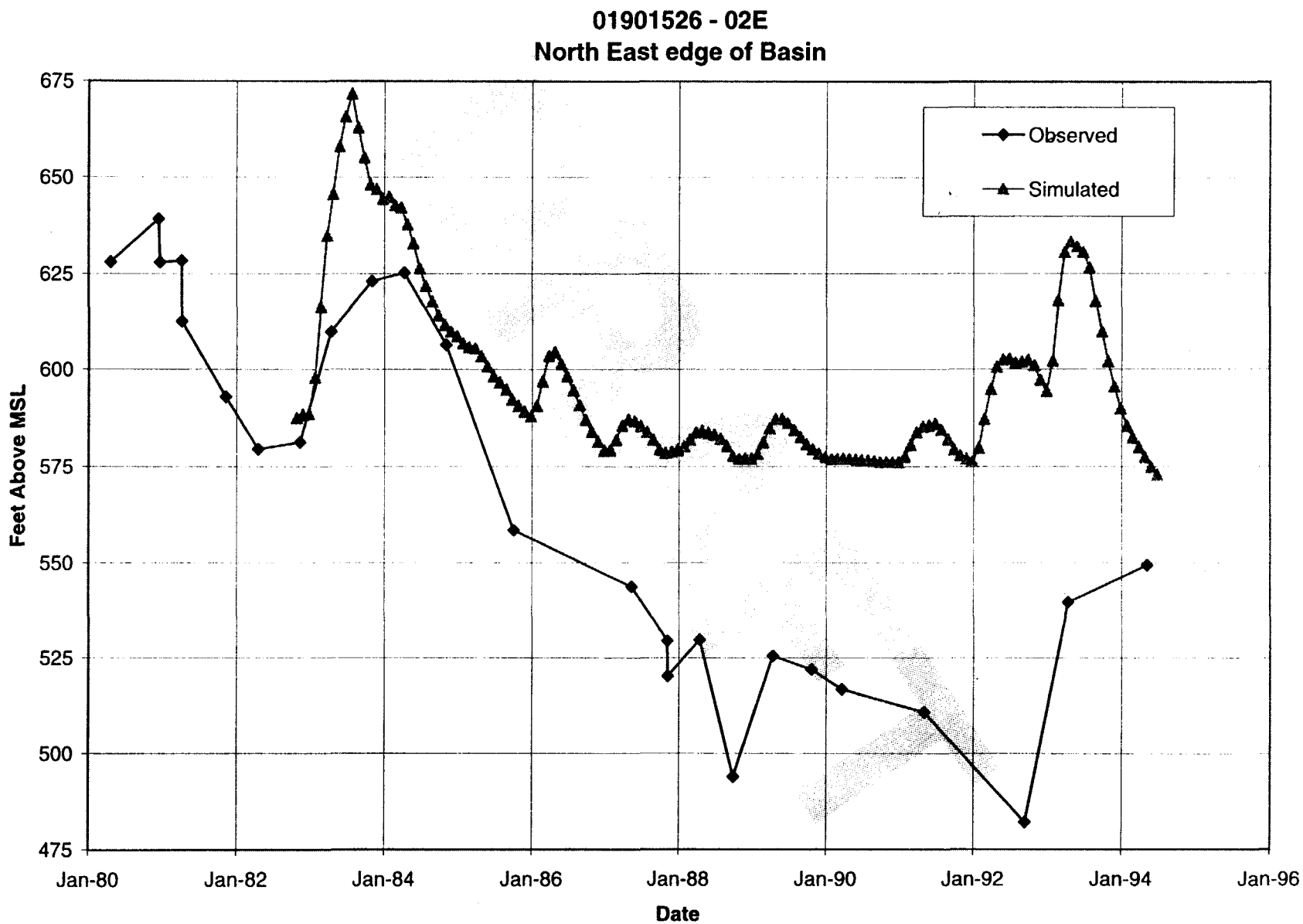
Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
Redkh1.xls-01900358
8/27/97

Figure 5-41

Baldwin Park Operable Unit Pre-Remedial Design
Groundwater Model



CDM Camp Dresser & McKee
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Figure 5-42

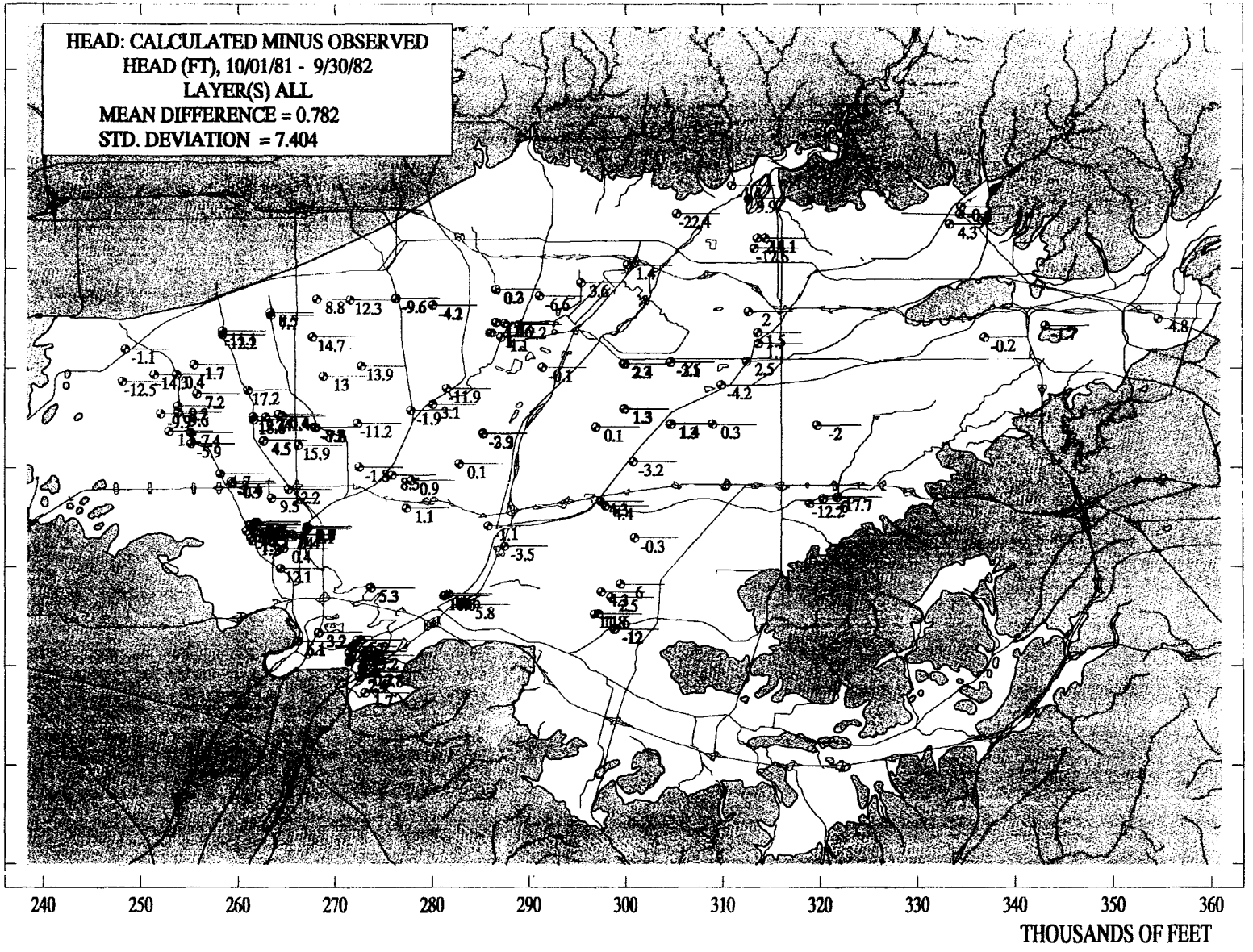


FIGURE 5-43	Sensitivity Analysis Case 1 Hydraulic Conductivities Increased by 50 ft/day in Center of Basin Calculated Minus Observed Water Levels Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

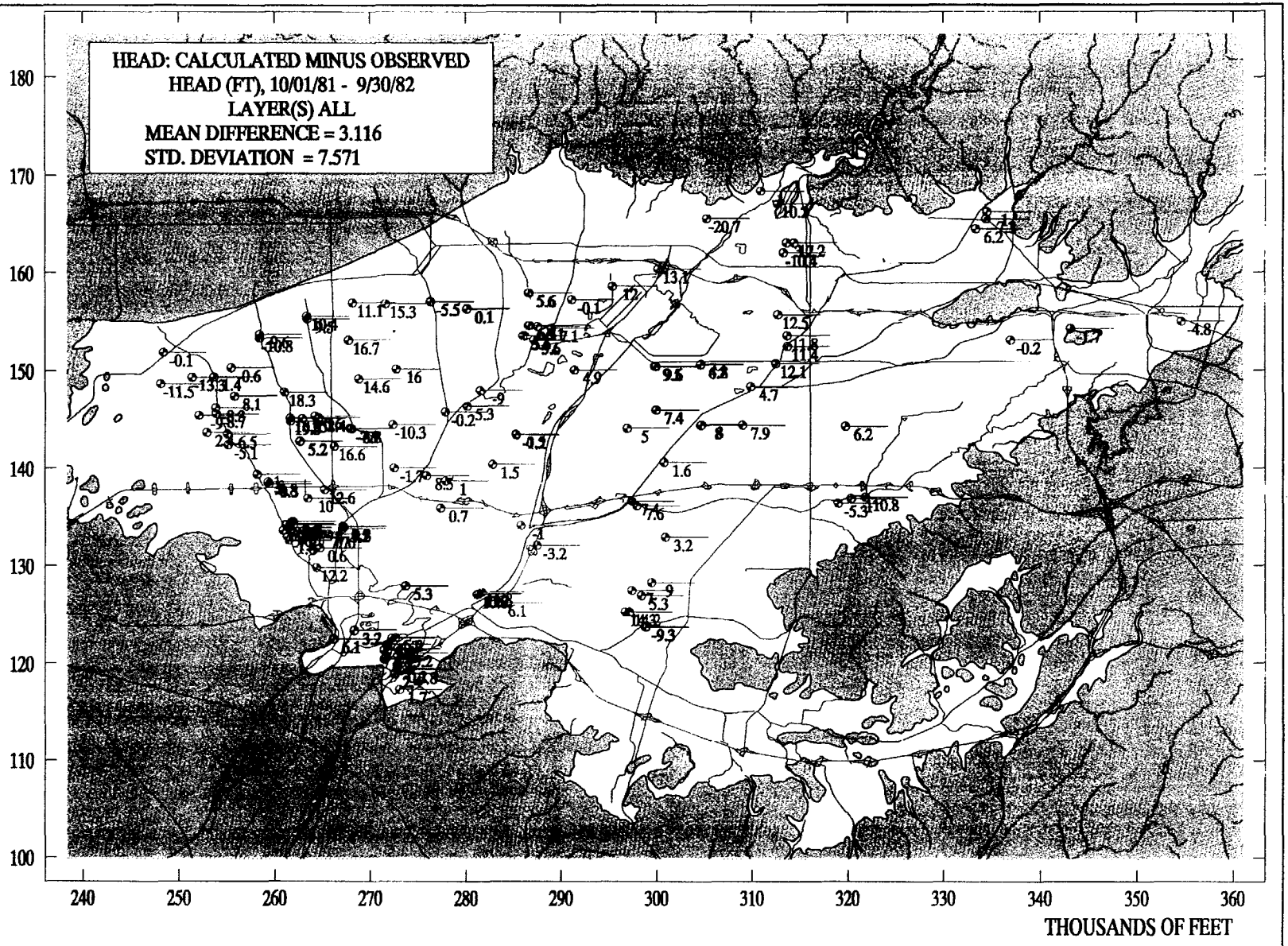


FIGURE 5-44	Sensitivity Analysis Case 2 Hydraulic Conductivities Reduced by 50 ft/day in Center of Basin Calculated Minus Observed Water Levels Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

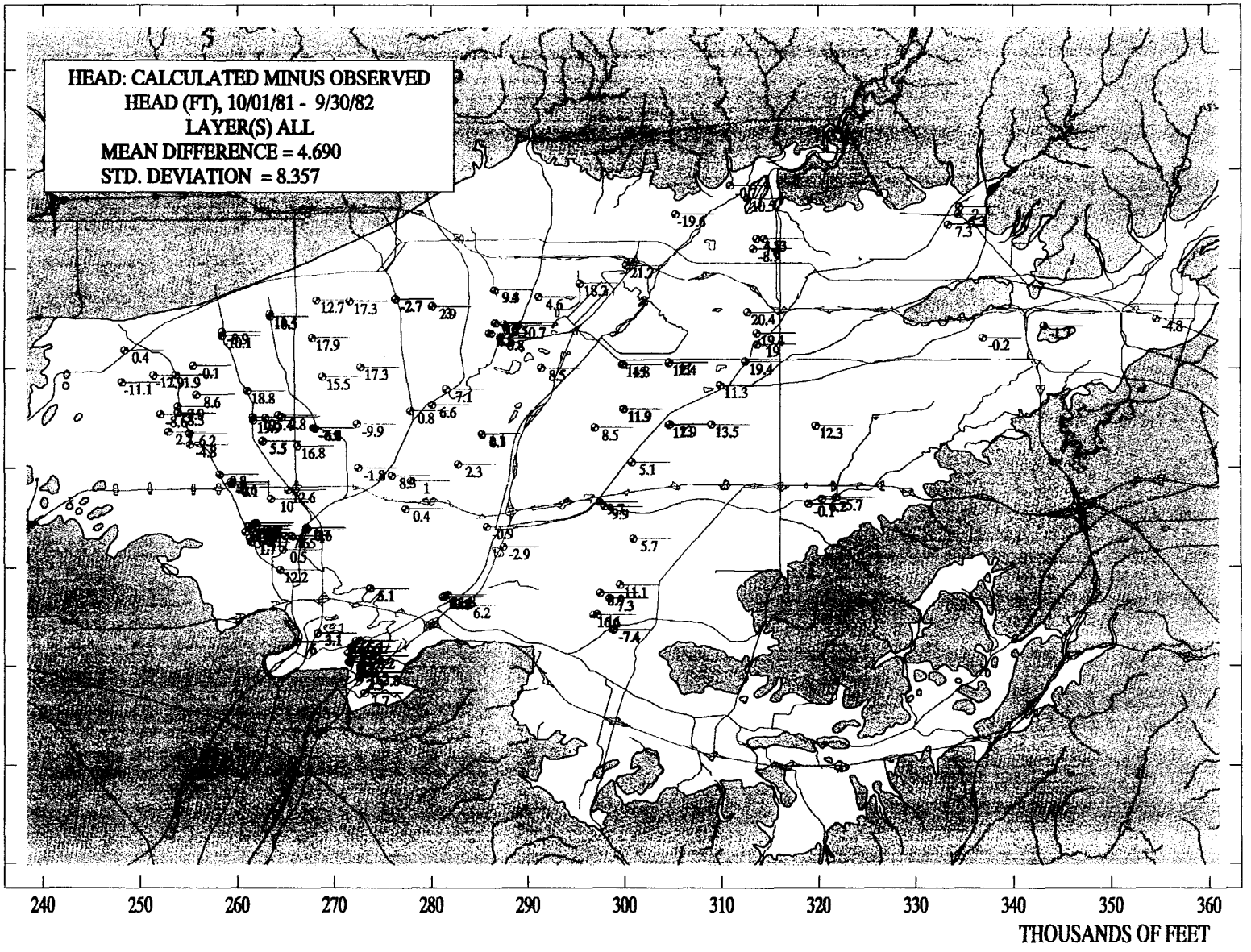


FIGURE 5-45

Sensitivity Analysis Case 3
Hydraulic Conductivities Reduced by 100 ft/day in Center of Basin
Calculated Minus Observed Water Levels
Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

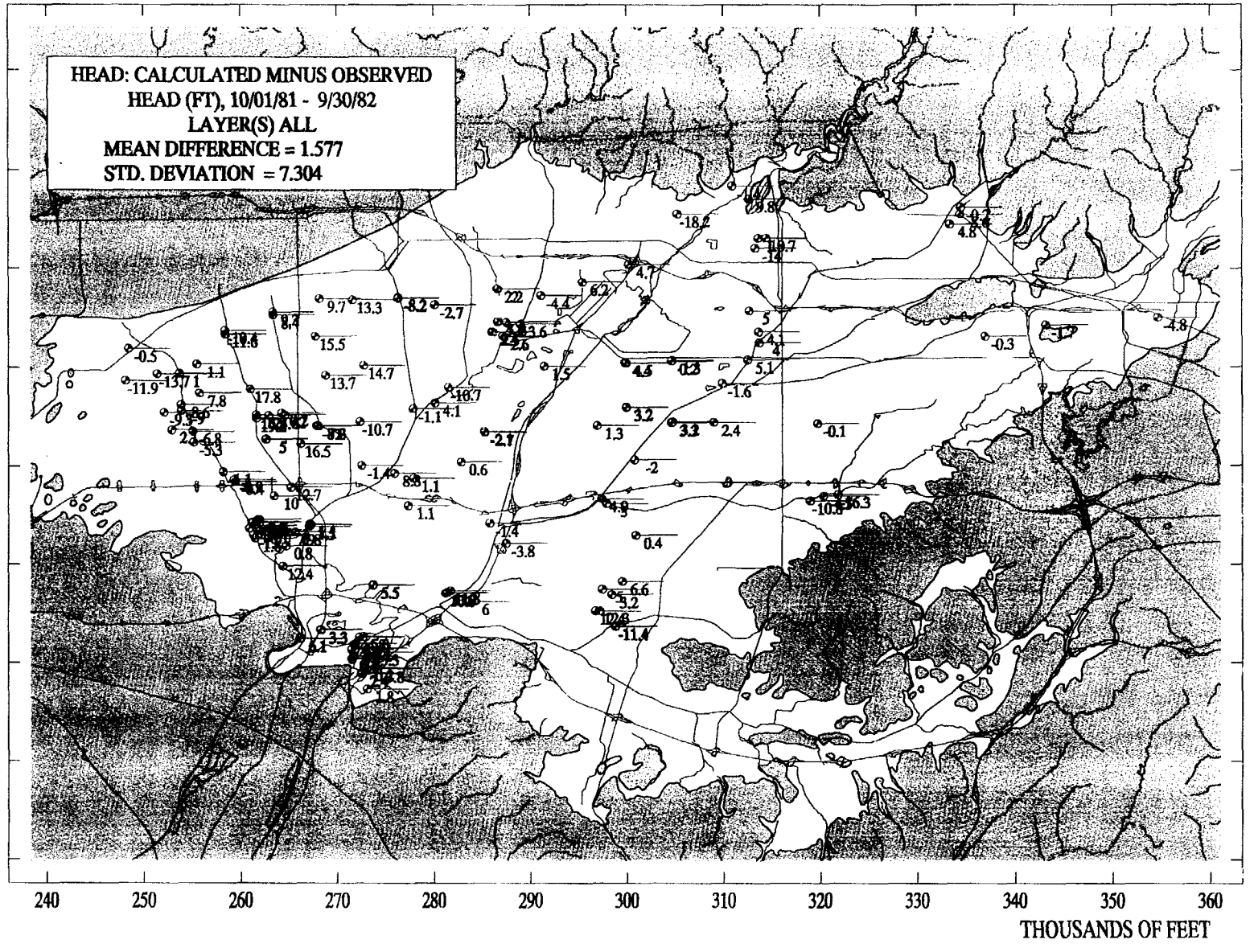


FIGURE 5-46

Sensitivity Analysis Case 4
Fault Gap Centered over the San Gabriel River
Calculated Minus Observed Water Levels
Baldwin Park Operable Unit Pre-Remedial Design

environmental engineers, scientists, planners, & management consultants

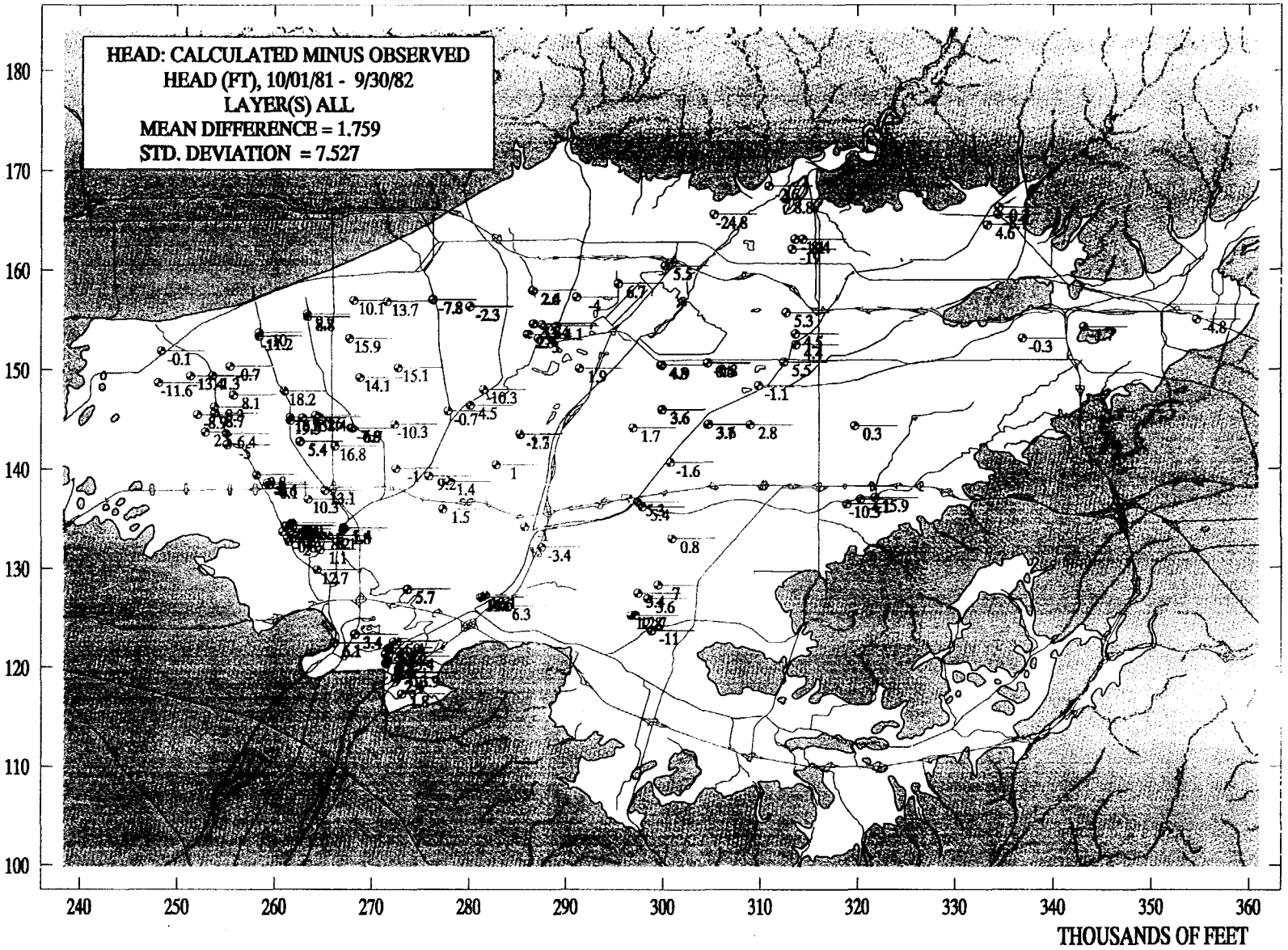


FIGURE 5-47	Sensitivity Analysis Case 5 Fault Gap Extended Along Entire San Gabriel Canyon Opening Calculated Minus Observed Water Levels Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

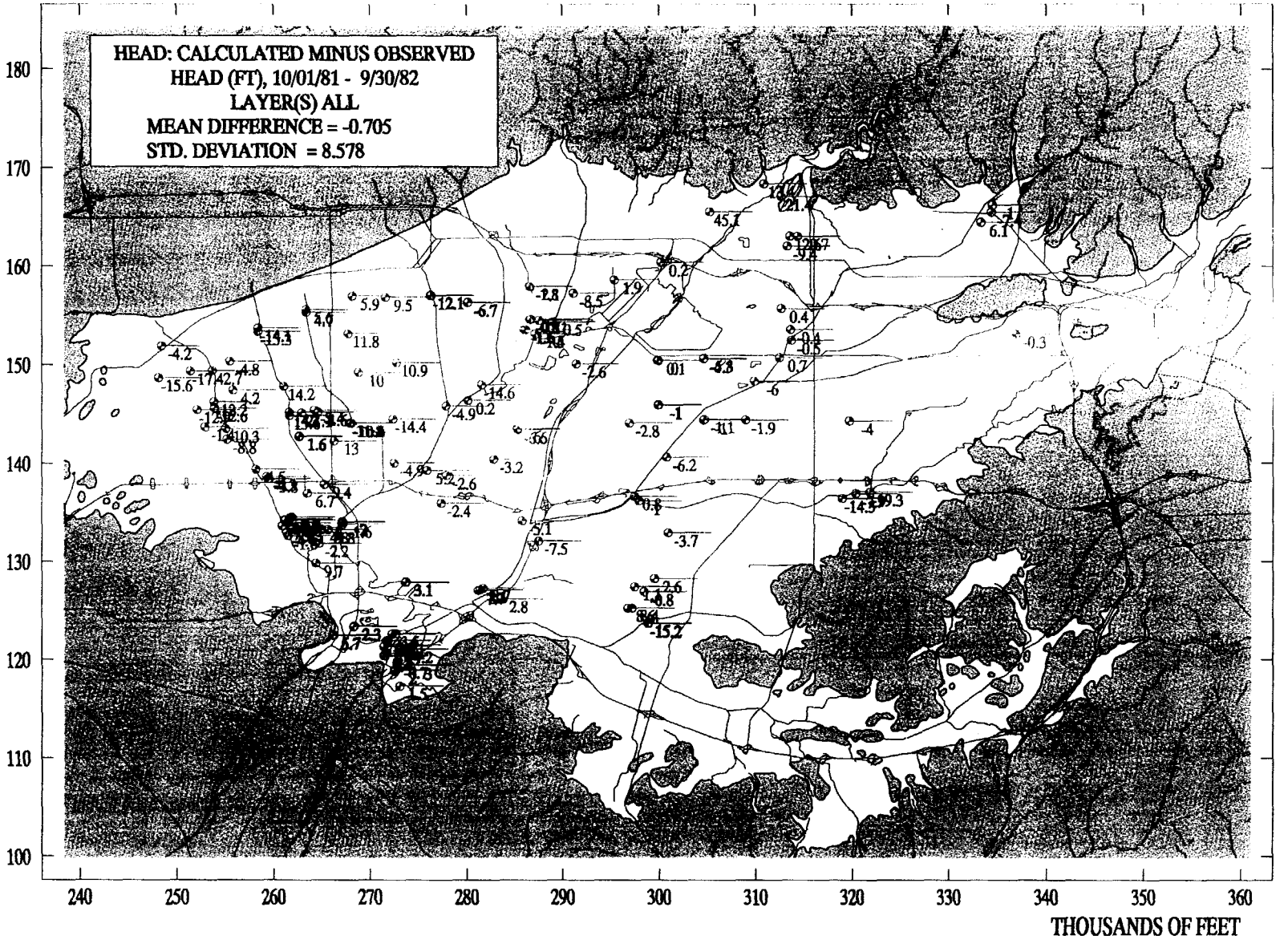


FIGURE 5-48

Sensitivity Analysis Case 6
Fault Gap Centered over VOC Plume
Calculated Minus Observed Water Levels
Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

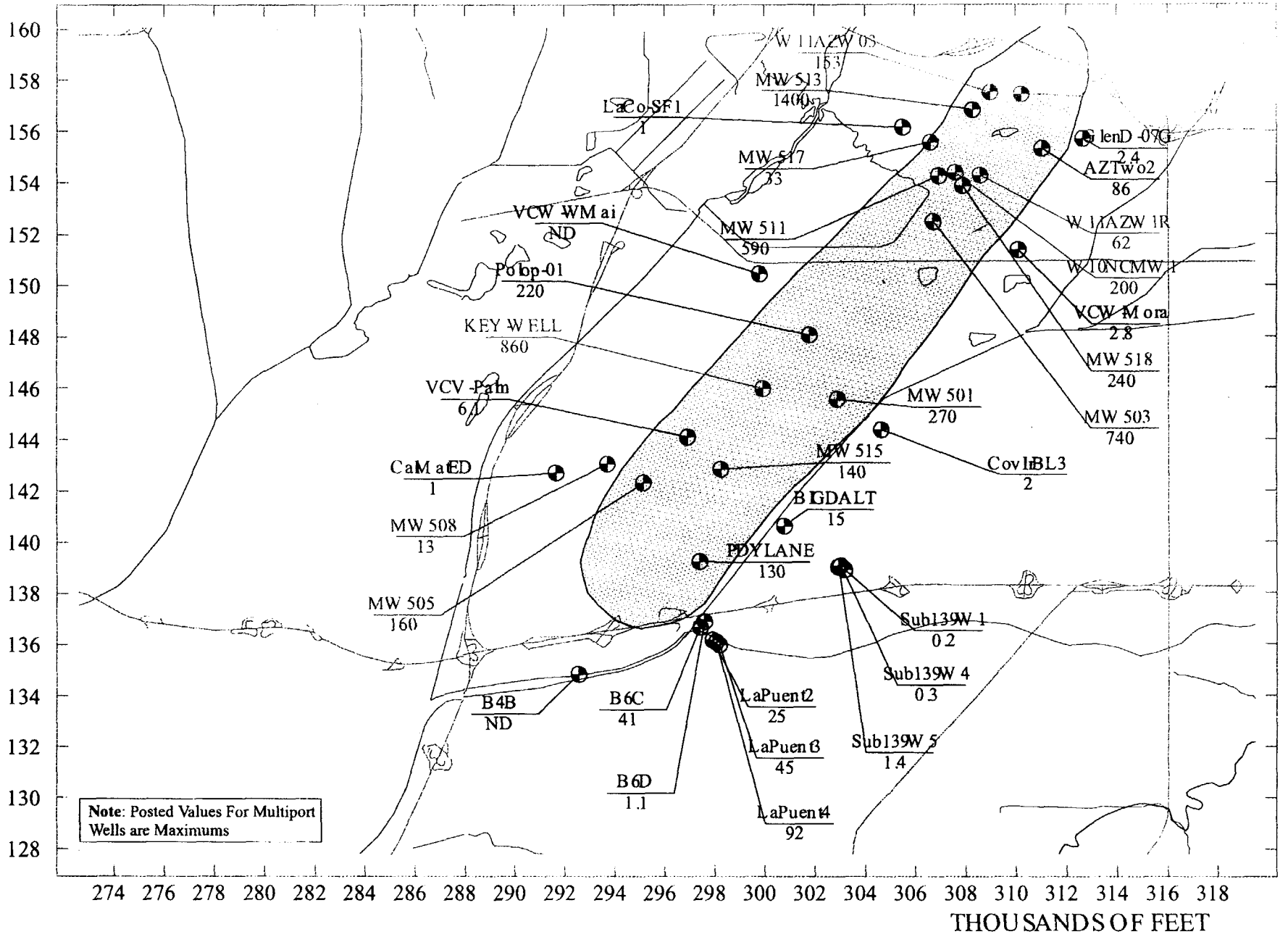
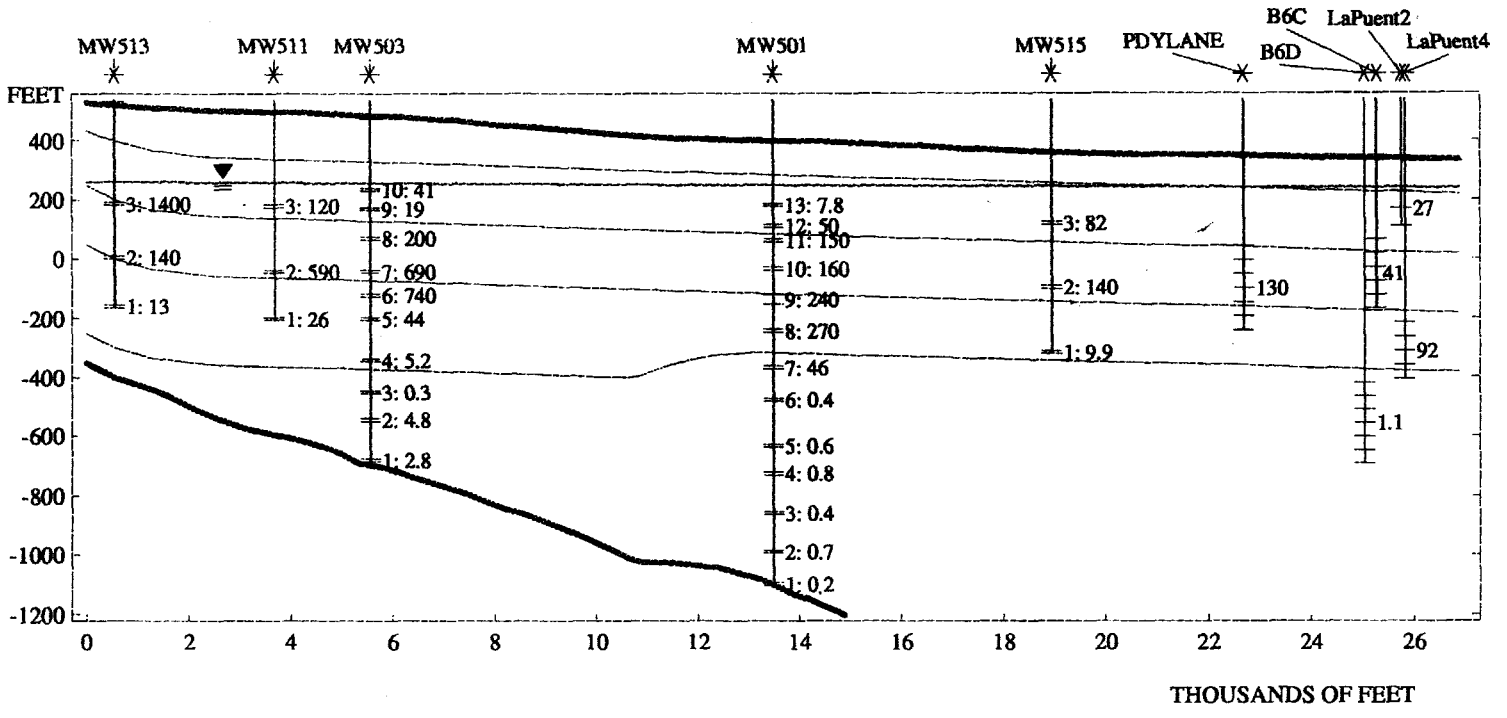


FIGURE 5-49

Generalized TCE Distribution Greater > 50 ug/l
Posted TCE Values For September and October 1996 Sampling

Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants



PRODUCTION WELL
EPA WELL
Site,Obs Well WITHIN 800.0 FT
GROUND SURFACE
TOP OF SCREEN
BOTTOM OF SCREEN

CROSS SECTION AA

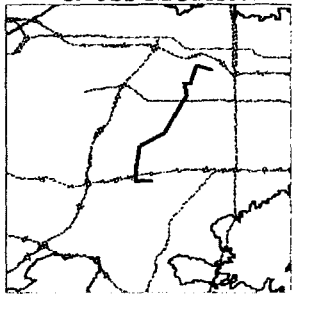


FIGURE 5-50	Cross Section Showing Average TCE Values (ug/l) September-October 1996 Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

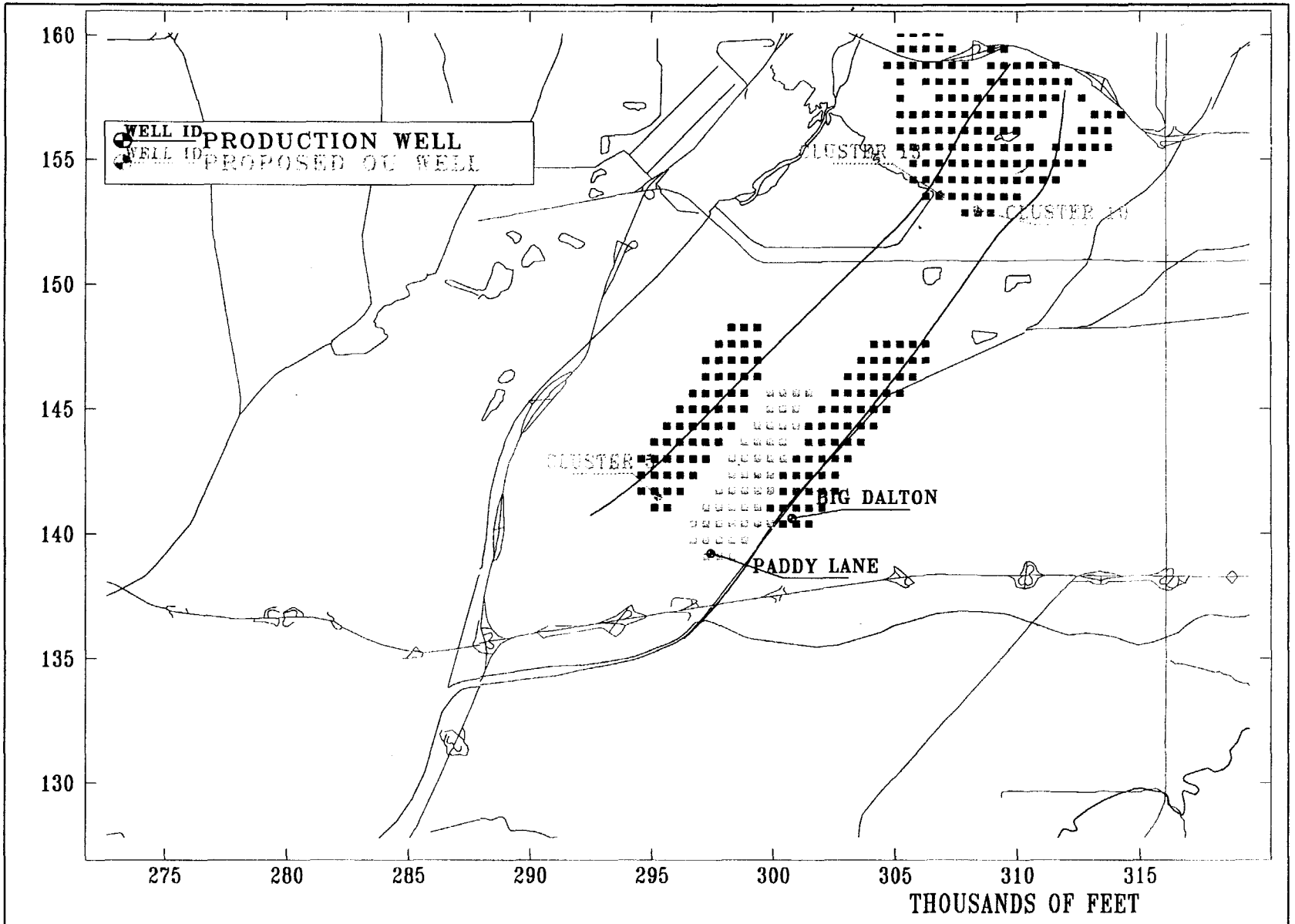


FIGURE 5-51

Extraction Simulation Case 1
12 Year Transient Capture Zone
50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

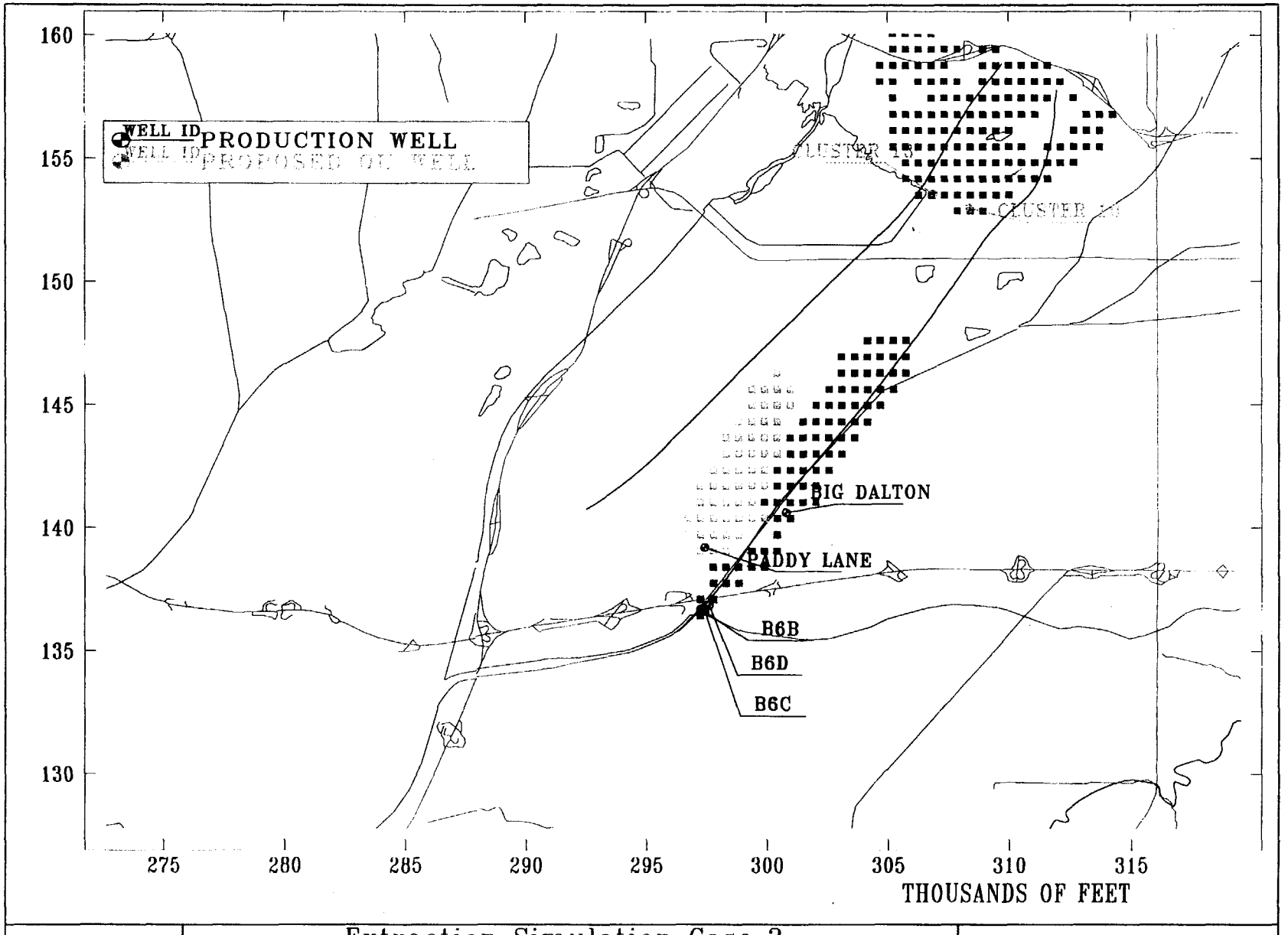


FIGURE 5-52

Extraction Simulation Case 2
12 Year Transient Capture Zone
50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

environmental engineers, scientists, planners, & management consultants

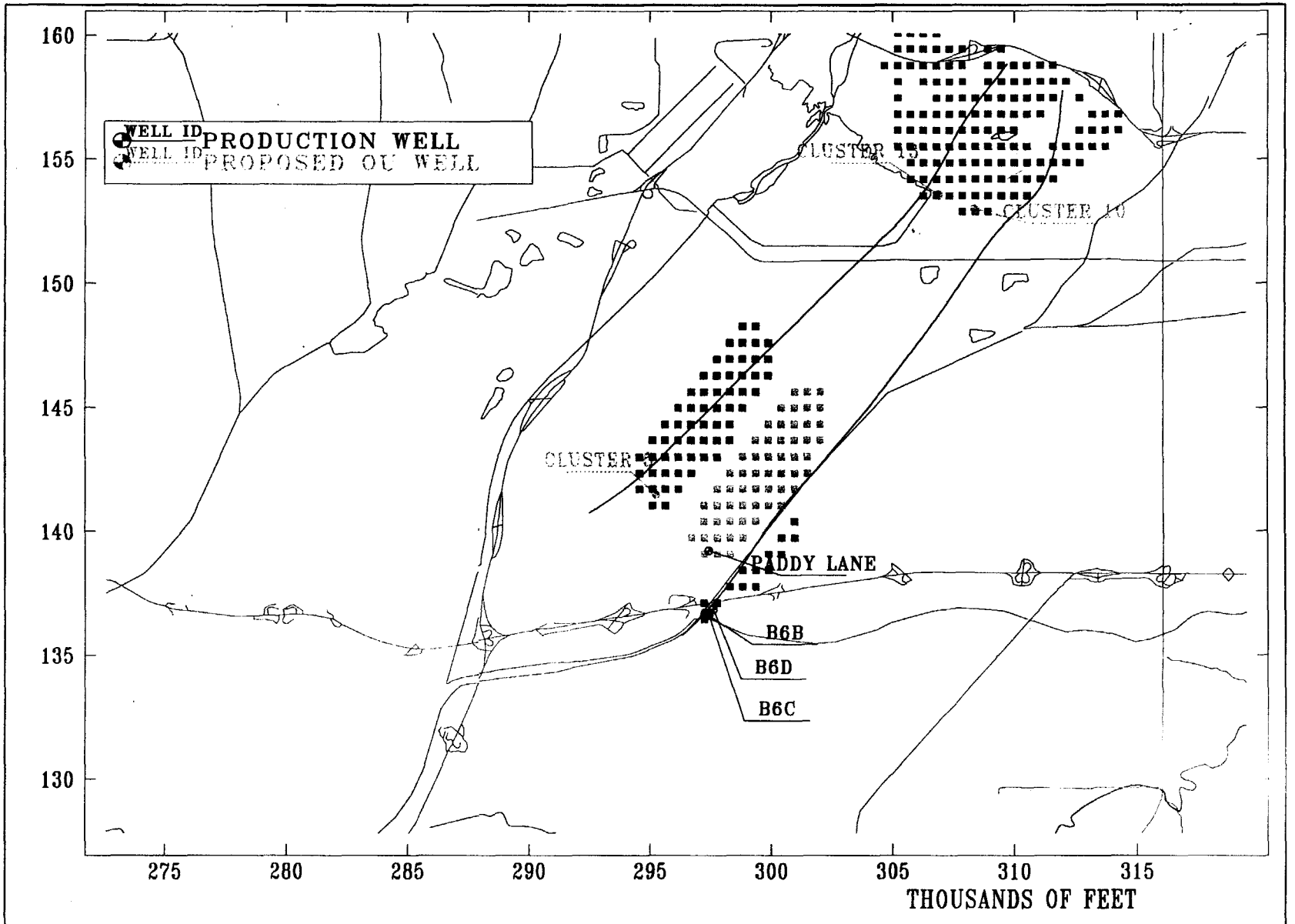


FIGURE 5-53

Extraction Simulation Case 3
12 Year Transient Capture Zone
50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

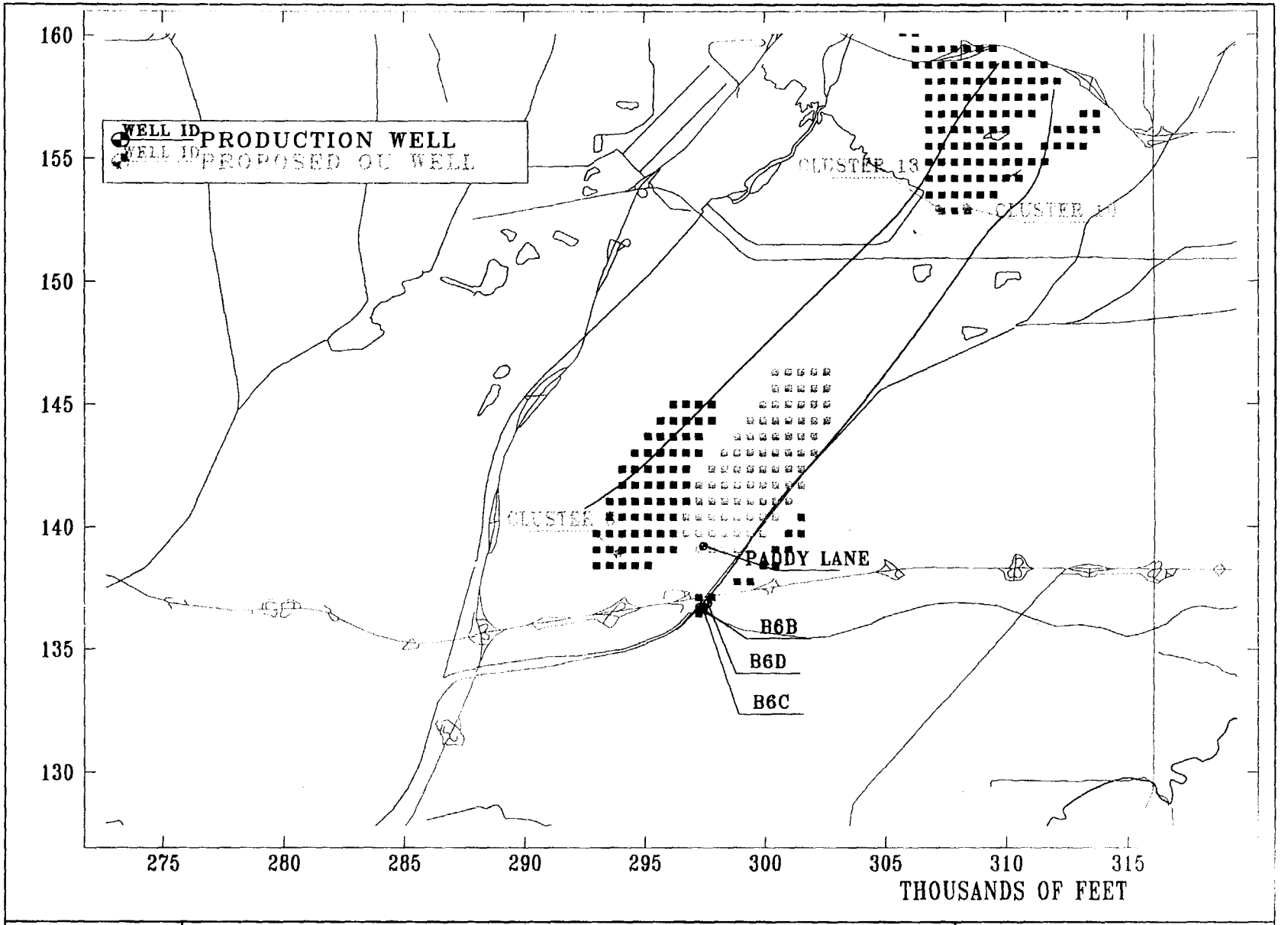


FIGURE 5-54

Extraction Simulation Case 4
12 Year Transient Capture Zone
50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

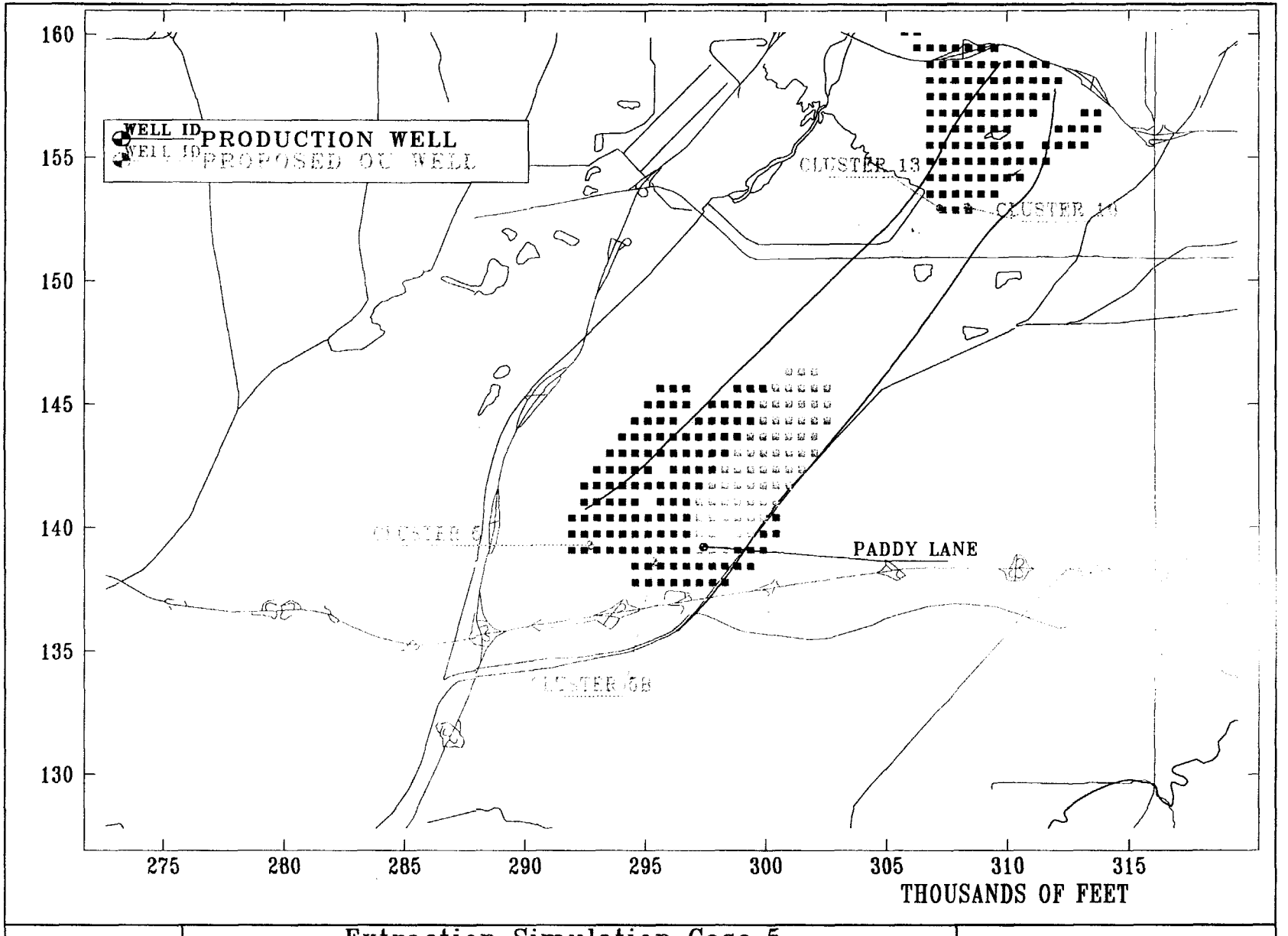


FIGURE 5-55

Extraction Simulation Case 5
12 Year Transient Capture Zone
50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

CDM
environmental engineers, scientists, planners, & management consultants

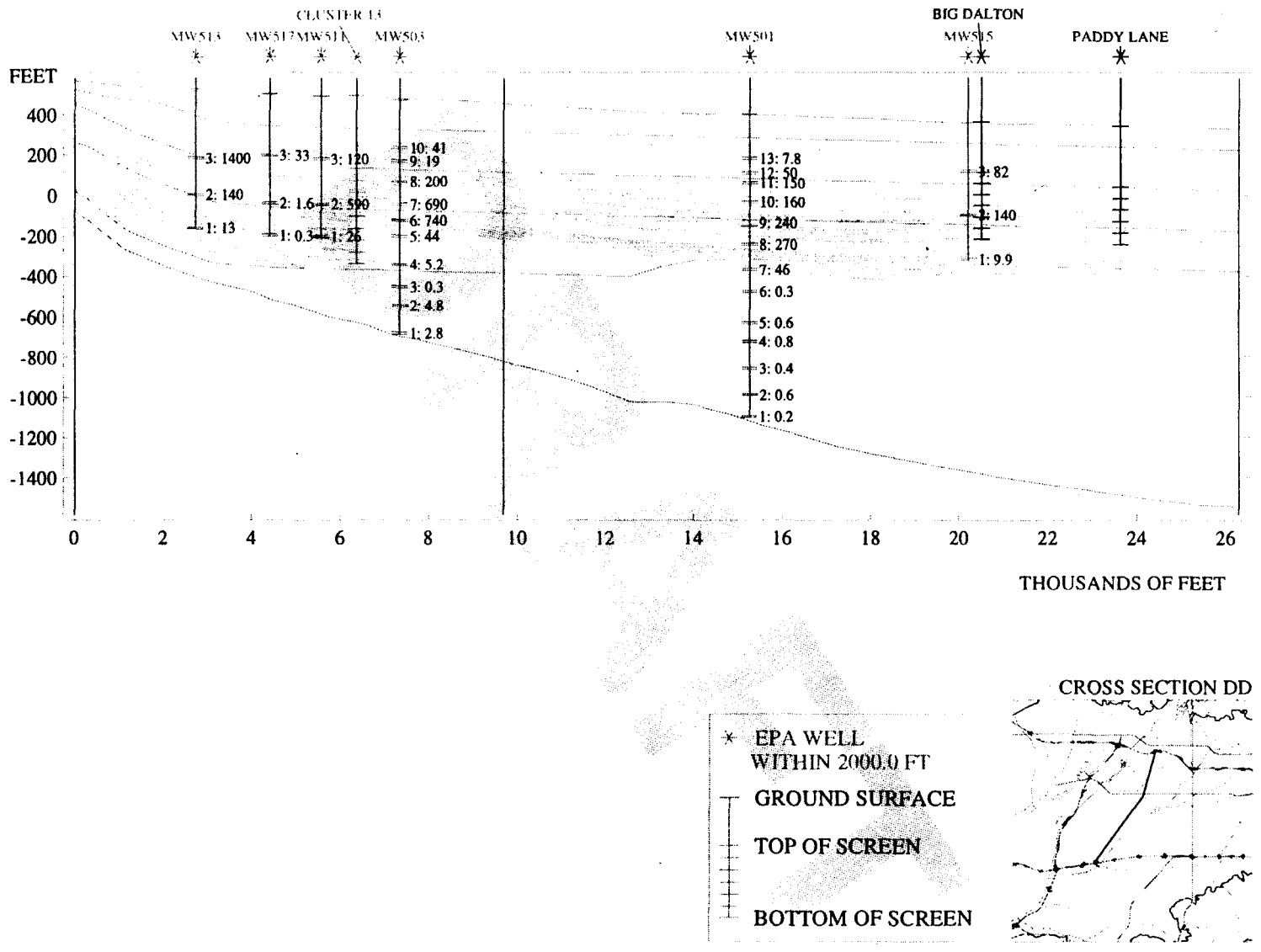


FIGURE 5-56	75-Year Particle Back Tracks From Extraction Wells ROD 1 Extraction Pumping - With 12 Year Average Conditions September-October 1996 TCE Values (ug/l) Baldwin Park Operable Unit Pre-Remedial Design	CDM environmental engineers, scientists, planners, & management consultants

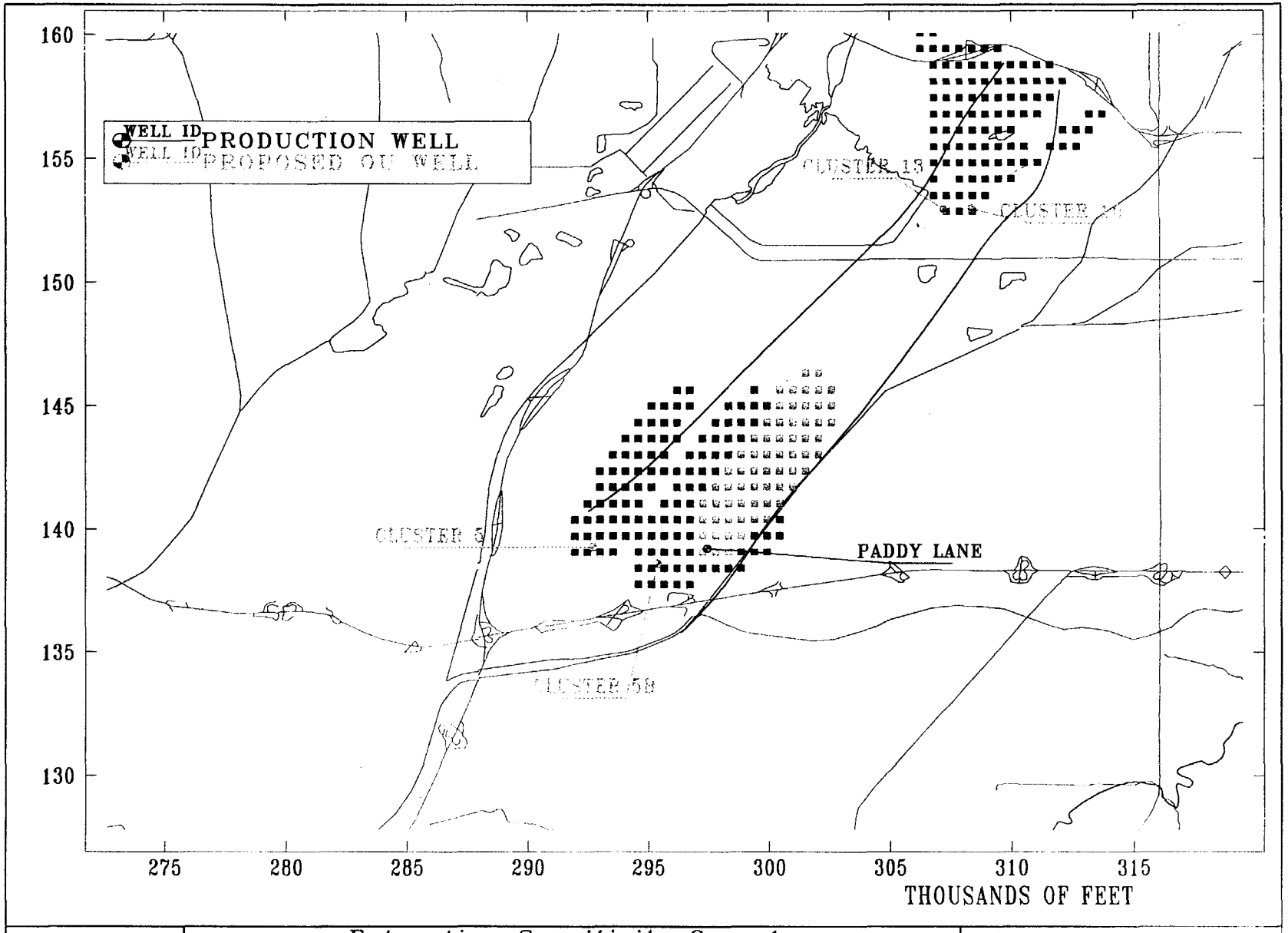


FIGURE 5-57

Extraction Sensitivity Case 1
Remedial Extraction Rates Decreased by 10%
12 Yr Transient Capture Zone - 50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

environmental engineers, scientists, planners, & management consultants

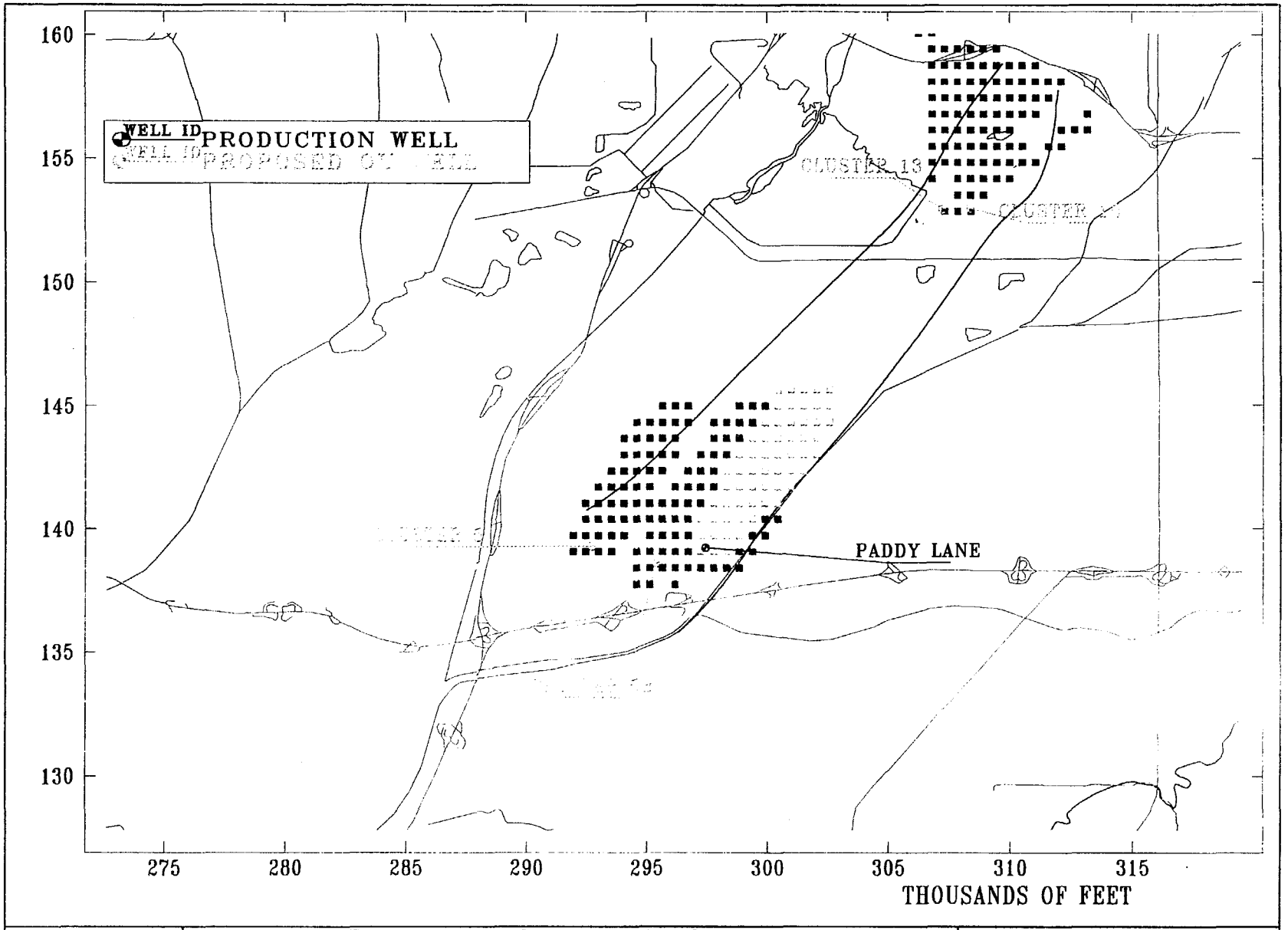


FIGURE 5-58

Extraction Sensitivity Case 2
Remedial Extraction Rates Decreased by 20%
12 Yr Transient Capture Zone - 50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

environmental engineers, scientists, planners, & management consultants

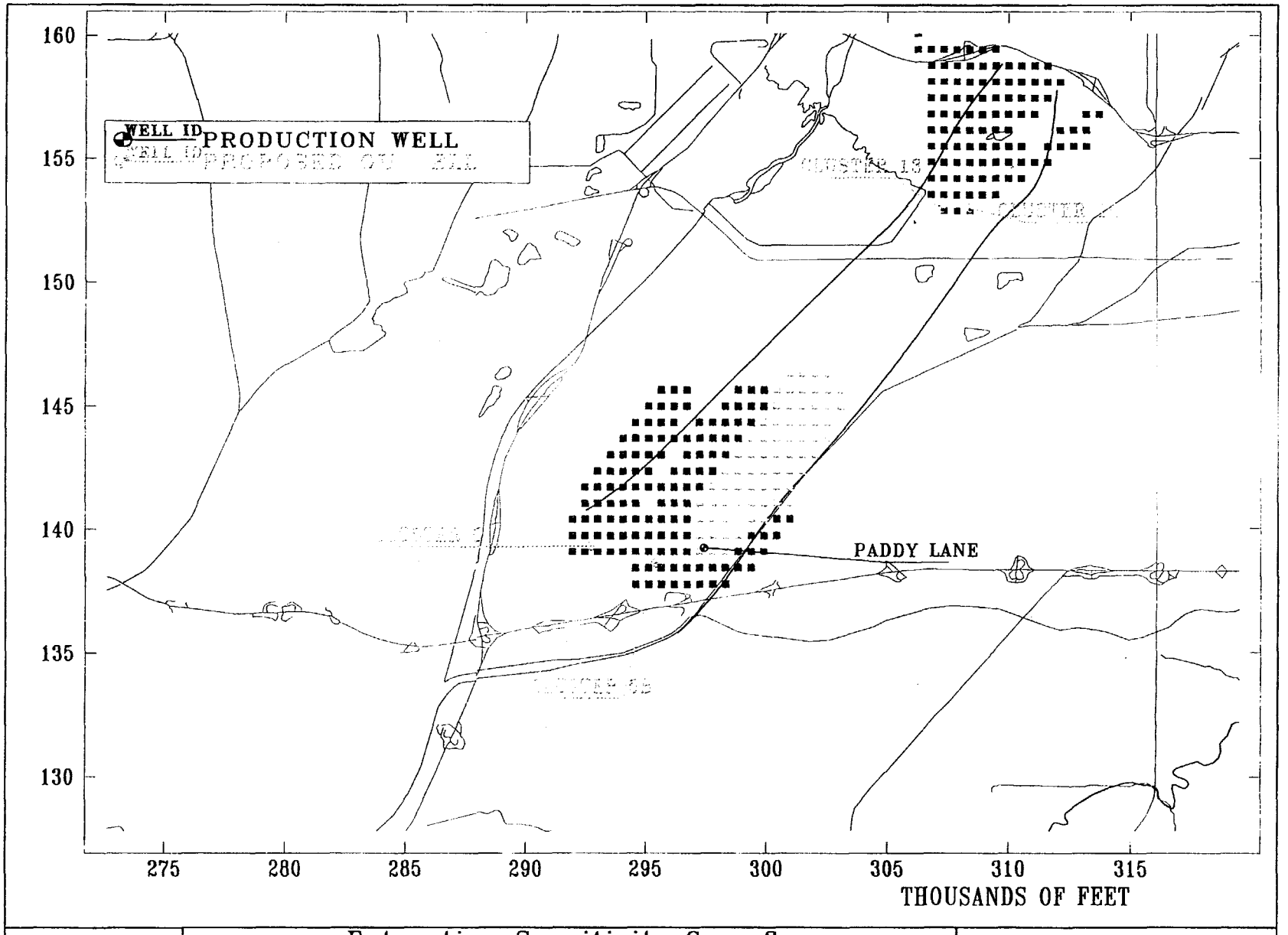


FIGURE 5-59

Extraction Sensitivity Case 3
Kh Increased by 10% in Center of Basin
12 Yr Transient Capture Zone - 50 ppb TCE Contour
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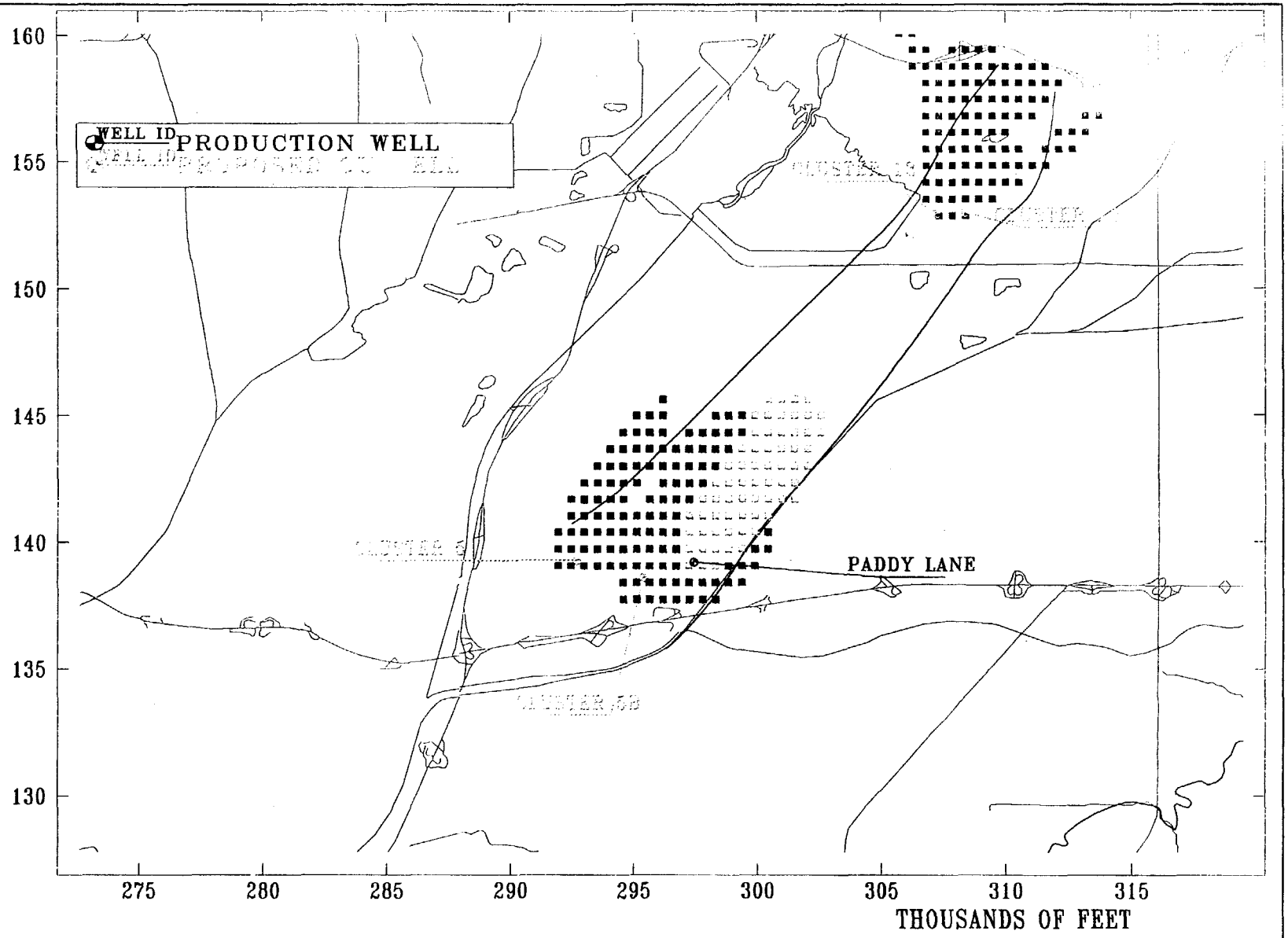

FIGURE 5-60

Extraction Sensitivity Case 4
Kh Decreased by 10% in Center of Basin
12 Yr Transient Capture Zone - 50 ppb TCE Contour
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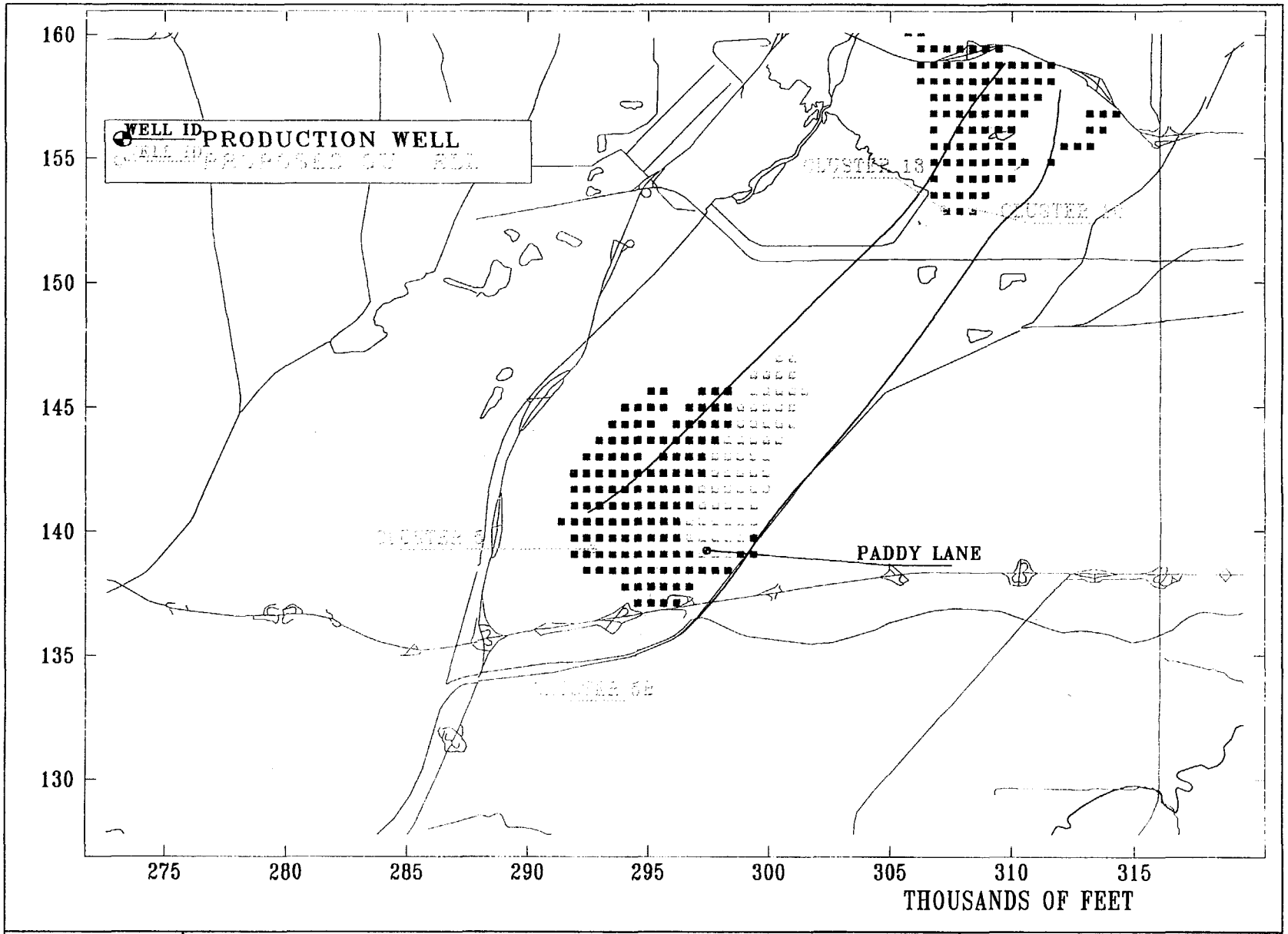

FIGURE 5-61

Extraction Sensitivity Case 5
BPOU Area Wells Simulated at Watermaster Projection
12 Yr Transient Capture Zone – 50 ppb TCE Contour
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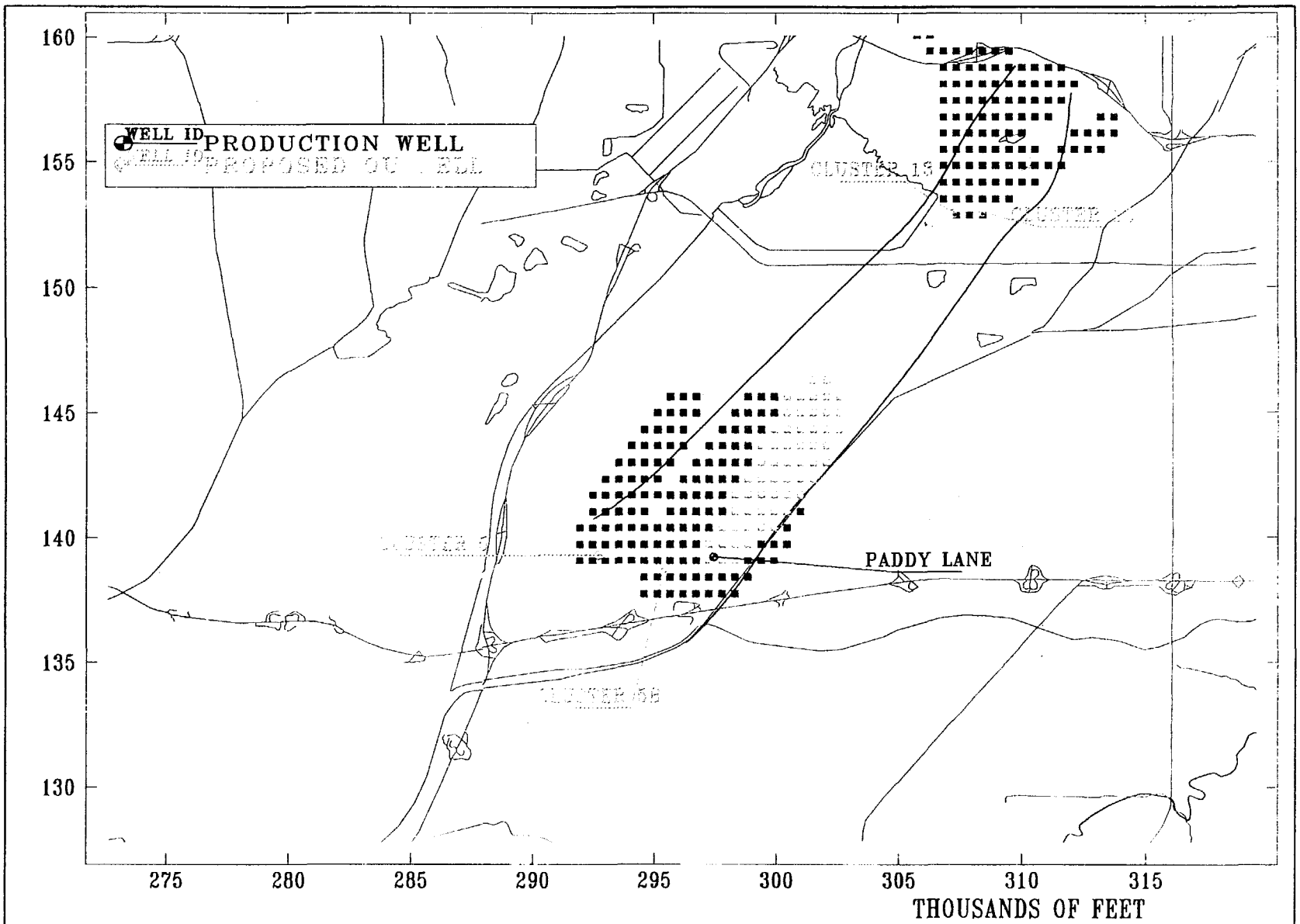

FIGURE 5-62

Extraction Sensitivity Case 6
Paddy Lane Extraction Simulated to Depth 700 ft bgs
12 Yr Transient Capture Zone - 50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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Table 5-1
Specified Boundary Fluxes

Boundary Location	*Total Flux in acre-feet per year*
Fluxes across Raymond Fault	6,200
Fluxes from the San Gabriel Mountains	5,000
Fluxes from Chino Basin	6,900

DRAFT

Table 5-2
Applied Recharge For Water Year 1981-1982

Spreading Facility	*Recharge Amount in acre-feet per year*
Valley Rubber Dam	0
Santa Fe Spreading Ground	35,046
San Dimas Spreading Ground	2,265
Little Dalton Spreading Ground	206
Citrus Spreading Ground	0
Forbes Spreading Ground	629
Big Dalton Spreading Ground	1,036
Walnut Creek Spreading Ground	1,720
Ben Lom and Spreading Ground	2,975
San Gabriel Canyon Spreading Ground	8,571
Buena Vista Spreading Basin	611
Irwindale/Manning Spreading Ground	2,833
Peck Road Spreading Basin	7,303
Eaton Spreading Basin	2,033
Sawpit Spreading Ground	1,008
Santa Fe Diversion Channel	13,050
Recharge along reaches of San Gabriel River	
Whittier Narrows to Valley Boulevard	0
Valley Boulevard to Santa Fe Dam	0
Santa Fe Dam to Foothill Boulevard	10,982
Foothill Boulevard to Morris Dam	28,062
Total Spreading Recharge	**118,330**

Table 5-3
Steady State Calibration Results
1981 - 1982 Water Year

Well ID	Head (ft)		
	Simulated	Observed	Difference
01900094	195.739	194.000	1.739
01900358	623.381	624.544	-1.163
01901200	1013.839	1018.600	-4.761
01901526	586.375	586.175	0.200
01901679	155.323	155.900	-0.577
01902271	736.930	737.200	-0.270
01902272	898.771	900.500	-1.729
01902372	195.476	187.875	7.601
01902458	629.015	618.963	10.052
08000034	473.260	484.650	-11.390
11900497	499.205	520.576	-21.371
01900011	153.699	167.500	-13.801
01900012	164.994	163.000	1.994
01900018	159.060	171.073	-12.013
01900354	265.801	258.876	6.925
01900455	179.871	176.007	3.863
01900828	558.973	553.750	5.223
01900920	207.295	193.500	13.795
01901430	199.302	194.067	5.236
01901432	196.151	196.383	-0.232
01901523	578.018	586.175	-8.157
01901619	266.784	275.750	-8.966
01901620	273.062	275.750	-2.688
01901685	279.708	277.889	1.819
01901747	198.971	196.383	2.588
01902024	206.282	213.468	-7.185
01902035	206.071	213.468	-7.396
01902115	524.853	513.123	11.730
01902116	519.168	516.041	3.127
01902424	223.734	234.500	-10.766
01902792	185.882	177.300	8.582
08000039	245.464	243.143	2.322
08000048	204.450	188.800	15.650
08000051	281.218	295.600	-14.382
08000135	199.799	196.383	3.416
08000136	198.666	196.383	2.282
11900095	197.854	194.067	3.787
11901508	207.326	197.500	9.826
18000102	238.279	240.050	-1.771
91901439	235.194	229.658	5.537
01900010	159.118	167.850	-8.732
01900013	160.703	170.100	-9.397
01900014	168.787	174.250	-5.463
01900015	167.098	174.000	-6.902
01900016	173.866	175.167	-1.301
01900017	160.950	172.450	-11.500
01900026	186.782	177.300	9.482
01900027	251.914	246.183	5.731
01900028	251.785	246.183	5.602
01900034	255.481	255.192	0.290

Table 5-3
Steady State Calibration Results
1981 - 1982 Water Year

Well ID	Head (ft)		
	Simulated	Observed	Difference
01900035	245.236	246.267	-1.031
01900355	255.535	248.022	7.513
01900420	245.516	241.073	4.443
01900457	171.920	173.281	-1.361
01900458	174.708	173.281	1.427
01900512	168.291	176.007	-7.716
01900514	174.093	175.167	-1.073
01900831	263.013	256.163	6.850
01900885	250.527	246.078	4.449
01900923	197.471	185.000	12.471
01900926	188.120	188.000	0.120
01900927	189.913	188.000	1.913
01901013	243.983	240.880	3.104
01901014	243.933	240.880	3.053
01901015	225.586	211.900	13.686
01901429	199.426	196.383	3.043
01901441	225.599	227.300	-1.701
01901672	155.004	154.100	0.904
01901681	153.298	154.400	-1.102
01901699	231.903	231.000	0.903
01901745	199.693	196.383	3.310
01901748	197.148	196.383	0.764
01902019	244.705	240.880	3.826
01902027	235.400	236.467	-1.066
01902034	239.250	249.704	-10.454
01902077	241.638	243.800	-2.162
01902078	241.682	243.800	-2.118
01902117	262.385	256.163	6.221
01902373	195.429	187.875	7.554
01902461	246.755	244.000	2.755
01902666	194.017	181.850	12.167
01902786	175.006	157.222	17.784
01902789	162.132	172.450	-10.318
01902791	222.396	207.500	14.896
01902818	169.186	176.007	-6.821
01903014	161.481	153.800	7.681
01903033	188.383	187.875	0.508
01903097	160.957	170.100	-9.143
08000060	255.366	253.642	1.724
08000067	175.394	157.222	18.172
08000071	201.070	196.383	4.687
08000073	205.174	213.468	-8.293
21900749	237.194	233.000	4.194
31900747	203.629	202.475	1.154
71903093	240.867	235.225	5.642
91901440	235.557	222.750	12.807
98000068	235.665	222.750	12.915
01900117	257.344	257.378	-0.033
01900356	249.917	253.450	-3.533
01900417	244.059	240.880	3.179

Table 5-3
Steady State Calibration Results
1981 - 1982 Water Year

Well ID	Head (ft)		
	Simulated	Observed	Difference
01900418	244.068	240.880	3.188
01900419	244.543	240.880	3.664
01900453	173.379	176.007	-2.628
01900454	174.542	176.007	-1.465
01900456	172.997	173.281	-0.284
01900510	168.675	173.281	-4.606
01900511	167.580	176.007	-8.428
01900513	171.468	176.007	-4.540
01900515	174.599	175.167	-0.568
01900725	185.781	176.007	9.773
01900881	262.041	256.163	5.878
01900883	250.432	246.034	4.399
01900918	200.599	184.300	16.299
01900921	181.758	157.222	24.536
01901460	241.024	235.225	5.799
01901493	245.530	243.300	2.230
01901521	235.520	234.777	0.744
01901525	260.014	253.038	6.976
01901596	233.446	229.658	3.789
01901623	236.972	229.658	7.314
01901627	232.803	234.035	-1.232
01901669	176.280	157.222	19.058
01901693	231.228	222.750	8.478
01901694	230.339	229.500	0.839
01901749	201.577	196.383	5.194
01902017	244.724	240.880	3.844
01902018	244.751	240.880	3.871
01902030	246.806	244.000	2.806
01902113	253.428	249.633	3.794
01903084	225.573	219.700	5.873
11900729	237.685	240.050	-2.365
31900736	203.983	203.225	0.758
31900746	203.303	202.475	0.828
41900739	223.652	212.000	11.652
41900745	223.020	212.000	11.020
41902713	222.665	212.000	10.665
61900718	232.652	236.183	-3.531
Z1000001	186.449	181.560	4.889
Z1000002	196.771	196.426	0.345
Z1000006	248.695	244.552	4.142
Z1000007	238.507	249.258	-10.751
Z1000009	242.094	249.750	-7.656
Z1000086	196.353	194.000	2.353
01902761	241.794	240.533	1.260
Z1000003	214.967	209.700	5.267
Z1000075	198.139	192.083	6.056
Z1000093	201.572	198.400	3.172

Table 5-4
1981-1982 Steady State Calibration Water Balance

Major Flux Components	*Fluxes in Acre-feet per Year*	
	Net Inflow	*Net Outflow*
Boundary Fluxes		
Chino/San Dimas	6,900	
Raymond Fault	6,200	
San Gabriel Mountains	5,000	
Puente Valley*	998	
Whittier Narrows*		13,457
Recharge Fluxes		
Precipitation and Applied Water	55,429	
Spreading Basins	118,330	
Pumping Fluxes		179,037
Model Generated Fluxes		
Morris Dam Boundary Nodes	1,950	
Rising/Dry		1,732
Net Model Flows	194,807	194,226
Net Model Water Balance Difference	0.30%	

* Computed Flux; all others are specified.

Table 5-5
Baldwin Park Operable Unit
Transient Simulation Flux Summary

Fluxes (Ac-Ft/Yr)	Water Year										
	82-83	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93
Boundary Fluxes											
Chino/San Dimas	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900
Raymond Fault	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200
San Gabriel Mount	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Puente Valley	2,064	1,624	851	771	852	503	555	366	594	1,850	2,050
Whittier Narrows	-14,694	-22,102	-14,014	-10,060	-5,355	-5,481	-2,040	-6,506	-11,321	-16,093	-12,335
Recharge Fluxes											
Precipitation & Applied Water	55,429	55,429	55,429	55,429	55,429	55,429	55,429	55,429	55,429	55,429	55,429
Spreading Basins	281,669	72,603	60,949	119,138	75,800	84,285	73,769	102,149	154,056	296,451	288,922
Pumping Fluxes	-187,775	-221,450	-217,875	-219,650	-231,885	-229,182	-229,852	-233,906	-207,947	-205,689	-214,018
Model Generated Fluxes											
Morris Dam Boundary Nodes	3,383	12,545	7,531	11,319	6,890	2,710	8,579	3,609	1,459	7,754	-12,994
Rising/Dry	-2,459	-1,810	120	-34	186	463	624	623	635	587	69
Storage Flux	152,841	-85,553	-88,663	-25,556	-80,023	-73,053	-74,116	-58,193	14,213	159,853	124,376

Table 5-6
Summary of Flow Model Sensitivity Analyses

Sensitivity Case	*Description of Modification*
1	Kh Increased by 50 feet/day in Center of Basin (Kh/Kv=10)
2	Kh Decreased by 50 feet/day in Center of Basin (Kh/Kv=30)
3	Kh Decreased by 100 feet/day in Center of Basin (Kh/Kv=30)
4	Fault Gap Centered over San Gabriel River
5	Fault Gap Extended Along San Gabriel Canyon Opening
6	Fault Gap Centered Over VOC Plume

Table 5-7(a)
Summary Statistics - Flow Model Sensitivity Analysis

Sensitivity Case	Mean Difference (feet)	Standard Deviation
Base Case	1.885	7.338
1	0.782	7.404
2	3.116	7.571
3	4.690	8.357
4	1.577	7.304
5	1.759	7.527
6	-0.705	8.578

Table 5-7 (b)
Transient Calibration - Summary Statistics

	Key Well		Glendora 07G		Z1000005	
	Corr. Coef.	RMSE	Corr. Coef.	RMSE	Corr. Coef.	RMSE
Base Case	0.9858	5.17	0.9819	4.80	0.9661	5.33
Sensitivity Case 1	0.9891	6.13	0.9826	6.52	0.9518	6.21
Sensitivity Case 2	0.9855	4.16	0.9819	7.84	0.9673	5.38
Sensitivity Case 3	0.9846	6.37	0.9917	15.72	0.9686	5.53

Table 5-8
Average Historical [1] and Projected Pumping Rates for Select Water Supply Production Wells

Well Group	Average Historical Pumping Rate (gpm)	Projected 5 Year Maximum Pumping Rate (gpm)
SGVWC B4	2352	50
SGVWC B6	1941	3956
Suburban 139	6413	7126
La Puente	1281	1883
AZ-Two2	450	784
Arrow/Lante	425	2400
Covina Irrig.	0.5	3340
Conrock East /West Durbin	820	375
Big Dalton	0.05	2790

[1] Based on the 12 year transient period

Section 6
Summary and Conclusions

The pre-remedial design groundwater monitoring program was completed in conformance with the March 31, 1994 Record of Decision. Specifically, water quality and piezometric data were collected and analyzed to determine the location, depth, well design, and pumping rates for remedial extraction. Furthermore, these data were analyzed to allow computer simulation of various pumping scenarios in order to identify the most effective means to meet the dual ROD objectives of limiting further migration of contaminated groundwater and begin to reduce VOC concentrations in the BPOU groundwater. In addition to these ROD objectives, the evaluation of remedial pumping scenarios necessarily considered the constraints on recharge and demand for water, both of which are critical to the overall success of the project.

These objectives were achieved through the drilling, installation, sampling, and piezometric monitoring of eight new multiport monitoring well; the sampling of site assessment monitoring wells and selected water supply wells; performance of an aquifer testing program; and data evaluation centered around the development and use of a three dimensional groundwater model. These program components were completed in order to evaluate spatial and temporal trends in water quality; changes in groundwater flow as a result of natural and artificial recharge, existing water supply pumpage, and proposed remedial pumpage; and the capture zones achievable by various extraction scenarios.

Water quality results from the eight newly installed multiport wells and at the existing EPA MP well provided further information on the distribution of VOCs in the BPOU area. These MP wells were sampled in addition to 21 water supply wells and 4 site assessment wells to provide coverage throughout the OU. Although the analytical suites included a broad spectrum of organic and inorganic compounds, the principal constituents used as indicator chemicals were TCE, PCE, 1,2-DCA and CTC. Details of the sampling results are in Section 4. These show that the highest VOC concentrations generally occur in Subarea 1 with decreasing concentrations as one moves southwards towards Subarea 3. The highest concentrations in Subarea 3 are generally at depths of about 400-600 ft bgs for TCE and PCE. The VOCs were generally detected, horizontally and vertically, in areas consistent with the simulated flow field as modeled in the BPOU. CTC was generally detected at higher concentration in the lower intervals (below 500 bgs) of the MP wells, and at deeper screens of the water supply wells in Subarea 3.

Four pumping tests were conducted during the study. Aquifer transmissivities ranged from 140,000 to 900,000 ft^2/day, with equivalent hydraulic conductivities ranging from 200 to 800 ft/day. These data are consistent with other estimates of hydraulic conductivity in this area on the San Gabriel basin, and are in general agreement with the hydraulic conductivities estimated during the calibration of the numerical model.

The installation of the multiport monitoring wells provided additional information on the variation of piezometric heads in the BPOU. In general, it was found that there was very little vertical head variation throughout the depth of the aquifer; the only exception being at MW5-05 where a four foot gradient is observed. At all locations, all screens responded similarly to seasonal variations in head. The horizontal distribution in piezometric head was consistent with prior estimates.

A three-dimensional groundwater flow model was developed and calibrated for the Main San Gabriel Basin. The purpose of this modeling effort was to develop a predictive tool to evaluate the effectiveness of various proposed BPOU extraction scenarios concurrently with the simulation of the effects of temporal changes in recharge and water supply pumping operations. This groundwater flow model was previously used to evaluate the operation of the proposed BPOU Water Delivery Project for the Three Valleys Municipal Water District (CDM, 1996). As part of the modeling effort described in this report, the model was updated and recalibrated under both quasi steady-state and transient conditions. The quasi steady-state calibration was based on Water Year 1981-82 when water-level elevations in the basin were generally stable indicating relatively small changes in basin groundwater storage. The transient model calibration was based on a 12-year period extending from October 1982 through June 1994. Model calibration results indicated that the model is a very good representation of the groundwater flow system within the BPOU as demonstrated by its ability to accurately: 1) simulate both regional and local flow patterns, 2) match observed water-level elevations within 5 feet throughout the BPOU under steady-state conditions, and 3) simulate temporal water-level fluctuations of up to 60 feet per year associated with pumping and recharge stresses.

Extraction scenarios were developed to evaluate the effectiveness of various extraction well locations, depths, and pumping rates. In general, these extraction scenarios focused on obtaining the following remedial action objectives as defined by the BPOU ROD (p. 26):

> ...to prevent future increases in, and begin to reduce, concentrations of all VOCs in groundwater in the Baldwin Park area by limiting further migration of contaminated groundwater into clean and less contaminated areas or depths that would benefit most from additional protection and by removing contamination from the aquifer.

In order to achieve these ROD -specified remedial action objectives, specific technical goals are as follows:

- Containment of groundwater with TCE concentrations greater than 50 µg/l TCE (and to the extent feasible, 5 µg/l TCE) upgradient of Subarea 1 and Subarea 3 extraction locations. TCE was used to represent the extent of the VOC plume because: TCE is the commonly occurring VOC with the highest concentration in the vicinity of the proposed extraction locations, and 2) the horizontal extent of TCE is slightly greater than PCE. Combined TCE and PCE represent the majority of the VOC mass in groundwater within the BPOU.

- Total project groundwater extraction was limited to 19,000 gpm in consideration of project constraints related to recharge capacity and MWD water supply demands described in Section 2.2.

- Groundwater extraction focused on a target depths of about 600 feet in Subarea 1 and 750 feet in Subarea 3 based on the observed vertical extent of VOC contamination presented in Section 4.

Although numerous permutations of extraction well locations, depths, and pumping rates were evaluated, five primary extraction scenarios are presented in this report. The first of these extraction scenarios, Case 1, approximates EPA's ROD remedy consisting of Subarea 1 extraction of 8,500 gpm and Subarea 3 extraction of 10,500 gpm. The second and third extraction scenarios, Cases 2 and 3, utilize the same extraction rates in Subareas 1 and 3 but attempt to incorporate the SGVWC B6 production wells into the extraction well configuration. The fourth extraction scenario, Case 4, also attempts to utilize the SGVWC B6 wells but decreases groundwater extraction in Subarea 1 to 5,500 gpm and increases extraction in Subarea 3 to 13,500 gpm to obtain better achieve containment in Subarea 3. The fifth extraction scenario, Case 5, also utilizes an extraction rate of 13,500 gpm in Subarea 3 but utilizes an additional Subarea 3 extraction well, Cluster 5B, to further improve containment in Subarea 3. Evaluation of these extraction scenarios indicated that Case 5 best achieves the remedial action objectives specified on page 26 of the ROD. Specifically, the Case 5 extraction scenario effectively demonstrates containment of TCE at concentrations greater than 50 µg/l in Subareas 1 and 3, and based on our judgement of existing data, we further believe that we have containment of TCE greater than 5 µg/l in Subarea 1 and Subarea 3.

In addition to the five primary extraction scenarios summarized above, the sensitivity of the model relative to achieving containment was evaluated by systematically adjusting various input parameters including extraction rates, extraction well depths, and aquifer hydraulic conductivity in the BPOU. In addition, the additive effect of increased groundwater pumping from various production wells in the vicinity of the BPOU, inclusive of Arrow, Lante, SGVWC B4, and B6, was also considered relative to achieving containment. This sensitivity evaluation indicated that Case 5 also provides the robust containment given uncertainties in aquifer hydraulic conductivities and potential variations in pumping rates associated with extraction system operation. Additionally, water supply pumping from other production wells further improves the containment achieved with Case 5.

Section 7
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Appendix F

EPA Comment and Response Memoranda

CDM Camp Dresser & McKee Inc.

environmental services

Ten Cambridge Ce
Cambridge, Mass 02142
Tel: 617 252-800 821-2565

MEMORANDUM

To: Don Vanderkar
Steve Richtel

From: Brendan Harley/Jennifer Wynn

Subject: Responses to Comments 5, 6, 8 and 11

Date: February 13, 1997

This memo presents a selected set of CDM's responses to EPA's January 15, 1997 preliminary comments on the Baldwin Park Draft Pre-Remedial Design Report. These responses address comments 5, 6, 8 and 11, in fulfillment of the schedule presented in the BPOU Steering Committee letter of January 31, 1997. Responses to the remaining EPA comments will be prepared in the next few weeks.

- Comment 5 requested 12 year transient particle tracks in plan view and cross-section for the preferred containment scenario, Extraction Case 5. These two figures are attached. All particles in this simulation are started at an elevation of 50 feet MSL, consistent with the previous analysis presented in the Draft Pre-Remedial Design Report. In plan view the particle tracks identify the general area of capture in 12 years for both the Subarea 1 and Subarea 3 containment. Some particles between Subarea 1 and Subarea 3 are seen moving in the direction of Subarea 3, but not yet reaching it. In cross-section particles that are removed are shown stopping at the extraction well screen. One particle can be seen moving past the Subarea 1 extraction wells. This particle was started on the outside edge of the capture area, and moves past on the eastern side of Cluster 10 (as seen in the plan view plot), but appears to be moving toward the Subarea 3 extraction wells.

  These particle tracks are not intended to address the question of depth of capture which is raised in Comment 9. That question will be addressed in a later memo in response to EPA's Comment 9.

- Comment 6 requested two additional extraction simulations; one with 6,500 gpm of extraction in Subarea 1, and one with 7,500 gpm of extraction in Subarea 1. The total extraction for each simulation was maintained at 19,000 gpm. The historical pumping at well AZ-2 was maintained in each of these simulations. For each of these scenarios the following figures have been included:

  1) 12 year capture zones comparable to those presented in the Draft Pre-Remedial Design Report
  2) Capture zones highlighting Subarea 1 and the locations of PRP facilities
  3) Capture zones with the 5 ppb TCE contour superimposed
  4) 12 year particle tracks in plan view - particles started at elevation 50
  5) 12 year particle tracks in cross-section - particles started at elevation 50

  These figures illustrate capture zones very similar to that of the preferred containment scenario, Extraction Case 5. As pumping is shifted from Subarea 3 to Subarea 1 a very slight degradation of capture between Cluster 5B and Cluster 5 is apparent. The additional capture achieved in Subarea 1 is most noticeable to the west of the highlighted facilities, in an area of clean water. The plan view and cross-section particle tracks present an area of capture which is almost exactly like that in the preferred containment scenario.

- Comment 8 requested that the results of the extraction simulations be presented in relation to suspected sources of contamination in Subarea 1, and superimposed upon an estimate of contamination to MCL levels in Subarea 3. For each of the Extraction Cases, 1 through 5, the following figures are enclosed:

  1) Capture zones highlighting Subarea 1 and the locations of PRP facilities, and posting the locations of PRP site wells.
  2) Capture zones in both Subarea 1 and Subarea 3 superimposed upon the TCE 5 ppb contour, as presented in Figure 4-18 of the Draft Pre-Remedial Design Report. This contour represents the horizontal extent of contamination to MCL levels.

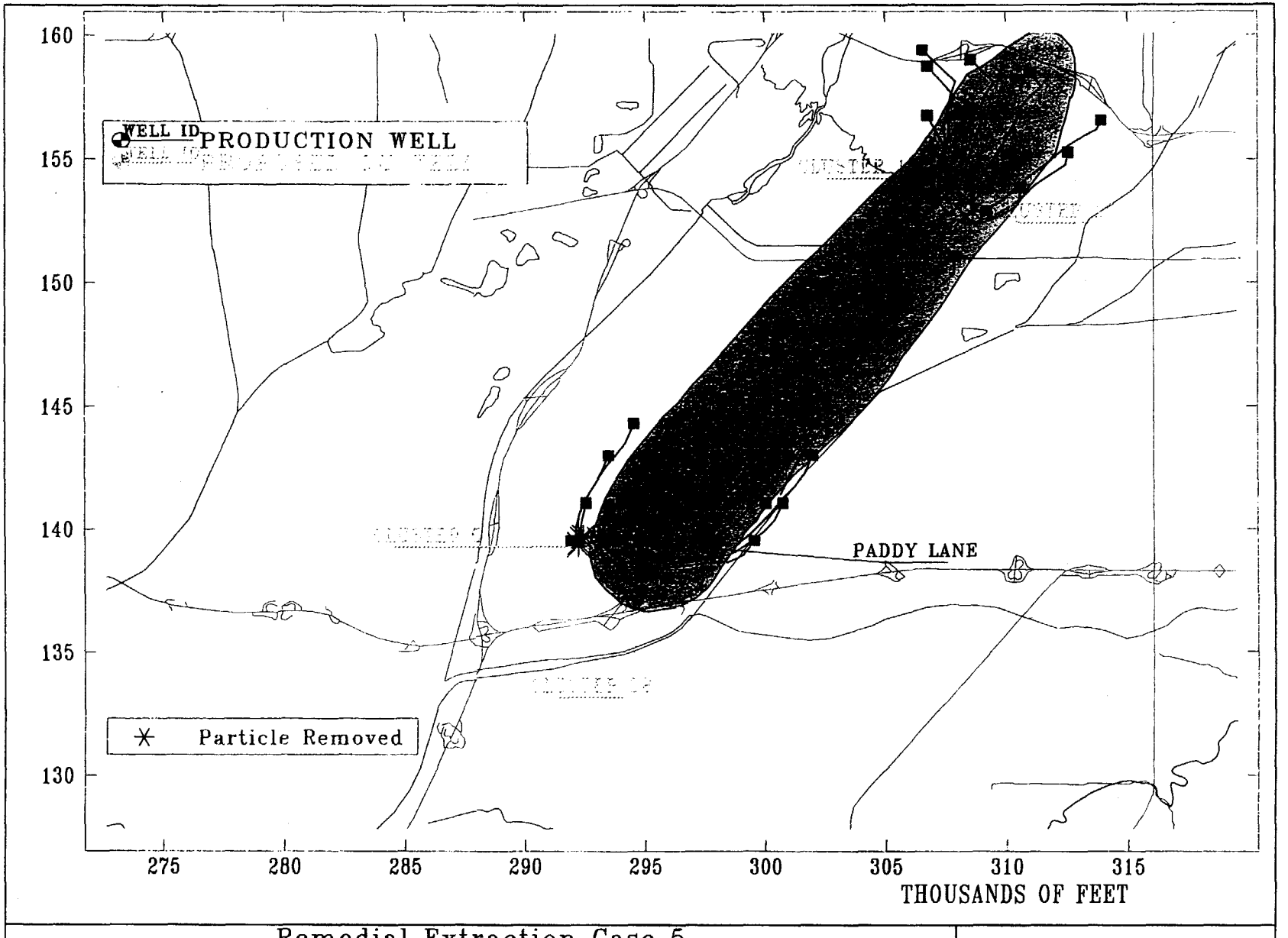
- Comment 11 requested snapshots of flow conditions in the Baldwin Park area for the preferred containment scenario, for three different quarters. Simulated water table contours, at one foot intervals are presented for Extraction Case 5 for the following quarters:

  1) 1/88 - 3/88: This quarter represents a moderate condition. Flow is generally from the Northeast to Southwest. Mounding can be seen at Santa Fe Spreading Grounds and the Valley Boulevard Rubber Dam as a result of spreading activities.

  2) 7/88 - 9/88: This quarter represents a dry condition. Flow is in a slightly more western direction than the previous quarter. No mounding from spreading is apparent, however some pumping drawdowns are noticeable at Cluster 5, Cluster 5B, and the Suburban 139 wells.

  3) 1/92 - 3/92: This quarter represents a wet condition. Flow is much less westerly and much more southerly than in the previous two quarters. Spreading activities at Santa Fe Spreading Grounds, Citrus Spreading Grounds, Peck Road Spreading Grounds, and along the San Gabriel River are very apparent. Pumping drawdowns at Cluster 5, Cluster 5B and the Suburban 139 wells are also apparent.

If you have any questions about these responses do not hesitate to contact us. Responses to the remaining comments will be included in a later memo.



Remedial Extraction Case 5
Representative 12 Year Transient Particle Tracks
Generalized TCE Distribution > 50 ppb
Baldwin Park Operable Unit Pre-Remedial Design

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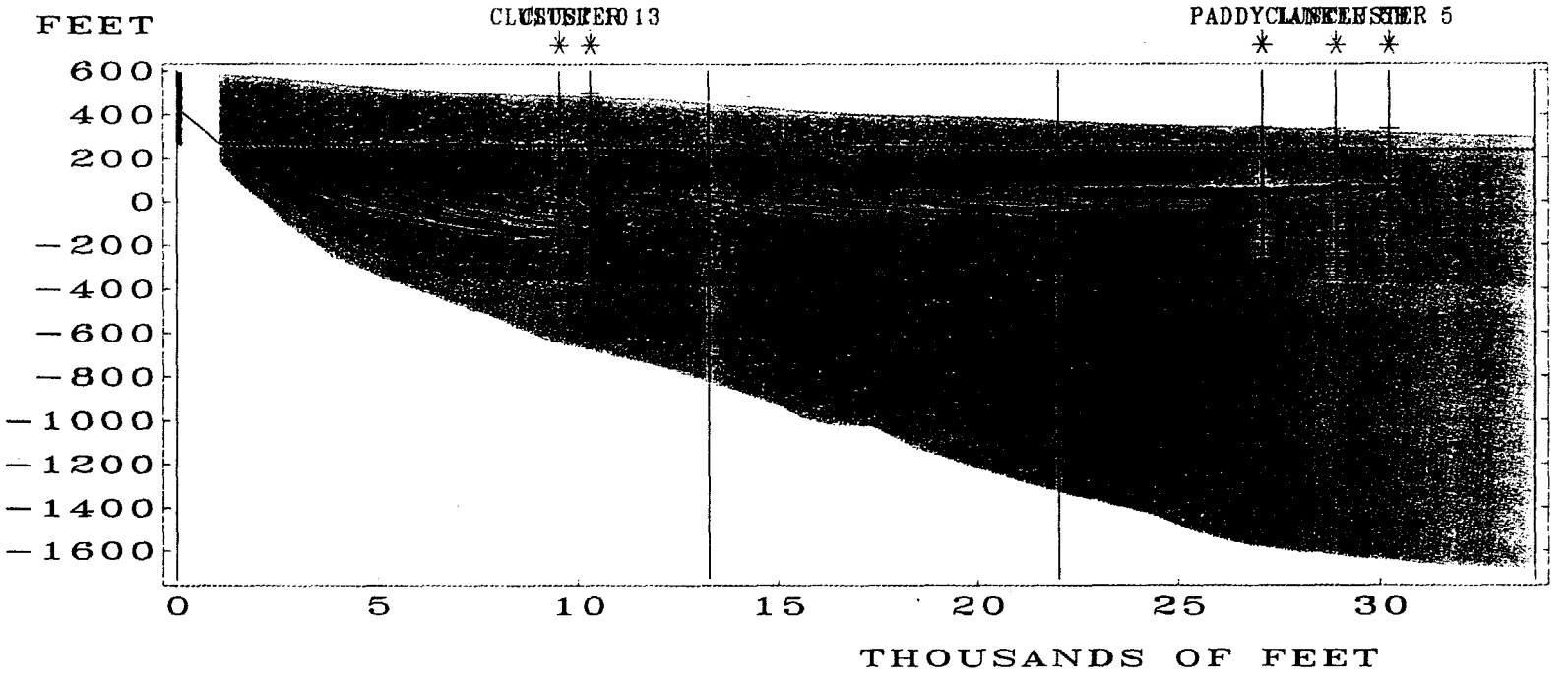


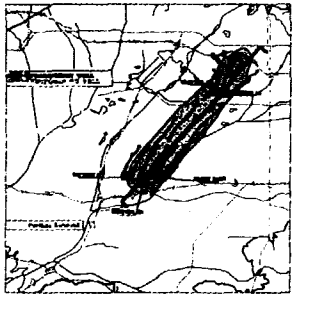
MATERIALS CROSS-SECTION AA

- K = 350.0 ft/day
- K = 250.0 ft/day
- K = 10.0 ft/day

1981-1982 Water Table

- PRODUCTION WELL
- PROPOSED OU WELL WITHIN 10000.0 FT
- GROUND SURFACE
- TOP OF SCREEN
- BOTTOM OF SCREEN

CROSS SECTION AA



Remedial Extraction Case 5
Representative 12 Year Transient Particle Tracks
Particles Started at Elevation 50
Baldwin Park Operable Unit Pre-Remedial Design

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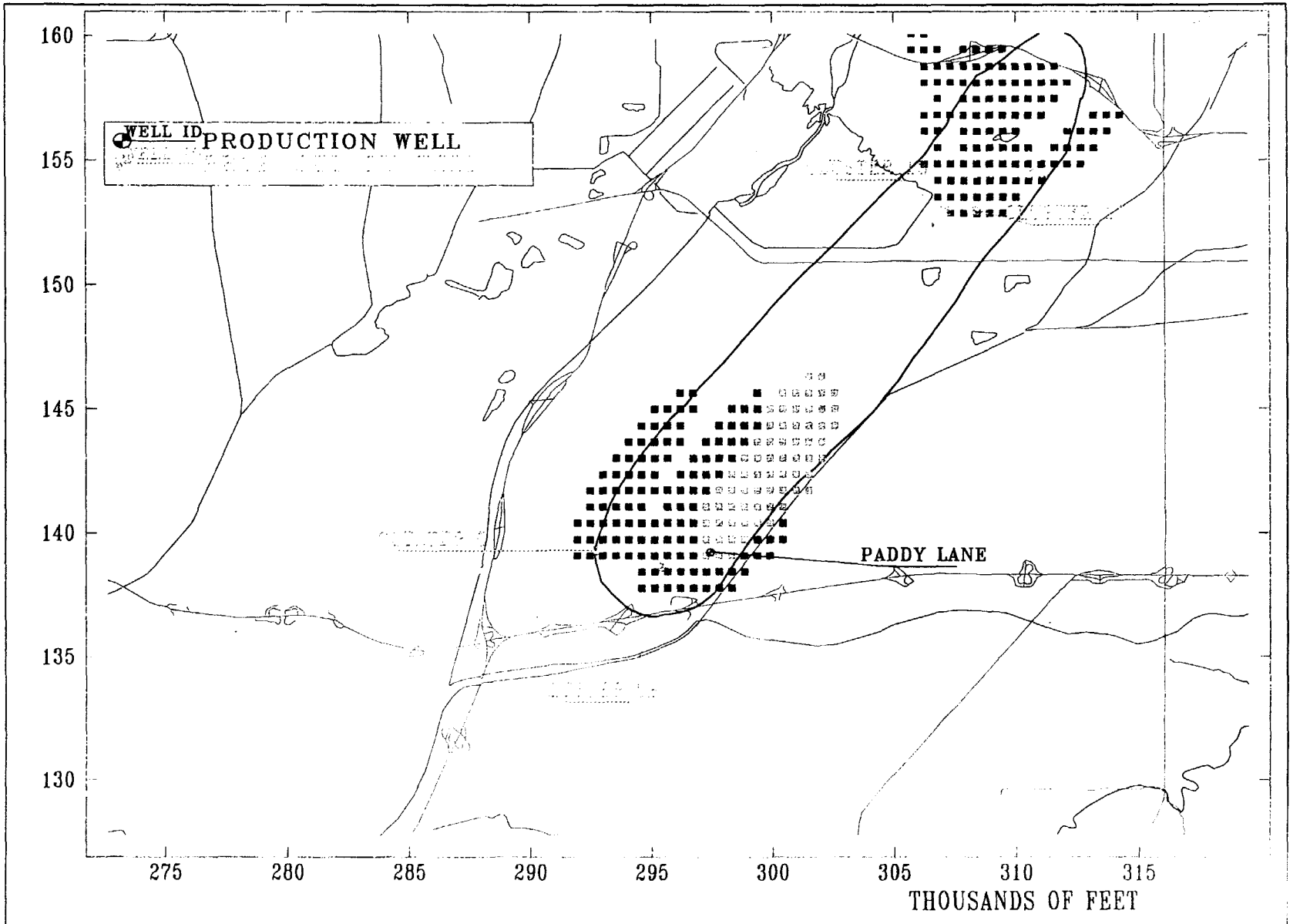

6,500 gpm Extraction Subarea 1
12 Year Transient Capture Zone
50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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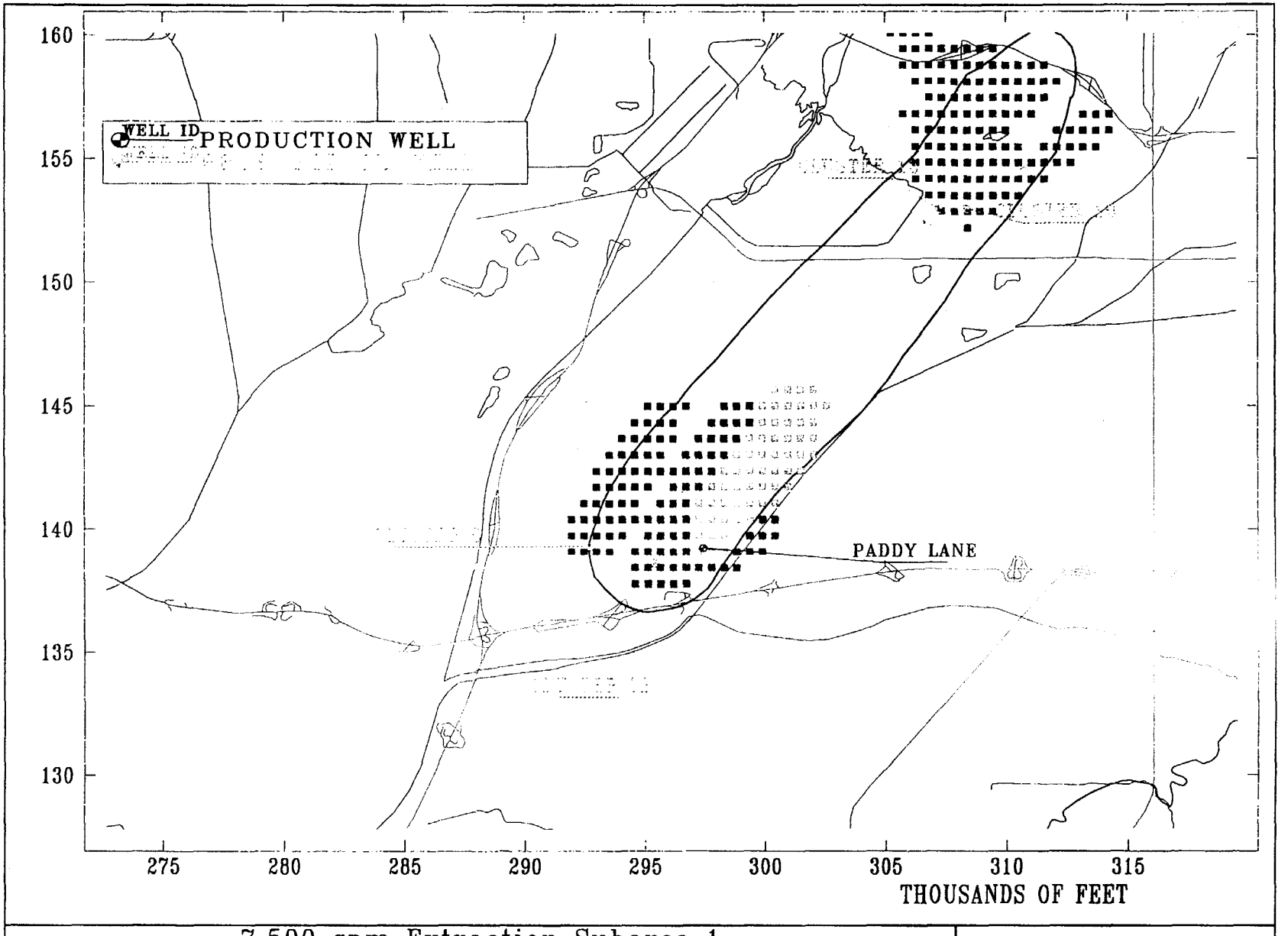

7,500 gpm Extraction Subarea 1
12 Year Transient Capture Zone
50 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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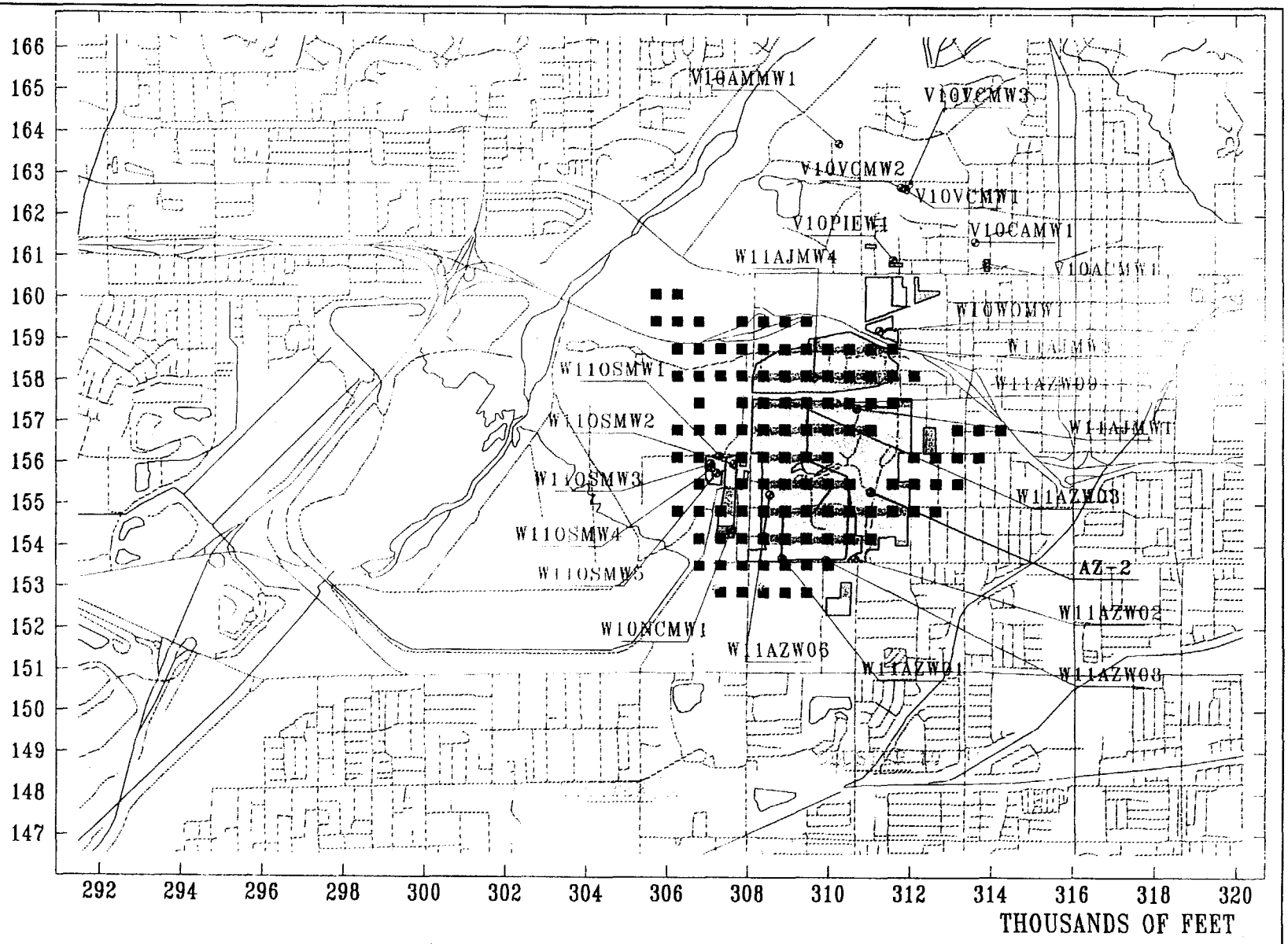

6,500 gpm Extraction Subarea 1
12 Year Capture Zone for Cluster 10 and Cluster 13
Site Locations Shaded in Gray - Site Wells Plotted
Baldwin Park Operable Unit Pre-Remedial Design

CDM
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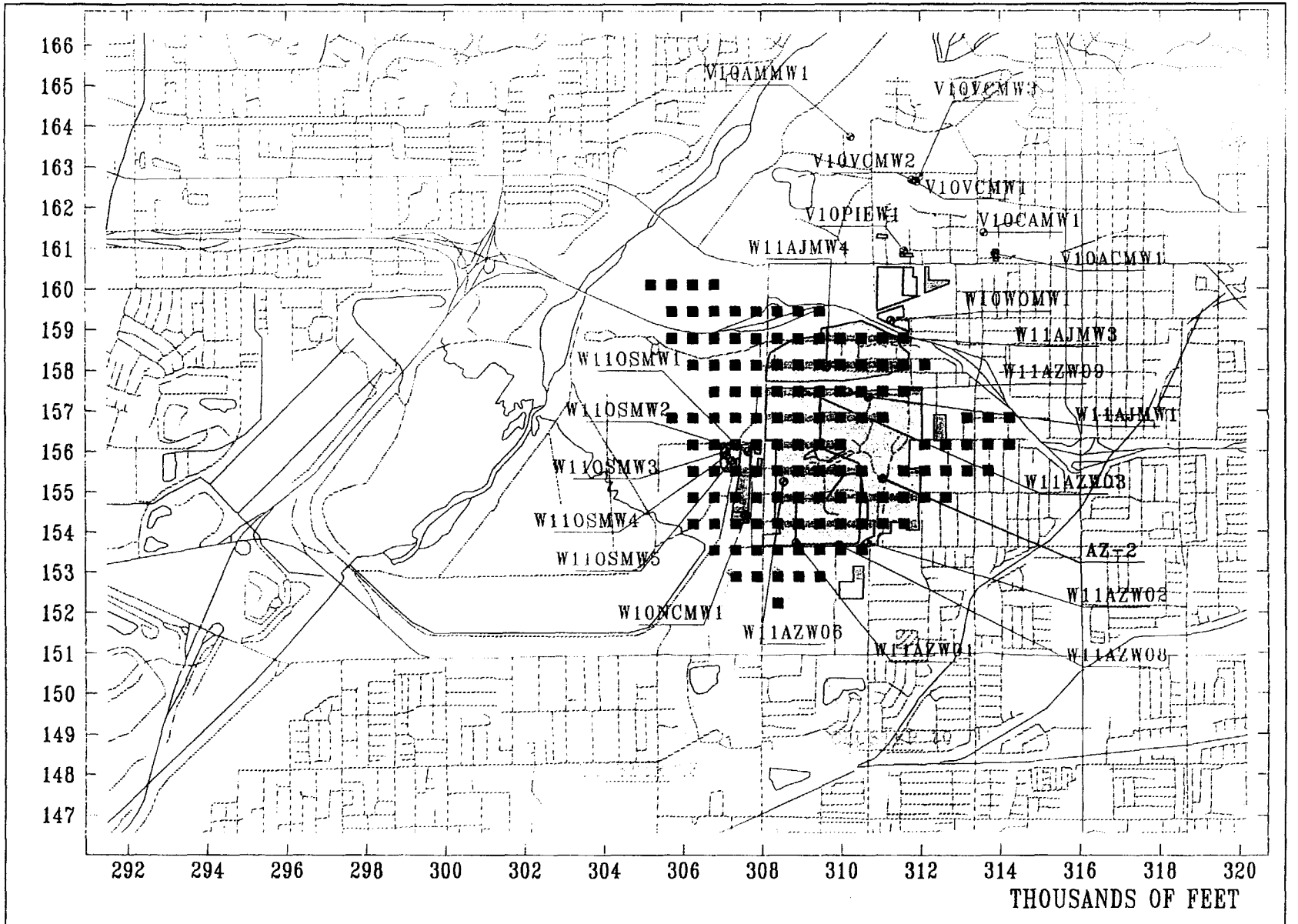

7,500 gpm Extraction Subarea 1
12 Year Capture Zone for Cluster 10 and Cluster 13
Site Locations Shaded in Gray - Site Wells Plotted
Baldwin Park Operable Unit Pre-Remedial Design

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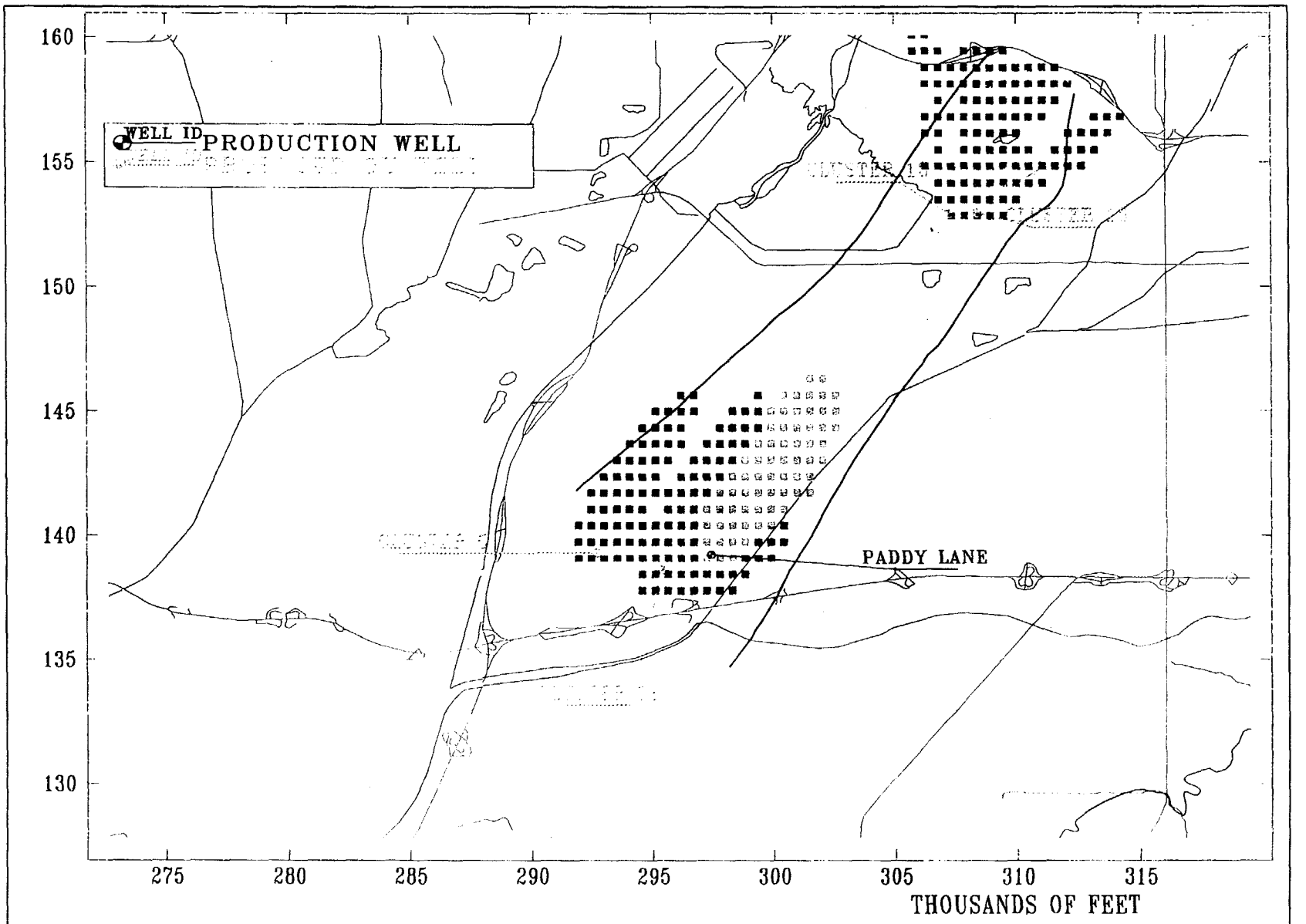

6,500 gpm Extraction Subarea 1
12 Year Transient Capture Zone
5 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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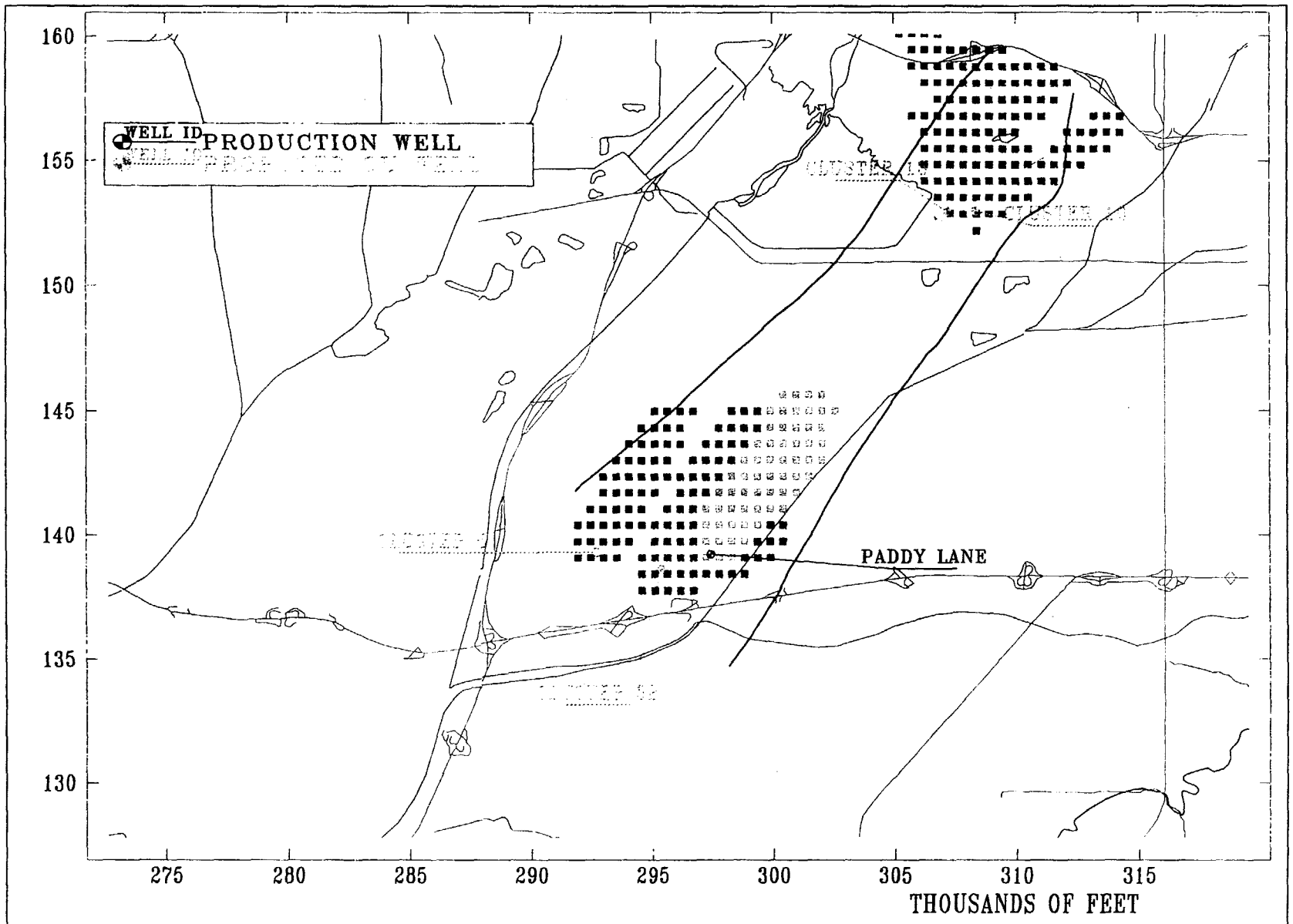

7,500 gpm Extraction Subarea 1
12 Year Transient Capture Zone
5 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

CDM
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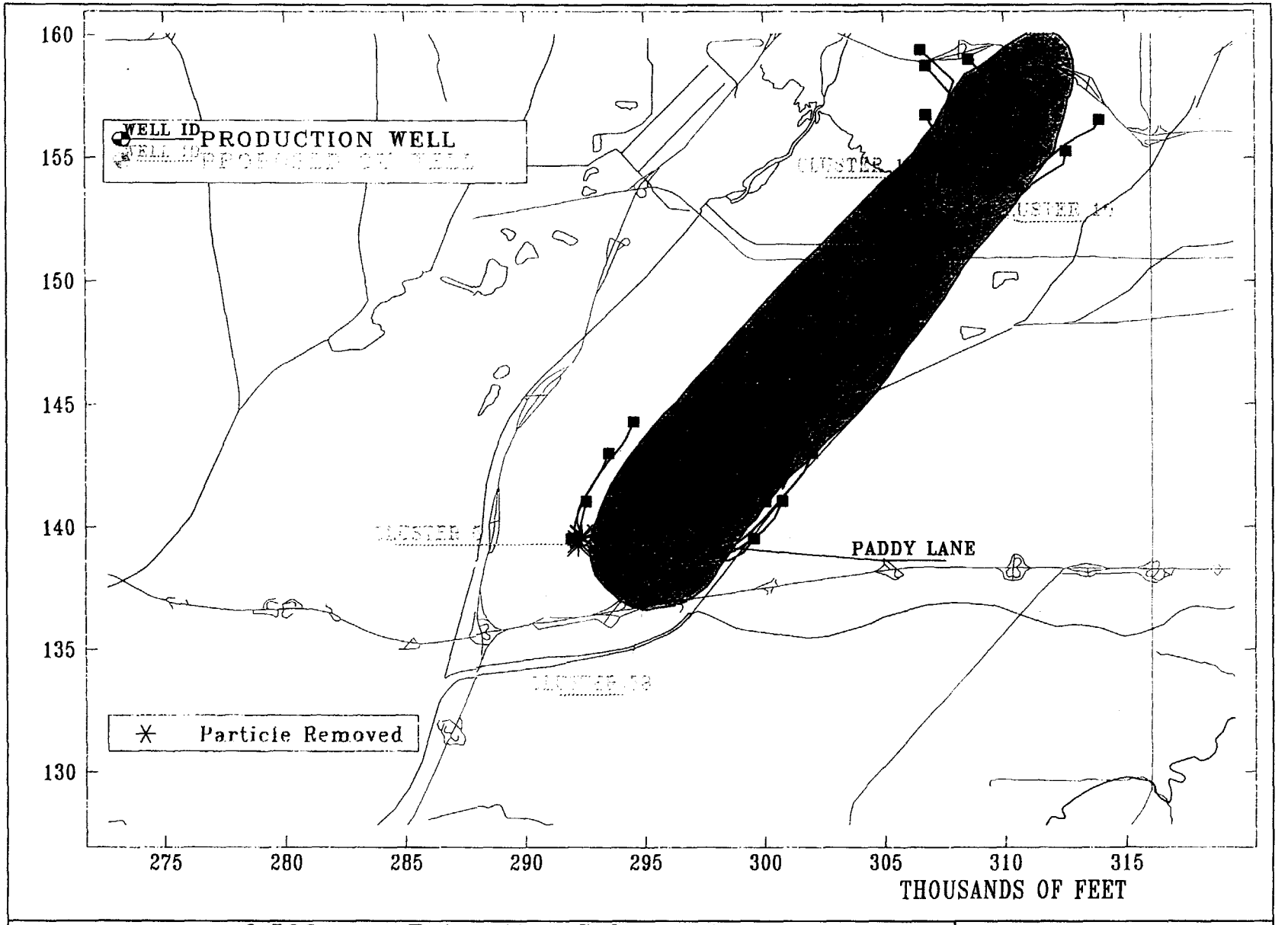

6,500 gpm Extraction Subarea 1
Representative 12 Year Transient Particle Tracks
Generalized TCE Distribution > 50 ppb
Baldwin Park Operable Unit Pre-Remedial Design

CDM
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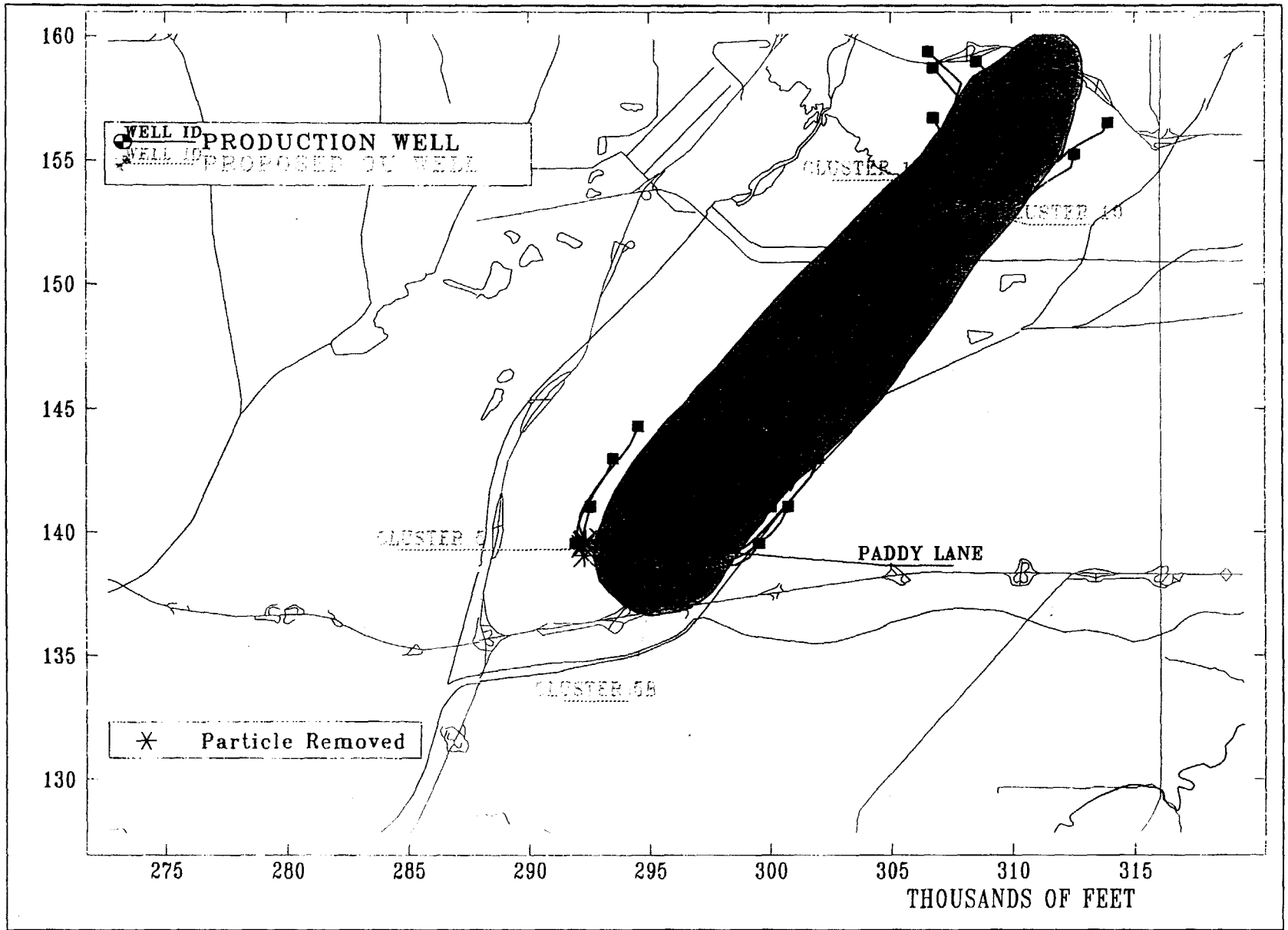

7,500 gpm Extraction Subarea 1
Representative 12 Year Transient Particle Tracks
Generalized TCE Distribution > 50 ppb
Baldwin Park Operable Unit Pre-Remedial Design

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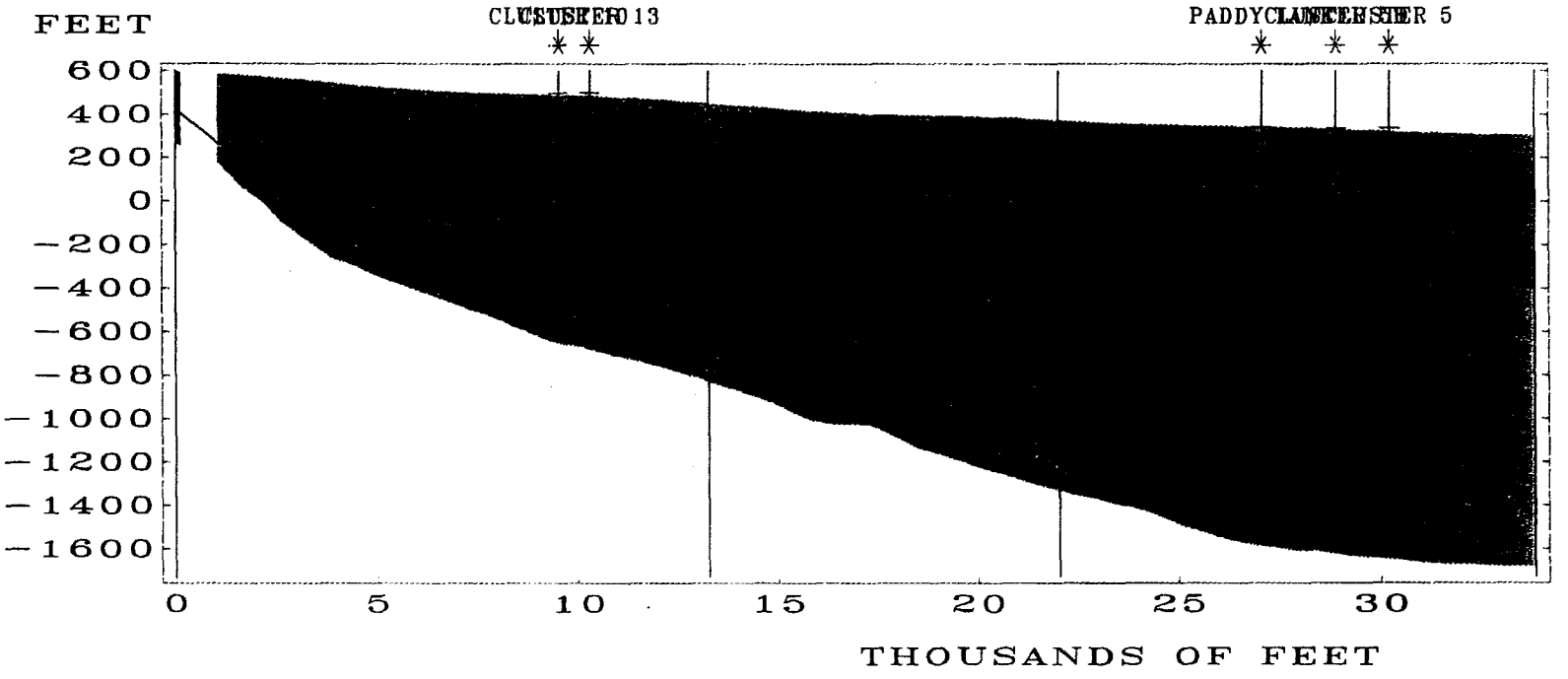


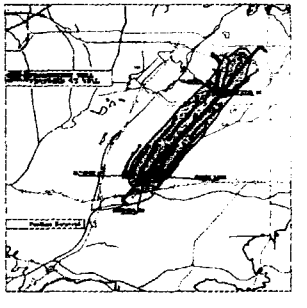
MATERIALS CROSS-SECTION AA

- K = 350.0 ft/day
- K = 250.0 ft/day
- K = 10.0 ft/day

1981-1982 Water Table

- PRODUCTION WELL
- PROPOSED OU WELL WITHIN 10000.0 FT
- GROUND SURFACE
- TOP OF SCREEN
- BOTTOM OF SCREEN

CROSS SECTION AA



6,500 gpm Extraction Subarea 1
Representative 12 Year Transient Particle Tracks
Particles Started at Elevation 50
Baldwin Park Operable Unit Pre-Remedial Design

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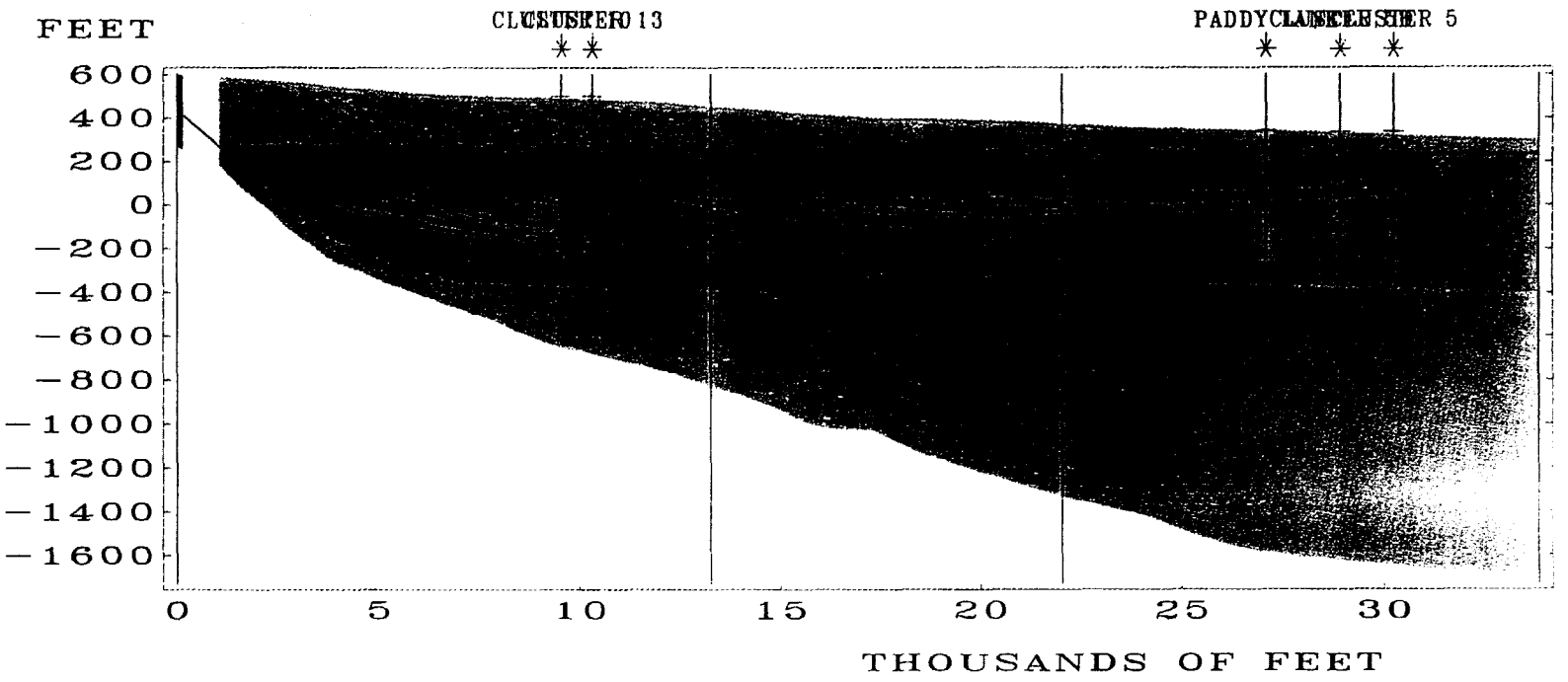


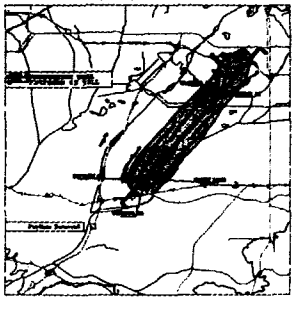
MATERIALS CROSS-SECTION AA

- K = 350.0 ft/day
- K = 250.0 ft/day
- K = 10.0 ft/day

1981-1982 Water Table

- PRODUCTION WELL
- PROPOSED OU WELL WITHIN 10000.0 FT
- GROUND SURFACE
- TOP OF SCREEN
- BOTTOM OF SCREEN

CROSS SECTION AA



7,500 gpm Extraction Subarea 1
Representative 12 Year Transient Particle Tracks
Particles Started at Elevation 50
Baldwin Park Operable Unit Pre-Remedial Design

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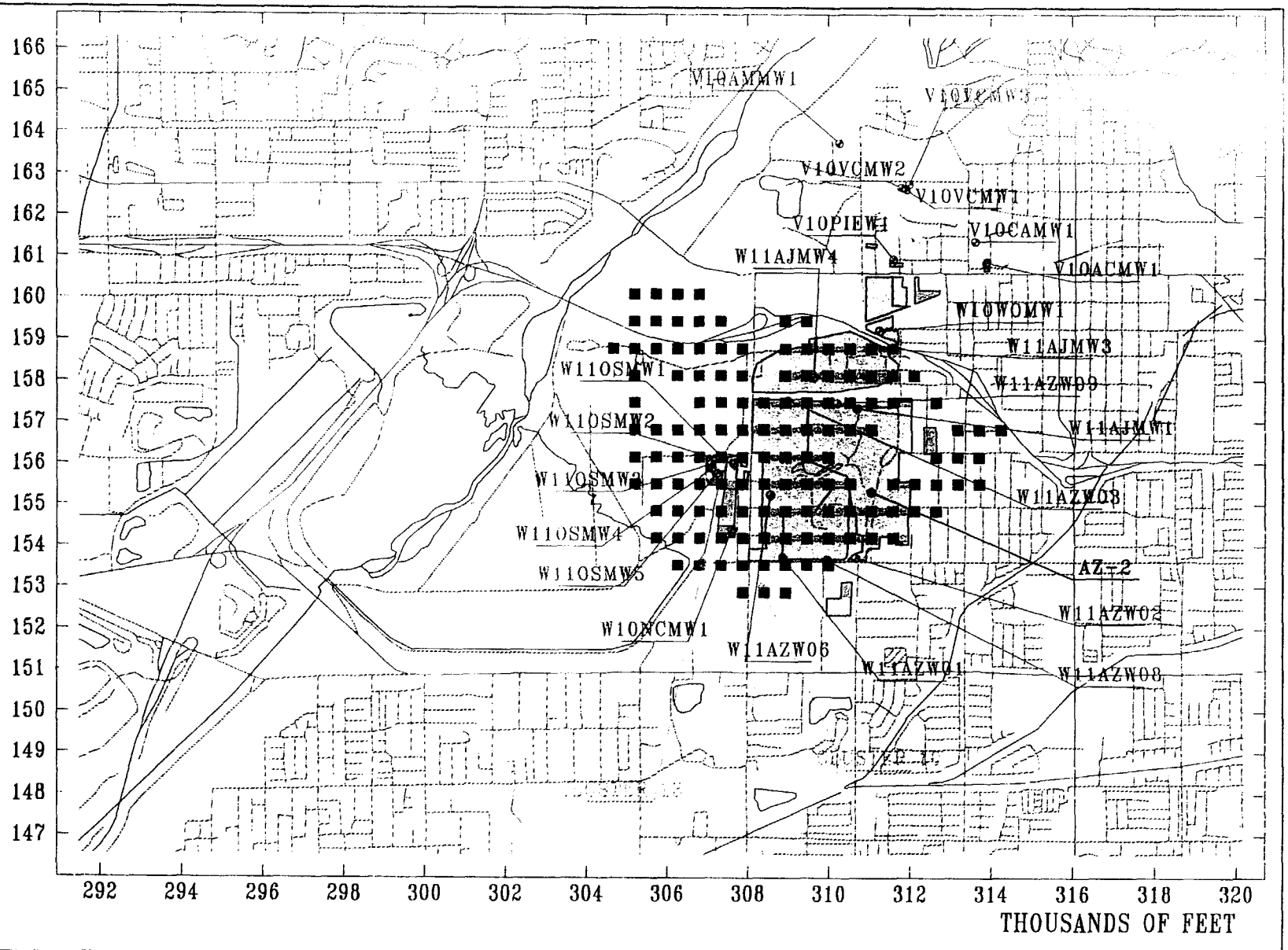

Remedial Extraction Case 1
12 Year Capture Zone for Cluster 10 and Cluster 13
Site Locations Shaded in Gray - Site Wells Plotted
Baldwin Park Operable Unit Pre-Remedial Design

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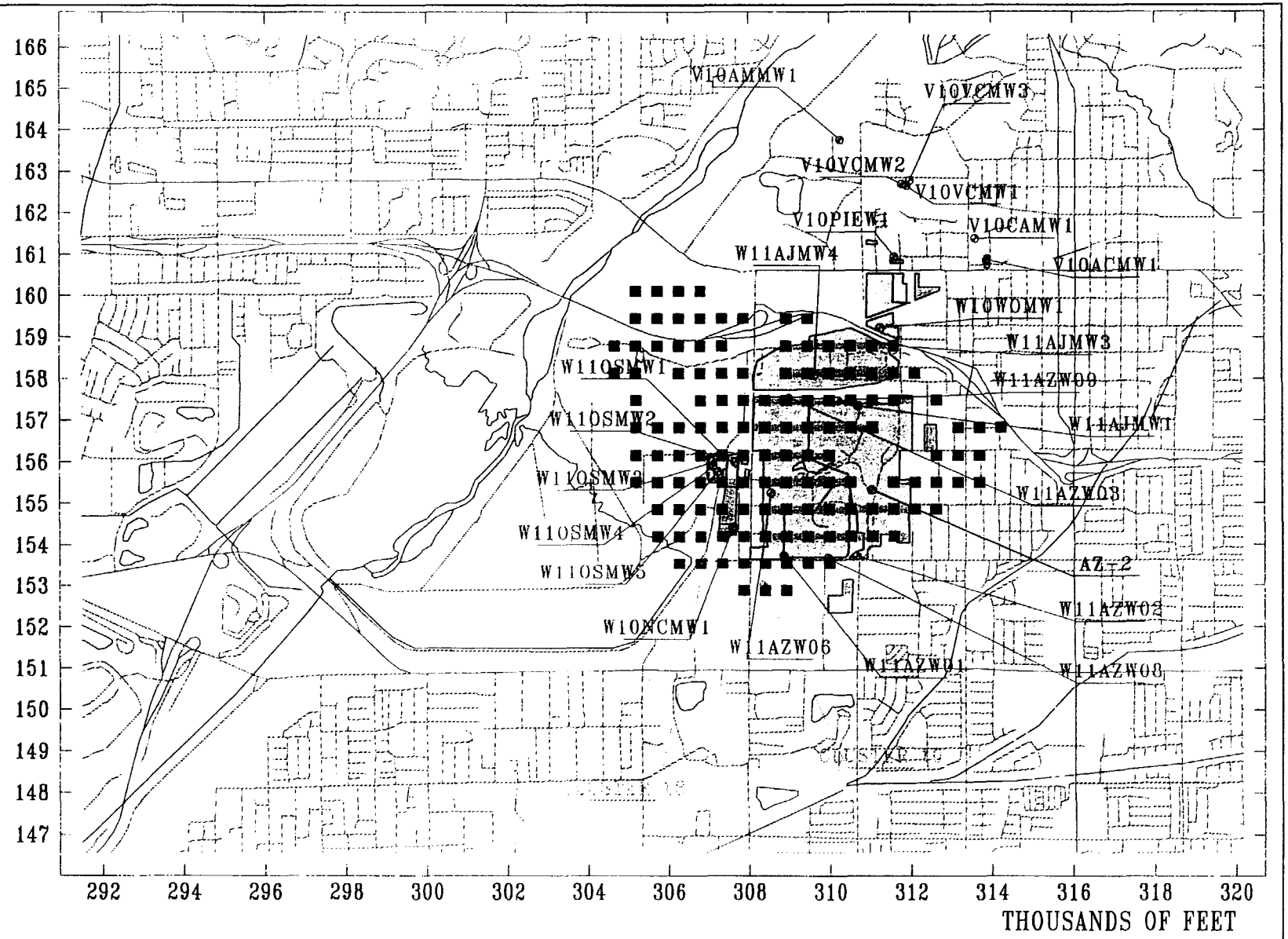

Remedial Extraction Case 2
12 Year Capture Zone for Cluster 10 and Cluster 13
Site Locations Shaded in Gray - Site Wells Plotted
Baldwin Park Operable Unit Pre-Remedial Design

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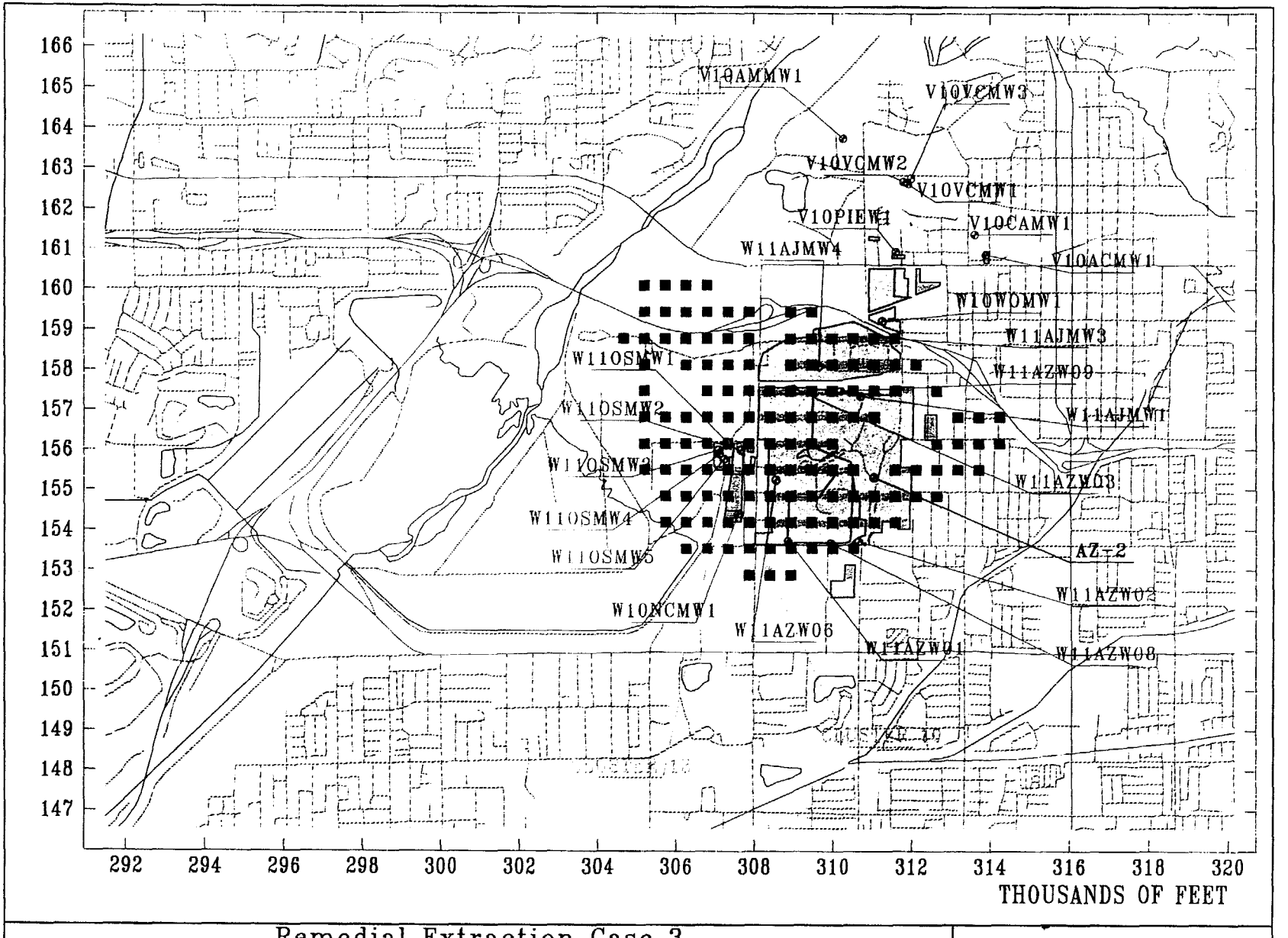

Remedial Extraction Case 3
12 Year Capture Zone for Cluster 10 and Cluster 13
Site Locations Shaded in Gray - Site Wells Plotted
Baldwin Park Operable Unit Pre-Remedial Design

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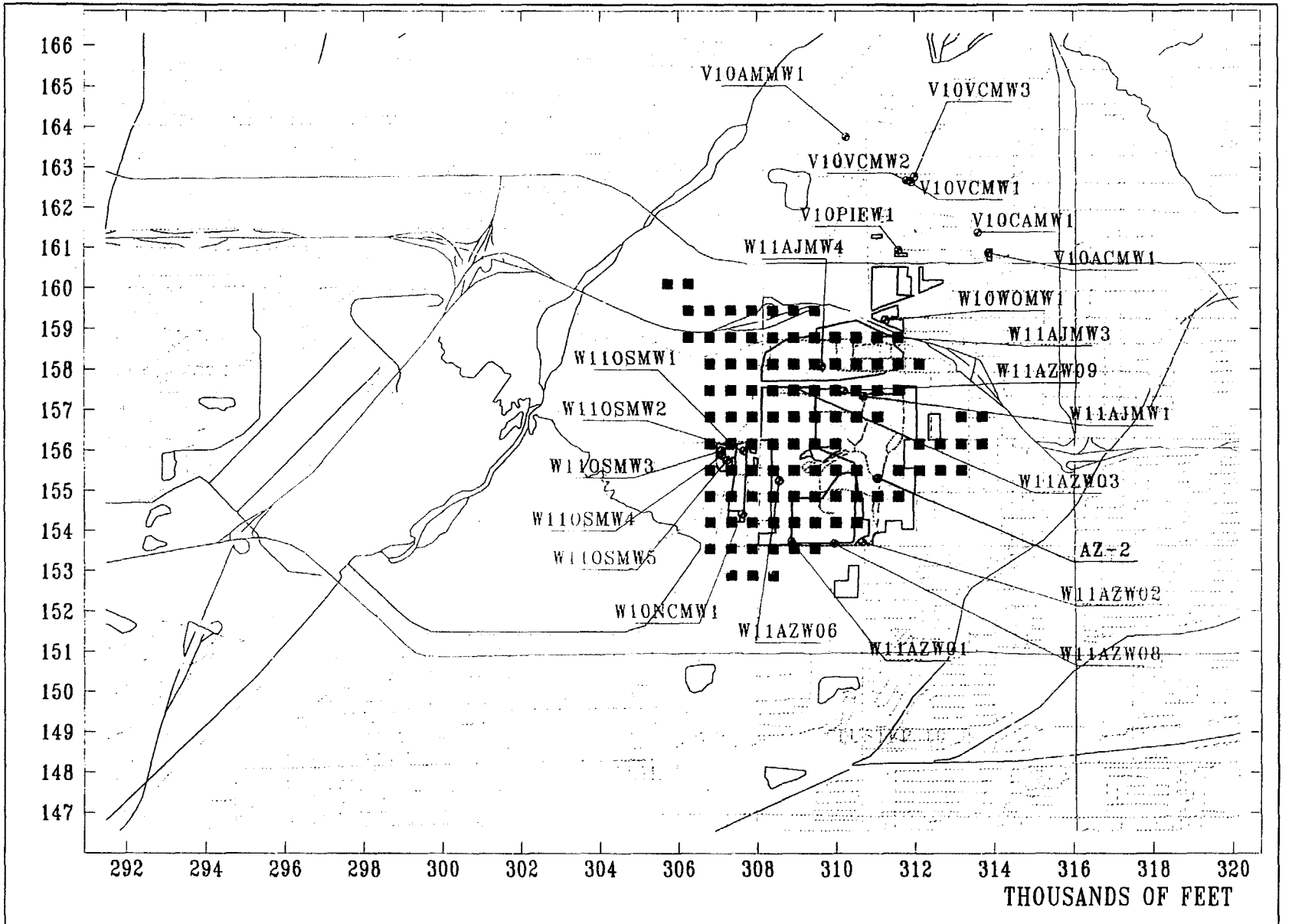

Remedial Extraction Case 4
12 Year Capture Zone for Cluster 10 and Cluster 13
Site Locations Shaded in Gray - Site Wells Plotted
Baldwin Park Operable Unit Pre-Remedial Design

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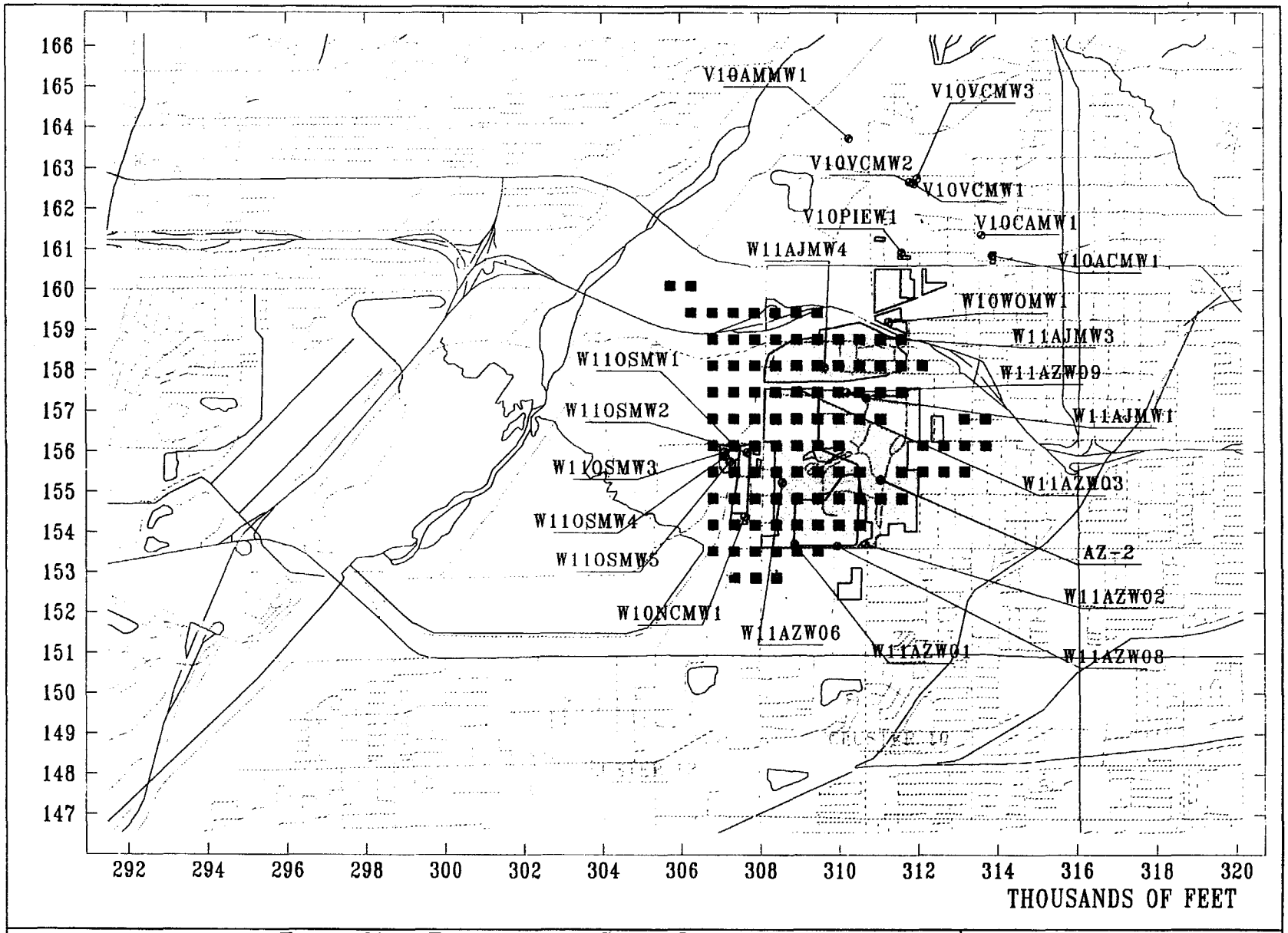

Remedial Extraction Case 5
12 Year Capture Zone for Cluster 10 and Cluster 13
Site Locations Shaded in Gray - Site Wells Plotted
Baldwin Park Operable Unit Pre-Remedial Design

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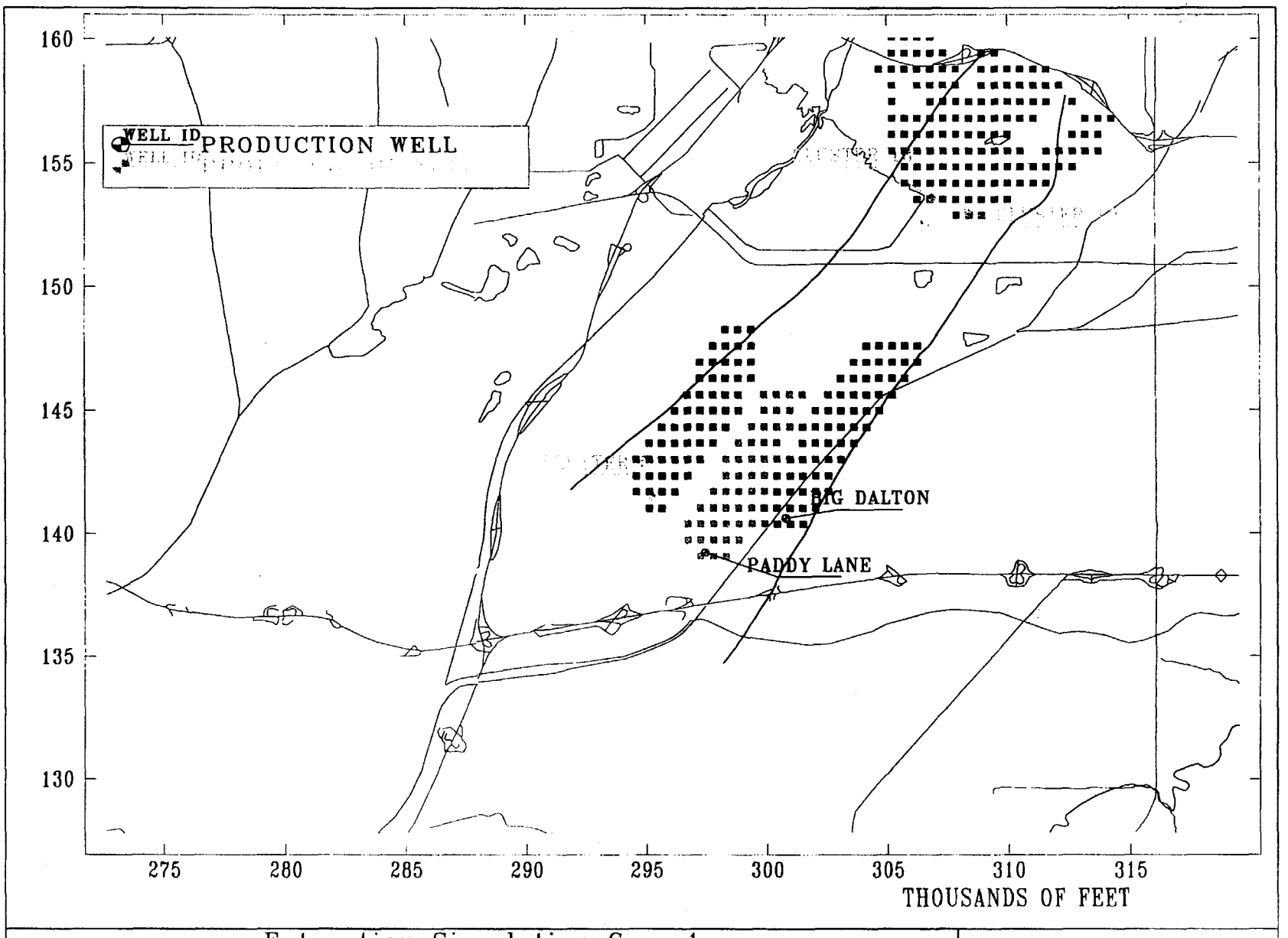

Extraction Simulation Case 1
12 Year Transient Capture Zone
5 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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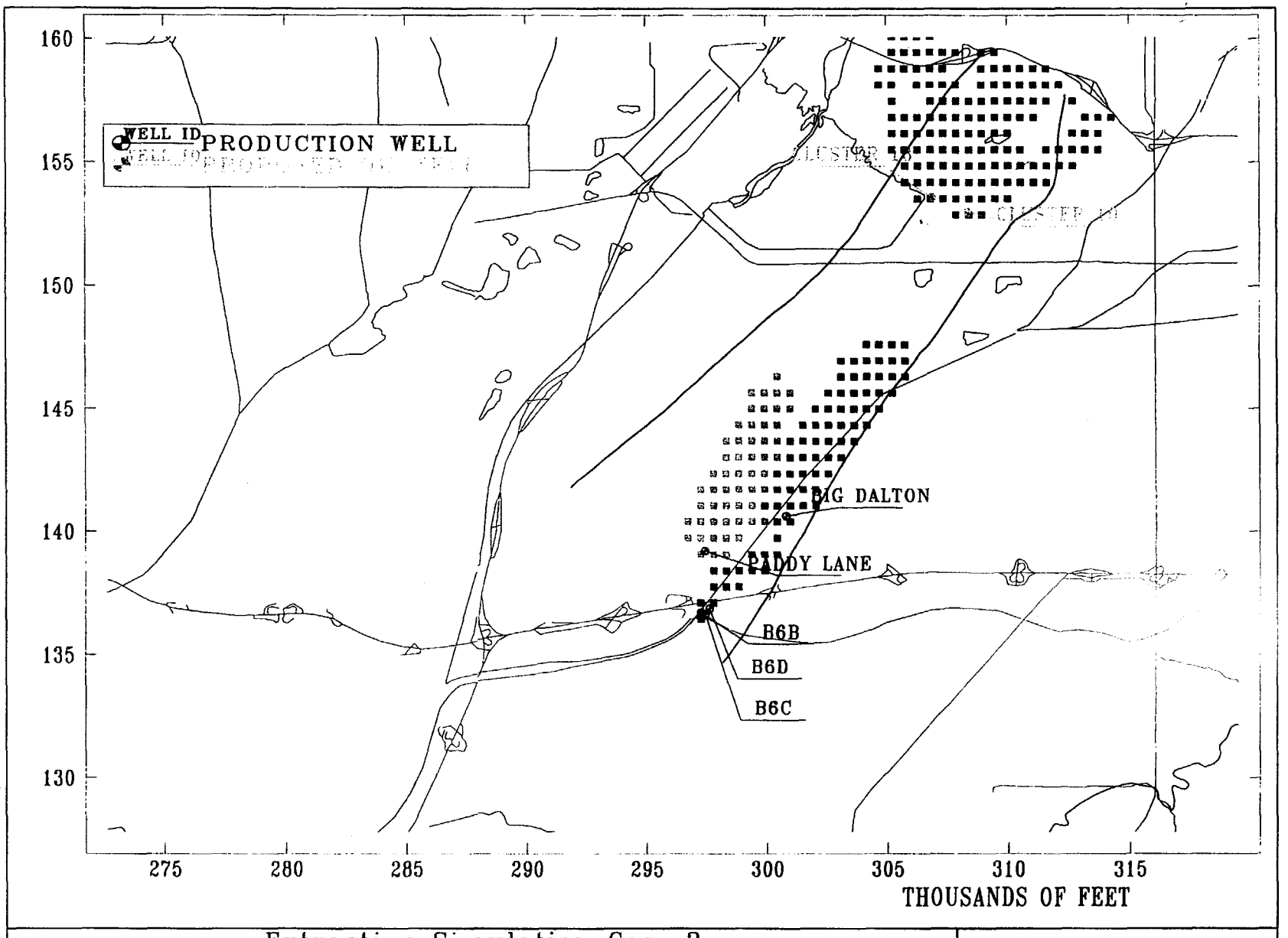

Extraction Simulation Case 2
12 Year Transient Capture Zone
5 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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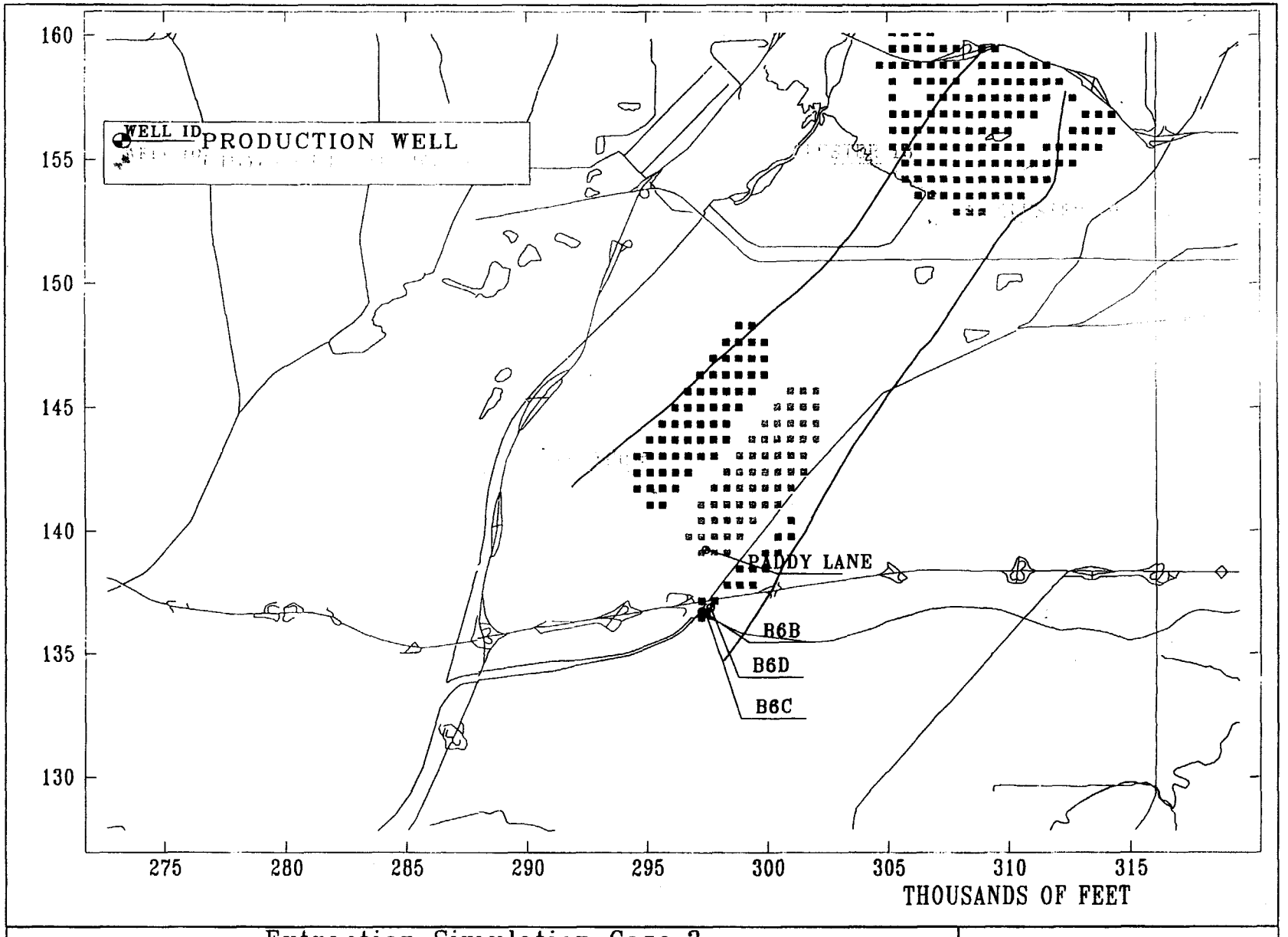

Extraction Simulation Case 3
12 Year Transient Capture Zone
5 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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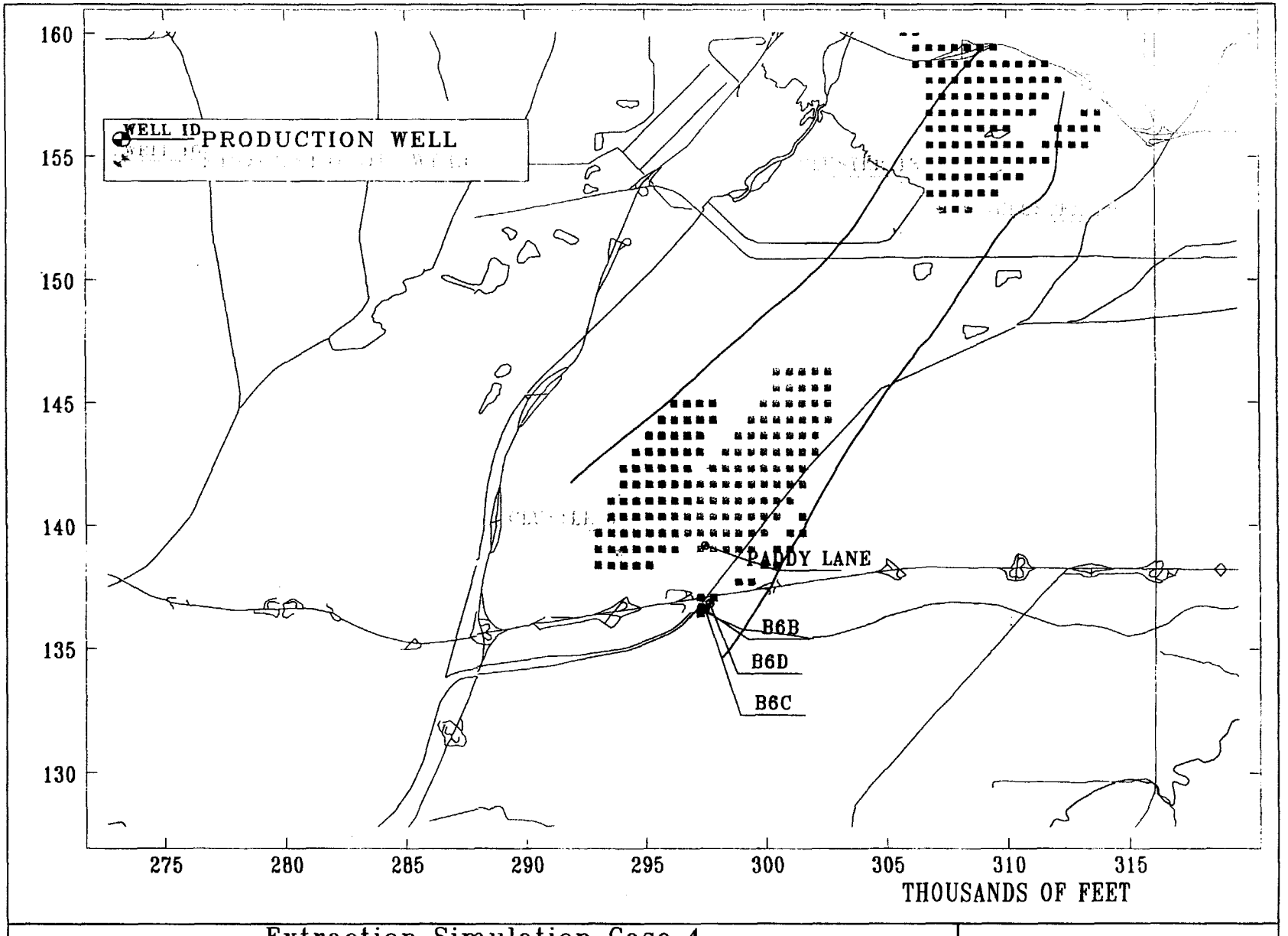

Extraction Simulation Case 4
12 Year Transient Capture Zone
5 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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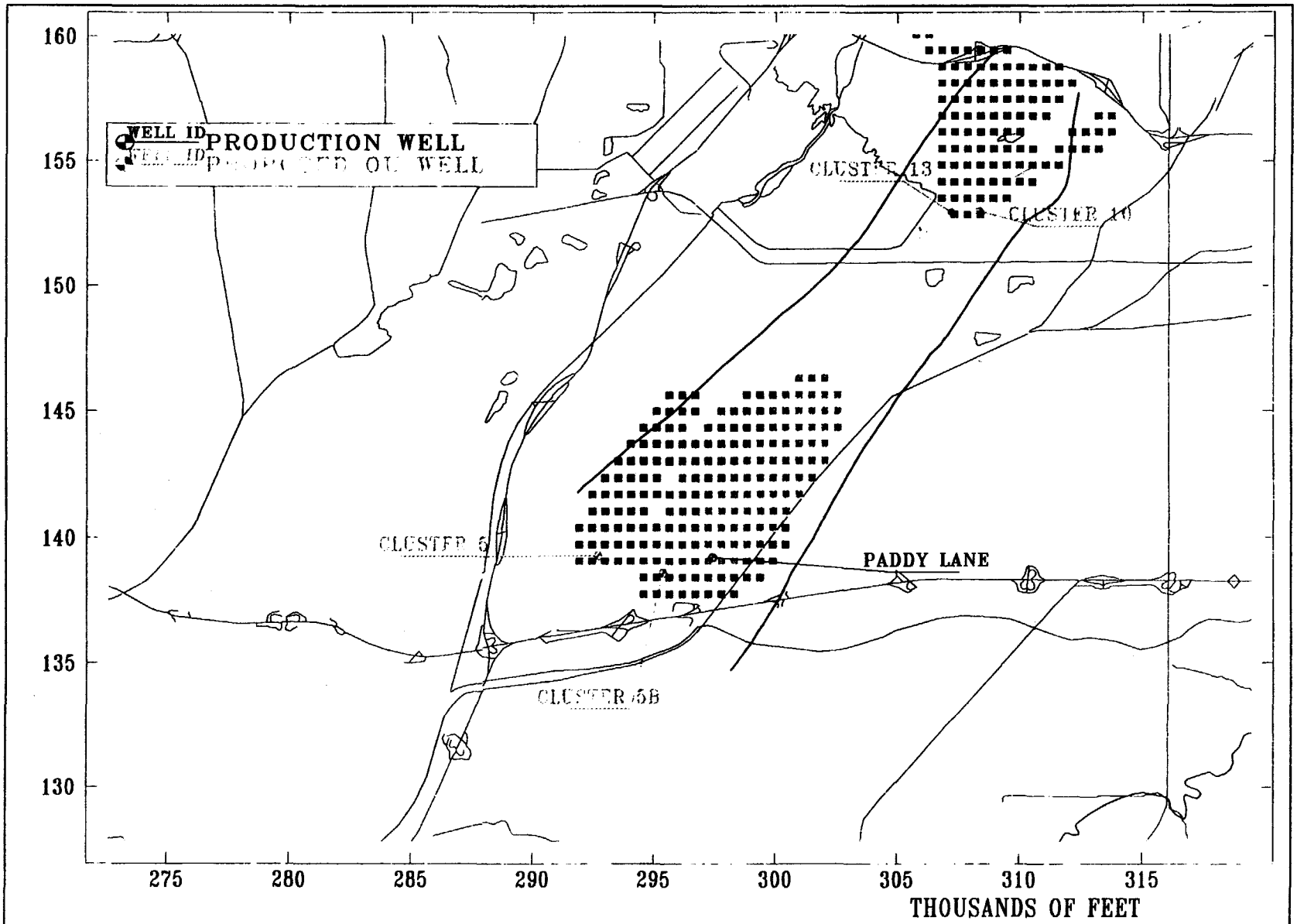

Extraction Simulation Case 5
12 Year Transient Capture Zone
5 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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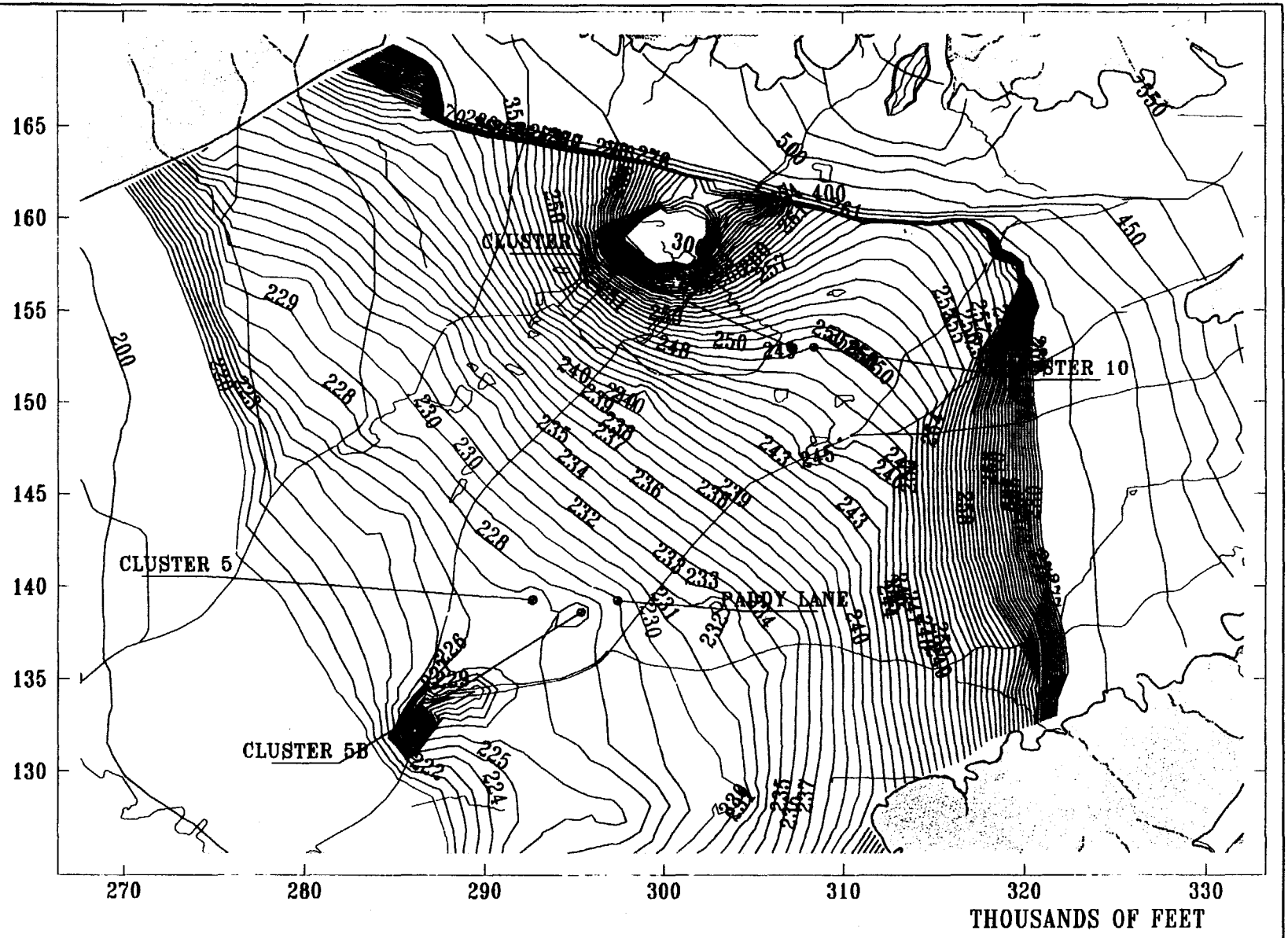

Simulated Water Table Contours 1/88 - 3/88
Extraction Simulation Case 5

Baldwin Park Operable Unit Pre-Remedial Design

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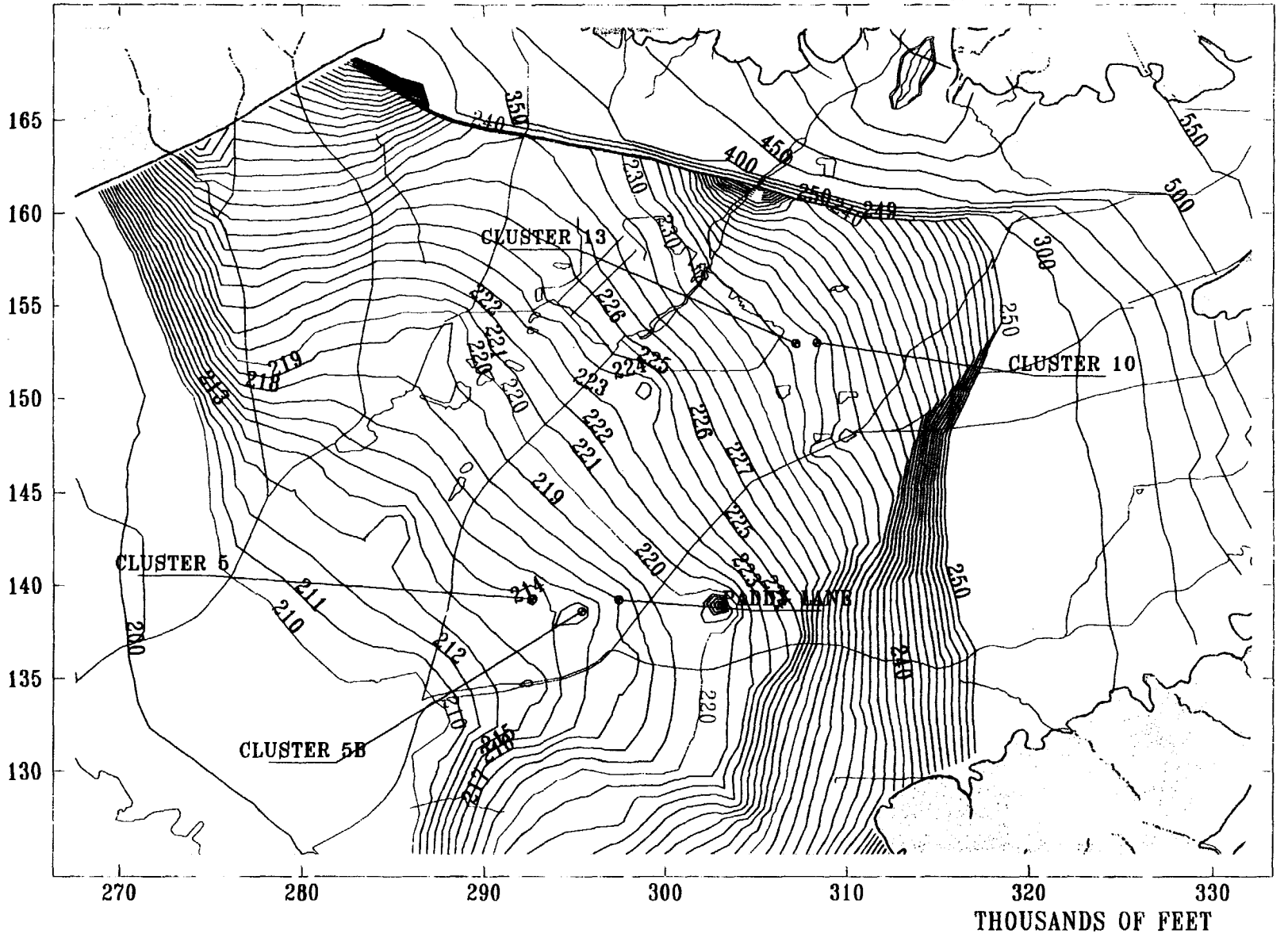

Simulated Water Table Contours 7/88 - 9/88
Extraction Simulation Case 5

Baldwin Park Operable Unit Pre-Remedial Design

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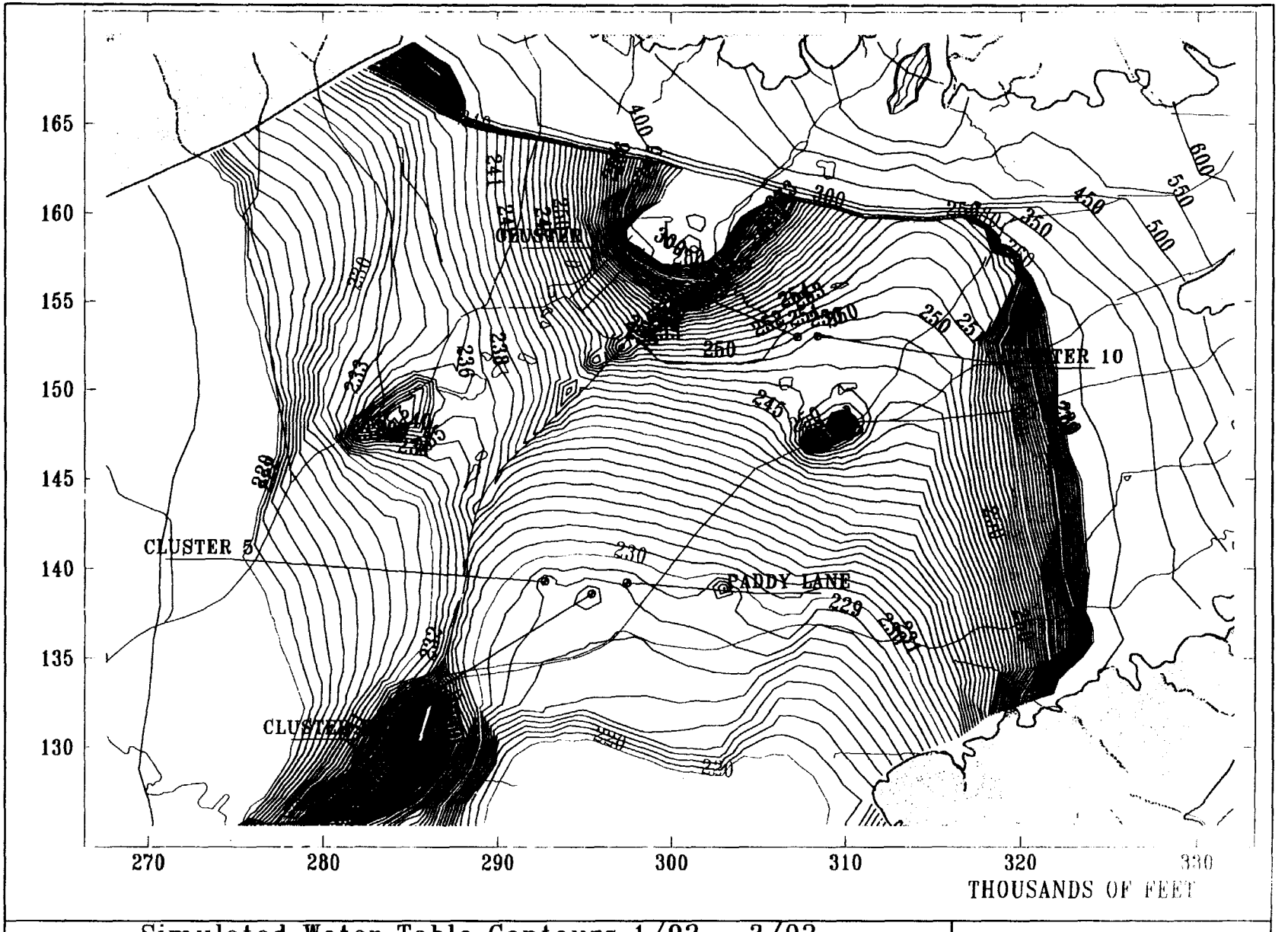


Simulated Water Table Contours 1/92 - 3/92
Extraction Simulation Case 5

Baldwin Park Operable Unit Pre-Remedial Design

CH2M HILL
environmental engineers, scientists, planners, & management consultants

CDM Camp Dresser & McKee Inc.

environmental services

Ten Cambridge Center
Cambridge, Massachusetts 02142
Tel: 617 252-8000 Fax: 617 621 2565

MEMORANDUM

To: Don Vanderkar
Steve Richtel

From: Brendan Harley/Jennifer Wynn JKW

Subject: Responses to Comments 1, 2, 3A, 3B, 4, 7

Date: March 6, 1997

CC: Dave Chamberlin

This memo presents CDM's responses to a set of the EPA comments on the Baldwin Park Draft Pre-Remedial Design Report contained in the EPA letter of January 15, 1997. These items are numbered in the same manner as the Steering Committee letter of January 31, 1997. These responses also address items outlined in the December 12, 1996 transmittal letter. A response to comment 9 will follow shortly.

Comment 1: Data on applied recharge for the areas and time periods listed below were obtained from the Los Angeles County Department of Public Works by Harding Lawson Associates for the development of their model of the BPOU area.

- San Gabriel River Reach from Morris Dam to F190: 10/82 through 9/88
- San Gabriel River Reach from F190 to Santa Fe Dam: 10/82 through 9/88
- San Gabriel River Reach from Santa Fe Dam to F261: 10/82 through 6/83
- Santa Fe Diversion Channel: 10/82 through 9/88

If not listed above, recharge for an area or time period was obtained from the Water Recharge Study for TVMWD Proposed Project prepared by Stetson Engineers for the Main San Gabriel Watermaster.

Comment 2: The quarterly applied recharge data will be presented in full in the Final Pre-Remedial Design Report, as Greg Woodside indicated is acceptable.

Comment 3A: This comment requested additional transient calibration statistics for the flow sensitivity Cases 4, 5, and 6; like the statistics presented in Table 5-7 (b) of the Pre-Remedial Design Report for the Base Case, and Cases 1, 2, and 3. The attached table presents these statistics. Cases 4 and 5 exhibit slightly better statistics than the Base Case at the Key Well and Glendora 07G, however the statistics at well Z1000005 are much poorer than the Base Case for both of these sensitivity cases. The RMSE at each of the three wells is much poorer for Sensitivity Case 6 than for the Base Case.

Comment 3B: This comment requested an additional extraction simulation with a modified notch representation. Four figures presenting the results of this simulation accompany this memo. The first presents the Subarea 1 and Subarea 3 capture zones superimposed upon the 5 ppb TCE contour. The capture zones are nearly identical to the Extraction Case 5 capture zones. The 2nd figure presents Subarea 1 capture with site locations. The 3rd and 4th figures present 12 year transient particle tracks in plan view and cross-section. These figures present a capture pattern very similar to the Extraction Case 5 capture.

Comment 4: In the extraction simulations the applied recharge consisted of the quarterly historical applied recharge as referred to in Item 2, plus the project recharge as presented in the Proposed Three Valleys Water Delivery Project. This additional recharge consisted of spreading at either Santa Fe SG, a collection of spreading grounds in the eastern portion of the basin (Citrus, San Dimas, and Little Dalton), Valley Boulevard Rubber Dam, or at all 5 of these spreading areas. Because the typical spreading cycle is a 7 month period from October through April, spreading was applied in the model for a 6 month period (to coincide with the quarterly time steps). The amounts presented in the attached table are the recharge from the proposed project applied during the 6 month period. The logic of the variation in project recharge is explained in the Draft Environmental Report for the Baldwin Park Operable Unit Water Delivery Plan.

Comment 7: The effective distribution with depth of the remedial extraction for each of the extraction simulations is presented below, determined from model layering and the location of nodal flux assignments. The values presented are given as elevations (feet MSL).

Case 1: Cluster 10 - 4500 gpm distributed approximately evenly from elevation -352 to +232 ft MSL
Cluster 13 - 4000 gpm distributed approximately evenly from elevation -351 to +233 ft MSL
Brandon - 3500 gpm distributed approximately evenly from elevation -236 to +153 ft MSL

Paddy Lane - 3500 gpm distributed approximately evenly from elevation -249 to +140 ft MSL
Cluster 5 - 3500 gpm distributed approximately evenly from elevation -349 to the water table

Case 2:

Cluster 10 - 4500 gpm distributed approximately evenly from elevation -352 to +232 ft MSL
Cluster 13 - 4000 gpm distributed approximately evenly from elevation -351 to +233 ft MSL
Big Dalton - 3500 gpm distributed approximately evenly from elevation -236 to +153 ft MSL
Paddy Lane - 3500 gpm distributed approximately evenly from elevation -249 to +140 ft MSL
B6 - 2500 gpm distributed approximately evenly from elevation -916 to -365 ft MSL (B6D); 1000 gpm distributed approximately evenly from elevation -265 to +124 ft MSL (B6C)

Case 3:

Cluster 10 - 4500 gpm distributed approximately evenly from elevation -352 to +232 ft MSL
Cluster 13 - 4000 gpm distributed approximately evenly from elevation -351 to +233 ft MSL
Paddy Lane - 3500 gpm distributed approximately evenly from elevation -249 to +140 ft MSL
B6 - 2500 gpm distributed approximately evenly from elevation -916 to -365 ft MSL (B6D); 1000 gpm distributed approximately evenly from elevation -265 to +124 ft MSL (B6C)
Cluster 5 - 3500 gpm distributed approximately evenly from elevation -349 to the water table

Case 4:

Cluster 10 - 4500 gpm distributed approximately evenly from elevation -352 to +232 ft MSL
Cluster 13 - 1000 gpm distributed approximately evenly from elevation -354 to +230 ft MSL
Paddy Lane - 5500 gpm distributed approximately evenly from elevation -249 to +140 ft MSL
B6 - 3000 gpm distributed approximately evenly from elevation -916 to -365 ft MSL (B6D); 1000 gpm distributed approximately evenly from elevation -265 to +124 ft MSL (B6C)
Cluster 5 - 5000 gpm distributed approximately evenly from elevation -364 to the water table

Case 5: Cluster 10 - 4500 gpm distributed approximately evenly from elevation -352 to +232 ft MSL
Cluster 13 - 1000 gpm distributed approximately evenly from elevation -354 to +230 ft MSL
Paddy Lane - 4000 gpm distributed approximately evenly from elevation -249 to +140 ft MSL
Cluster 5 - 4000 gpm distributed approximately evenly from elevation -364 to the water table
Cluster 5B - 5500 gpm distributed approximately evenly from elevation -362 to the water table

Information outlined in the December 12, 1996 letter

Item A: Additional Flux Calculations 1993/94 Water:

The transmittal letter of 12/12/96 stated that additional flux calculations would be provided. The transient calibration simulation was run for the time period of 11/1/82 through 6/30/94. Only 3 quarters of the 1993/94 Water Year were simulated. To provide flux numbers that are consistent with those presented in the Draft Pre-Remedial Design Report, the following flux calculations are for the time period of 7/1/93 through 6/30/94, a full year. All the fluxes given below are in Acre-Feet.

Boundary Fluxes	
Chino/San Dimas	6,900
Raymond Fault	6,200
San Gabriel Mountains	5,000
Puente Valley	1,536
Whittier Narrows	-9,783
Recharge Fluxes	
Precipitation & Applied Water	55,429
Spreading Basins	105,223
Pumping Fluxes	-219,725
Model Generated Fluxes	
Morris Dam Boundary Nodes	15,603
Rising/Dry	231
Storage Flux	33,302

Item B: Darcian Flux Calculations at Whittier Narrows:

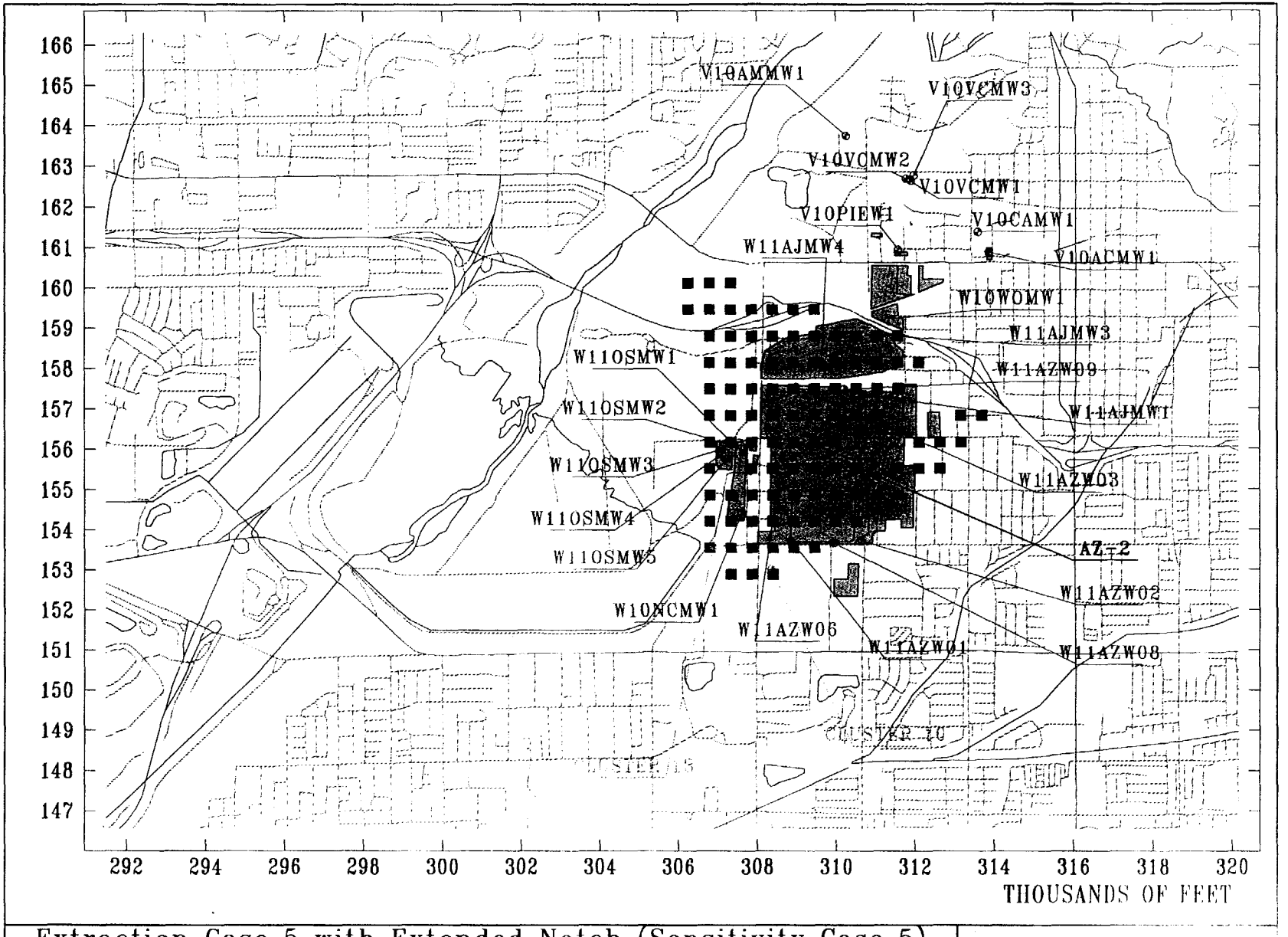
The transmittal letter also stated that Darcian flux calculations at Whittier Narrows would be provided. The following table presents several calculated flux values. The cross-sectional area used to calculate the flux is presented in the accompanying figure. In this area the model-derived conductivities are 40 ft/day in the lowest layer, and 175 ft/day in the upper layers. The value of the cross-sectional area multiplied by these conductivities is 934,562,500 ft^3/day. This number is then multiplied by the various gradients determined from different head observations in the area, as presented in accompanying figures.

Time Period	Wells	Gradient	Flux
10/1/81 - 12/31/81	Well 17 to Well 14	.0011 ft/ft	8,500 AF/Yr
10/1/81 - 12/31/81	Well 17 to Well 8	.0036 ft/ft	28,000 AF/Yr
1/1/82 - 3/31/82	2947F to Z1000109	.0017 ft/ft	12,750 AF/Yr
1/1/82 - 3/31/82	2947F to Z1000098	.0034 ft/ft	25,000 AF/Yr
4/1/82 - 6/30/82	Z1000093 to Grate 94	.0004 ft/ft	2,900 AF/Yr
4/1/82 - 6/30/82	Z1000093 to Grate 84	.0012 ft/ft	9,100 AF/Yr
4/1/82 - 6/30/82	Z1000093 to Z1000090	.0031 ft/ft	24,000 AF/Yr

The calculated flux varies from as low as 2,900 AF/Yr to as high as 28,000 AF/Yr. Point observations of water levels in this area are heavily influenced by local production pumping, and it is therefore difficult to find head observations that would be representative of the flux out of the basin at Whittier Narrows. For comparison, the model derived flux through this boundary, calculated for the 10/81 - 9/82 steady-state condition is 13,500 AF.

Transient Calibration - Summary Statistics

	Key Well		Glendora 07G		Z1000005	
	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE
Sensitivity Case 4	0.9888	4.5759	0.9841	4.4828	0.9528	6.3915
Sensitivity Case 5	0.9888	4.3385	0.9842	4.4369	0.9528	6.5127
Sensitivity Case 6	0.9885	7.481	0.9841	6.8081	0.9541	6.2184



Extraction Case 5 with Extended Notch (Sensitivity Case 5)
12 Year Capture Zone for Cluster 10 and Cluster 13
Site Locations Shaded in Gray - Site Wells Plotted
Baldwin Park Operable Unit Pre-Remedial Design

CH2M HILL
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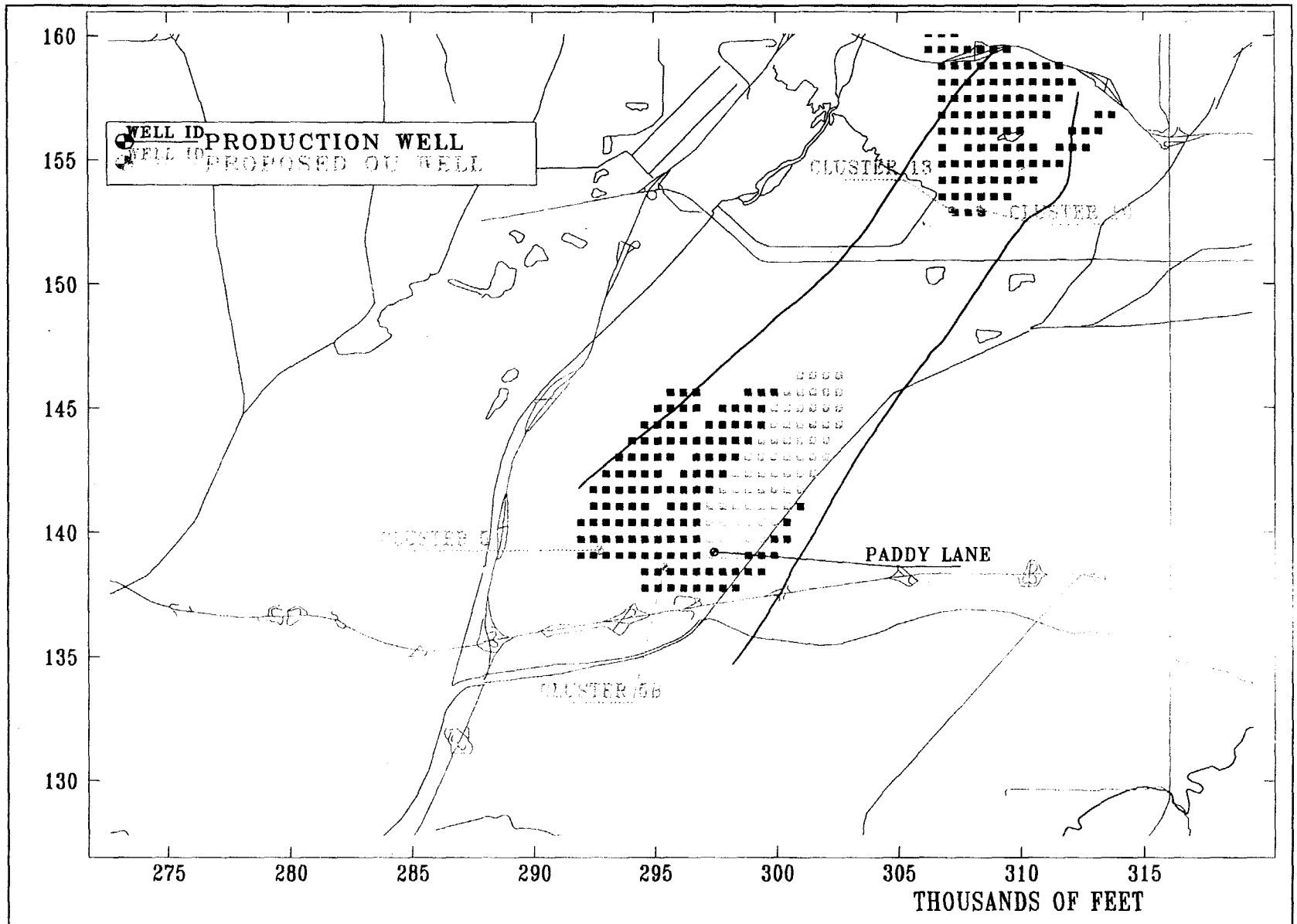

Extraction Case 5 with Extended Notch (Flow Sensitivity 5)
12 Year Transient Capture Zone
5 ppb TCE Contour
Baldwin Park Operable Unit Pre-Remedial Design

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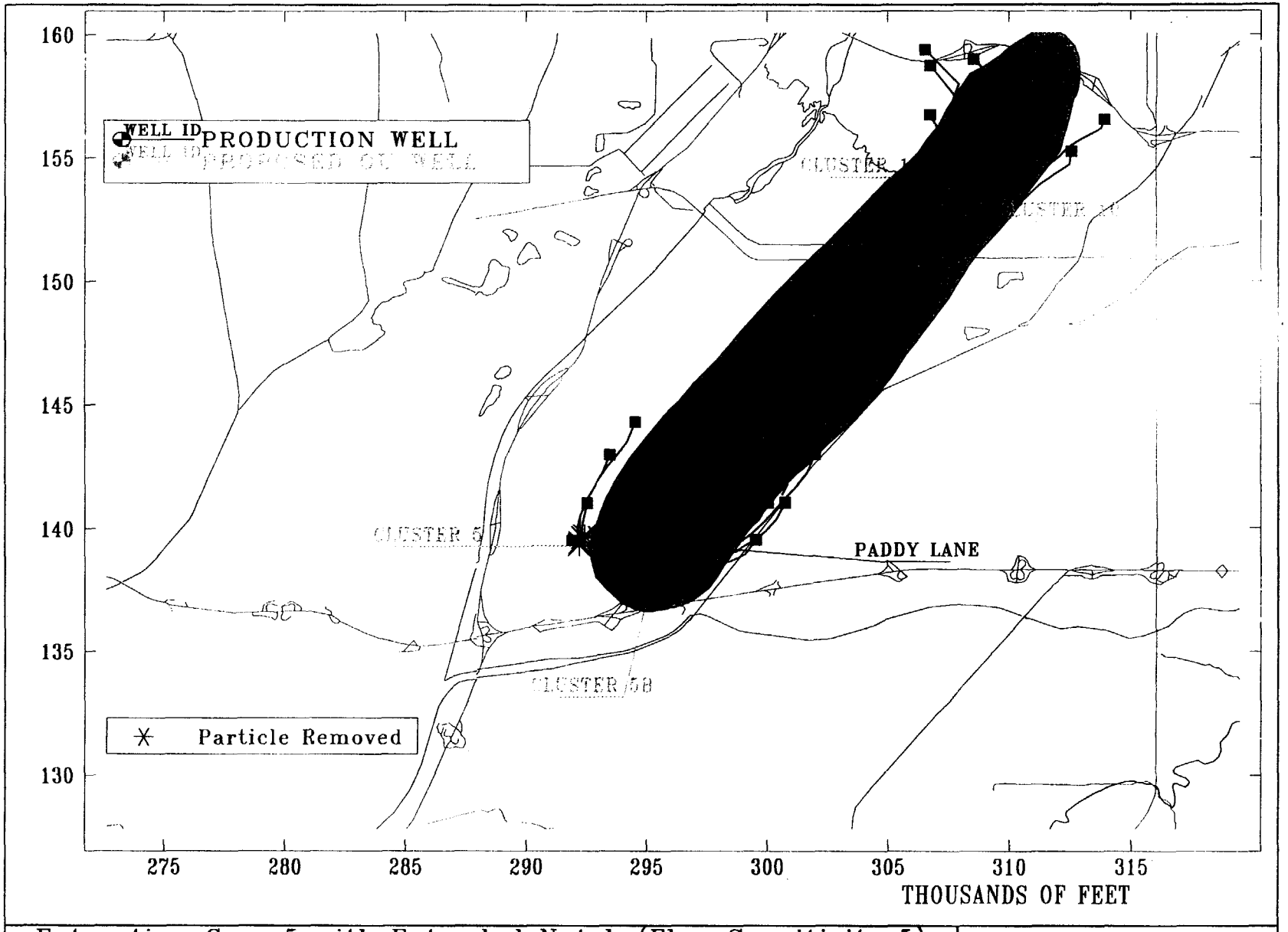

Extraction Case 5 with Extended Notch (Flow Sensitivity 5)
Representative 12 Year Transient Particle Tracks
Generalized TCE Distribution > 50 ppb
Baldwin Park Operable Unit Pre-Remedial Design

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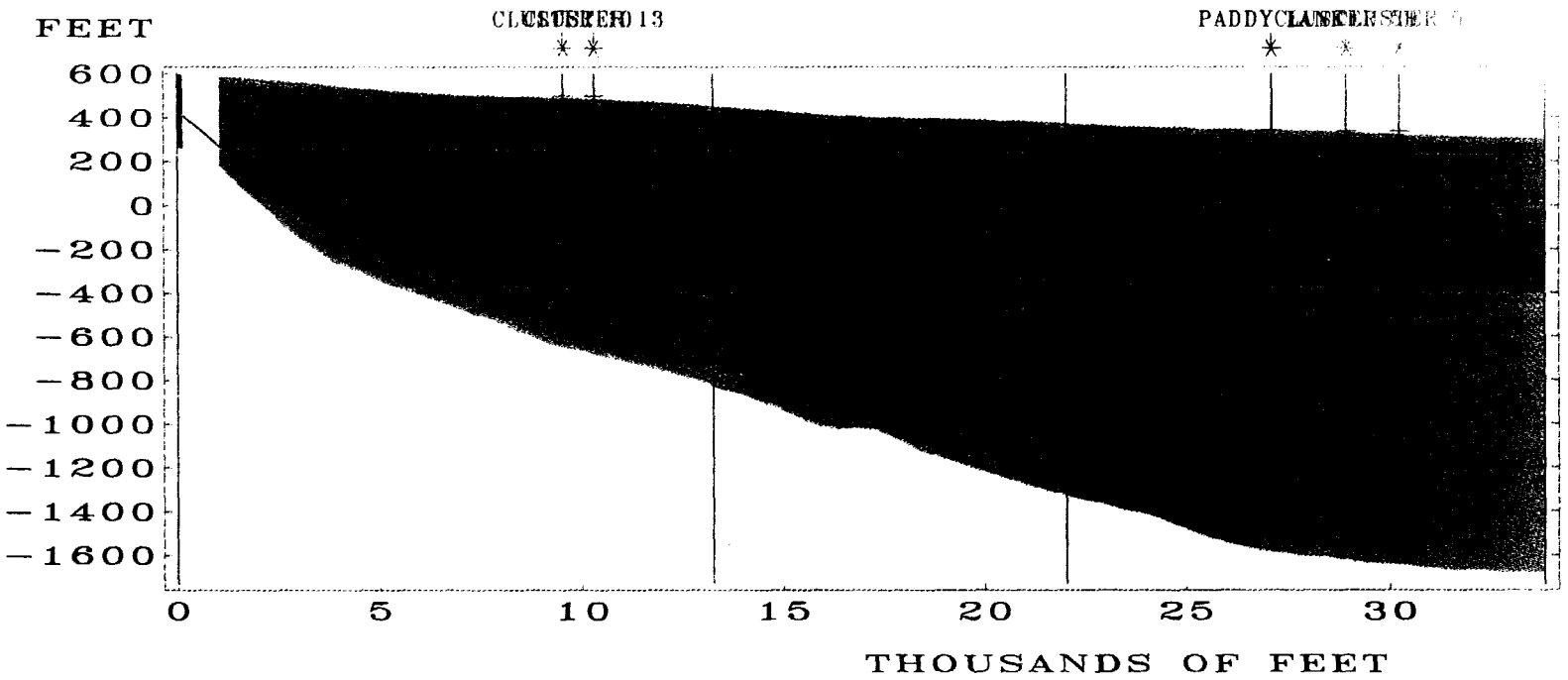


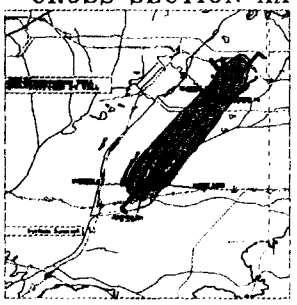
MATERIALS CROSS-SECTION AA

K = 350.0 ft/day
K = 250.0 ft/day
K = 10.0 ft/day

1981-1982 Water Table

* PRODUCTION WELL
* PROPOSED OU WELL WITHIN 10000.0 FT
GROUND SURFACE
TOP OF SCREEN
BOTTOM OF SCREEN

CROSS SECTION AA



Extraction Case 5 with Extended Notch (Sensitivity Case 5)
Representative 12 Year Transient Particle Tracks
Particles Started at Elevation 50
Baldwin Park Operable Unit Pre-Remedial Design

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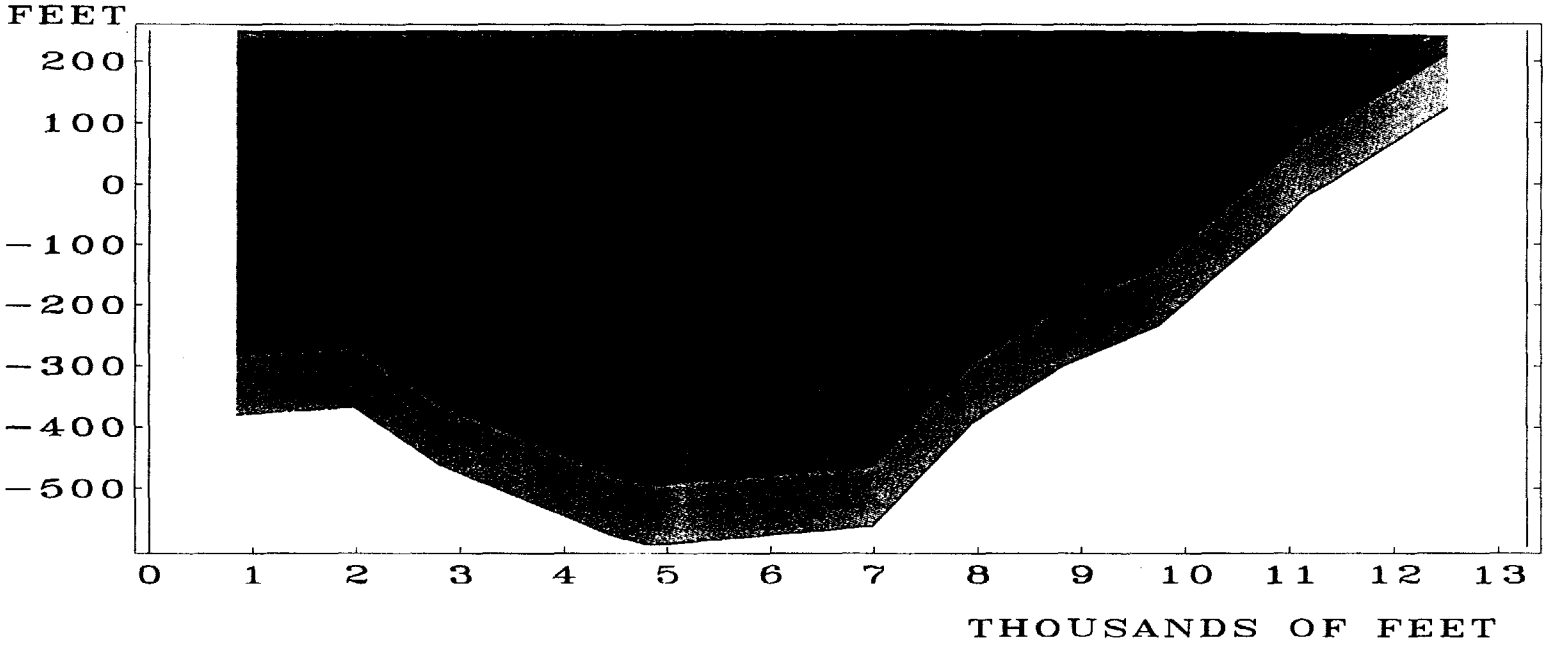
APPLIED PROJECT RECHARGE PROPOSED THREE VALLEYS WATER DELIVERY PROJECT					
Date	Santa Fe Spreading Gr. (AF)	Valley Blvd Rubber Dam (AF)	Citrus (AF)	San Dimas (AF)	Little Dalton (AF)
10/82 - 3/83			6200	2400	5000
4/83 - 9/83					
10/83 - 3/84			6200	2400	5000
4/84 - 9/84					
10/84 - 3/85	30600				
4/85 - 9/85					
10/85 - 3/86	30600				
4/86 - 9/86					
10/86 - 3/87	33700	12700			
4/87 - 9/87					
10/87 - 3/88	33700	12700			
4/88 - 9/88					
10/88 - 3/89	33700	12700	6200	2400	5000
4/89 - 9/89					
10/89 - 3/90	33700	12700	6200	2400	5000
4/90 - 9/90					
10/90 - 3/91	33700	12700	6200	2400	5000
4/91 - 9/91					
10/91 - 3/92	30600				
4/92 - 9/92					
10/92 - 3/93			6200	2400	5000
4/93 - 9/93					
10/93 - 3/94			6200	2400	5000
4/94 - 6/94					

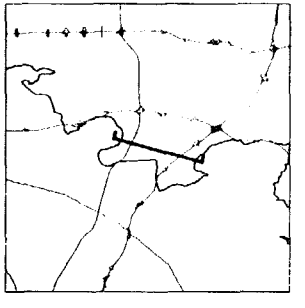


MATERIALS CROSS-SECTION BB

K = 175.0 ft/day

K = 40.0 ft/day

CROSS SECTION BB



Cross-Section at Whittier Narrows
Model Hydraulic Conductivities

Baldwin Park Operable Unit Pre-Remedial Design

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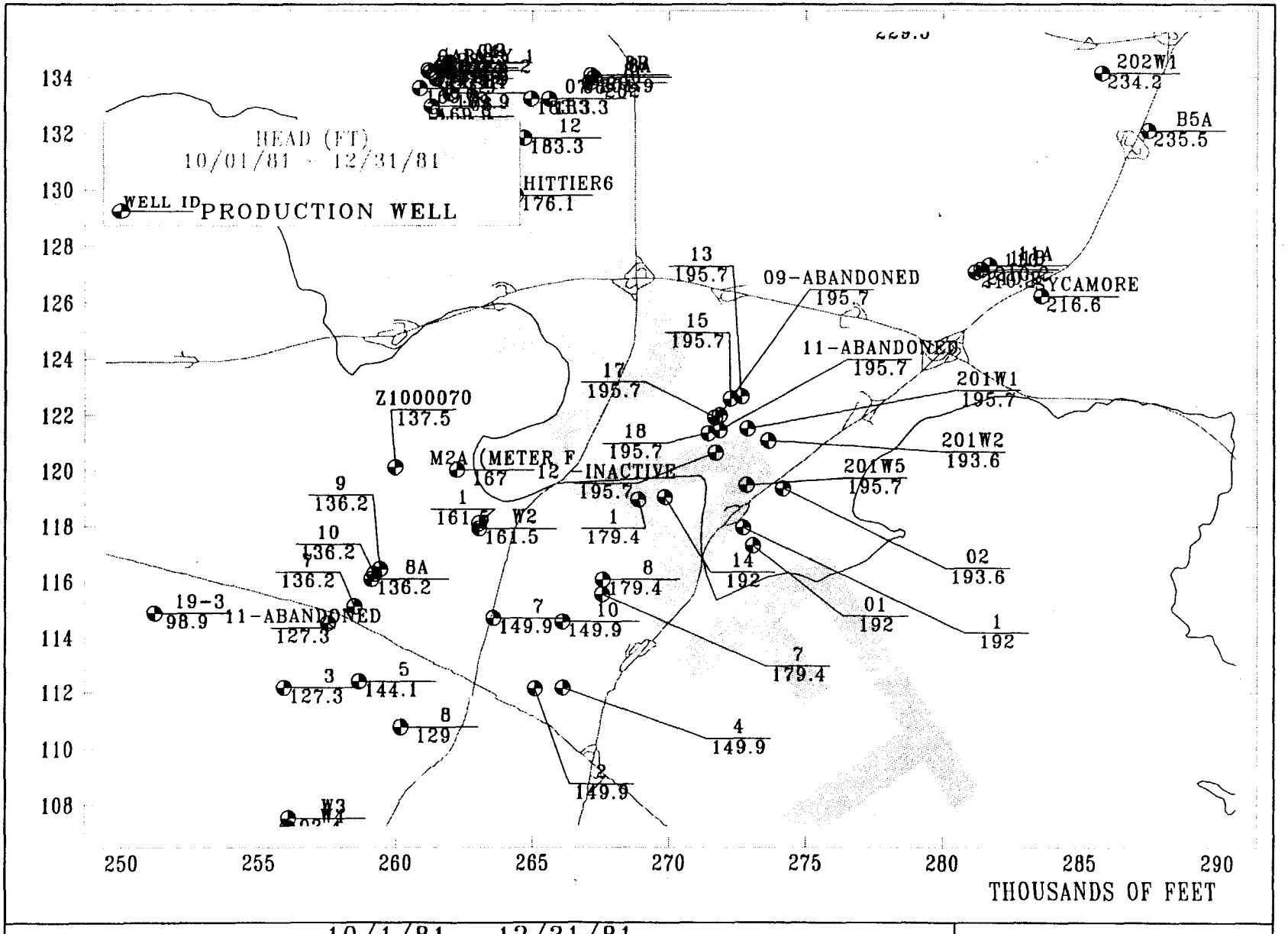

10/1/81 - 12/31/81
Observed Water Levels

Baldwin Park Operable Unit Pre-Remedial Design

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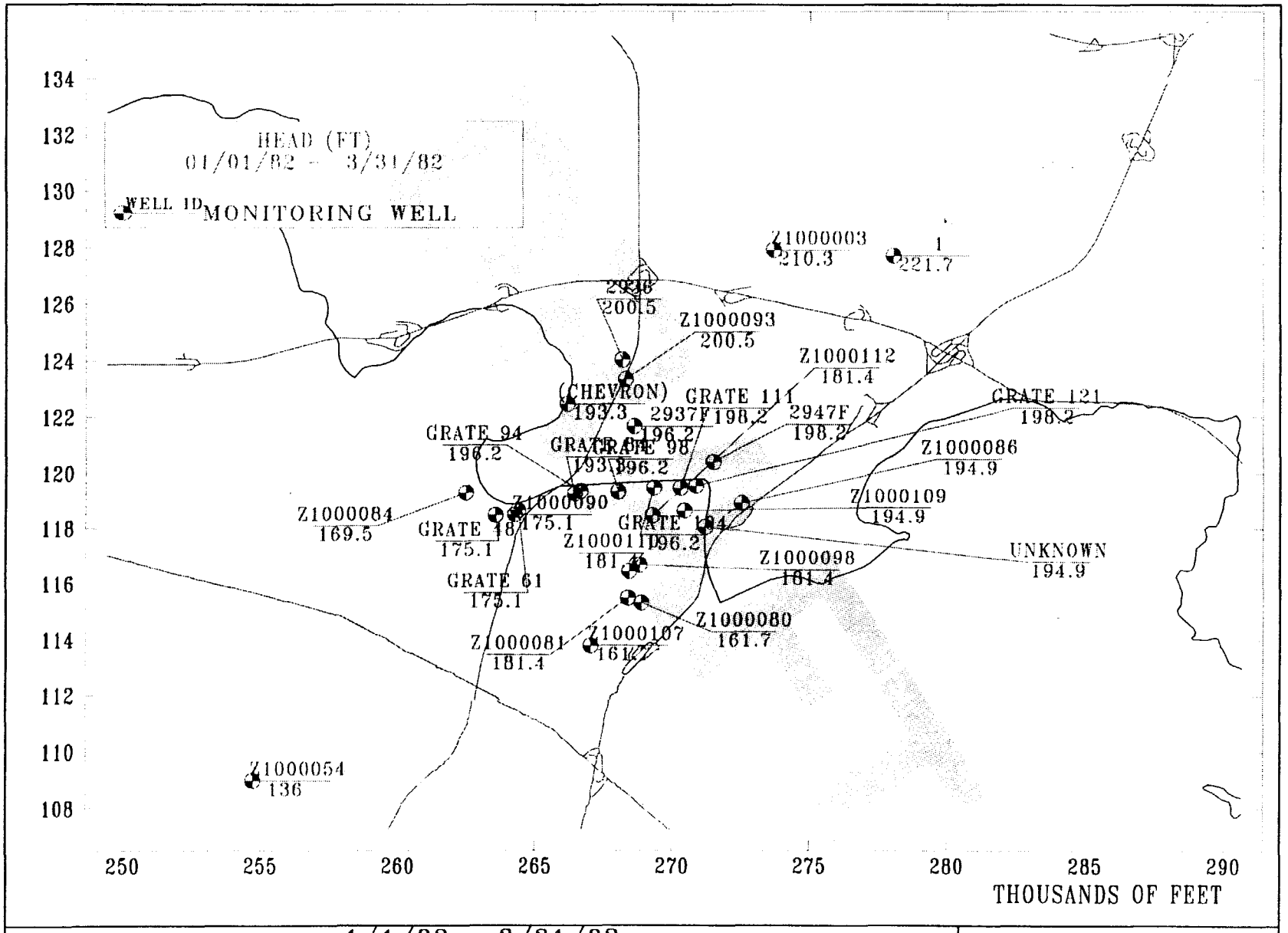

1/1/82 - 3/31/82
Observed Water Levels

Baldwin Park Operable Unit Pre-Remedial Design

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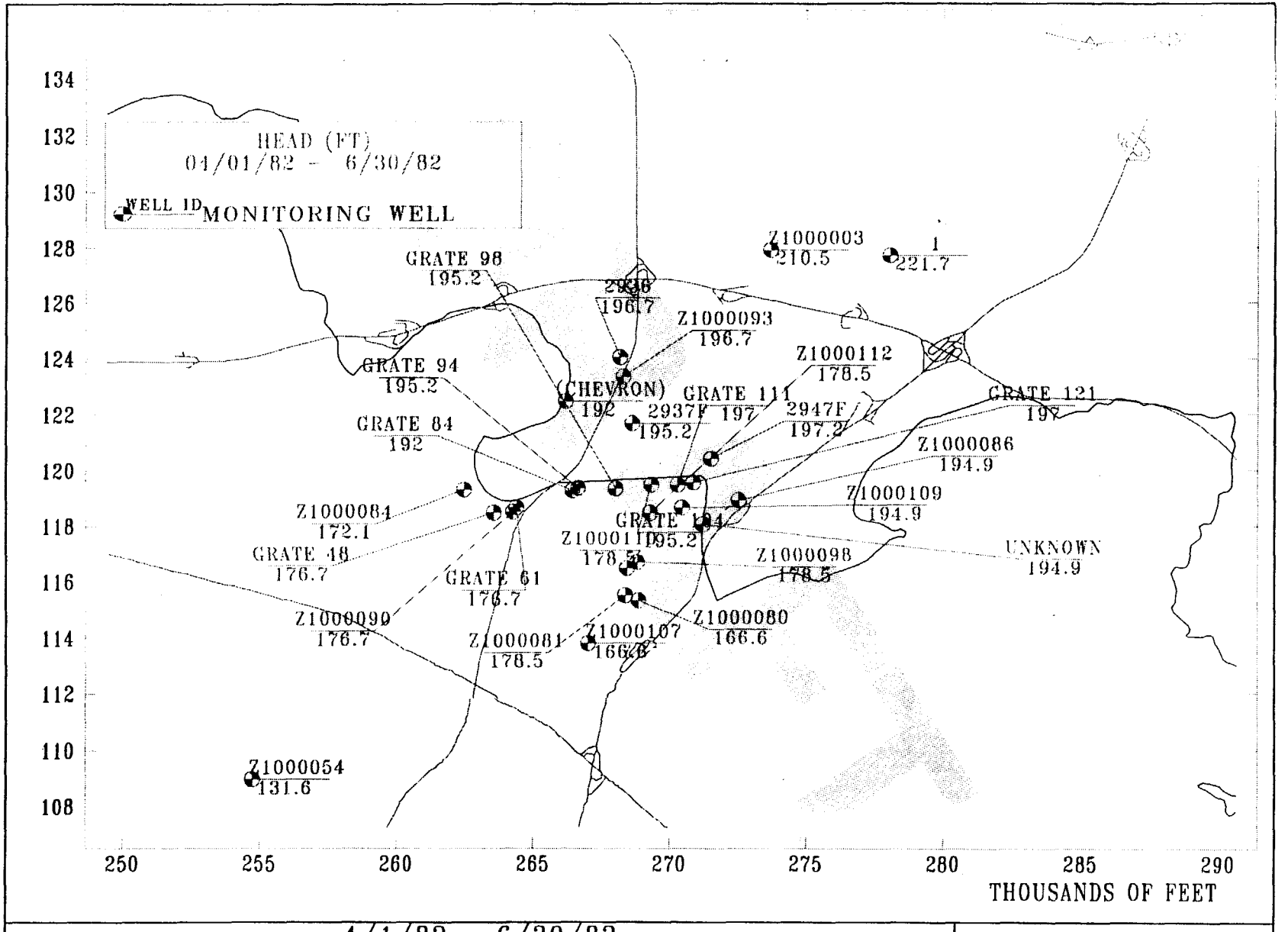

4/1/82 - 6/30/82
Observed Water Levels

Baldwin Park Operable Unit Pre-Remedial Design

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CDM Camp Dresser & McKee Inc.

environmental services

Ten Cambridge Center
Cambridge, Massachusetts 02142
Tel: 617 252-6000 Fax: 617 621-2565

MEMORANDUM

To: Don Vanderkar
Steve Richtel

From: Brendan Harley/Jennifer Wynn

Subject: Response to Comment 9

Date: March 14, 1997

CC: Dave Chamberlin

Comment 9 requested that the preferred containment scenario (Extraction Case 5) be simulated with particles started at depth. In response to this comment, we have conducted further evaluation of containment at greater depths. Due to the apparent ineffectiveness of the Case 5 extraction configuration to achieve containment of VOCs at greater depths, a revised Case 5 extraction configuration was developed. This configuration involved the movement of Cluster 5B slightly to the northwest and the inclusion of Cluster 6 in lieu of Paddy Lane. The vertical distribution of pumping was also shifted to focus more pumping deeper.

Two extraction wells were utilized in Cluster 6, named Cluster 6 and 6B. Cluster 6, the shallower of the two wells, extracts groundwater from an elevation of -250 feet MSL to the water table, whereas Cluster 6B, extracts deeper groundwater from an elevation of -250 to -500 feet MSL. The remedial extraction wells Cluster 5 and Cluster 5B, are also simulated pumping to an elevation of -500 feet MSL (approximately 800 feet bgs). The elevation of -500 feet MSL is generally consistent with the maximum depth of VOC concentrations exceeding MCLs. The depths and distribution of pumping for all extraction wells in the revised Case 5 configuration are as follows:

Cluster 10:	4500 gpm distributed approximately evenly from elevation -352 to +232 ft MSL
Cluster 13:	1000 gpm distributed approximately evenly from elevation -354 to +230 ft MSL
Cluster 5:	1500 gpm distributed from elevation -500 to -265 ft MSL 1000 gpm distributed from elevation -265 to -75 ft MSL 500 gpm distributed from elevation -75 ft MSL to water table

Cluster 5B:	2063 gpm distributed from elevation -500 to -262 ft MSL
	1375 gpm distributed from elevation -262 to -72 ft MSL
	2062 gpm distributed from elevation -72 ft MSL to water table
Cluster 6B:	2733 gpm distributed from elevation -500 to -250 ft MSL
Cluster 6:	1033 gpm distributed from elevation -250 to -60 ft MSL
	1234 gpm distributed from elevation -60 ft MSL to water table

Particles are started at four different elevations. A wide block of particles is started at each elevation so that the entire area of capture at that elevation can be delineated. A separate figure depicting the capture at each elevation is presented. Particles are started at the following elevations:

1) +50 feet MSL
2) -150 feet MSL
3) -300 feet MSL
4) -500 feet MSL

In each of the figures, the capture zone of each remedial extraction well is presented in a different color. Also included on these attached figures is the capture zone of the productions wells located at the southern edge of the BPOU area. These wells are Suburban 139, San Gabriel B4 and B5, the Cal Domestic Wells just west of the San Gabriel River, and the La Puente well. The capture zone of these wells is depicted in gray particles. In addition, observed TCE and CCL concentrations for September and October 1996 were contoured for each depth interval to more accurately represent the approximate extent of VOC concentrations greater than MCLs for each depth interval. September and October, 1996 VOC concentration data were used for consistency with previous interpretations of the extent of VOCs in the BPOU. We are currently evaluating these data relative to other sampling events pursuant to EPA's comment in their February 27, 1997 letter.

Summary of Results

Groundwater extraction associated with the revised Case 5 configuration (i.e. Subarea 1 = 5,500 gpm and Subarea 3 = 13,500 gpm) generally achieves containment of all VOCs exceeding MCLs at depths less than -350 feet MSL. (See figures showing particles started at +50, -150, and -300 feet MSL.) The majority of VOCs at depths from -350 feet to -500 feet MSL are also contained to MCLs, with the exception of a small area near monitoring well MW5-05, in Subarea 3. However, concentrations in this depth interval, as measured in well MW5-05, were less than 0.7 µg/l for both TCE and CCL in September/October, 1996. We are continuing to refine the distribution of pumpage in Subarea 3 to improve containment in this portion of Subarea 3.

Emphasis should be placed upon the statistics at wells Z1000006, 01900831 and Z1000005. These wells are either within the BPOU or located in the proximity of the OU. All of these wells have a correlation coefficient greater than 0.95, and a RMSE of less than 5.5. On the basis of the statistics provided, it is apparent that the model best represents conditions within and adjacent to the BPOU, inclusive of the areas being considered for groundwater extraction.

Comment 4

Comment 4 requests that figures and contours be modified to incorporate: 1) maximum detected values from a period of time that is representative of future conditions, and 2) other prevalent groundwater contaminants (PCE and CTC). Although we understand EPA's concern regarding temporal variability in VOC concentrations and the resulting uncertainty associated with the representation of future conditions, we do not believe that maximum detected values are representative of the concentration or distribution of contamination in the BPOU for the following reasons:

- Temporal fluctuations in VOC concentrations occur in the BPOU in response to groundwater recharge and pumping, which produce changing groundwater flow directions and water table fluctuations. Contouring of isolated maximum VOC concentrations from different time periods will not accurately represent the distribution of VOCs at a given time nor will it allow for an understanding of the temporal changes in the distribution and/or concentration of VOCs. For example, maximum TCE concentrations at L.A. County Santa Fe well (08000070) in March, 1996, were 17 ug/l. However since 1985, TCE concentrations had never before exceeded MCLs in this well. Since March, 1996, TCE concentrations in this well have decreased below MCLs. Consequently, it appears that the use of maximum concentrations does not accurately represent the distribution of TCE at this location.

- The Westbay MP well systems may require some time to equilibrate after installation. This is evidenced by elevated VOC concentrations in samples collected after well construction/development with consistent decreases in concentration in subsequent sampling events. This is demonstrated in Figures 4-1 through 4-5 of the Draft Pre-Remedial Design Report, which present concentration of TCE versus time at the multi-port monitoring wells. These initial samples may exaggerate the concentration of VOCs at depth, and exaggerate the depth for which groundwater remediation may be required. Therefore a consideration of only maximum observed concentrations may be unrepresentative.

The capture zone figures included in the Revised Response to EPA Comment 9 represent our current best estimate of the extent of VOC contamination greater than MCLs, at different depth intervals. PCE and CCL concentrations, along with TCE, have been utilized to develop contours representing the extent of VOC concentrations exceeding MCLs. In addition, we recommend that temporal changes in the distribution of VOCs continue to be evaluated as additional data become available.

Comment 5

Comment 5 requested that Figure 5-56 of the Draft Pre-Remedial Design Report be modified to depict particle tracks from the transient simulation. The accompanying figure presents 75 year transient particle tracks developed for the revised Case 5 extraction scenario. This extraction scenario was described in the responses dated March 14th and 19th.

The particle tracks illustrated in this figure are generated from particles started at elevations ranging from +50 feet MSL to -500 feet MSL. The particle tracks indicate that capture is achieved across this entire interval. The average of the September and October, 1996 TCE observations are also posted on this figure. Concentrations greater than MCL are generally contained within the capture interval. As discussed in the memo of March 19th the actual depth of contamination is somewhat uncertain in the vicinity of Well MW5-03.

March 4th Comment

The March 4th EPA letter requested that a "16" year transient flow simulation be run, which superimposed the period from October, 1990 through June, 1994 at the beginning of the simulation. This was accomplished by superimposing the historical pumping and recharge fluxes from October, 1990 through June, 1994 at the beginning of the simulation, and then continuing the transient simulation with the October, 1982 through June, 1994 period. Particle tracks were then developed from this 15.5 year flow field record.

The "16" year simulation was run with two different remedial extraction rates. The first rate was the revised Case 5 extraction scenario described in the March 14th and 19th memos. This scenario includes 19,000 gpm of remedial pumping. The second simulation incorporates 20,000 gpm of remedial extraction; an additional 1,000 gpm of pumping occurs in Subarea 1 in this scenario. The additional 1,000 gpm of extraction in Subarea 1 is divided between Cluster 10 and Cluster 13 to maintain the same relative weighting of pumping. For each of these scenarios capture zones were developed at 4 different elevations. Particles were started at elevations of +50, -150, -300, and -500 feet MSL.

The addition of the October, 1990 through June, 1994 period to the beginning of the simulation produces an extended "wet period", when water levels are relatively high in the basin. This longer wet period does not degrade the effectiveness of the remedial extraction. The capture zones pictured in the accompanying figures are as robust as those generated by the simulated 12 year historical flow field shown in the March 19th memo. The proposed remedial extraction would likely be as effective within an expected range of climatic conditions.

A comparison of the 19,000 gpm and 20,000 gpm simulations shows very little difference in capture. A few additional particles are captured on the eastern edge of the Subarea 1 capture zone. The majority of these additional particles are to the east of the contour line indicating the estimated extent of VOC concentrations above MCL. The additional particles are in the vicinity of the Glendora 07G well which has observed concentrations of TCE and CCL less than MCL. The most noticeable differences are seen in the capture zones at -300, and -500 feet MSL. At -300 feet the capture zone is approximately 25% larger, and at -500 feet a few particles are now captured in Subarea 1. However, the increased capture at 20,000 gpm at -300 feet MSL is upgradient of the 19,000 gpm capture area and probably along the same flow paths, so does not represent a significant increase in lateral capture. The deepest groundwater sample in this area of increased capture was collected from EPA well MW5-13, from zone 1 at -153 feet MSL. The September sample from MW5-13 zone 1 contained only 7.1 ug/l of PCE and 13 ug/l of TCE, indicating that there are likely very little, if any VOCs at -300 feet MSL in this part of Subarea 1.

There is no observed evidence of any contamination at the elevation of -500 feet in Subarea 1. Concentrations of CCL, 1,2-DCA, TCE, and PCE were all less than the detection limits or MCLs in the September groundwater sample from zone 1 (-286 feet MSL) of EPA well MW5-18. Thus the apparent increase in capture at -500 feet MSL due to the increased pumping rates, does not significantly enhance the ability of the extraction scheme to achieve the remedial objectives for Subarea 1

DRAFT

Transient Calibration - Summary Statistics
Group 1 Wells

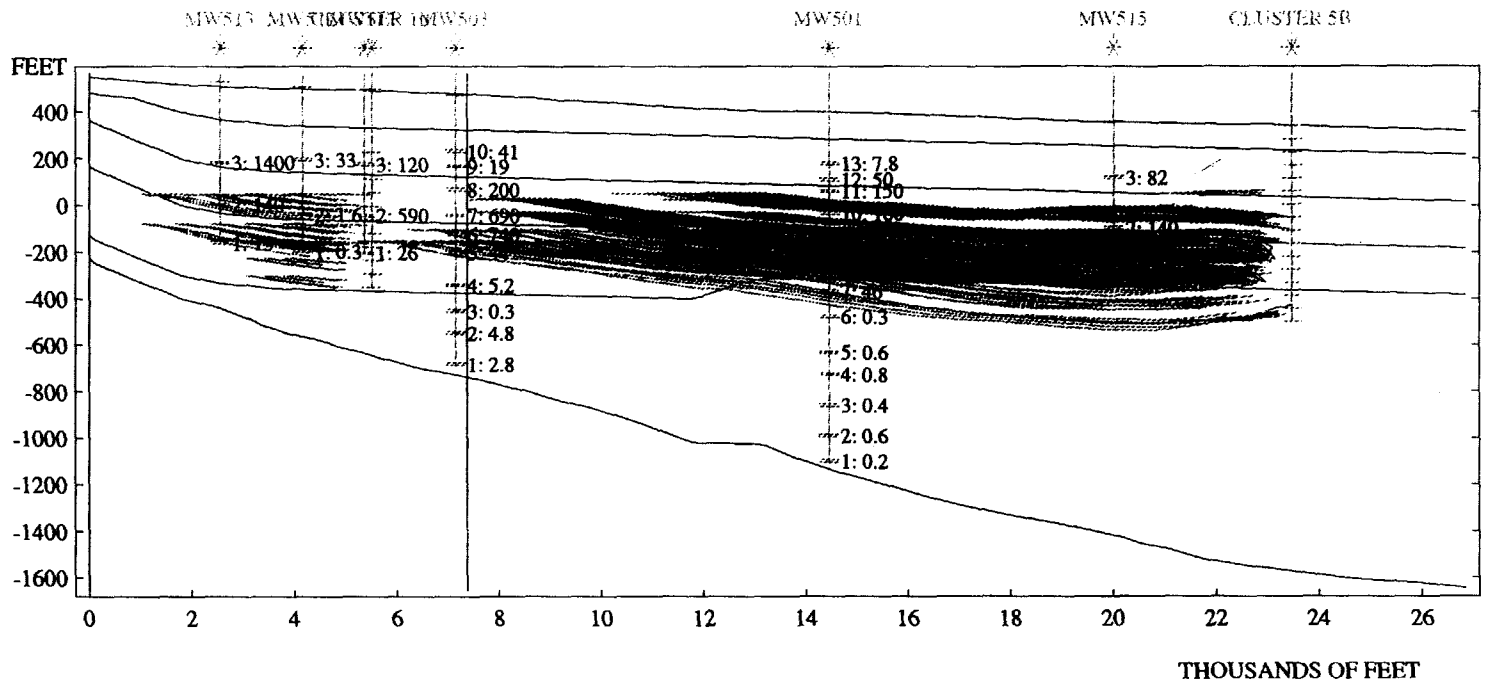
	Base Case	
	Corr Coef	RMSE
Z1000006	0.9859	5.17
01900831	0.9819	4.80
Z1000005	0.9661	5.33
Z1000011	0.9454	11.31
Z1000008	0.9504	5.49
01900358	0.5403	16.60
Z1000009	0.8777	8.81
Z1000007	0.8632	16.70
Z1000002	0.6460	10.35
Z1000001	0.8864	6.72

DRAFT

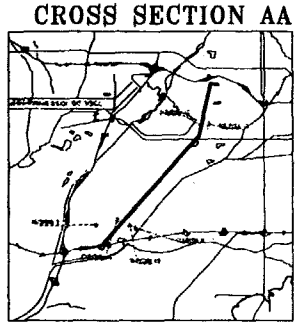
Transient Calibration - Summary Statistics
Group 2 Wells

	Base Case	
	Corr Coef	RMSE
01900918	0.5861	21.73
01902271	0.5815	20.55
01902272	0.4963	13.68
01901526	0.7264	62.36

DRAFT



CROSS SECTION AA



PROPOSED OU WELL WITHIN 2000.0 FT

GROUND SURFACE

TOP OF SCREEN

BOTTOM OF SCREEN

75-Yr Transient Particle Tracks to Cluster 10 and Cluster 13
Revised Extraction Case 5
September-October 1996 TCE Values (ug/l)
Baldwin Park Operable Unit Pre-Remedial Design

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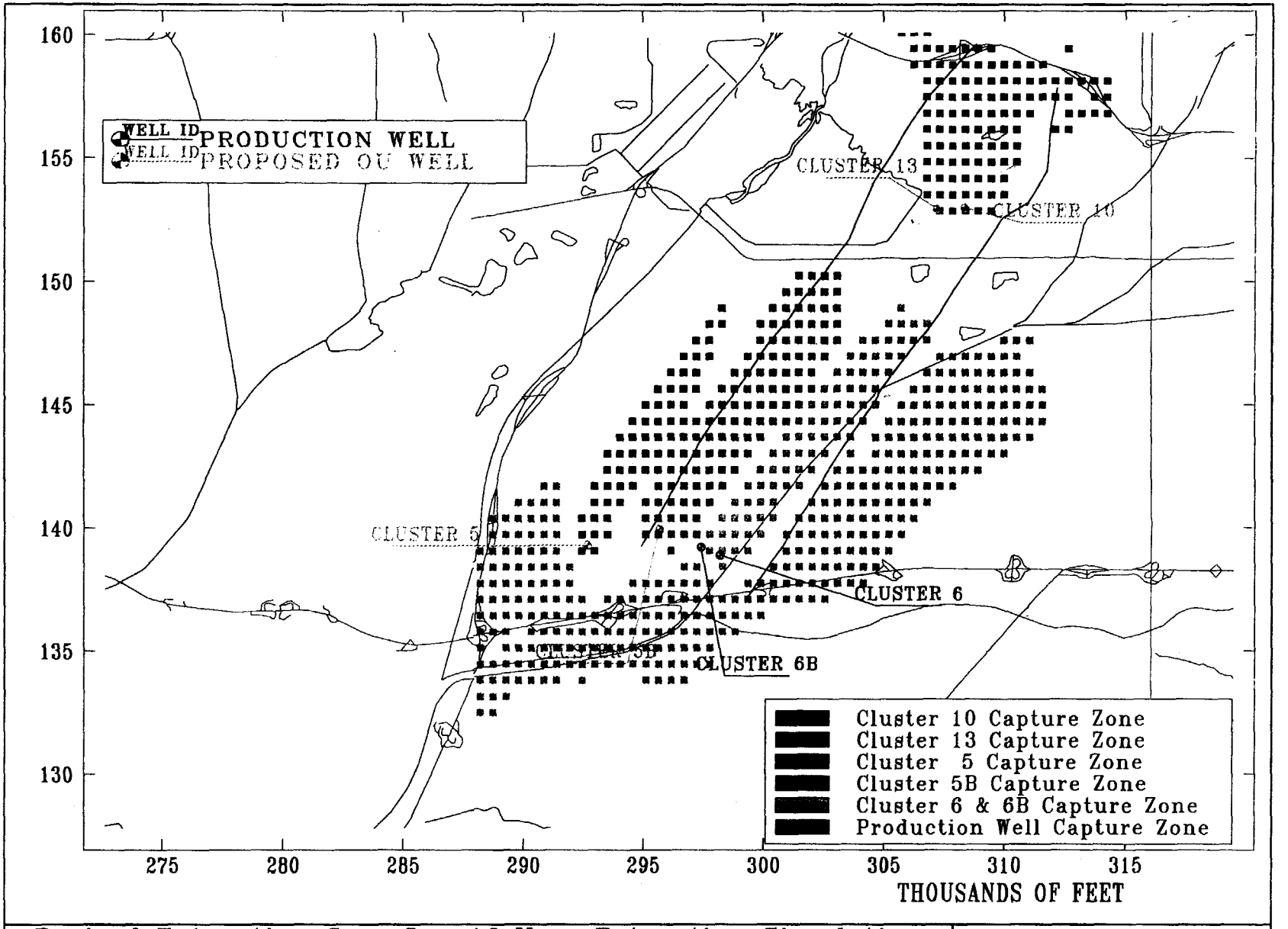

Revised Extraction Case 5 – 16 Year Extraction Simulation
19,000 GPM Extraction, Additional Wet Period Simulated
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb

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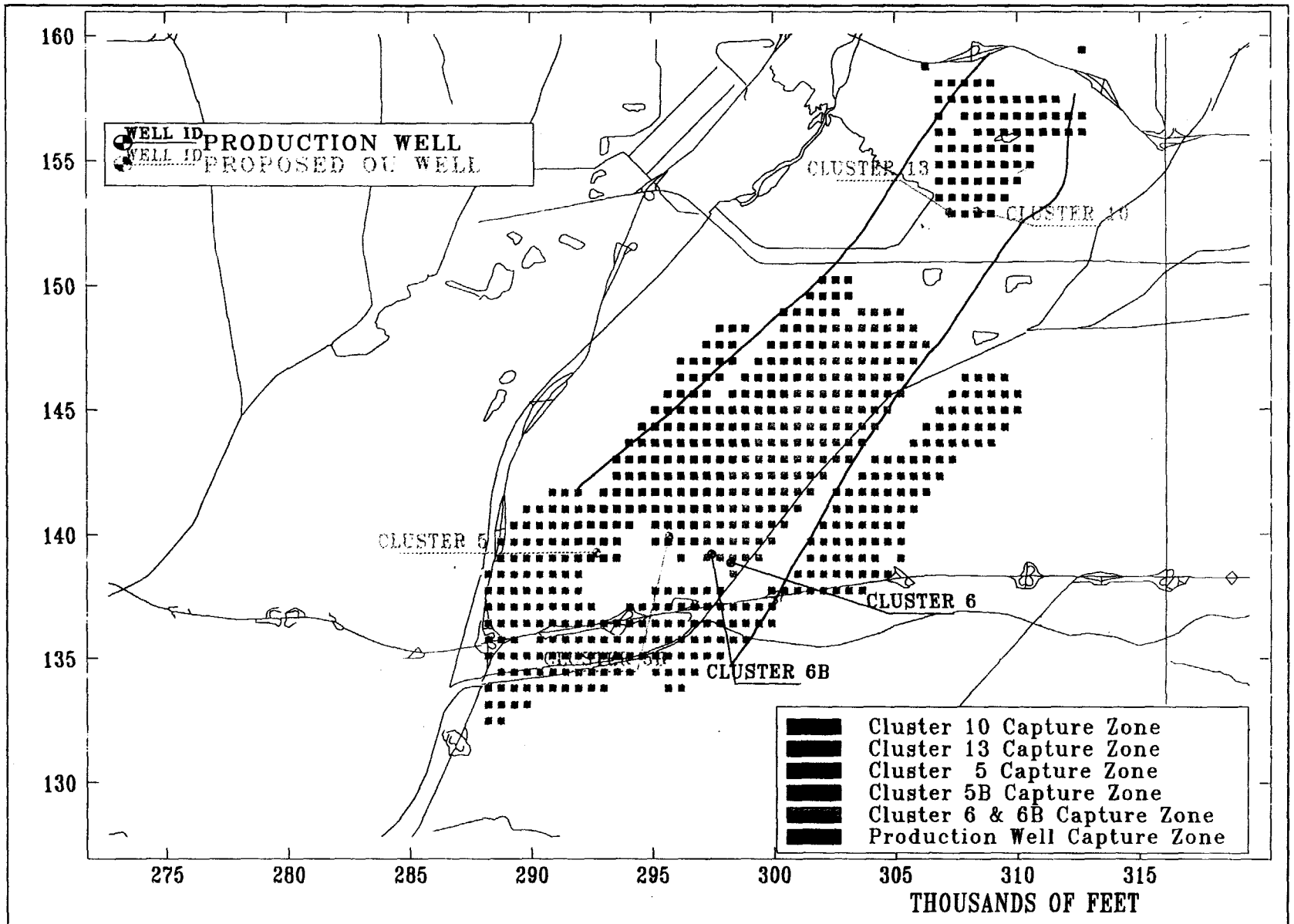

Revised Extraction Case 5 - 16 Year Extraction Simulation
19,000 GPM Extraction, Additional Wet Period Simulated
Particles Started -150 Elevation
Approximate Extent of TCE >5 ppb and/or CCL > 0.5 ppb

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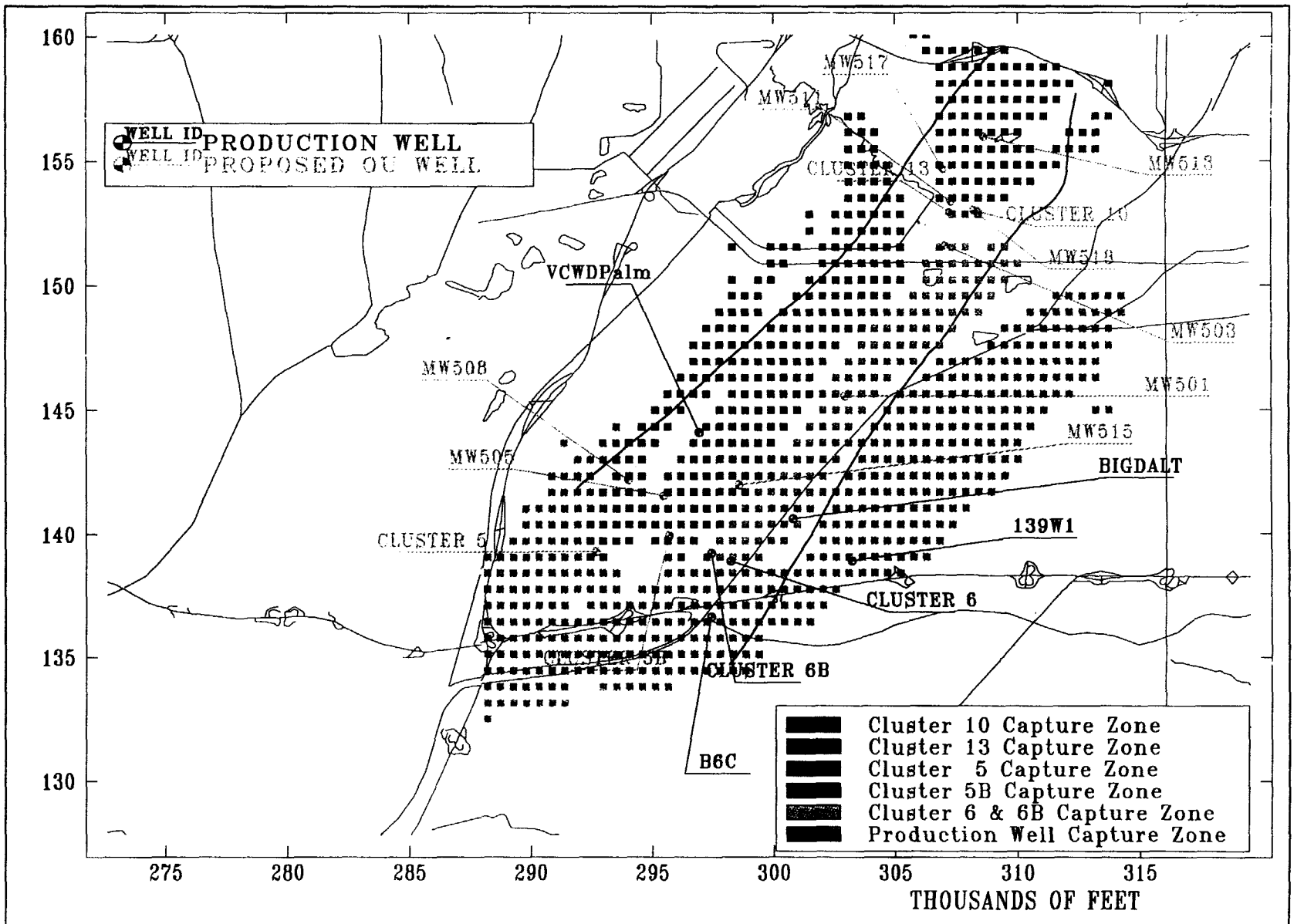

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -150 ft MSL to Water Table

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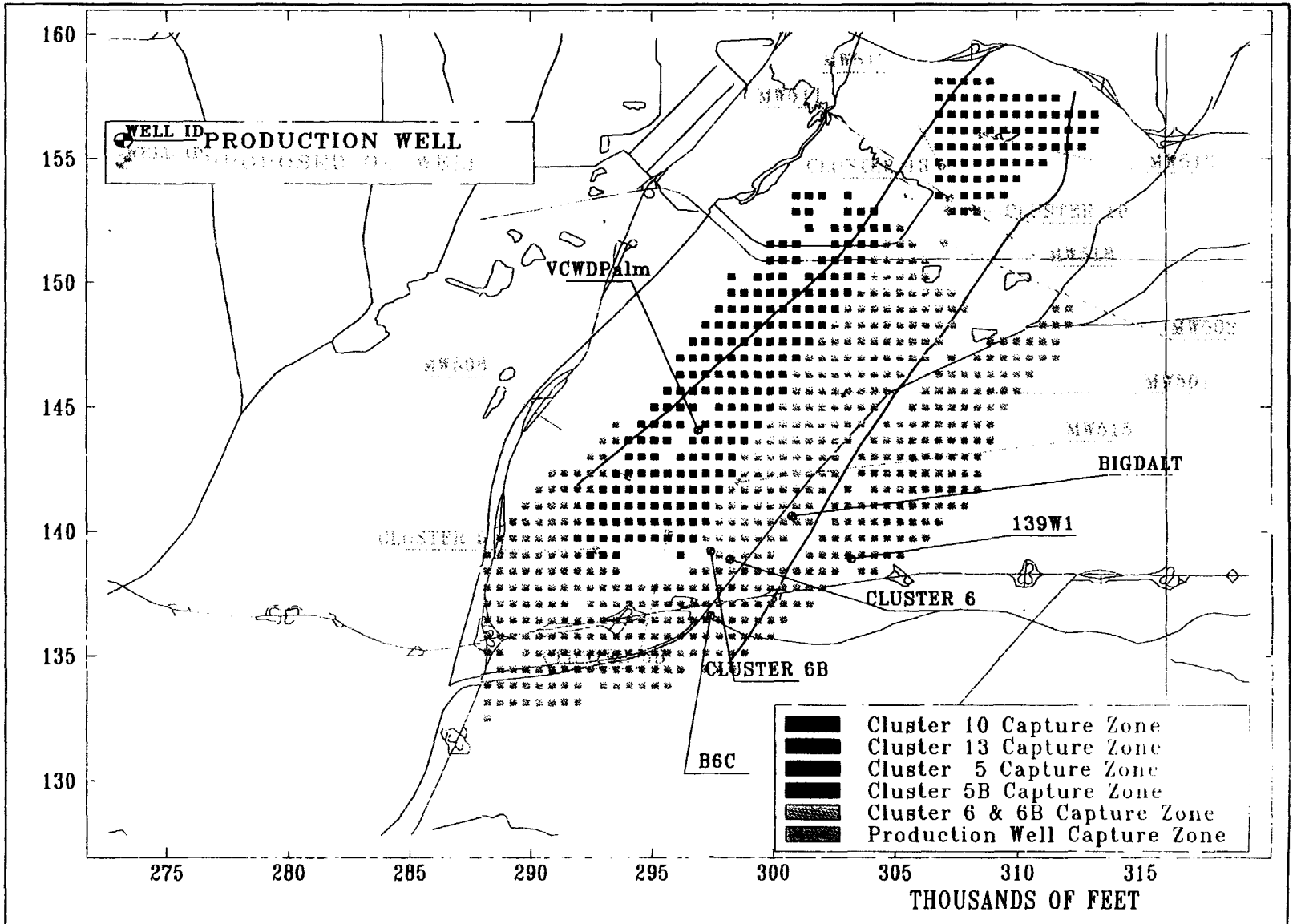

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started -150 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -350 ft MSL to +50 ft MSL

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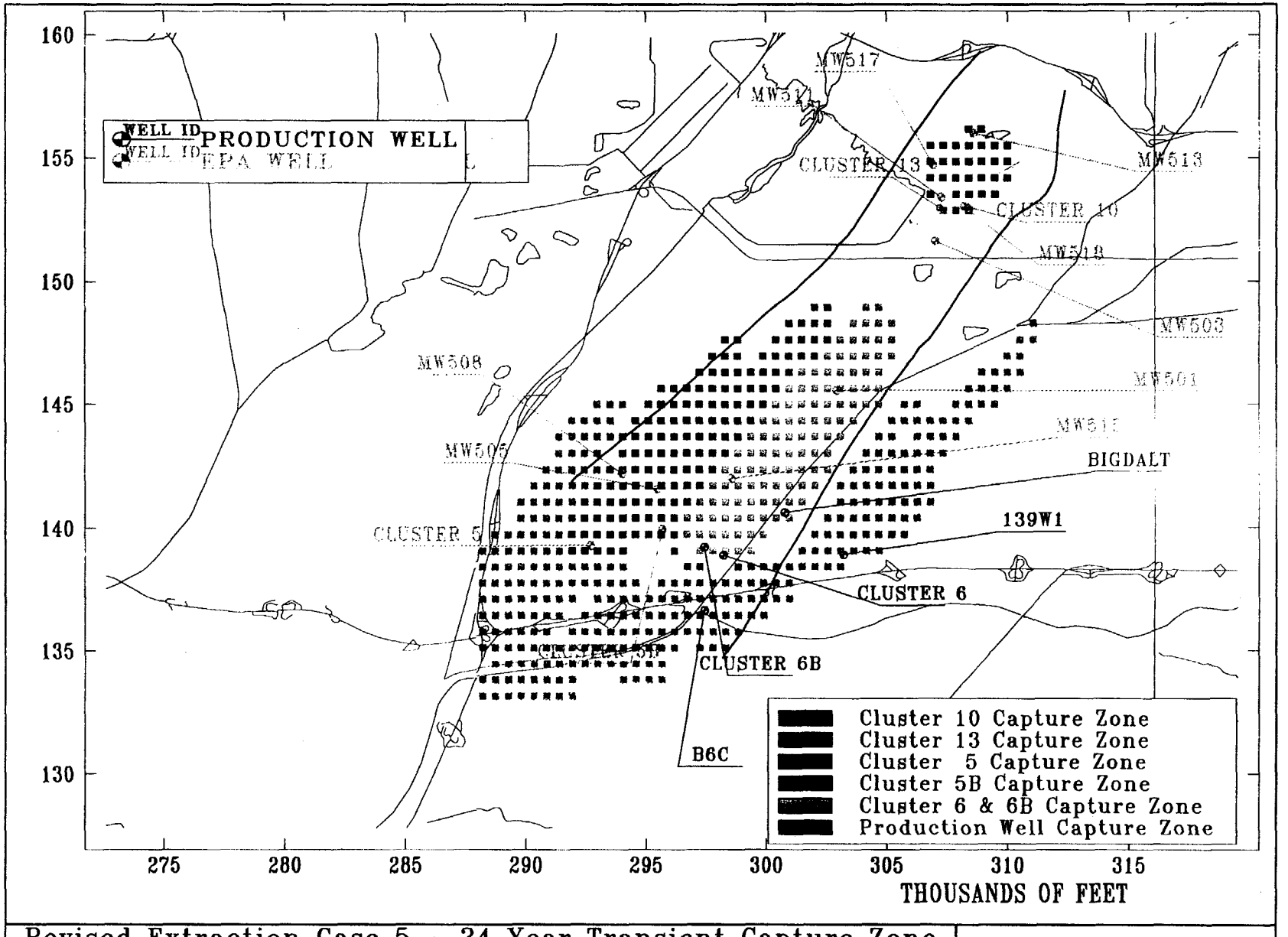

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -350 ft MSL to -150 ft MSL

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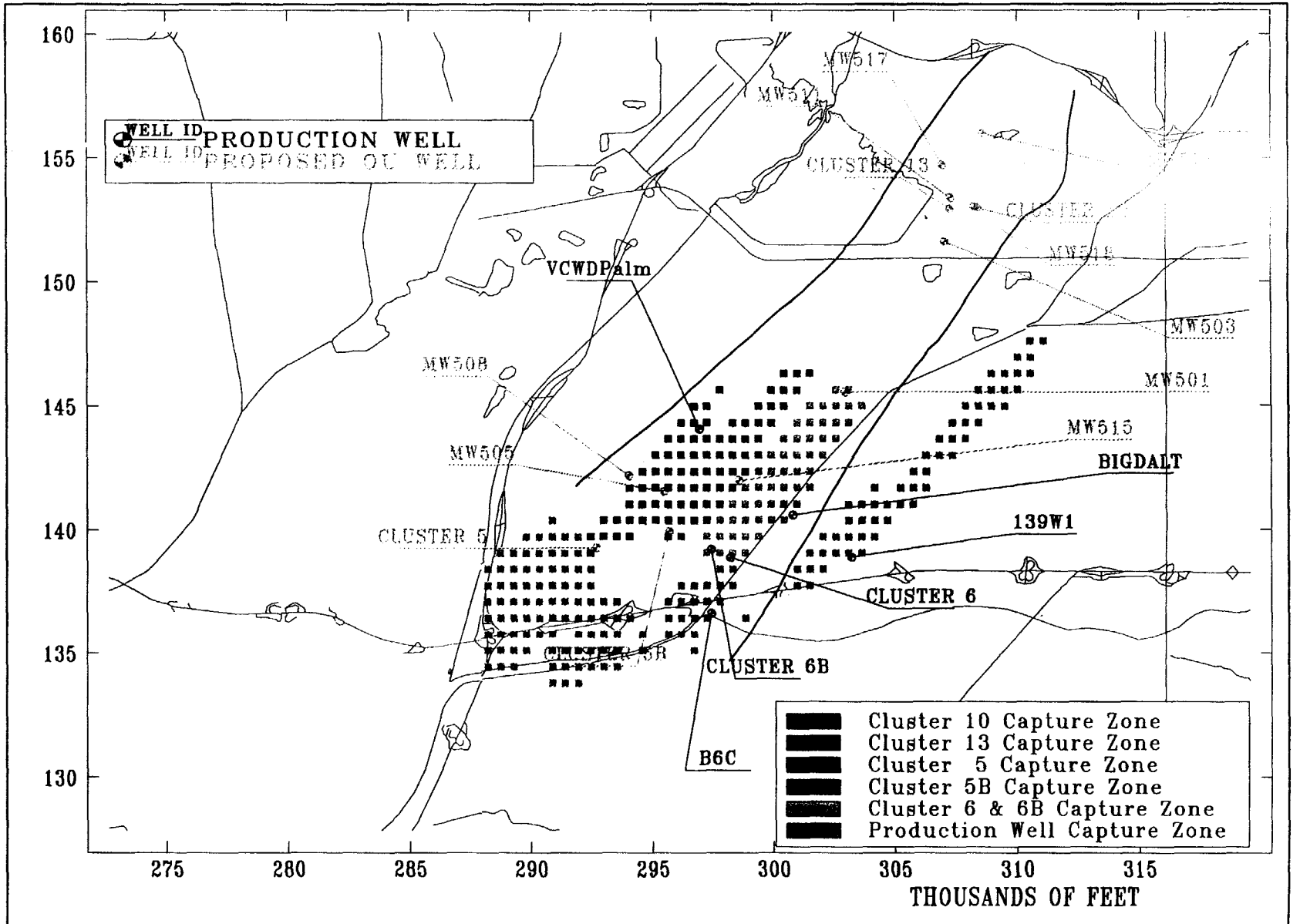

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations Below -350 ft MSL

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CDM Camp Dresser & McKee Inc.

environmental services

Environmental Management Division
Ten Cambridge Center
Cambridge, Massachusetts 02142
Tel: 617 252-8000 Fax: 617 621-2565

MEMORANDUM

To: Wayne Praskins, EPA

From: Brendan Harley/Jennifer Wynn JKW

Subject: Revised Response to Comment 9

Date: March 19, 1997

CC: Don Vanderkar
Steve Richtel
Dave Chamberlin

This memorandum provides a revised response to EPA Comment 9 and supersedes the response provided in our memorandum dated March 14, 1997. This revised memorandum generally provides the same response provided in the March 14, 1997 memorandum, however TCE and CCL contours have been revised to better represent the observed distribution of VOCs. Specifically, several of the figures demonstrating the extent of TCE and CCL concentrations exceeding MCLs at various depths were revised for Subarea 1.

The previous version of these figures did not accurately represent the extent of TCE and CCL concentrations exceeding MCLs at depths greater than -150 feet MSL in Subarea 1. Specifically, the available data indicate that the plume is not as laterally extensive in Subarea 1, below -150 feet MSL as was previously depicted. Additionally, there is some question as to the actual depth of contamination in the vicinity of Monitoring Well MW5-03. PCE and TCE concentrations in the deeper sampling ports (Zones 1-4) have declined steadily since the first sampling event in August, 1995; this may be due to the time required for the Westbay MP well system to reach equilibrium. In Zones 1 and 3, TCE and PCE concentrations declined below MCLs after the sixth sampling event in September, 1996. However, TCE and PCE concentrations remain slightly above MCLs in Zones 2 and 4 in September, 1996. These zones correspond to mid-point sampling port elevations of -545 and -340 feet MSL, respectively. Maximum PCE and TCE concentrations in these sampling ports were 5.9 and 5.2 ug/l, respectively, in September, 1996.

It should be noted that the figure illustrating capture areas associated with particles started at -500 feet MSL does not show capture areas for Clusters 10 and 13, because extraction from these wells was only simulated to a depth of -350 feet MSL. Given the uncertainty associated with TCE and PCE concentrations at depths equal to or greater than -340 feet

MSL, an extraction depth of -350 feet MSL was considered adequate to contain VOC concentrations at this depth in Subarea 1.

In addition to the revisions described above, an error in the summary of results paragraph in the March 14, 1997 memorandum, was corrected to refer to Monitoring Well MW5-08 rather than MW5-05.

We apologize for any inconvenience associated with these revisions.

Revised Response

Comment 9 requested that the preferred containment scenario (Extraction Case 5) be simulated with particles started at depth. In response to this comment, we have conducted further evaluation of containment at greater depths. Due to the apparent ineffectiveness of the Case 5 extraction configuration to achieve containment of VOCs at greater depths, a revised Case 5 extraction configuration was developed. This configuration involved the movement of Cluster 5B slightly to the northwest and the inclusion of Cluster 6 in lieu of Paddy Lane. The vertical distribution of pumping was also shifted to focus more pumping deeper.

Two extraction wells were utilized in Cluster 6, named Cluster 6 and 6B. Cluster 6, the shallower of the two wells, extracts groundwater from an elevation of -250 feet MSL to the water table, whereas Cluster 6B, extracts deeper groundwater from an elevation of -250 to -500 feet MSL. The remedial extraction wells Cluster 5 and Cluster 5B, are also simulated pumping to an elevation of -500 feet MSL (approximately 800 feet bgs). The elevation of -500 feet MSL is generally consistent with the maximum depth of VOC concentrations exceeding MCLs. The depths and distribution of pumping for all extraction wells in the revised Case 5 configuration are as follows:

Cluster 10:	4500 gpm distributed approximately evenly from elevation -352 to +232 ft MSL
Cluster 13:	1000 gpm distributed approximately evenly from elevation -354 to +230 ft MSL
Cluster 5:	1500 gpm distributed from elevation -500 to -265 ft MSL
	1000 gpm distributed from elevation -265 to -75 ft MSL
	500 gpm distributed from elevation -75 ft MSL to water table
Cluster 5B:	2063 gpm distributed from elevation -500 to -262 ft MSL
	1375 gpm distributed from elevation -262 to -72 ft MSL
	2062 gpm distributed from elevation -72 ft MSL to water table
Cluster 6B:	2733 gpm distributed from elevation -500 to -250 ft MSL
Cluster 6:	1033 gpm distributed from elevation -250 to -60 ft MSL
	1234 gpm distributed from elevation -60 ft MSL to water table

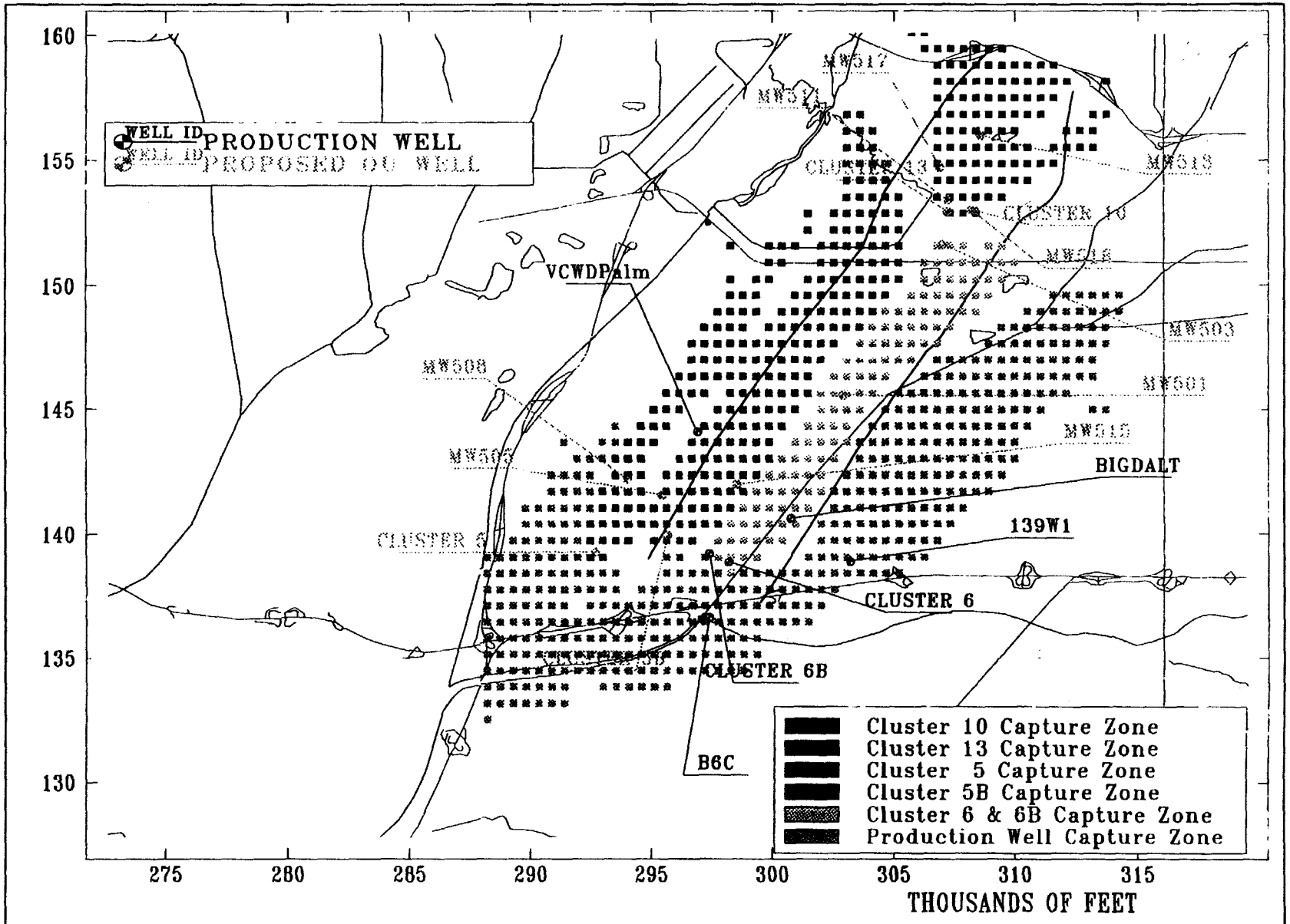
Particles are started at four different elevations. A wide block of particles is started at each elevation so that the entire area of capture at that elevation can be delineated. A separate figure depicting the capture at each elevation is presented. Particles are started at the following elevations:

1) +50 feet MSL
2) -150 feet MSL
3) -300 feet MSL
4) -500 feet MSL

In each of the figures, the capture zone of each remedial extraction well is presented in a different color. Also included on these attached figures is the capture zone of the productions wells located at the southern edge of the BPOU area. These wells are Suburban 139, San Gabriel B4 and B5, the Cal Domestic Wells just west of the San Gabriel River, and the La Puente well. The capture zone of these wells is depicted in gray particles. In addition, observed TCE and CCL concentrations for September and October 1996 were contoured for each depth interval to more accurately represent the approximate extent of VOC concentrations greater than MCLs for each depth interval. September and October, 1996 VOC concentration data were used for consistency with previous interpretations of the extent of VOCs in the BPOU. We are currently evaluating these data relative to other sampling events pursuant to EPA's comment in their February 27, 1997 letter.

Summary of Results

Groundwater extraction associated with the revised Case 5 configuration (i.e. Subarea 1 = 5,500 gpm and Subarea 3 = 13,500 gpm) generally achieves containment of all VOCs exceeding MCLs at depths less than -350 feet MSL. (See figures showing particles started at +50, -150, and -300 feet MSL.) The majority of VOCs at depths from -350 feet to -500 feet MSL are also contained to MCLs, with the exception of a small area near monitoring well MW5-08, in Subarea 3. However, concentrations in this depth interval, as measured in well MW5-08, were less than 0.7 µg/l for both TCE and CCL in September/October, 1996. We are continuing to refine the distribution of pumpage in Subarea 3 to improve containment in this portion of Subarea 3.



Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -150 ft MSL to Water Table

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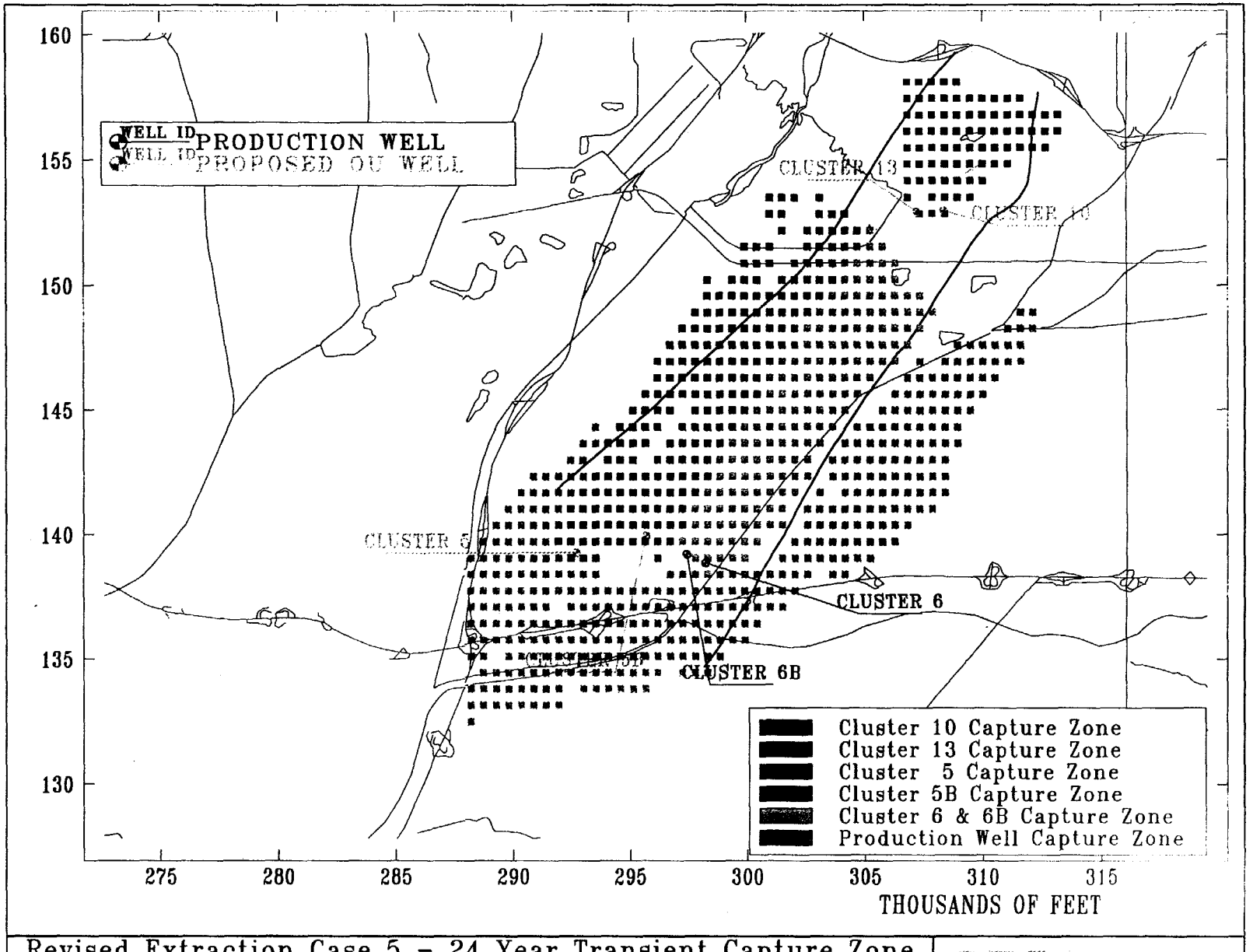

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started -150 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -250 ft MSL to +50 ft MSL

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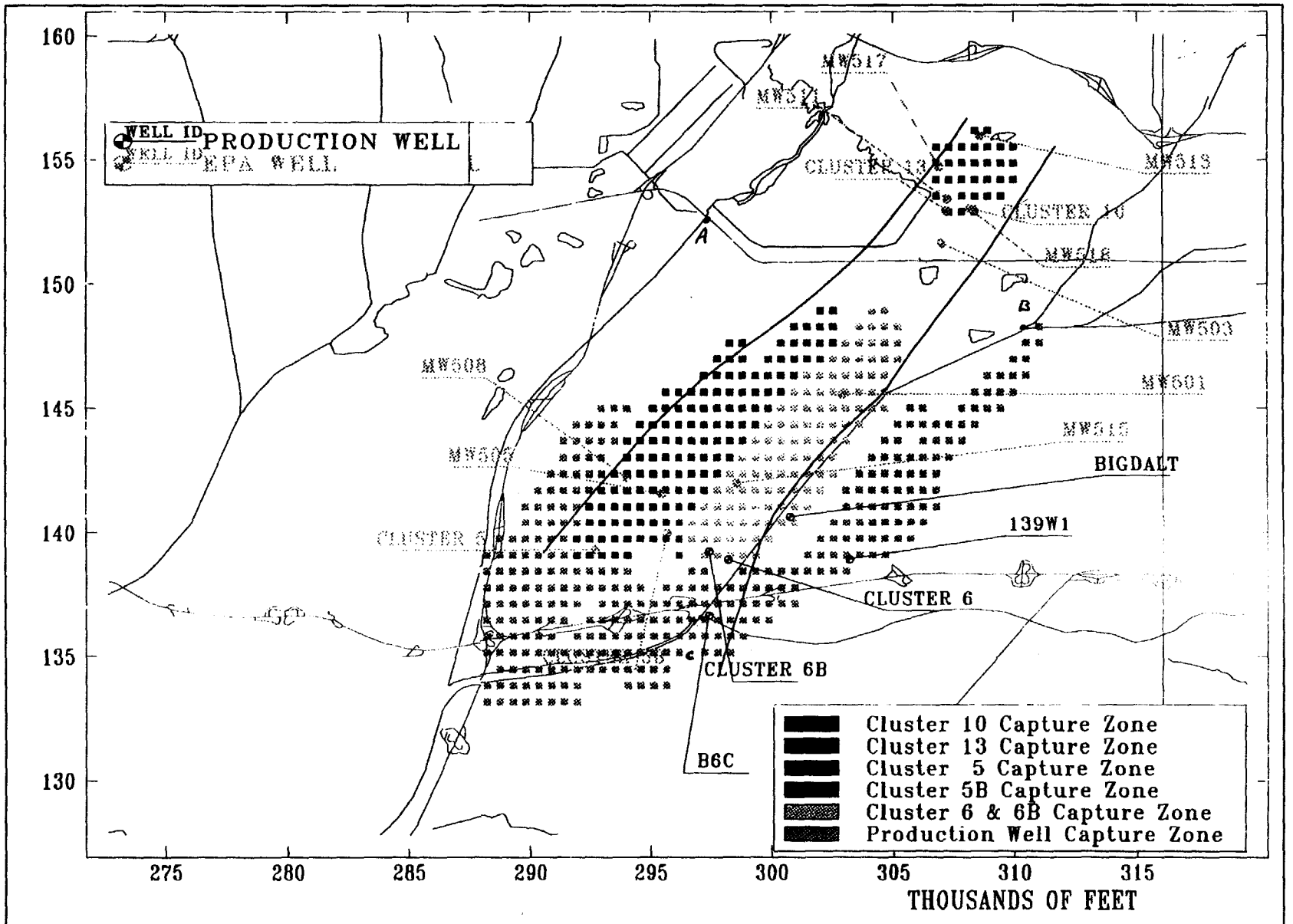

Revised Extraction Case 5 – 24 Year Transient Capture Zone
Particles Started –300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from –350 ft MSL to –150 ft MSL

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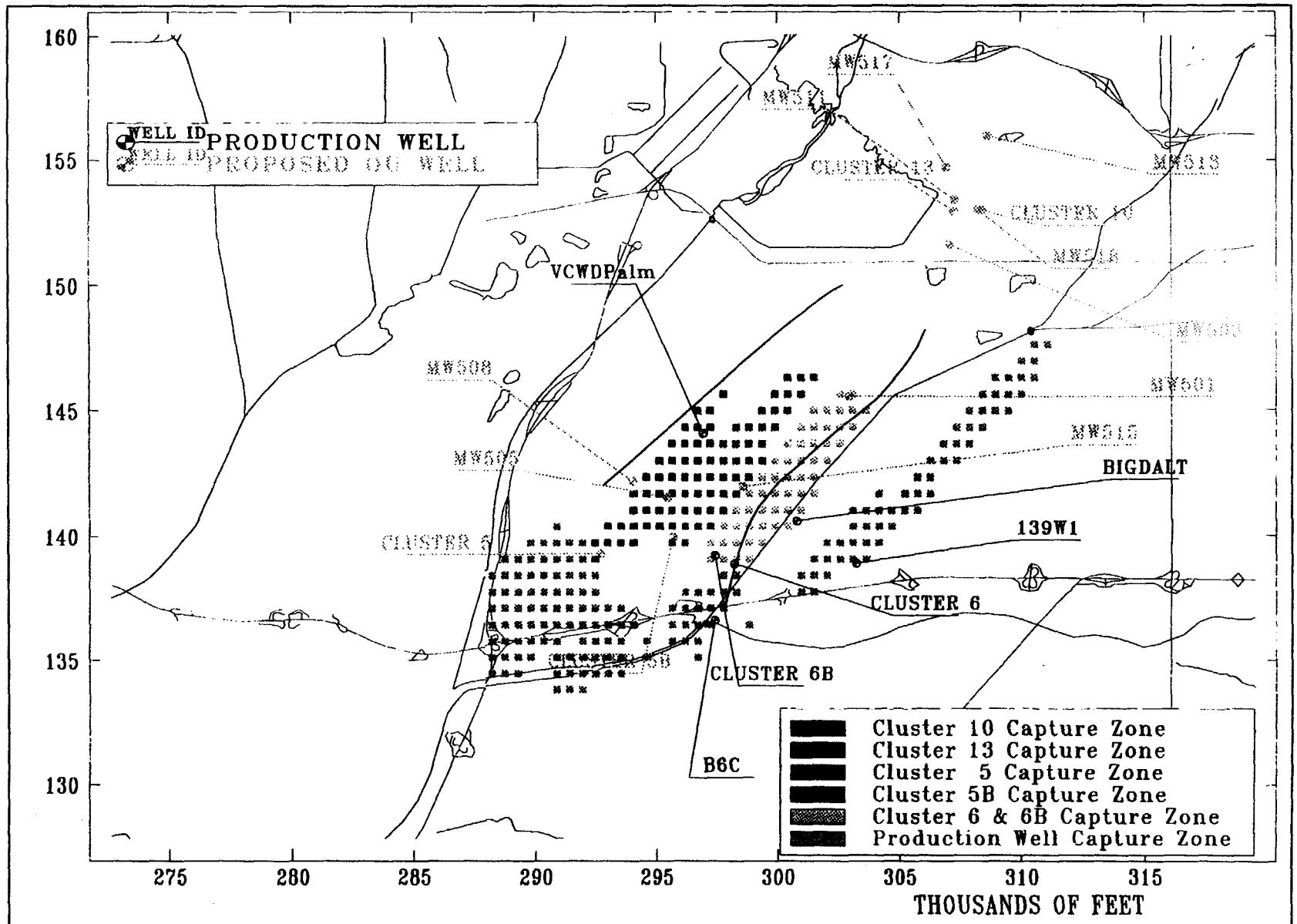

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations Below -350 ft MSL

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50th Anniversary

MEMORANDUM

To: Wayne Praskins, EPA

From: Brendan Harley/Jennifer Wynn JKW

Subject: Response to EPA Letters of February 27, 1997 and March 4, 1997

Date: March 28, 1997

CC: Don Vanderkar
Steve Richtel
Dave Chamberlin

This memorandum provides responses to Comments 3, 4 and 5 from EPA's letter dated February 27, 1997 and to the request of the March 4, 1997 EPA letter.

Comment 3

Comment 3 requested transient calibration statistics at each of the 16 transient calibration wells, for the Base Case and the 6 calibration sensitivity runs. This memo provides the statistics for the Base Case. The statistics for the 6 sensitivity runs will be provided in a memorandum on April 1st.

Attached to this memorandum are two separate tables. The first table contains the statistics for a subset of the transient statistics wells classified as Group 1 wells. The Group 1 wells are those wells which have enough observed data points to produce meaningful statistics (more than 25 observed data points). The Group 1 wells include: Z1000006, 01900831, Z1000005, Z1000011, Z1000008, 01900358, Z1000009, Z1000007, Z1000002, and Z1000001.

The second table contains the Group 2 wells. The Group 2 wells generally contain fewer than 25 observed data points over the transient periods. Transient statistics have been calculated, however these statistics are considered less meaningful than those for the Group 1 wells. The Group 2 wells include: 01900918, 01902271, 01902272, 01901526.

No statistics were calculated for the wells 01901200 and Z1000003. These two wells had too few observed data points to calculate transient statistics.

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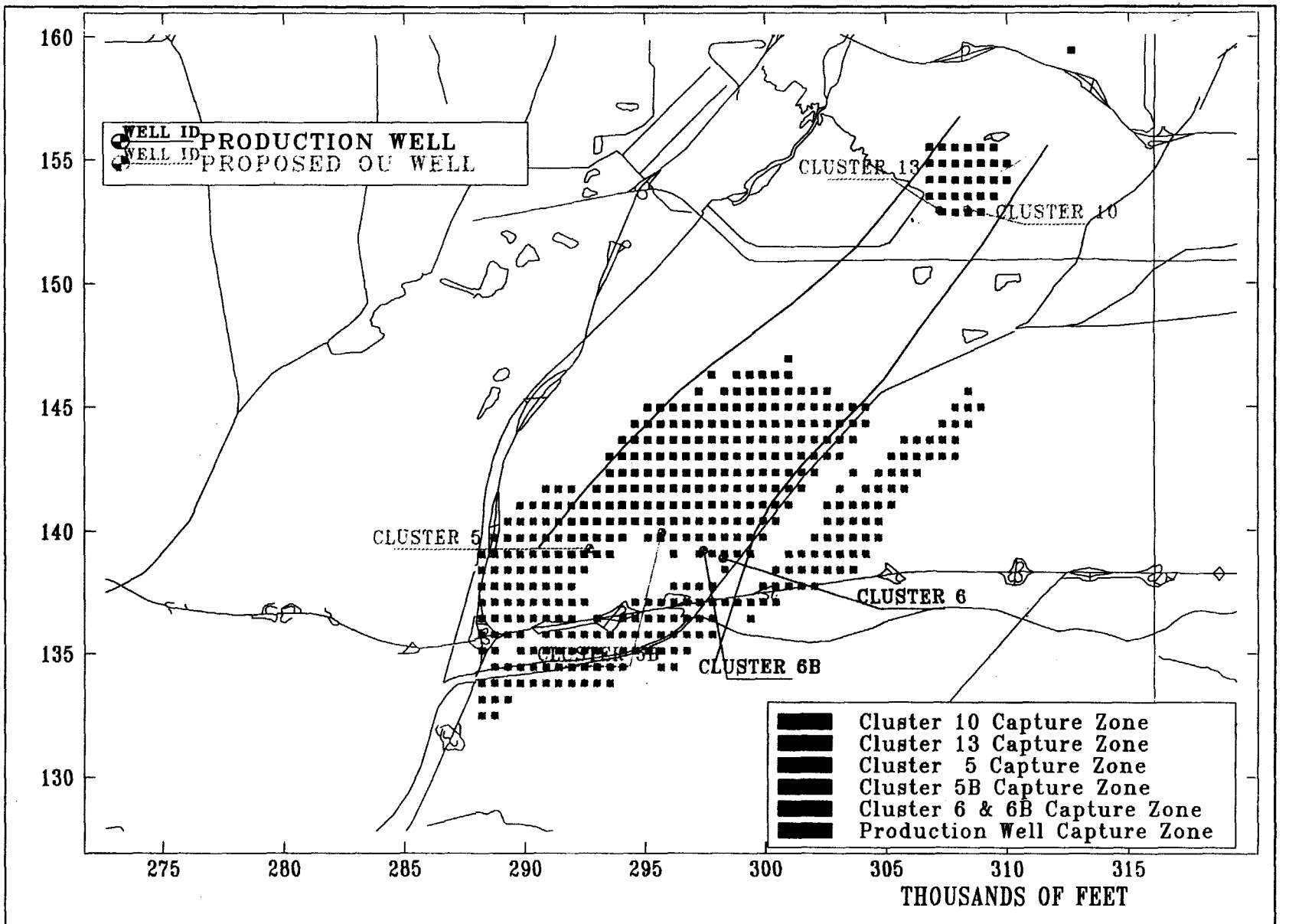

Revised Extraction Case 5 - 16 Year Extraction Simulation
19,000 GPM Extraction, Additional Wet Period Simulated
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb

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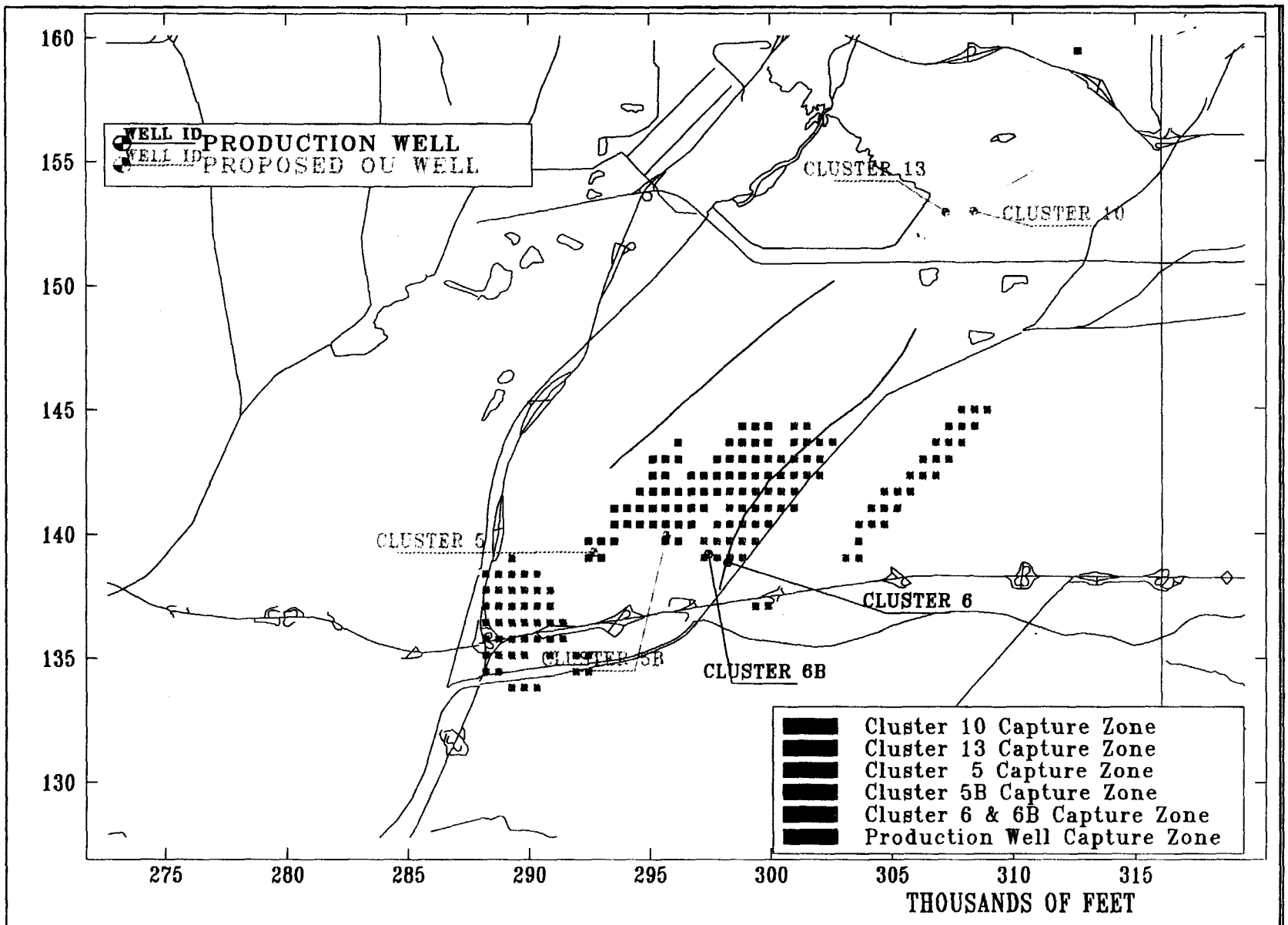

Revised Extraction Case 5 - 16 Year Extraction Simulation
19,000 GPM Extraction, Additional Wet Period Simulated
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb

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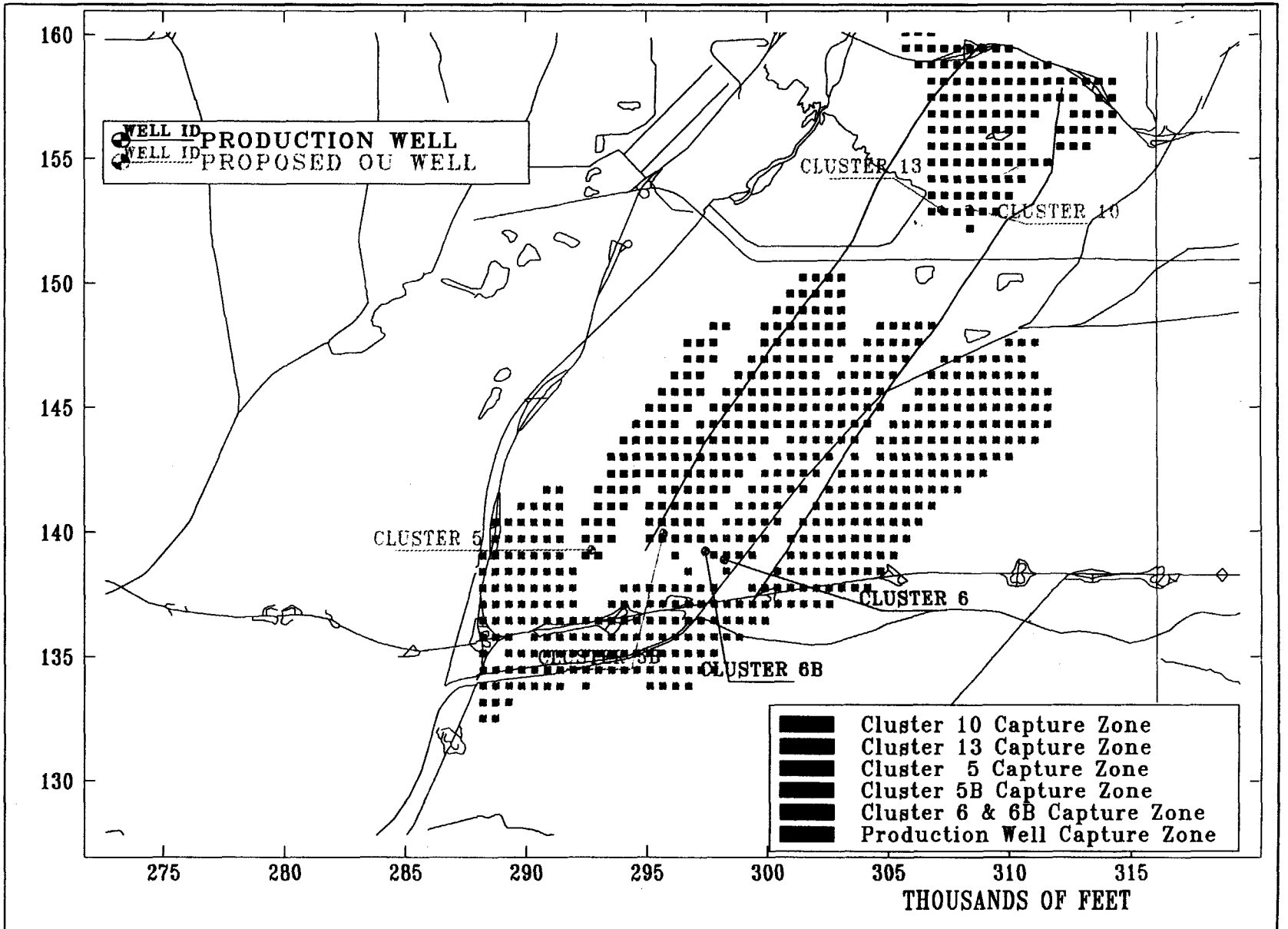

Revised Extraction Case 5 – 16 Year Extraction Simulation
20,000 GPM Extraction, Additional Wet Period Simulated
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb

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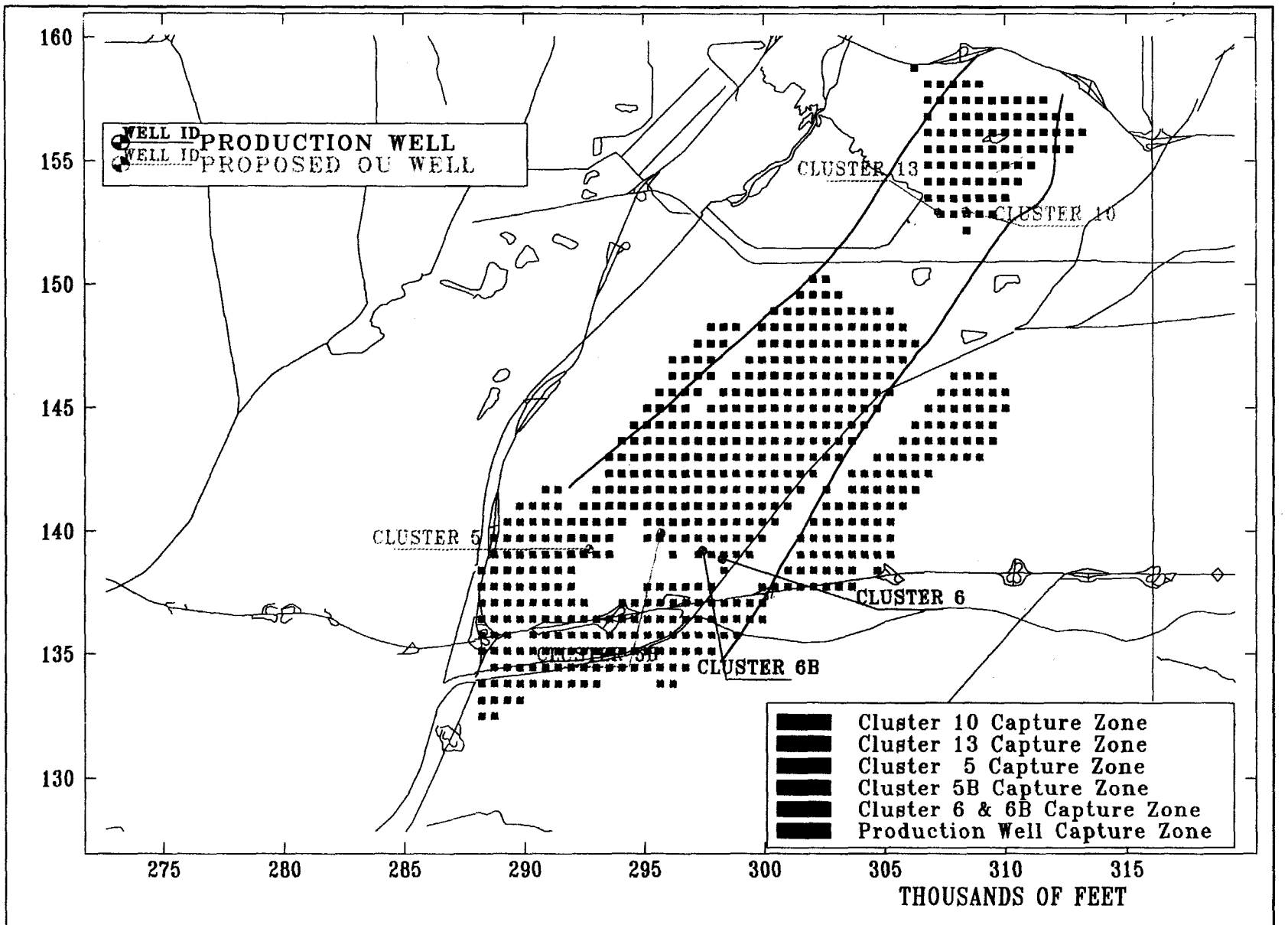

Revised Extraction Case 5 - 16 Year Extraction Simulation
20,000 GPM Extraction, Additional Wet Period Simulated
Particles Started -150 Elevation
Approximate Extent of TCE >5 ppb and/or CCL > 0.5 ppb

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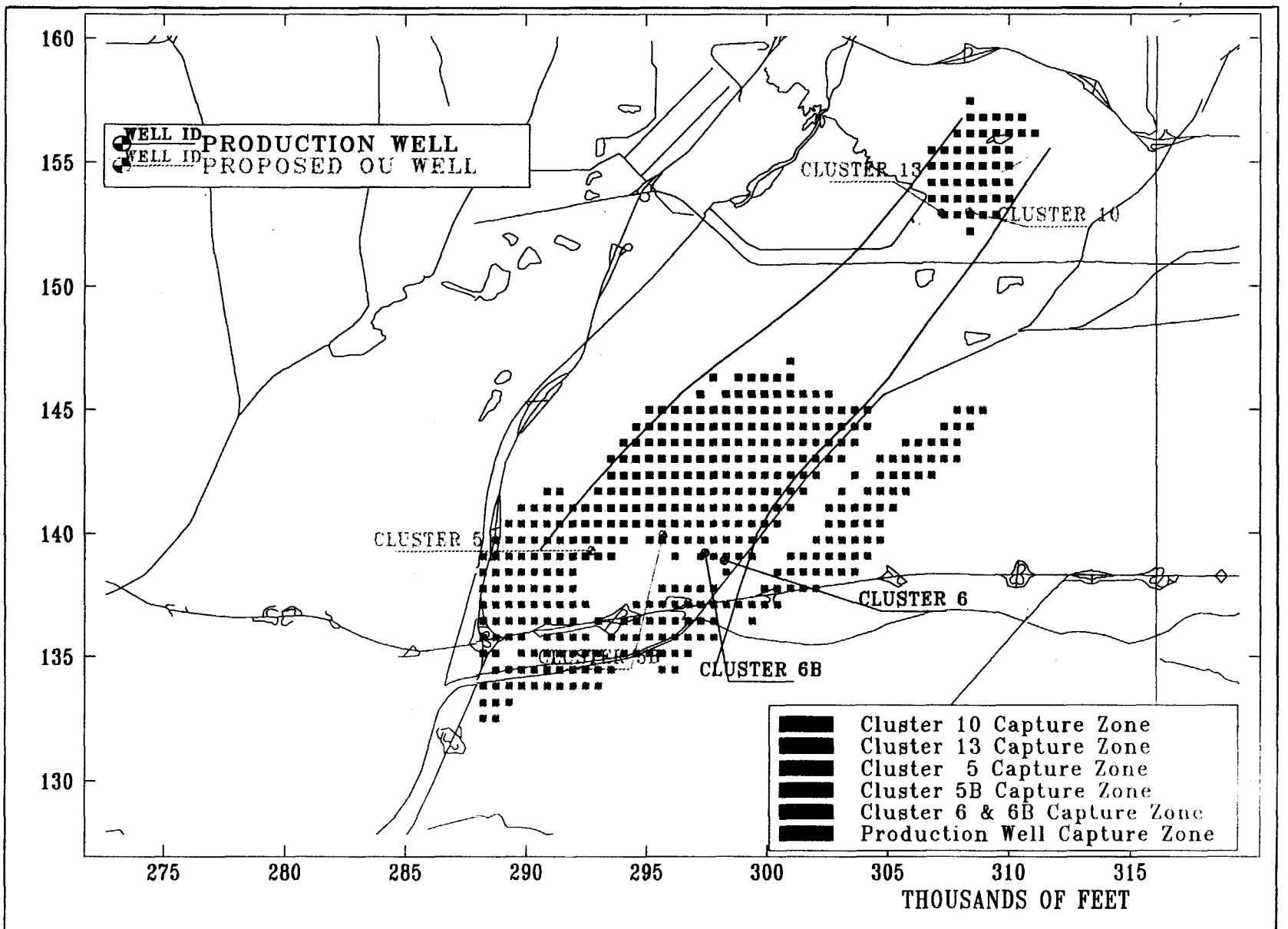

Revised Extraction Case 5 – 16 Year Extraction Simulation
20,000 GPM Extraction, Additional Wet Period Simulated
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb

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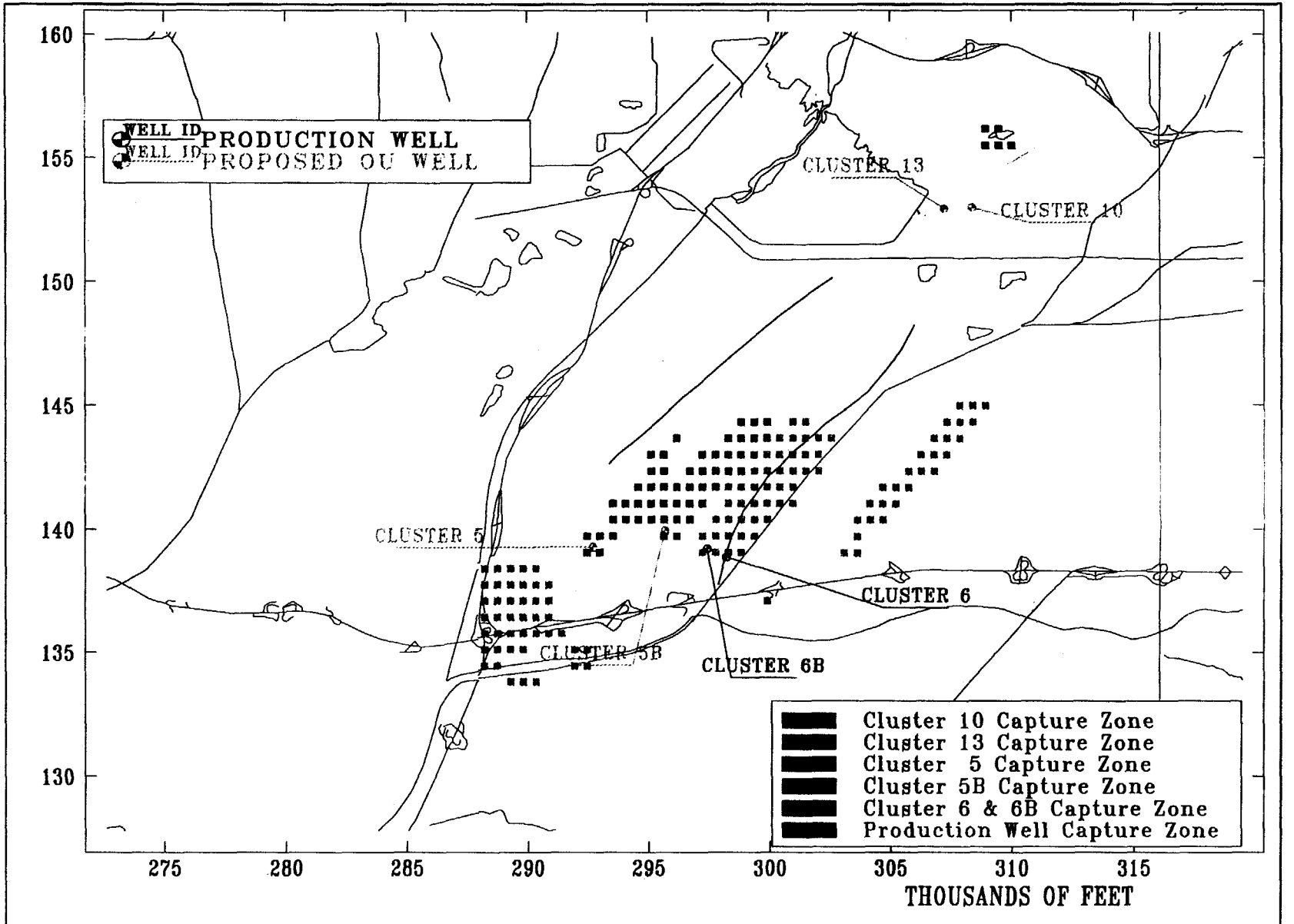

Revised Extraction Case 5 - 16 Year Extraction Simulation
20,000 GPM Extraction, Additional Wet Period Simulated
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb

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MEMORANDUM

To: Wayne Praskins, EPA

From: Brendan Harley/Jennifer Wynn JKW

Subject: Transient Calibration Statistics

Date: April 2, 1997

CC: Don Vanderkar
Steve Richtel
Dave Chamberlin

DRAFT

This memorandum provides the remaining transient calibration statistics requested in Comment 3 of EPA's February 27th letter. Calibration statistics are presented for the Base Case model and the six flow sensitivity cases. Descriptions of these cases can be found in the Draft Pre-Remedial Design Report. The two attached tables present the Group 1 and Group 2 wells as described in the response of March 28th. Also included is a figure showing the location of the transient calibration wells.

A review of the Group 1 wells shows that for some of the sensitivity cases there are select wells which have better calibration statistics than the Base Case. However, the Base Case provides a better overall calibration. The variation in calibration statistics is fairly small in many cases. Sensitivity Cases 1, 2, 4 and 5 have calibration statistics which are comparable to the Base Case. This indicates that the model is relatively insensitive to these changes in conductivity, and changes in the fault. Greater differences can be seen in the statistics for Sensitivity Cases 3 and 6 in which the hydraulic conductivity is reduced by 100 ft/day, and the fault notch is centered over the VOC plume, respectively. These cases have noticeably poorer calibration statistics than the Base Case.

The statistics for the Group 2 wells show very little difference for the different sensitivity cases. Three of the four wells; 01902271, 01902272 and 0191526 are located in remote corners of the basin. As expected they are unaffected by changes to the model in the BPOU area. Well 01900918 is located west of the Rio Honda and is likely much more influenced by production pumping in that area of the basin, than by changes affecting the flow regime in the central portion of the basin.

Transient Calibration - Summary Statistics
Group 1 Wells

	Base Case		Case 1 Kh Increased 50 ft/day		Case 2 Kh Decreased 50 ft/day		Case 3 Kh decreased 100 ft/day		Case 4 Fault Gap Centered Over San Gabriel River		Case 5 Fault Gap Extended Along SG Canyon		Case 6 Fault Gap Centered Over VOC Plume	
	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE
Z1000006	0.9859	5.17	0.9891	6.13	0.9855	4.16	0.9846	6.37	0.9888	4.57	0.9888	4.34	0.9885	7.48
01900831	0.9819	4.80	0.9826	6.52	0.9819	7.84	0.9819	15.62	0.9841	4.48	0.9842	4.44	0.9841	6.81
Z1000005	0.9661	5.33	0.9518	6.21	0.9673	5.38	0.9687	5.53	0.9528	6.39	0.9528	6.51	0.9541	6.22
Z1000011	0.9454	11.31	0.9369	12.29	0.9466	10.06	0.9490	8.48	0.9367	11.01	0.9369	10.72	0.9371	13.86
Z1000008	0.9504	5.49	0.9521	4.59	0.9495	9.54	0.9432	14.96	0.9504	5.27	0.9504	5.49	0.9492	4.68
01900358	0.5403	16.60	0.5502	16.49	0.5405	16.55	0.5402	16.49	0.5524	16.49	0.5503	16.88	0.5653	18.24
Z1000009	0.8777	8.81	0.8795	10.10	0.8513	10.71	0.8626	9.58	0.8778	8.97	0.8777	8.81	0.8795	11.15
Z1000007	0.8632	16.70	0.8502	17.87	0.8640	15.39	0.8645	13.49	0.8511	16.86	0.8512	16.54	0.8511	19.96
Z1000002	0.6460	10.35	0.6439	10.36	0.6450	10.35	0.6436	10.36	0.6378	9.79	0.6379	9.80	0.6378	9.75
Z1000001	0.8864	6.72	0.8808	6.93	0.8865	6.89	0.8845	7.14	0.8811	7.48	0.8808	7.78	0.8795	5.18

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Transient Calibration - Summary Statistics
Group 2 Wells

	Base Case		Case 1 Kh Increased 50 ft/day		Case 2 Kh Decreased 50 ft/day		Case 3 Kh decreased 100 ft/day		Case 4 Fault Gap Centered Over San Gabriel River		Case 5 Fault Gap Extended Along SG Canyon		Case 6 Fault Gap Centered Over VOC Plume	
	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE	Corr Coef	RMSE
01900918	0.5861	21.73	0.5622	22.60	0.5860	21.88	0.5867	22.12	0.5578	23.38	0.5576	23.66	0.5583	20.86
01902271	0.5815	20.55	0.5816	20.54	0.5822	20.57	0.5813	20.60	0.5817	20.54	0.5821	20.54	0.5815	20.54
01902272	0.4963	13.68	0.4959	13.68	0.4961	13.69	0.4962	13.69	0.4957	13.68	0.4958	13.68	0.4958	13.68
01901526	0.7264	62.36	0.6951	62.62	0.7278	62.96	0.7275	63.83	0.7021	62.32	0.7021	62.19	0.6965	63.87

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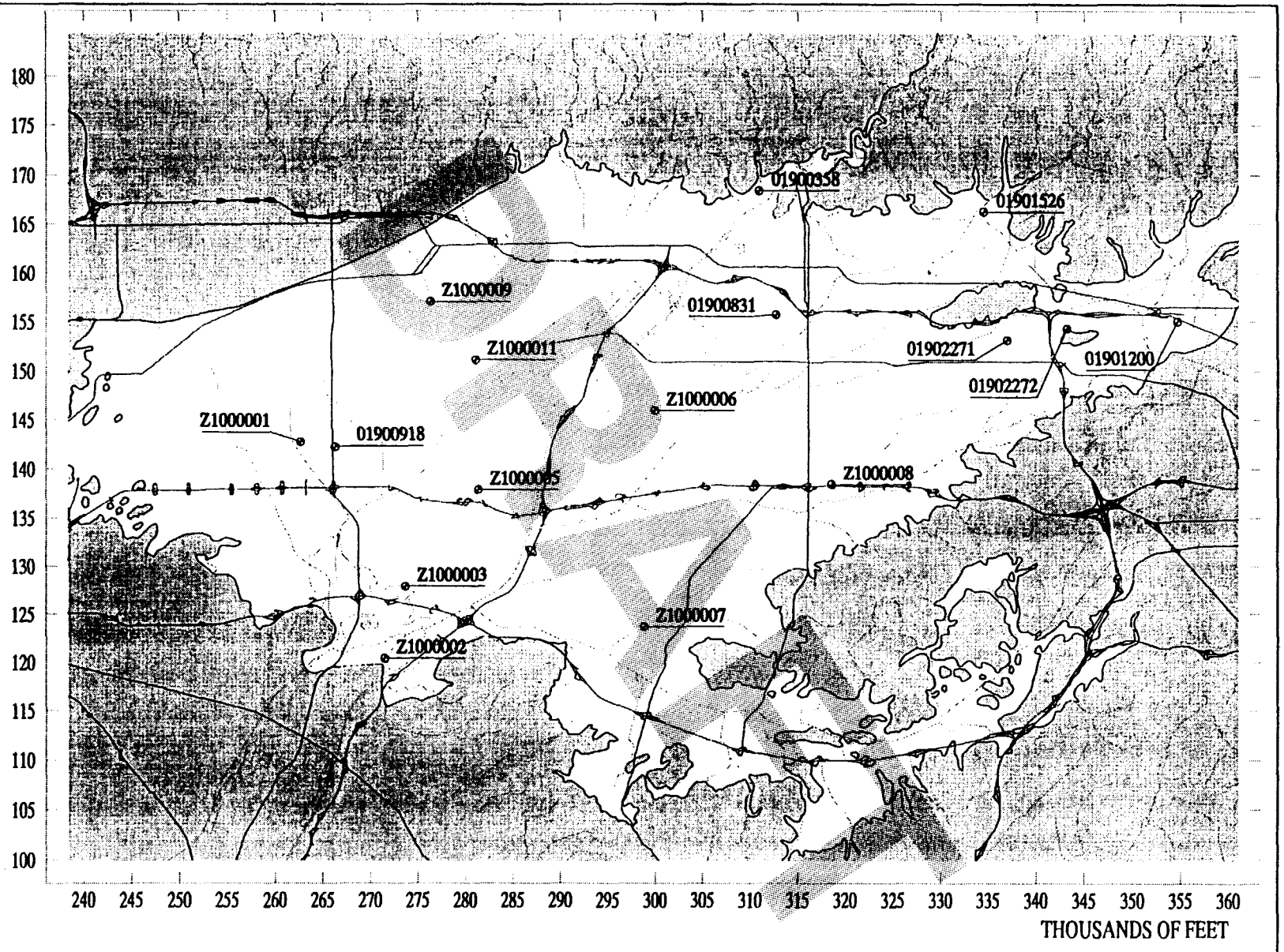

FIGURE 7-2

Location of Transient Calibration Wells

Baldwin Park Operable Unit Pre-Remedial Design

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MEMORANDUM

To: Wayne Praskins, EPA

From: Brendan Harley/Jennifer Wynn JKW

Subject: Additional Modeling Results

Date: April 29, 1997

CC: Baldwin Park Operable Unit Steering Committee
Dave Chamberlin

This memorandum presents the results of additional modeling requested by the BPOU Steering Committee. Three additional modeling tasks are presented below. The first task consists of the simulation of the effects on containment of seasonal variations in pumping rates from extraction wells in the BPOU. These seasonal variations were evaluated in the event that operational changes are necessary to accommodate constraints in the quantity of water delivered to the Metropolitan Water District. The second task consists of an evaluation of Subarea 1 containment without the operation of Well AZ-2 (Recordation No. 11900038). The third task is a new modification to the Revised Case 5 extraction scenario, also without the operation of Well AZ-2.

Seasonally Varying Pumping

This task evaluated the impact of reducing the remedial extraction in one quarter by 30%, and then increasing pumping by 10% in the remaining 3 quarters. This scenario was simulated four times alternating the quarter which was simulated with reduced pumping. For each of the simulations the capture zones at 4 different elevations were produced. Particles were started at elevations of +50, -150, -300, and -500 feet MSL. A comparison of these figures to the capture zones produced by the Revised Case 5 Extraction Scenario indicates that there is very little difference between the capture zones. (Figures of the Revised Extraction Case 5 capture zones are included with this memorandum for comparison to the additional modeling simulations presented.) A reduction of the remedial pumping for one quarter appears to have almost no impact upon the resulting capture zone. It is also apparent that the choice of quarters in which to reduce pumping has no distinguishable impact upon the capture zone. This would allow for some flexibility in managing the amount of water delivered to MWD at different times of the year, without negatively impacting the resulting capture zone.

DRAFT

Simulation of No Pumping at AZ-Two

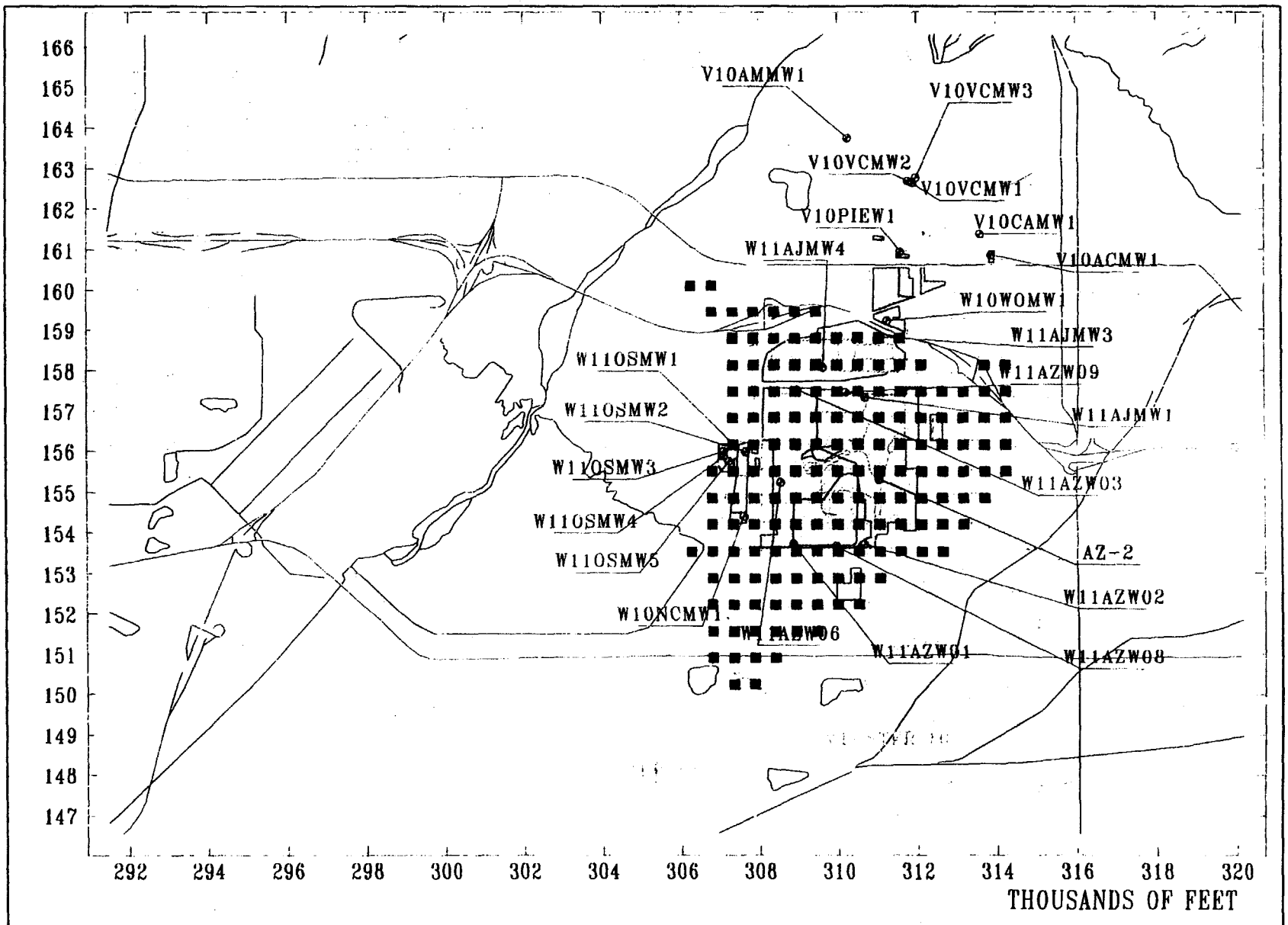
A scenario was simulated which assumed no pumping occurred at well AZ-Two. Plots of the resulting capture zones with particles started at 4 different elevations are included. The Subarea 1 and 3 capture zones for particles started at all 4 elevations, +50, -150, -300 and -500 feet MSL, remain relatively unchanged with removal of pumping at AZ-Two. The gap in Subarea 1 which had previously been created by particles removed at AZ-Two no longer exists, and those particles are shown being removed by the Subarea 1 extraction wells. The breadth of capture in Subarea 1 remains essentially the same as that produced by the Revised Extraction Case 5, which included pumping at AZ-Two, but somewhat less of the southeast corner of the ALR property is captured. Groundwater beneath all of the facilities north of Gladstone Avenue is still captured.

Also included are plots illustrating 12-year forward transient particle tracks, started from the approximate MCL contour of the TCE/CCL plume at three different elevations; +50 feet MSL, -150 feet MSL, and -300 feet MSL. These figures indicate that particles which are started at the outermost edge of the VOC plume in Subarea 1 are either captured by the Subarea 1 extraction wells, Cluster 10 and Cluster 13; or are drawn in toward the central portion of the plume, into the area of the flow field that is captured by the Subarea 3 extraction wells.

Additional Revision to Extraction Scenario 5 with No AZ-Two Pumping

Based on the results of the simulation of the Revised Case 5 extraction scenario without well AZ-Two pumping, an additional modification to the Case 5 scenario was simulated to attempt to improve the capture of groundwater beneath the PRP facilities north of Arrow Highway. In this simulation the location of Cluster 13 was shifted slightly south, and the location of Cluster 10 was shifted south and west, almost directly south of Cluster 13. Cluster 10 is pumping at a rate of 3,000 gpm, and Cluster 13 is pumping at a rate of 2,500 gpm. At each of these wells the pumping is distributed evenly from -350 ft MSL to approximately +220 feet MSL.

The results of the simulation are shown in the attached figures which highlight the capture zone in Subarea 1. The 24 year capture zones are presented for particles started at an elevation of +50, -150, and -300 feet MSL. For particles started at an elevation of +50 feet groundwater from beneath nearly all the PRP facilities is captured. A longer simulation period would extend the capture zone further to the northeast at all three elevations. These simulations indicate adequate containment of groundwater beneath the Subarea 1 PRP facilities, consistent with the Subarea 1 objectives discussed in the ROD and EPA correspondence.



Revised Extraction Case 5 - No AZ-2 Pumping
24 Year Capture Zone for Cluster 10 and Cluster 13
3,000 gpm Pumping at Cluster 10, 2,500 gpm Pumping at Cluster 13
Particles Started at 50 ft MSL

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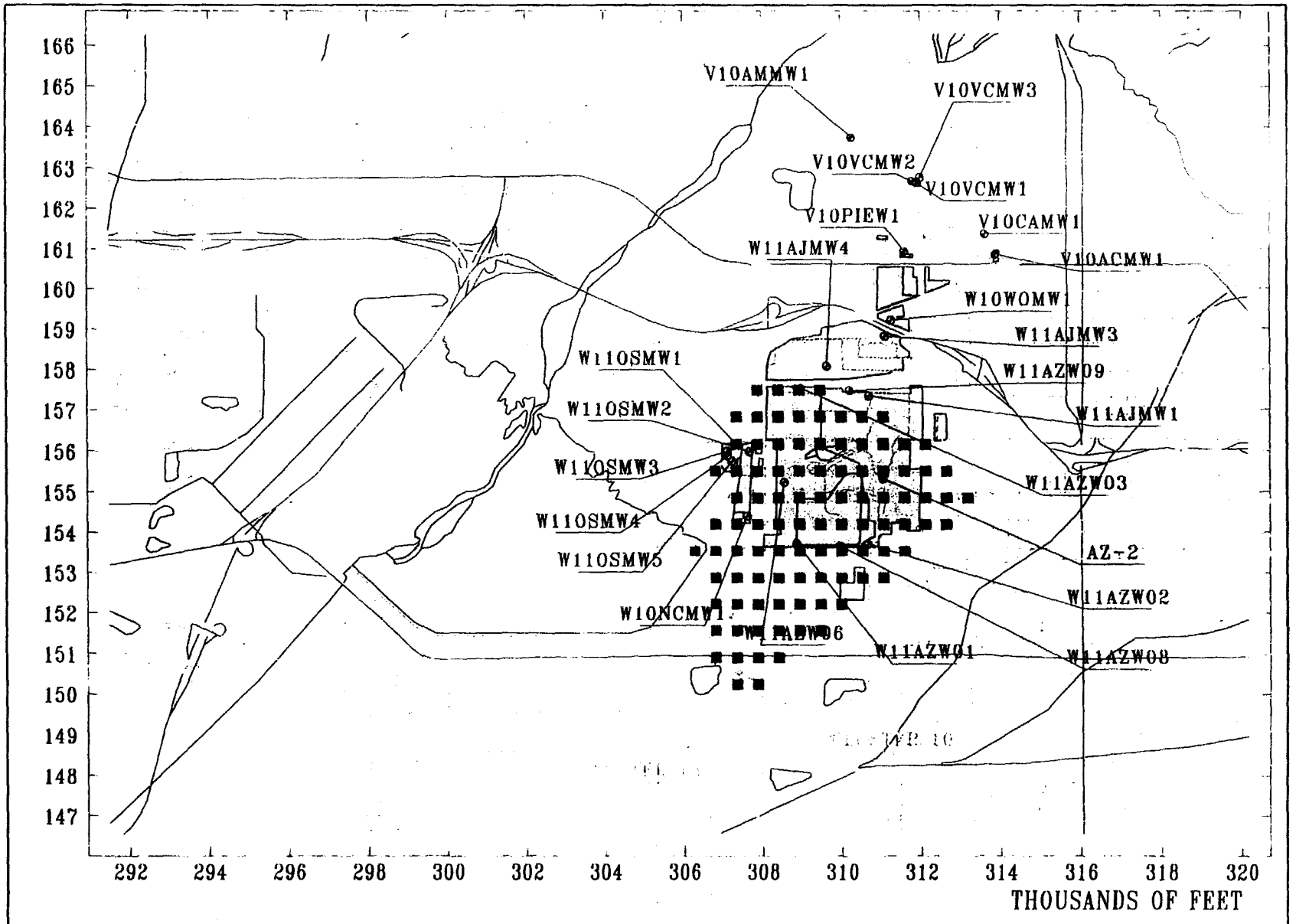

Revised Extraction Case 5 - No AZ-2 Pumping
24 Year Capture Zone for Cluster 10 and Cluster 13
3,000 gpm Pumping at Cluster 10, 2,500 gpm Pumping at Cluster 13
Particles Started at -150 ft MSL

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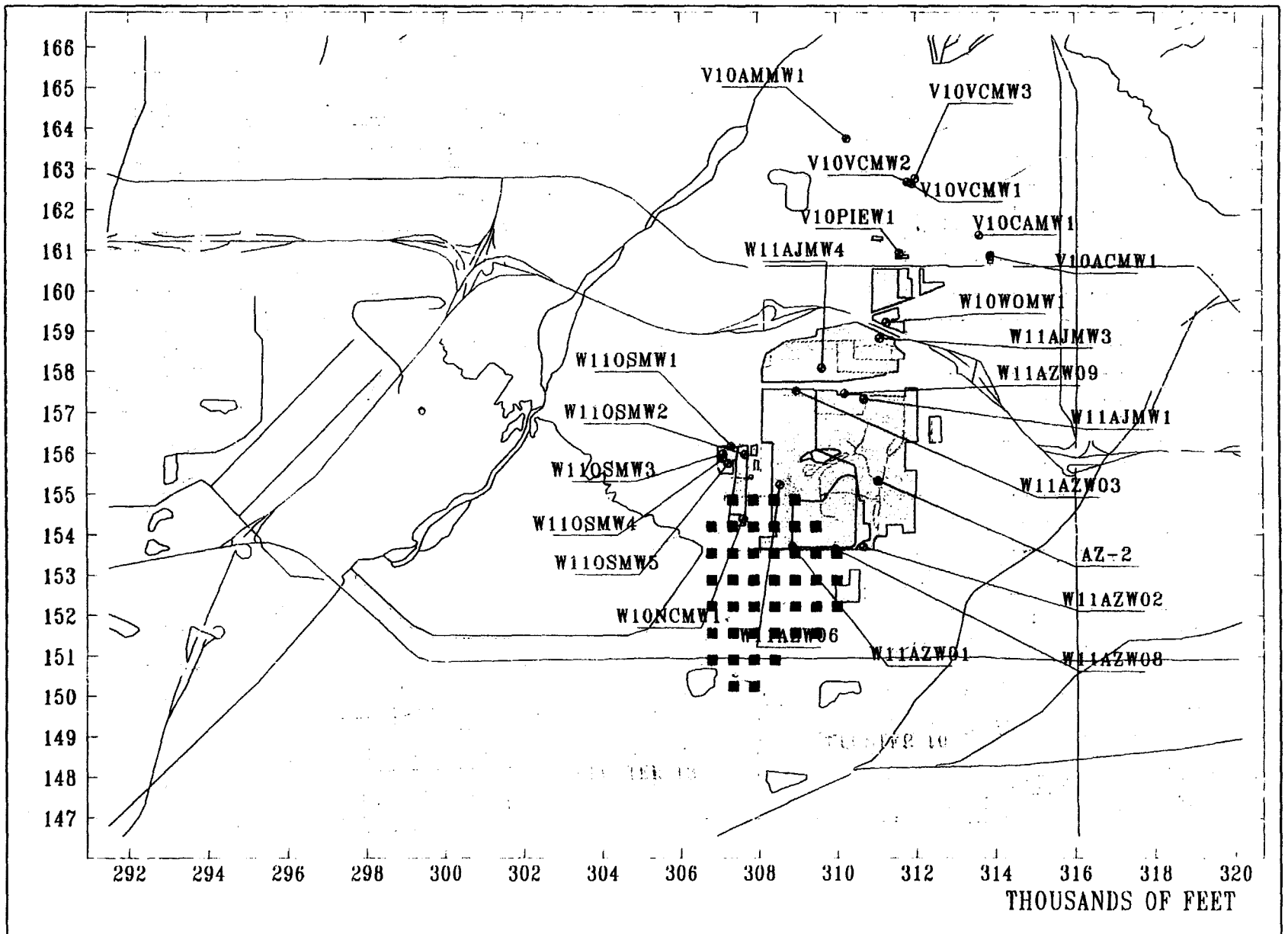

Revised Extraction Case 5 - No AZ-2 Pumping
24 Year Capture Zone for Cluster 10 and Cluster 13
3,000 gpm Pumping at Cluster 10, 2,500 gpm Pumping at Cluster 13
Particles Started at -300 ft MSL

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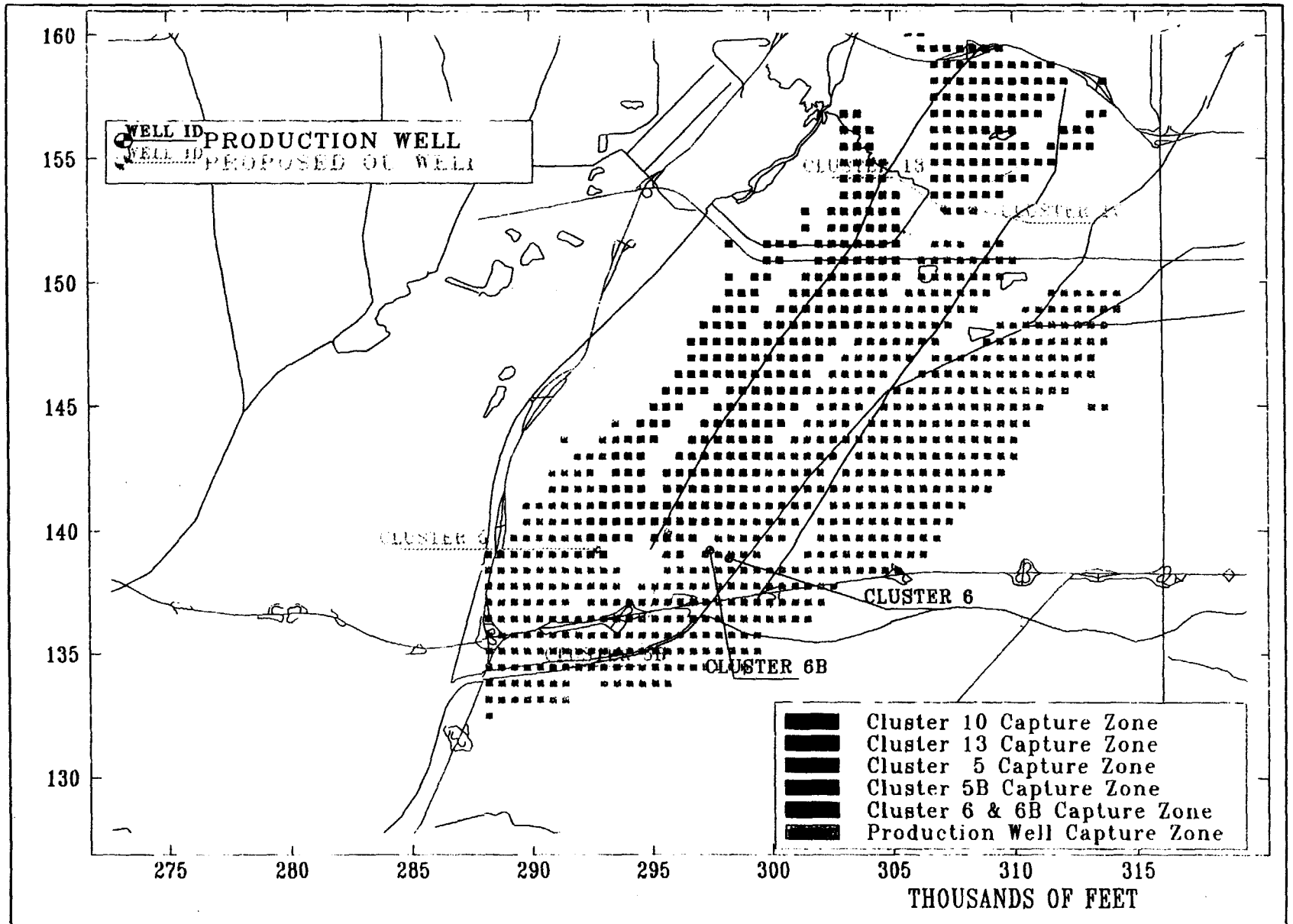

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -150 ft MSL to Water Table

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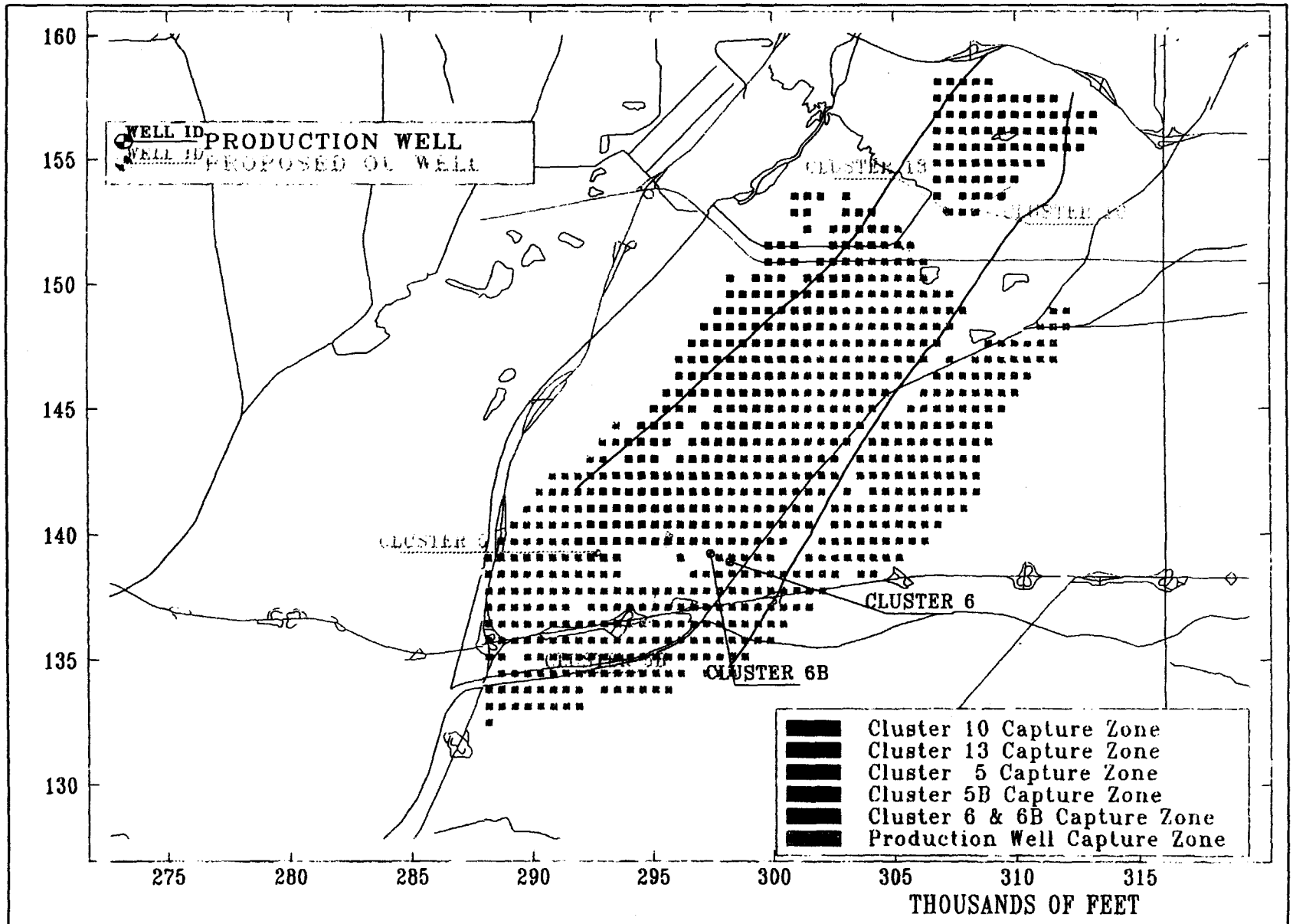

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started -150 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -250 ft MSL to +50 ft MSL

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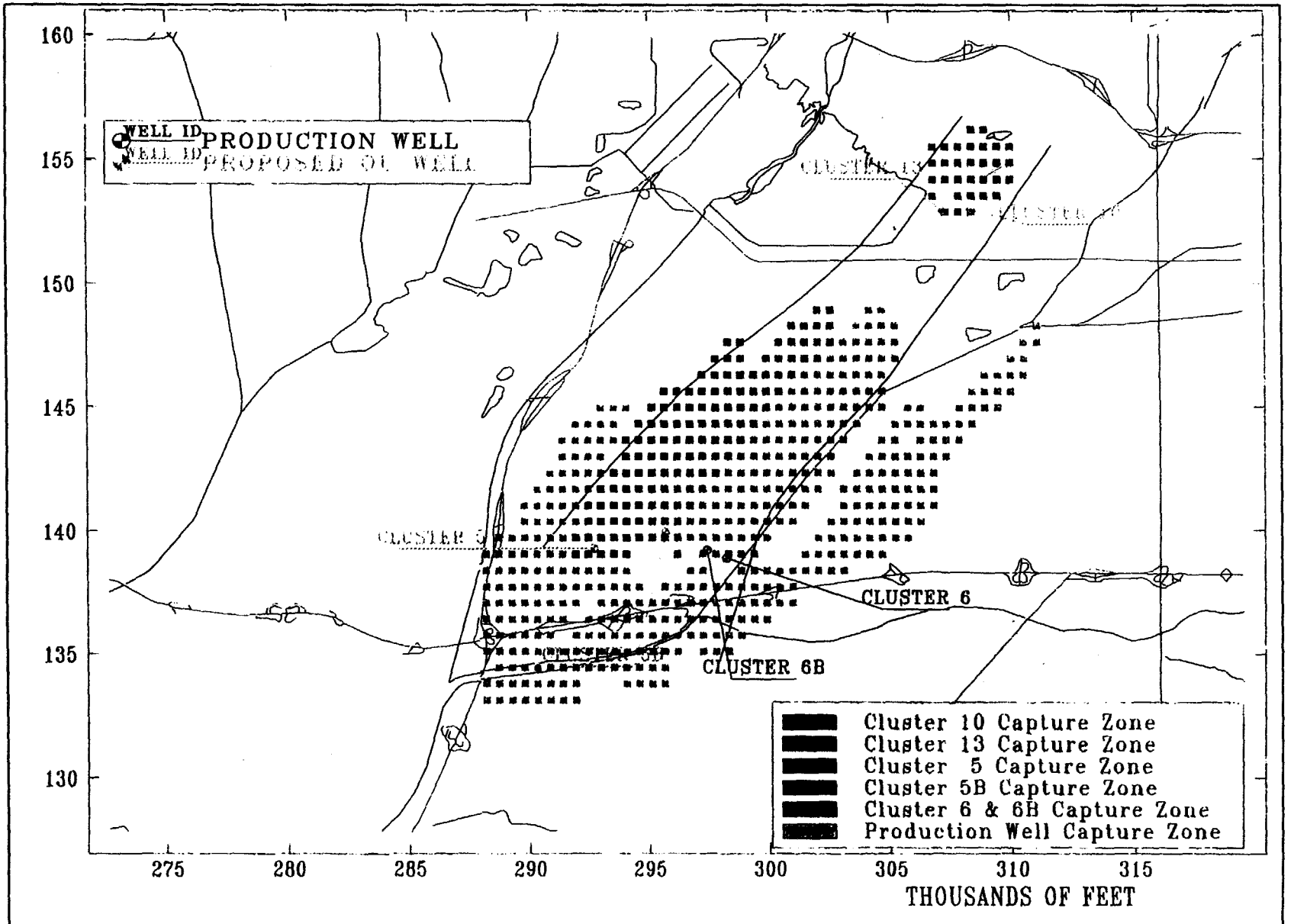

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -350 ft MSL to -150 ft MSL

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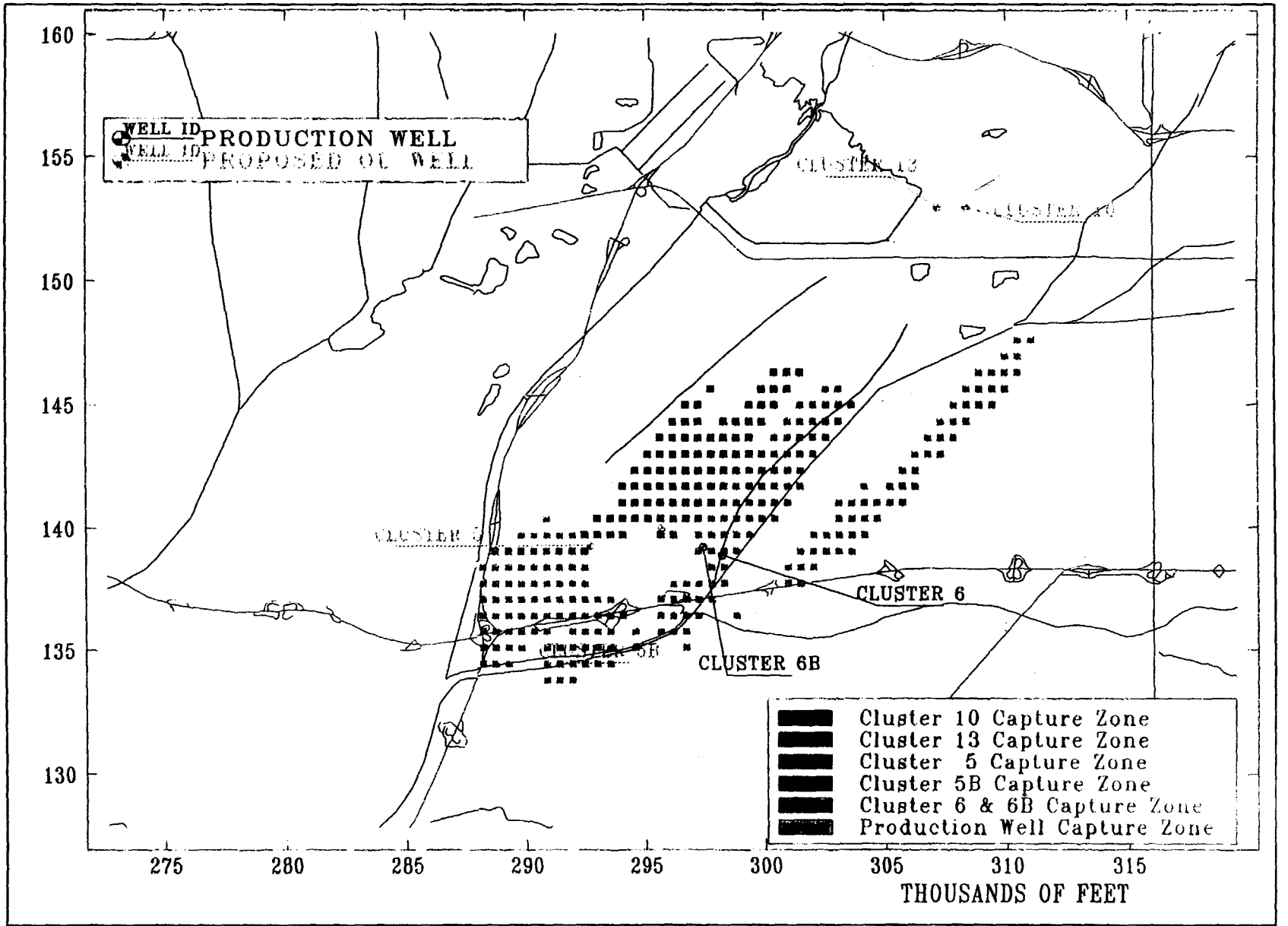

Revised Extraction Case 5 - 24 Year Transient Capture Zone
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations Below -350 ft MSL

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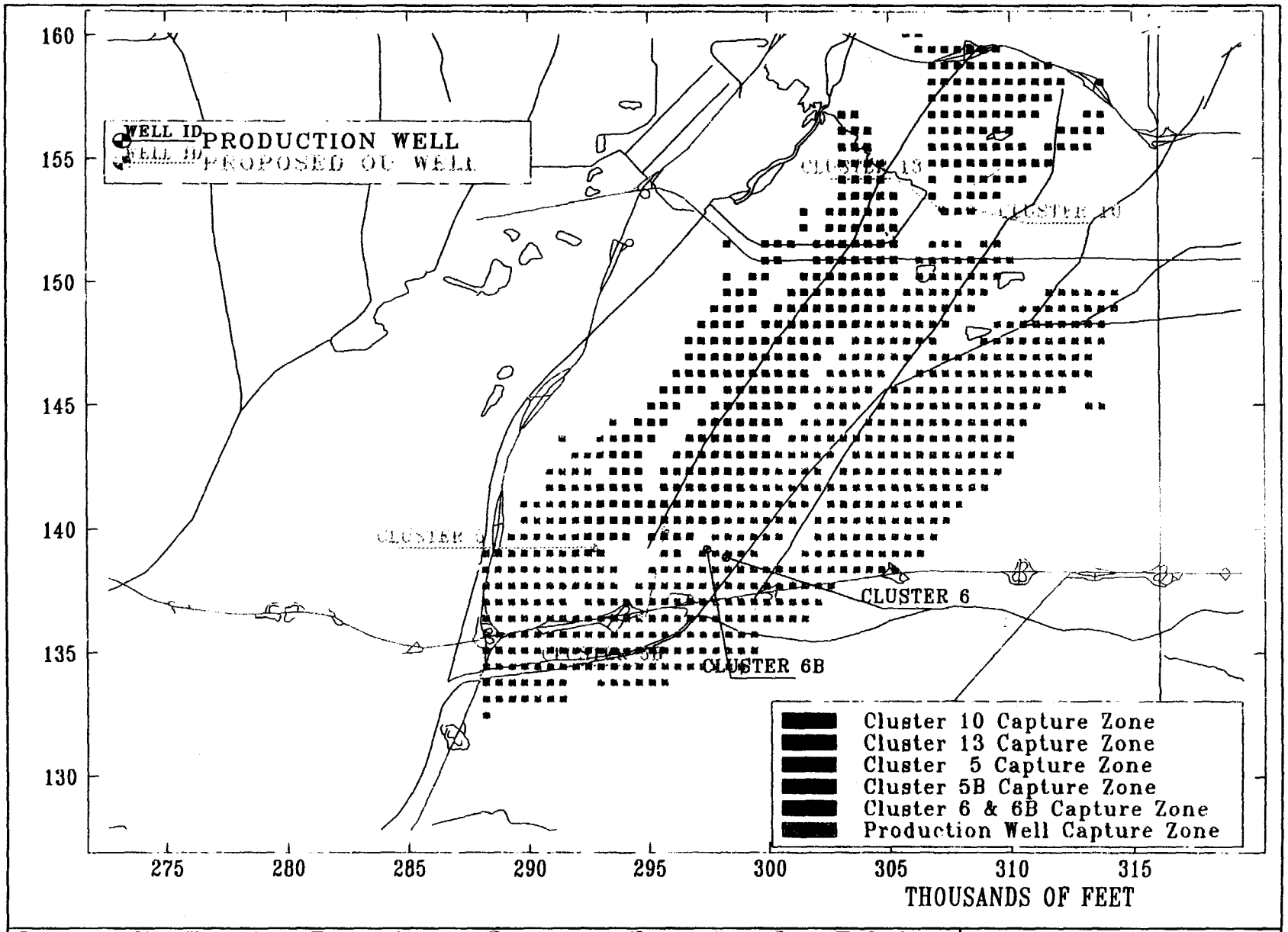

Seasonally Varying Pumping - Decrease Pumping Jan Feb Mar
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -150 ft MSL to Water Table

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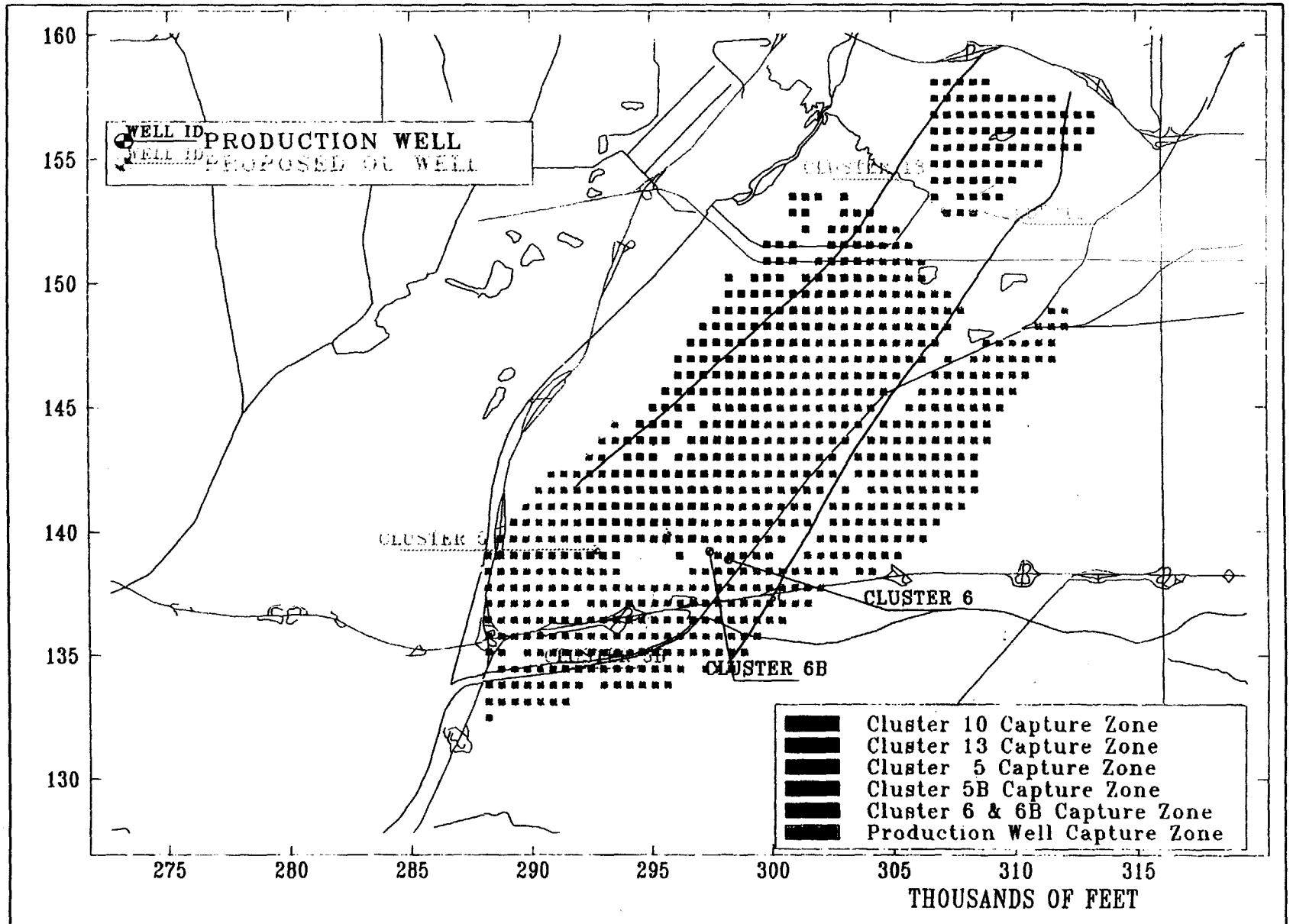

Seasonally Varying Pumping - Decrease Jan Feb Mar
Particles Started -150 Elevation
Approximate Extent of TCE >5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -250 ft MSL to +50 ft MSL

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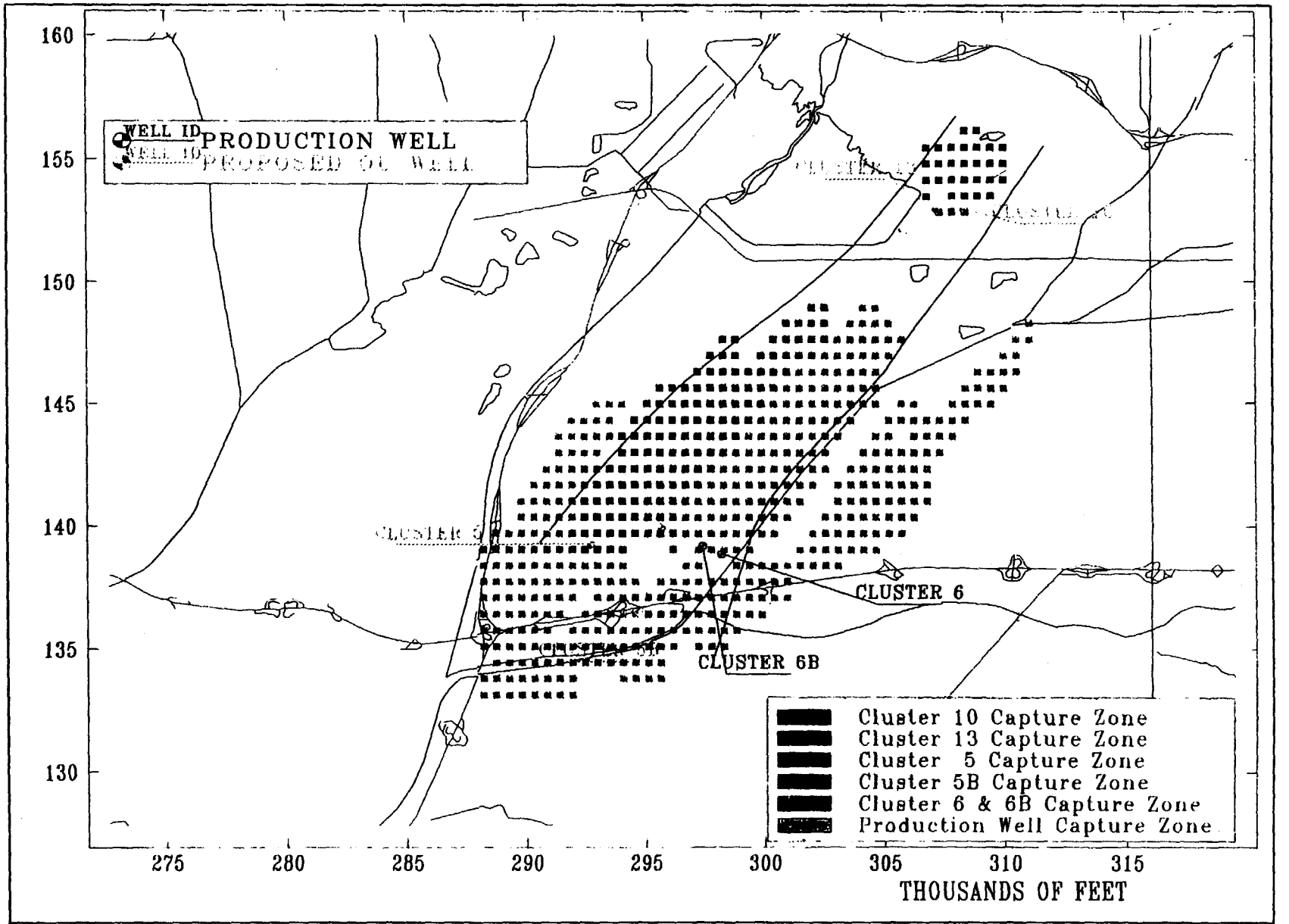

Seasonally Varying Pumping - Decrease Jan Feb Mar
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -350 ft MSL to -150 MSL

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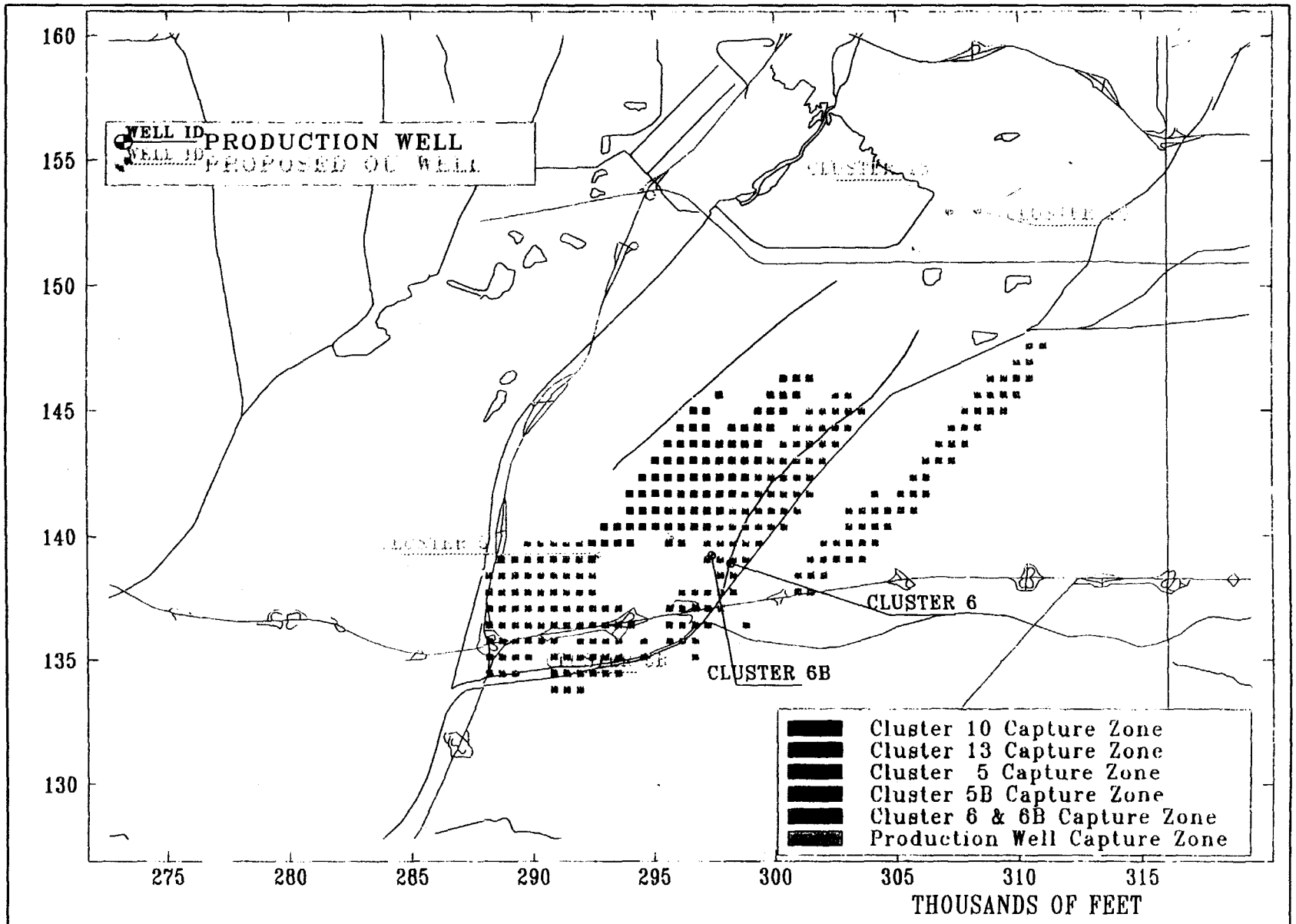

Seasonally Varying Pumping _ Decrease Pumping Jan Feb Mar
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations Below -350 ft MSL

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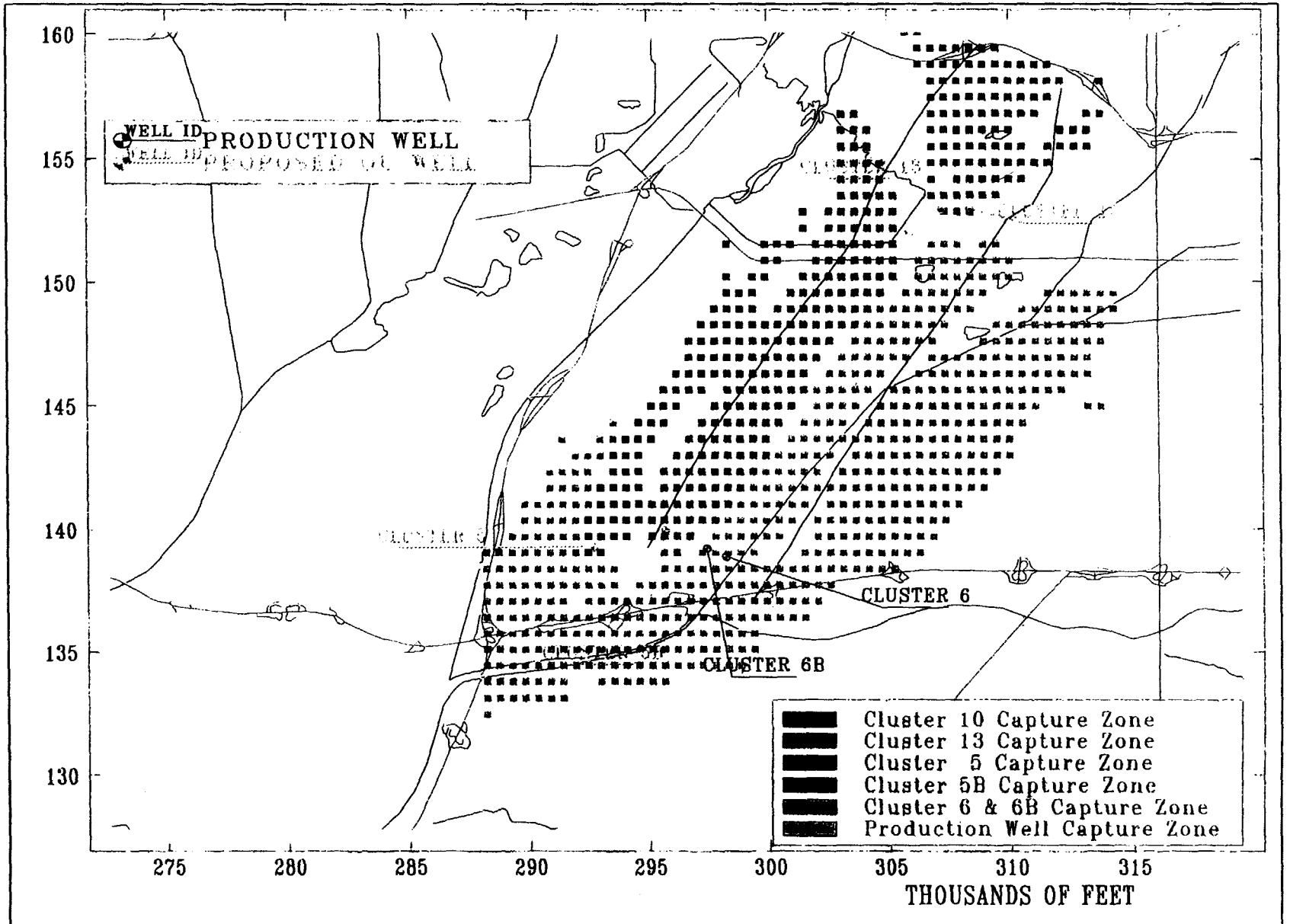
environmental engineers, scientists, planners, & management consultants



Seasonally Varying Pumping – Decrease Pumping Apr May June
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from −150 ft MSL to Water Table

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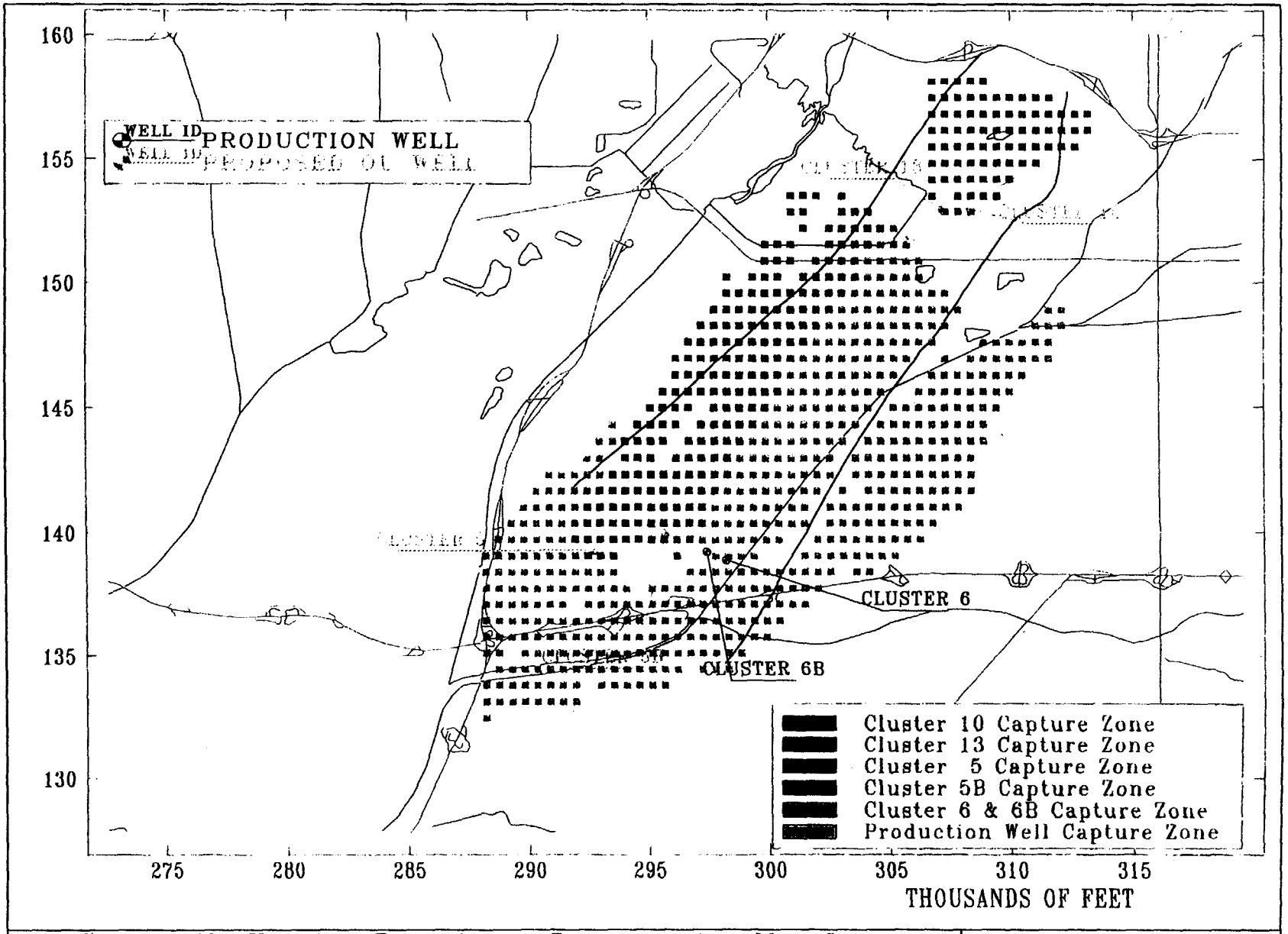

Seasonally Varying Pumping - Decrease Apr May June
Particles Started -150 Elevation
Approximate Extent of TCE >5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -250 ft MSL to +50 ft MSL

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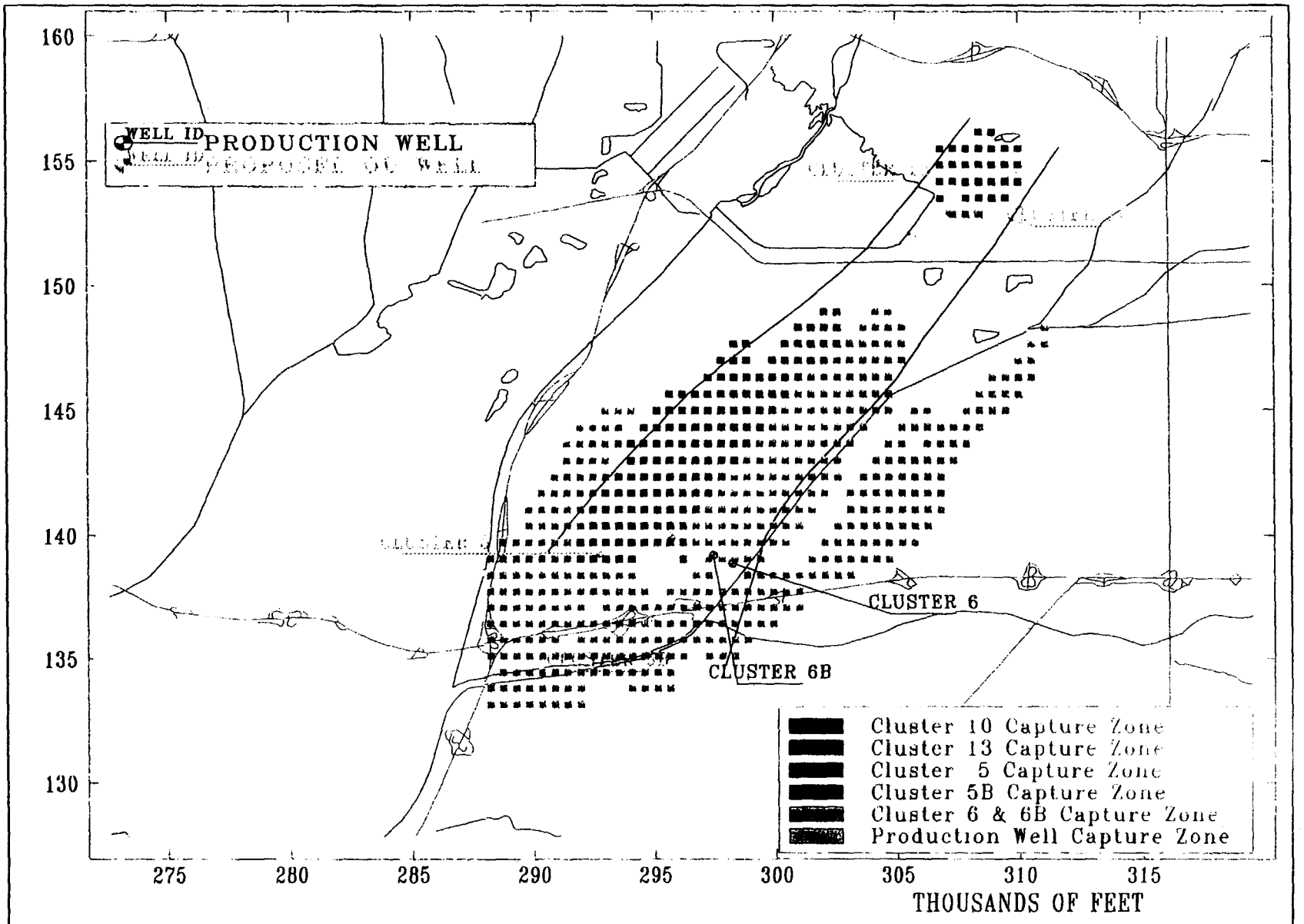

Seasonally Varying Pumping – Decrease Apr May June
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -350 ft MSL to -150 MSL

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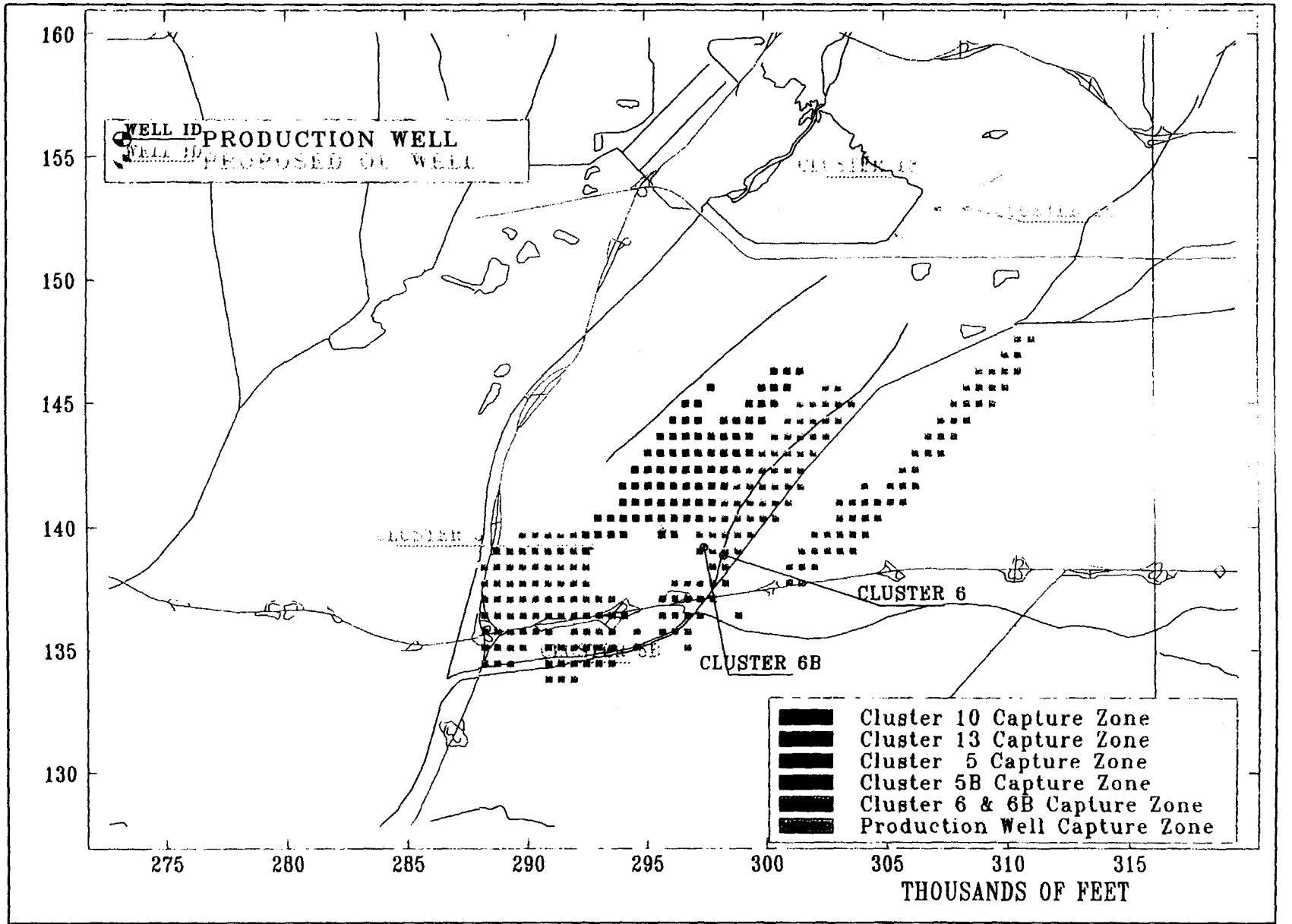
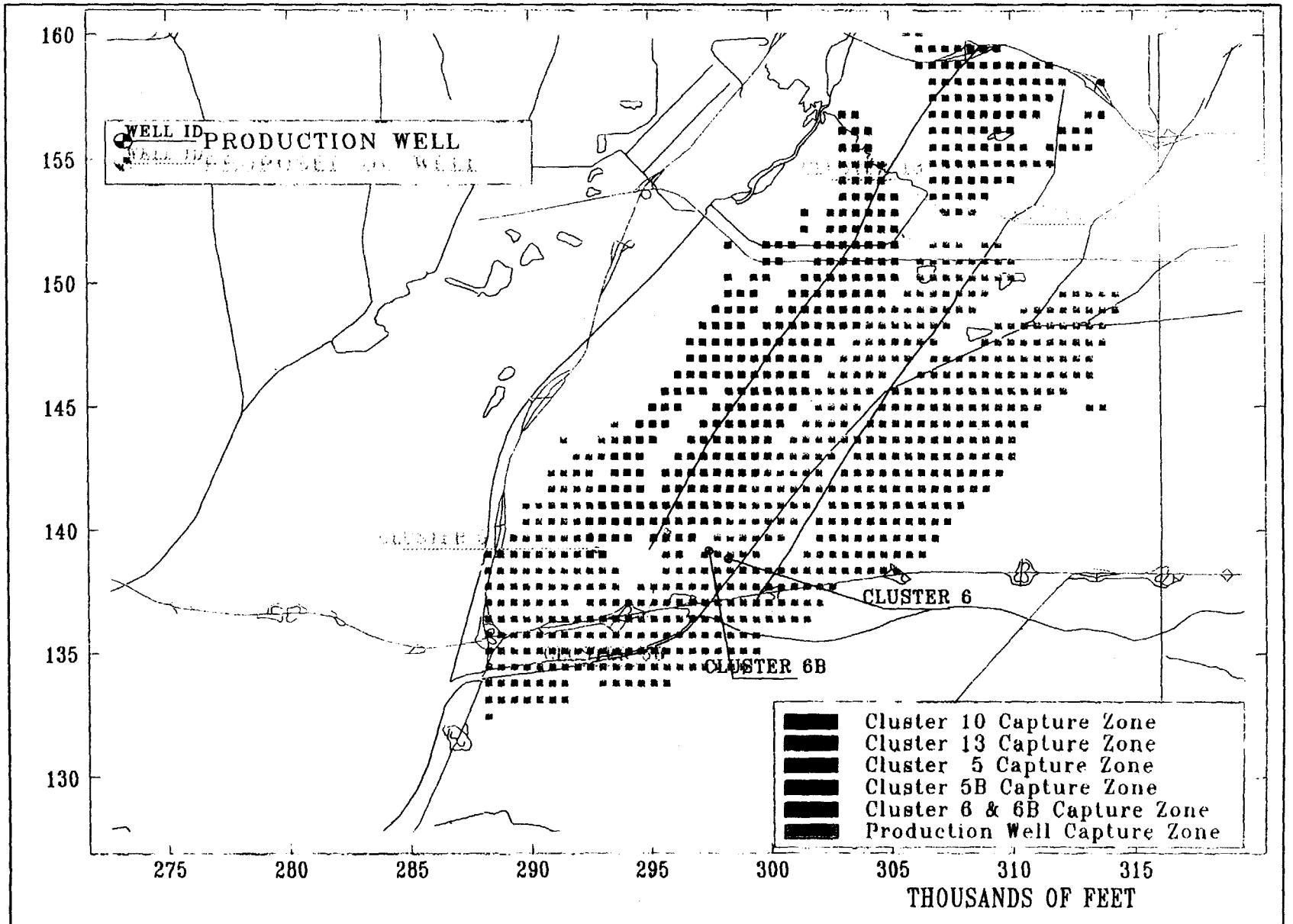


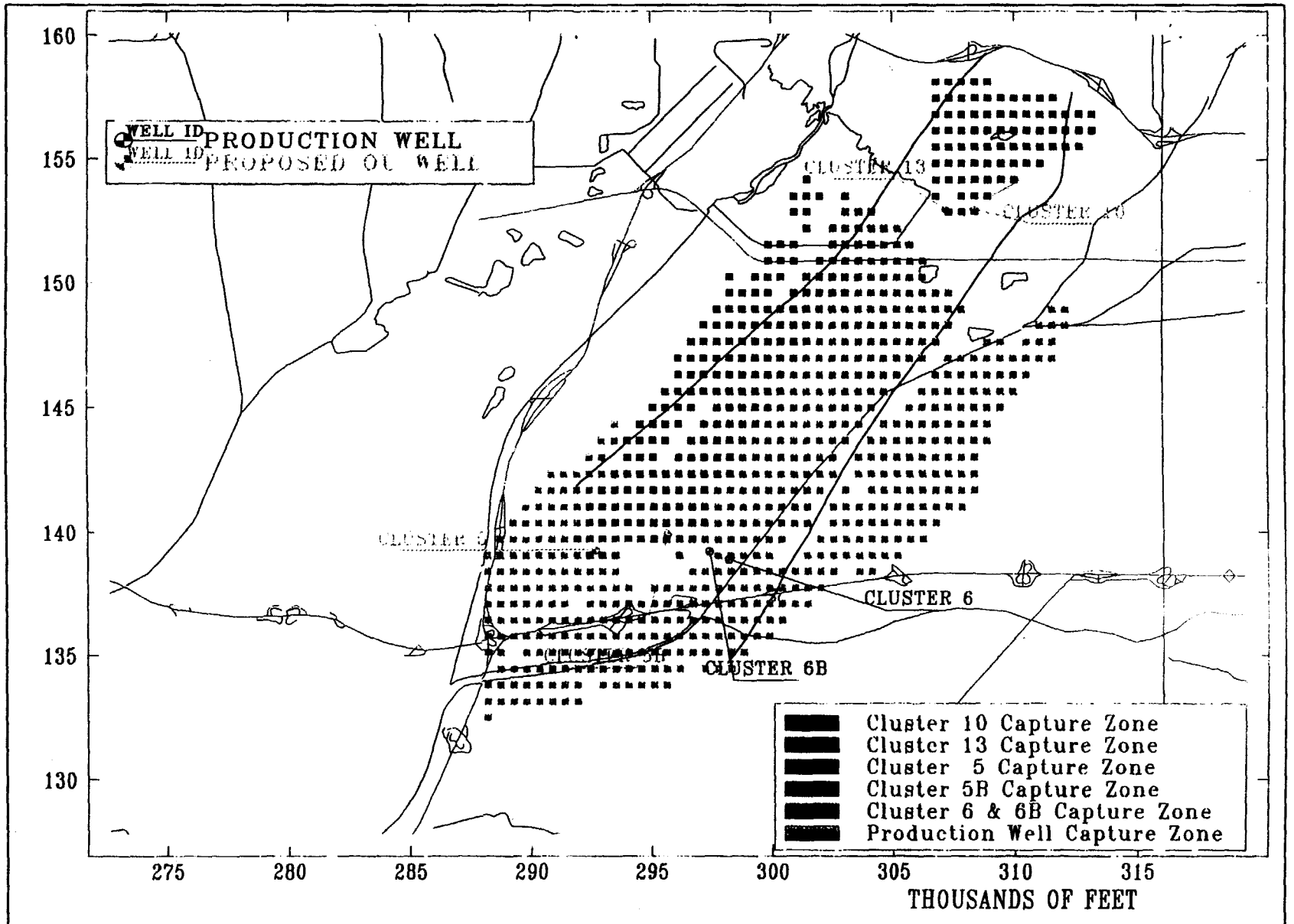
Seasonally Varying Pumping _ Decrease Pumping Apr May June
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations Below -350 ft MSL

CDM
environmental engineers, scientists, planners, & management consultants



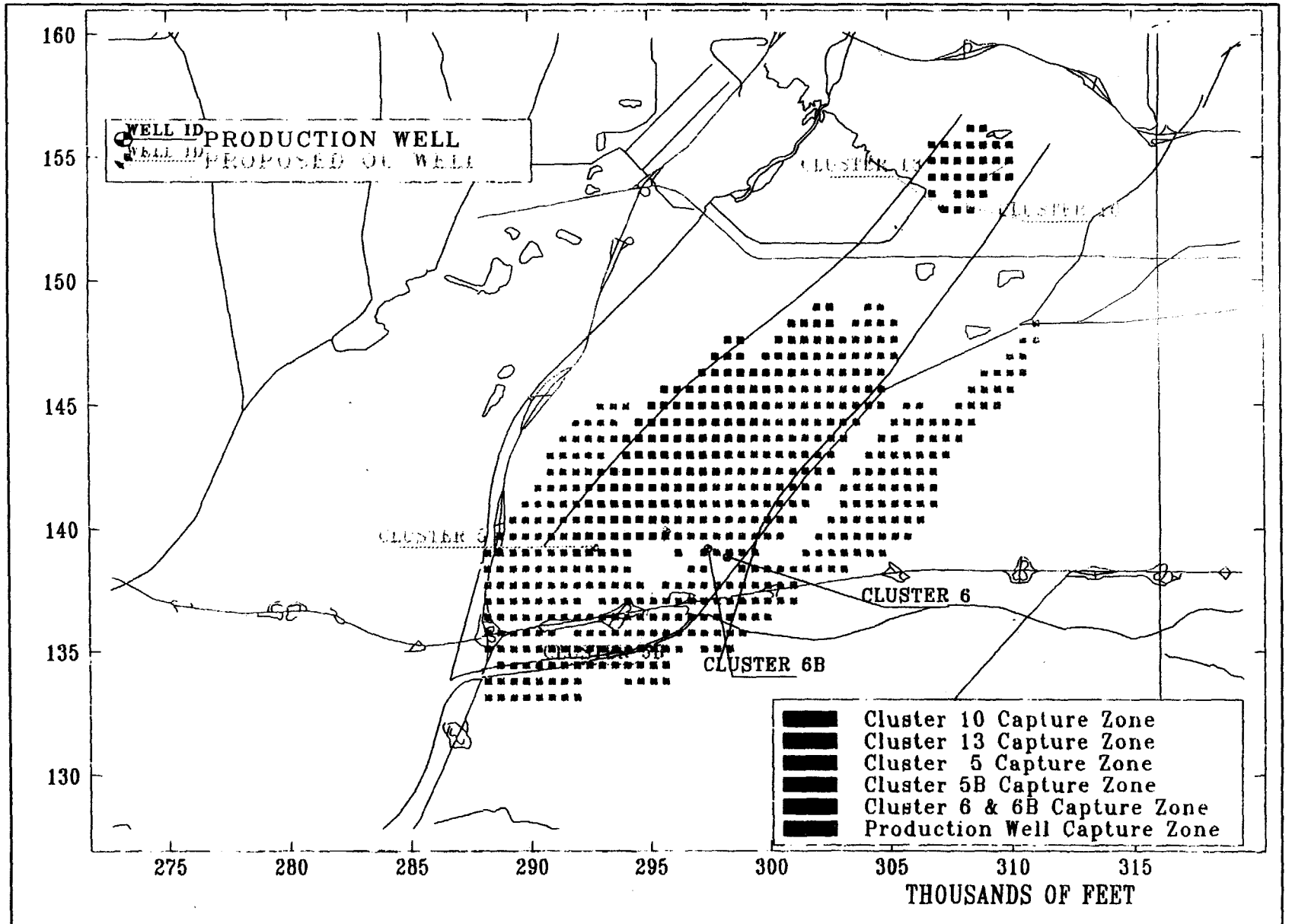
Seasonally Varying Pumping – Decrease Pumping Jul Aug Sep
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -150 ft MSL to Water Table

CDM
environmental engineers, scientists, planners, & management consultants



Seasonally Varying Pumping – Decrease Pumping Jul Aug Sep
Particles Started -150 Elevation
Approximate Extent of TCE >5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -250 ft MSL to +50 ft MSL

CDM
environmental engineers, scientists, planners, & management consultants



Seasonally Varying Pumping - Decrease Pumping Jul Aug Sep
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -350 ft MSL to -150 MSL

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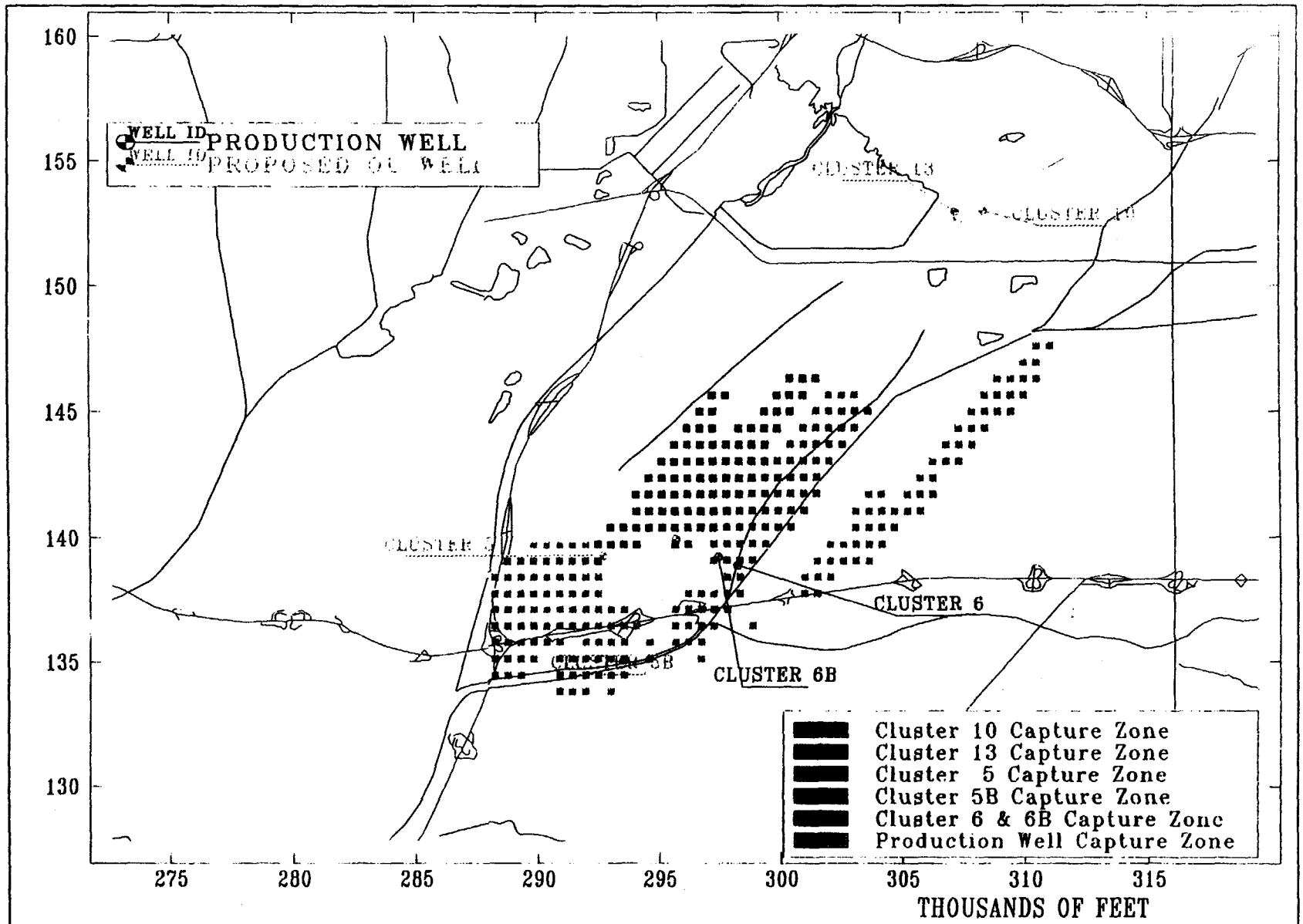

Seasonally Varying Pumping _ Decrease Pumping Jul Aug Sep
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations Below -350 ft MSL

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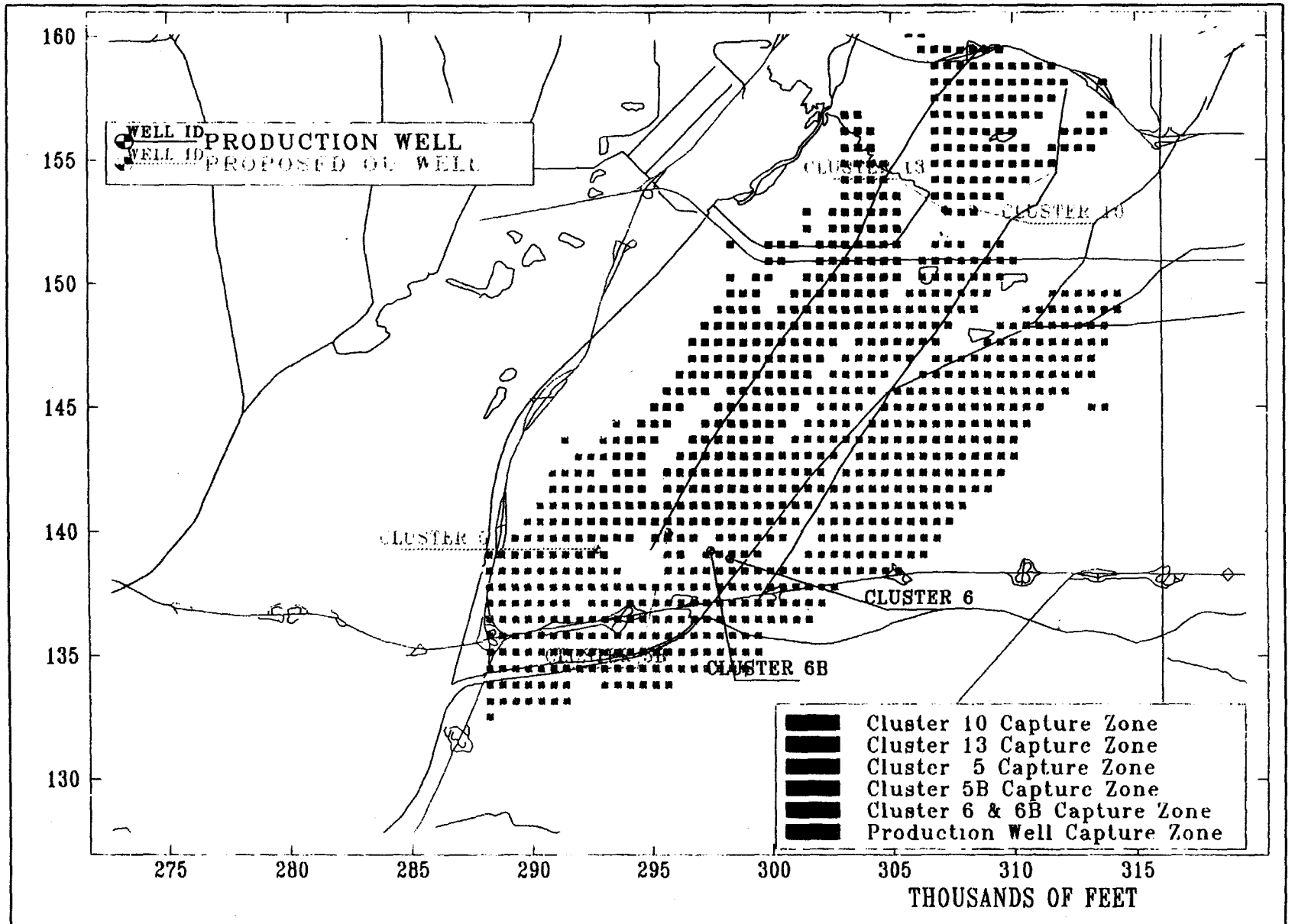

Seasonally Varying Pumping – Decrease Pumping Oct, Nov Dec
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from –150 ft MSL to Water Table

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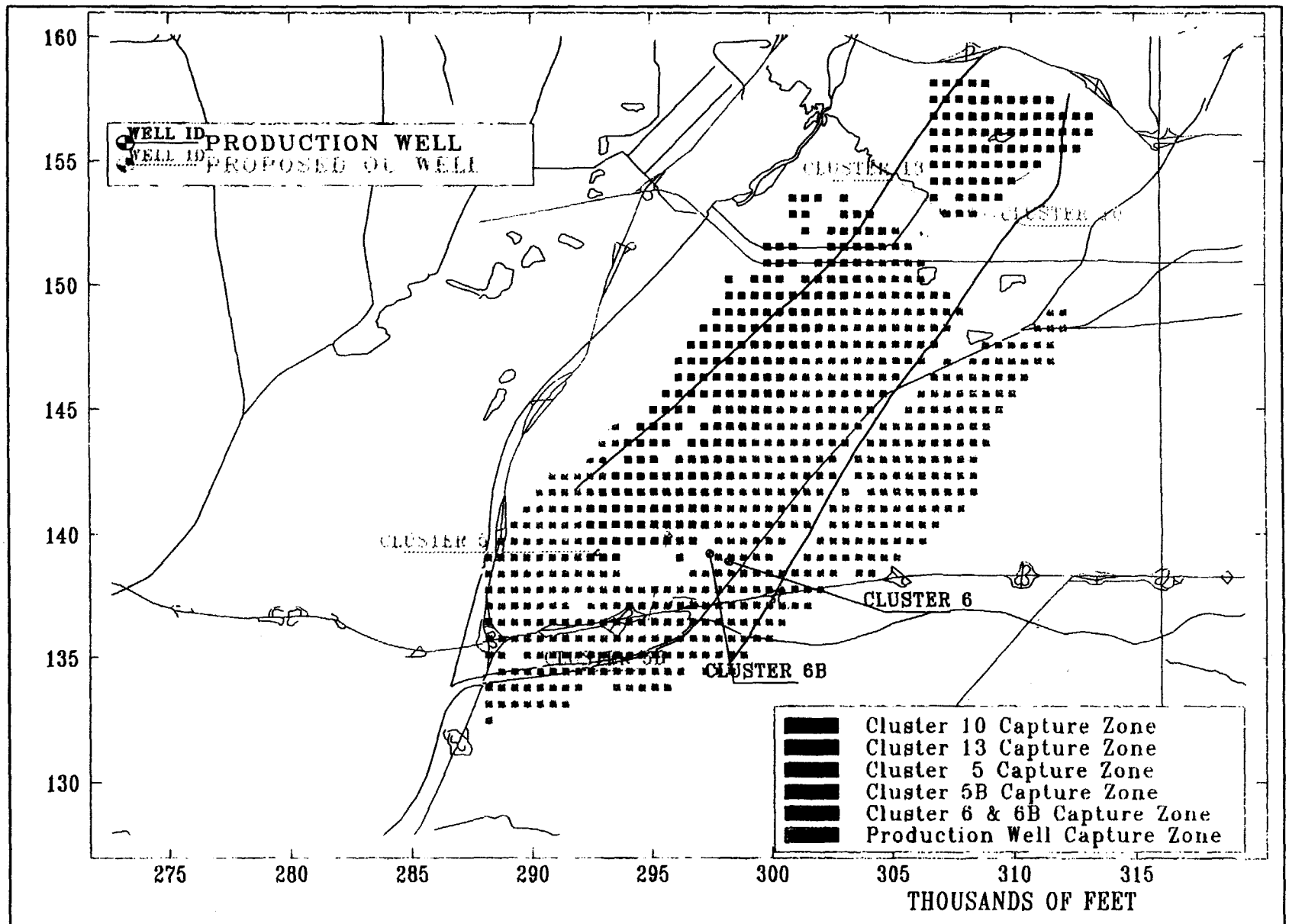

Seasonally Varying Pumping – Decrease Oct Nov Dec
Particles Started –150 Elevation
Approximate Extent of TCE >5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from –250 ft MSL to +50 ft MSL

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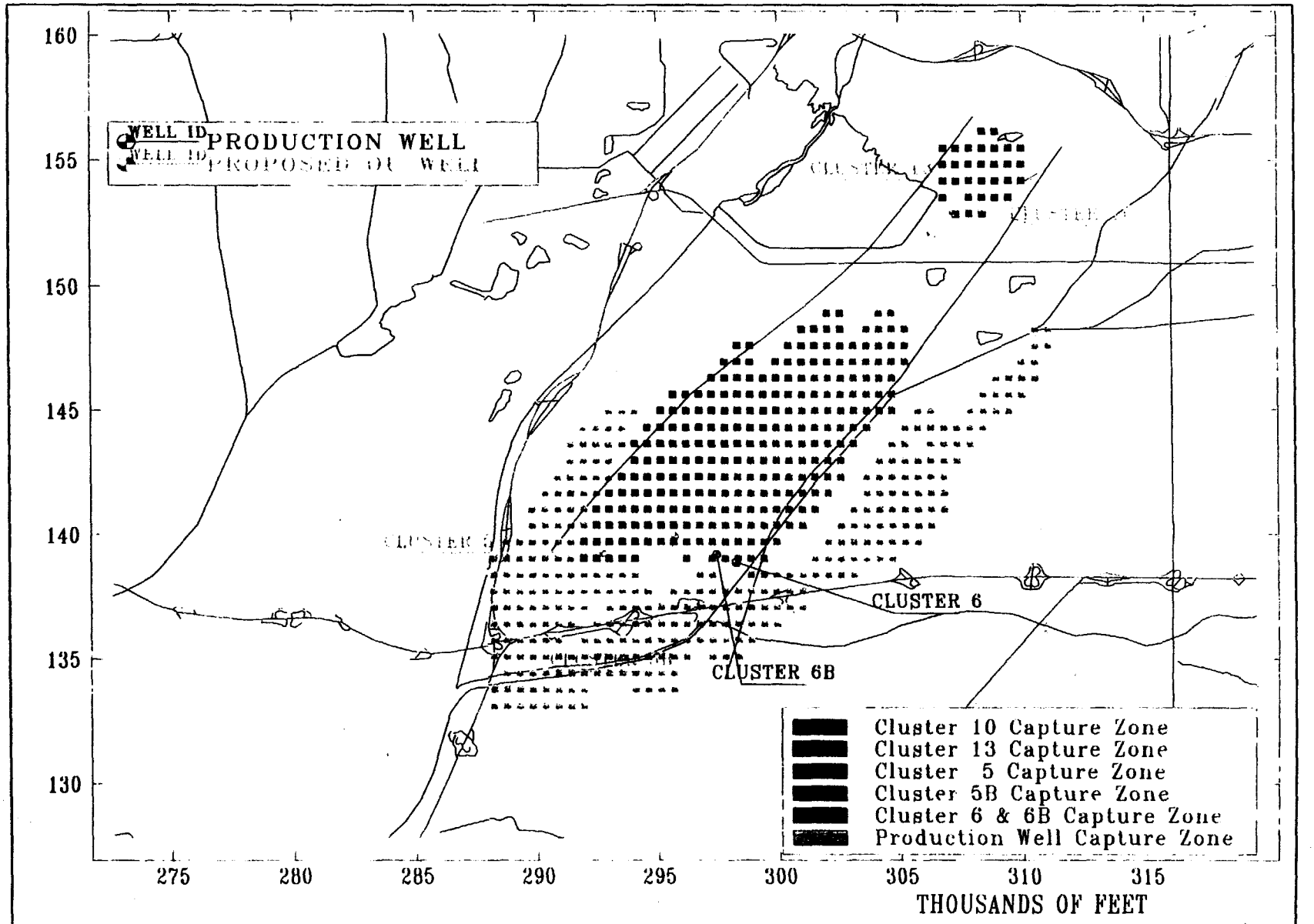

Seasonally Varying Pumping – Decrease Oct Nov Dec
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -350 ft MSL to -150 MSL

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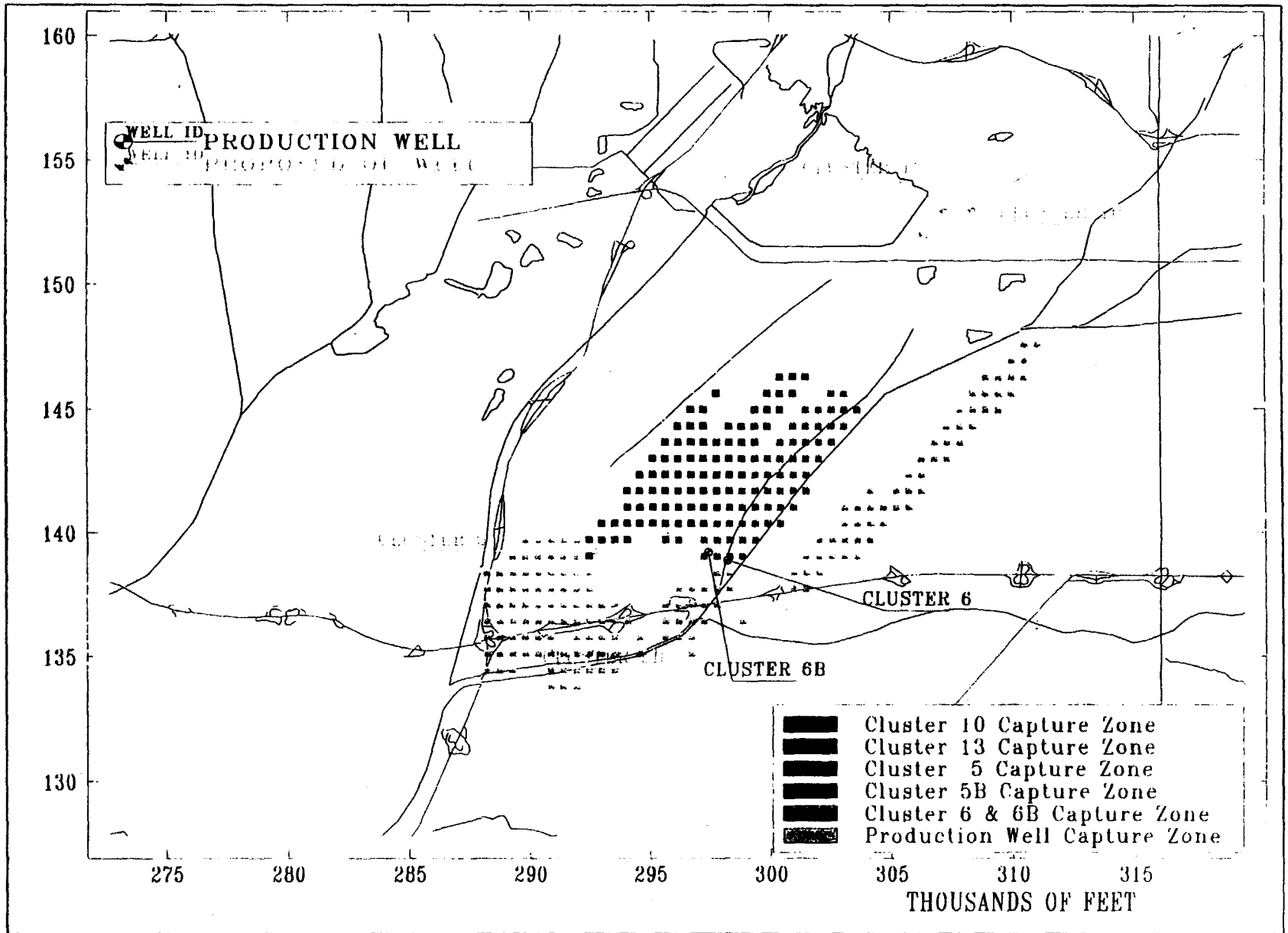

Seasonally Varying Pumping _ Decrease Pumping Oct Nov Dec
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations Below -350 ft MSL

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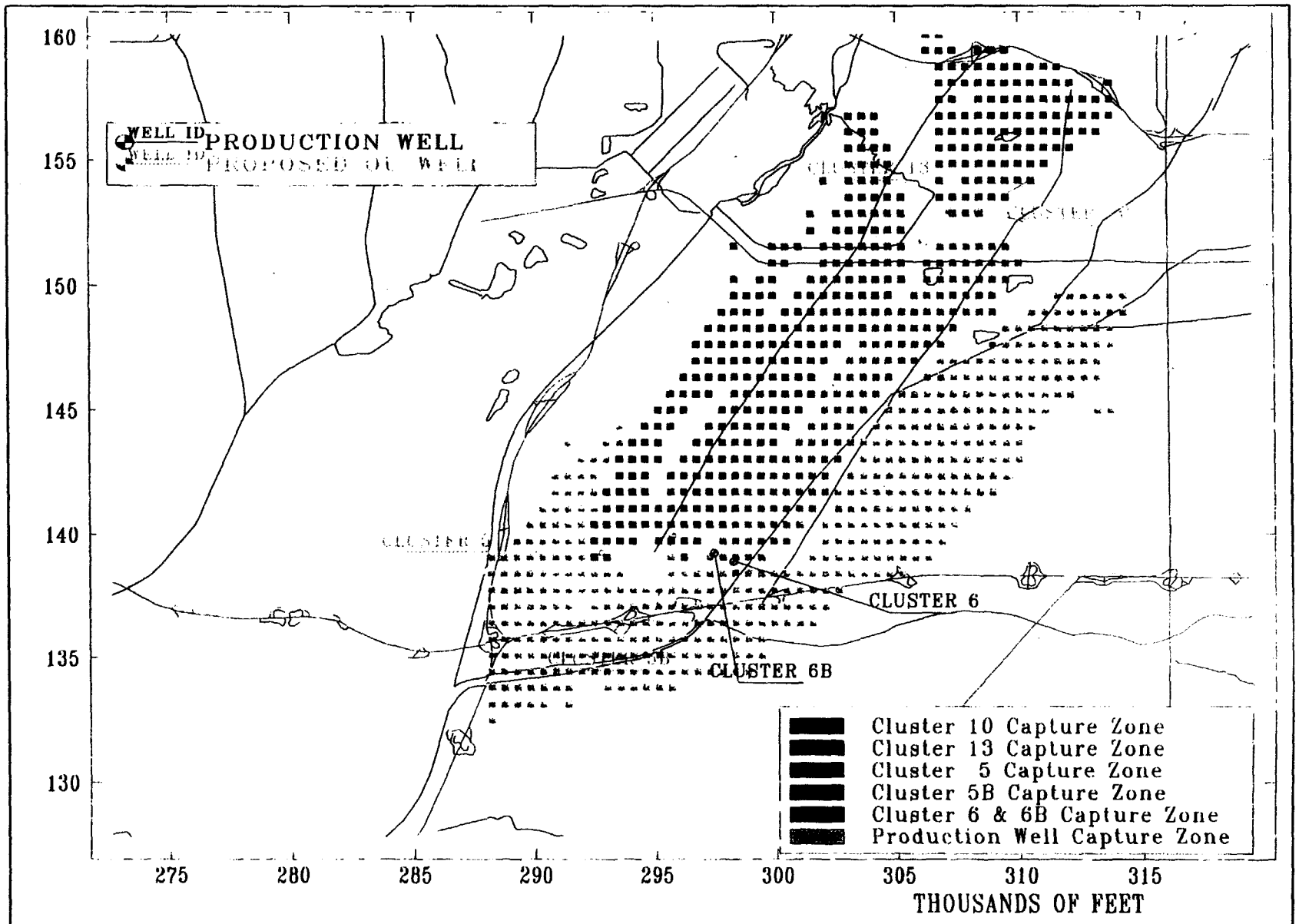

Revised Extraction Case 5 - No AZ-2 Pumping
Particles Started +50 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -150 ft MSL to Water Table

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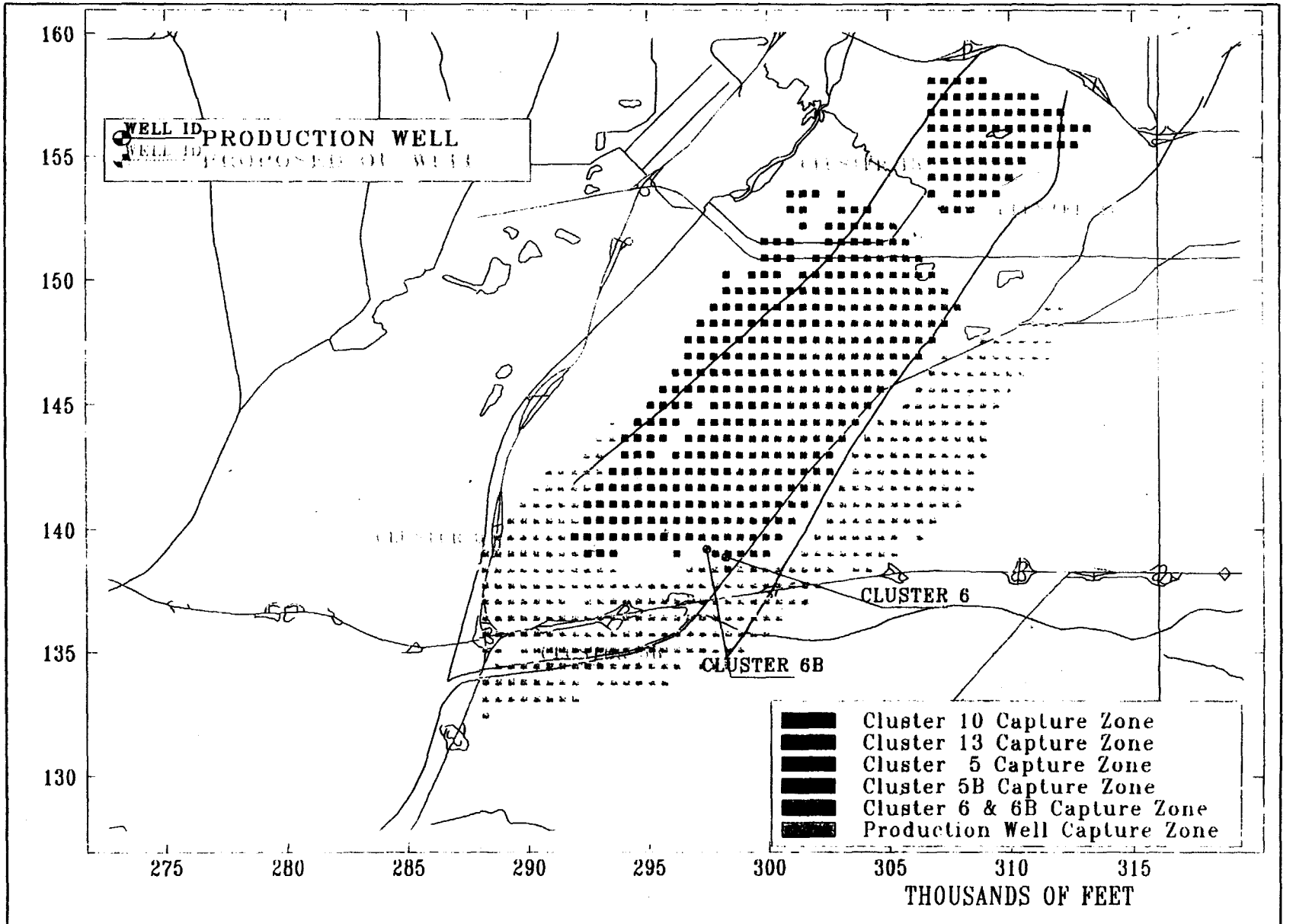
environmental engineers, scientists, planners, & management consultants



Revised Extraction Case 5 - No AZ-2 Pumping
Particles Started -150 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -250 ft MSL to +50 ft MSL

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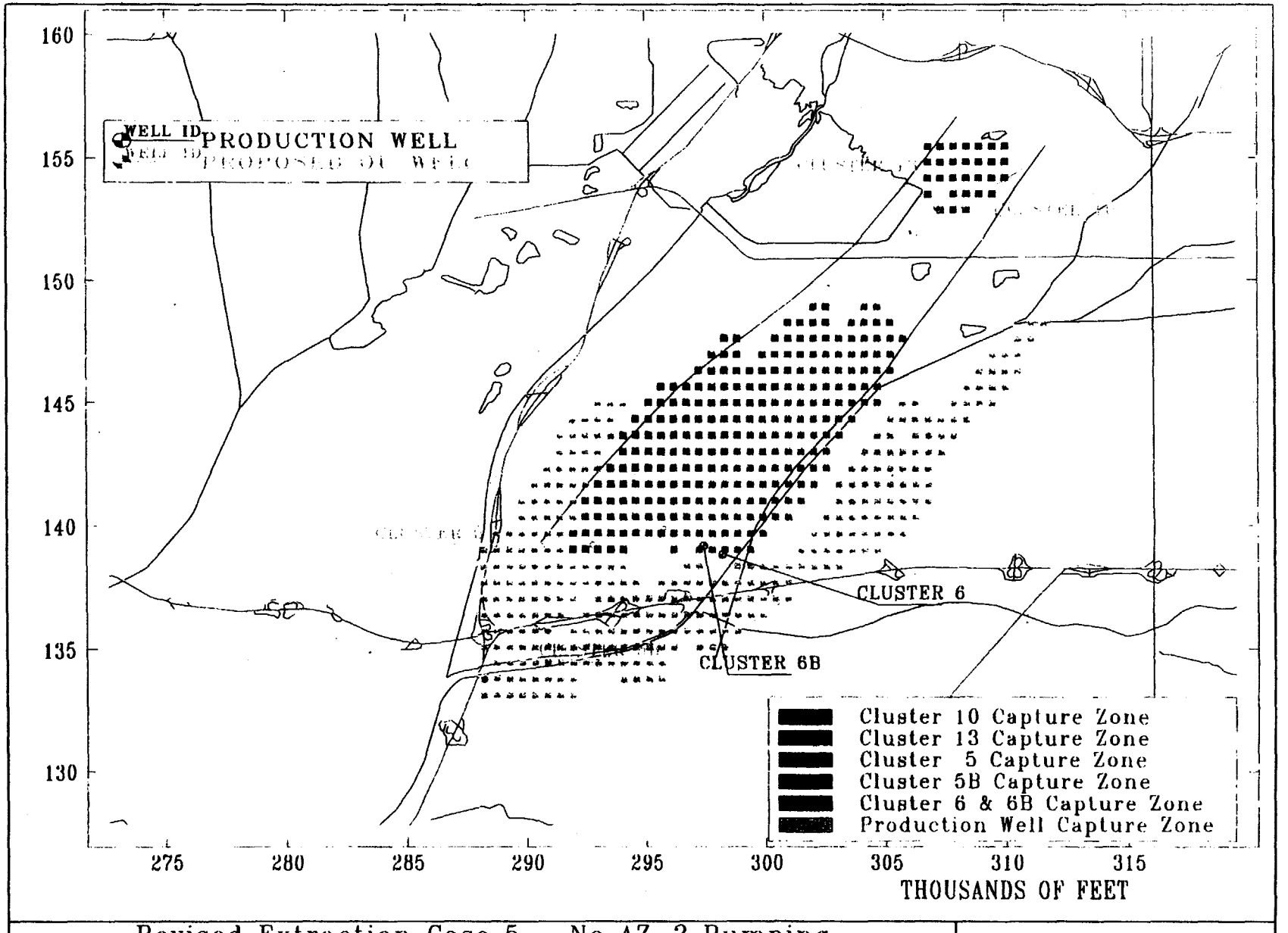
environmental engineers, scientists, planners, & management consultants



Revised Extraction Case 5 - No AZ-2 Pumping
Particles Started -300 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations from -350 ft MSL to -150 ft MSL

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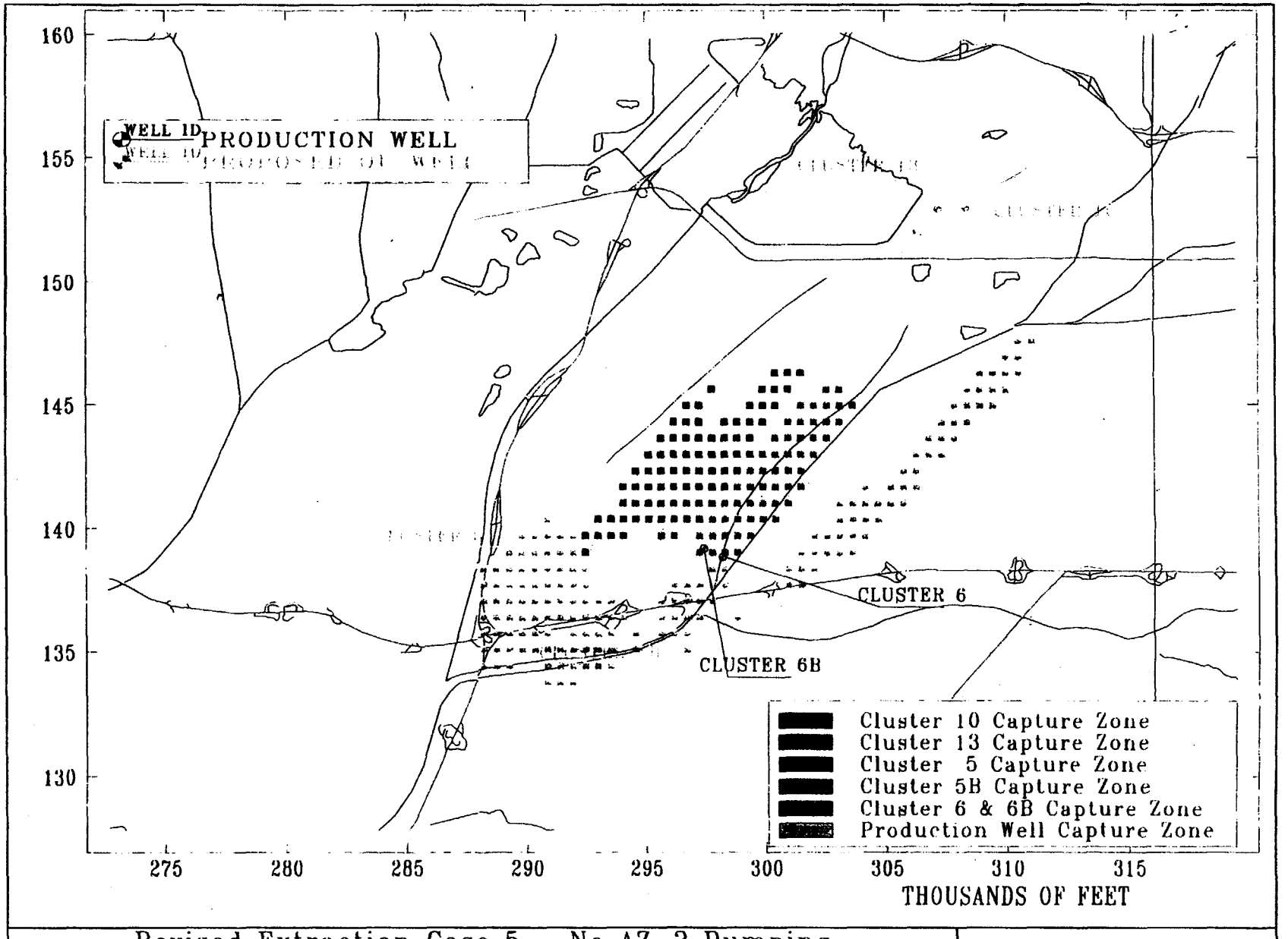

Revised Extraction Case 5 - No AZ-2 Pumping
Particles Started -500 Elevation
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Based Upon Observations Below -350 ft MSL

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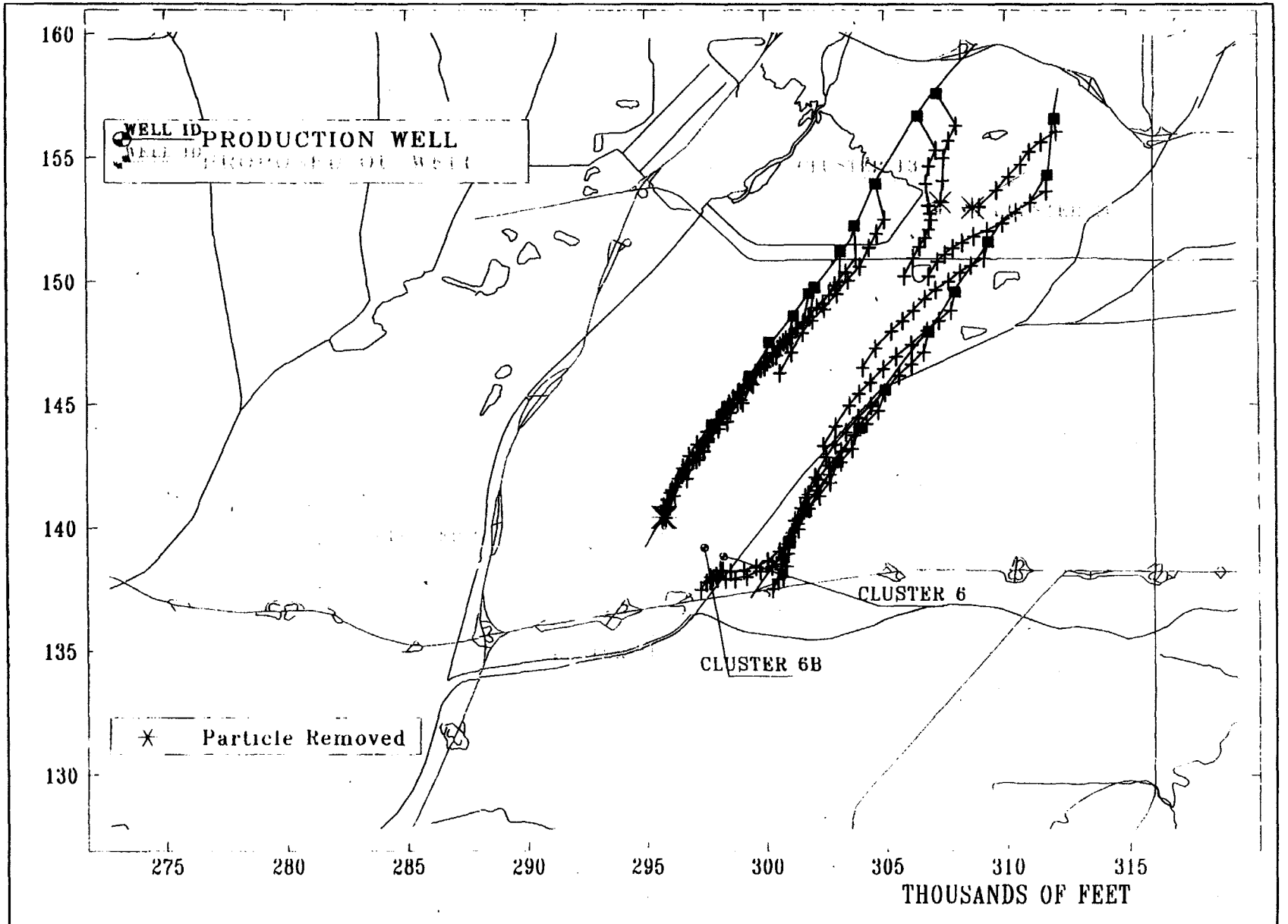

Remedial Extraction Case 5 - No AZ-2 Pumping
Representative 12 Year Particle Tracks at Elevation 50 ft MSL
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Baldwin Park Operable Unit Pre-Remedial Design

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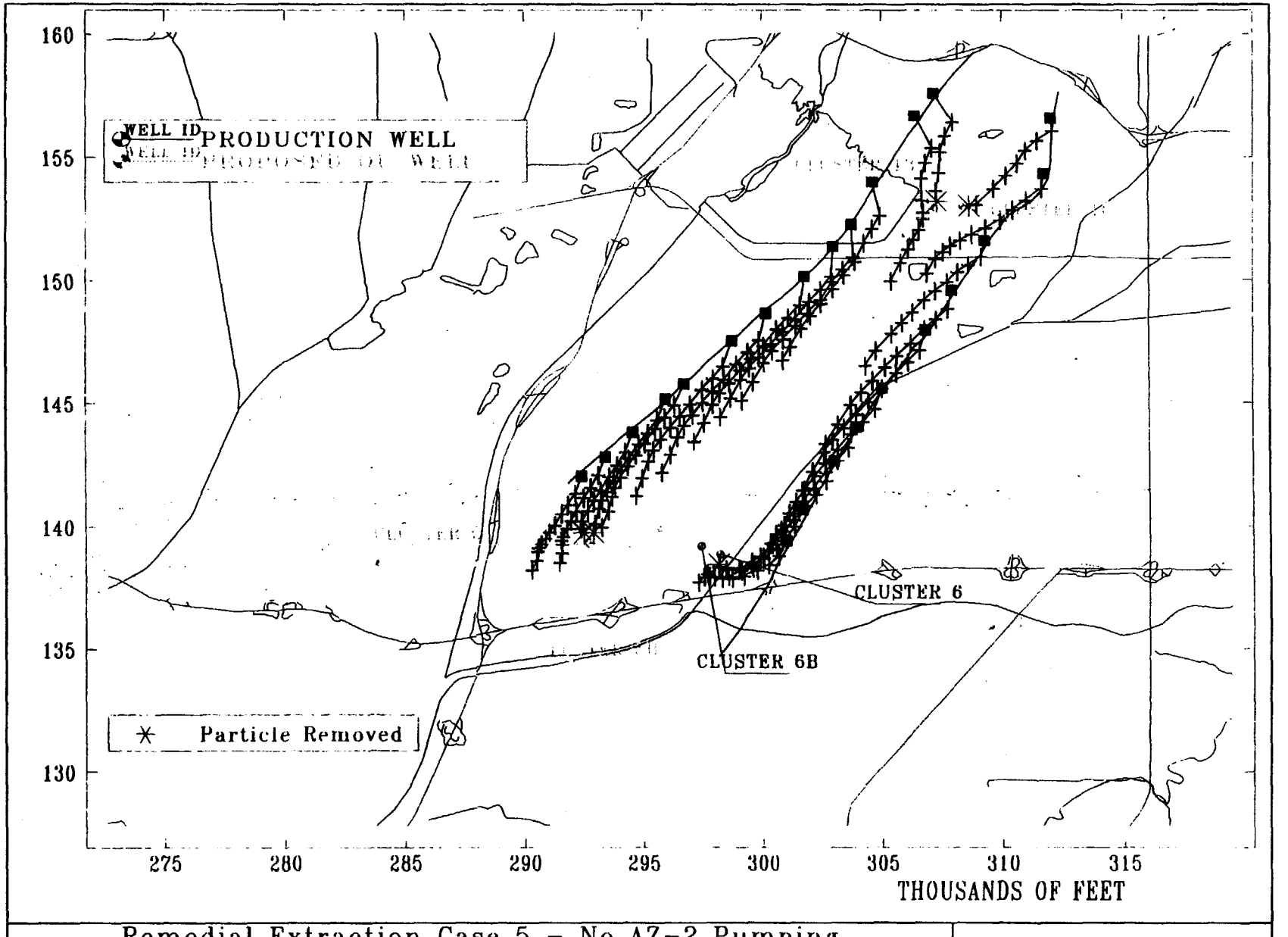

Remedial Extraction Case 5 - No AZ-2 Pumping
Representative 12 Year Particle Tracks at Elevation -150 ft MSL
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Baldwin Park Operable Unit Pre-Remedial Design

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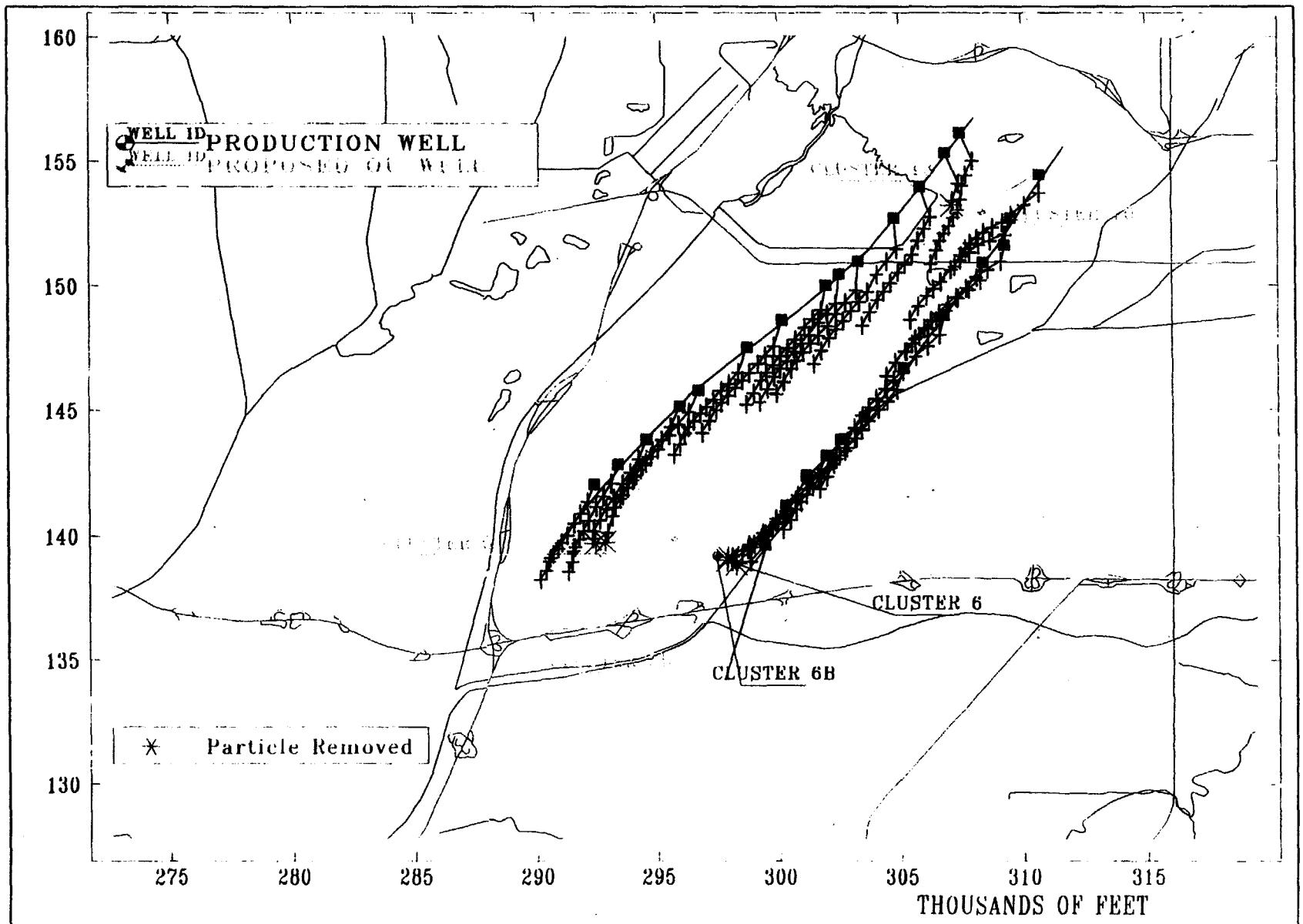

Remedial Extraction Case 5 - No AZ-2 Pumping
Representative 12 Year Particle Tracks at Elevation -300 ft MSL
Approximate Extent of TCE > 5 ppb and/or CCL > 0.5 ppb
Baldwin Park Operable Unit Pre-Remedial Design

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Appendix G

Quarterly Spreading Basin Applied Recharge Input Data

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Quarterly Spreading Basin Applied Recharge
(cubic feet per day)

Spreading Basin	1982-4Q	1983-1Q	1983-2Q	1983-3Q	1983-4Q	1984-1Q	1984-2Q	1984-3Q	1984-4Q	1985-1Q
Santa Fe S.G.	9400345.	14884890.	30943525.	5018595.	3456389.	4831095.	0.	0.	0.	4098319.
San Dimas S.G.	278509.	779482.	1246590.	625183.	712787.	407915.	42640.	0.	261408.	262909.
Little Dalton S.G.	0.	415320.	233578.	39785.	54014.	30686.	3630.	0.	21054.	23861.
Citrus S.G.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Forbes S.G.	16117.	202699.	324812.	203861.	204732.	48739.	30831.	823.	54111.	64953.
Big Dalton S.G.	81215.	495668.	756250.	109336.	209475.	151056.	3001.	10212.	41043.	78118.
Walnut Creek S.G.	192487.	282027.	382360.	245727.	416240.	258988.	232707.	157590.	64517.	111804.
Ben Lomond S.G.	699235.	518170.	714045.	290352.	1023176.	351239.	36978.	4888.	82425.	361306.
San Gabriel Canyon S.G.	831560.	1278534.	1457469.	991184.	1834989.	1572661.	525624.	44673.	267652.	1854349.
Buena Vista S.B.	267507.	138279.	70132.	178790.	199892.	138811.	107496.	32864.	92057.	69672.
Irwindale/Manning S.G.	435068.	474465.	467108.	0.	566861.	185033.	0.	0.	608146.	415320.
Peck Road S.B.	558100.	12893760.	8527596.	2465496.	3407360.	1065139.	109045.	211460.	1208113.	211121.
Eaton S.B.	0.	0.	0.	150863.	596675.	31315.	21490.	25216.	350077.	68389.
Sawpit S.G.	0.	0.	0.	241564.	0.	195197.	106625.	46222.	158897.	168335.
Santa Fe Diversion Channel	3157229.	3157229.	3157229.	3157229.	769802.	769802.	769802.	769802.	33638.	33638.
Whittier Narrows to Valley Boulevard	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Valley Boulevard to Santa Fe Dam	84700.	84700.	84700.	0.	84700.	0.	0.	0.	0.	0.
Santa Fe Dam to Foothill Boulevard	2260280.	2260280.	2260280.	2260280.	692459.	692459.	692459.	692459.	971243.	971243.
Foothill Boulevard to Morris Dam	1512500.	1512500.	1512500.	1512500.	639412.	639412.	639412.	639412.	1092316.	1092316.

Quarterly Spreading Basin Applied Recharge (cont)
(cubic feet per day)

Spreading Basin	1985-2Q	1985-3Q	1985-4Q	1986-1Q	1986-2Q	1986-3Q	1986-4Q	1987-1Q	1987-2Q	1987-3Q
Santa Fe S.G.	0.	1042197.	11048270.	10142705.	0.	0.	3343472.	6522870.	1681900.	0.
San Dimas S.G.	0.	41818.	0.	226851.	165528.	0.	143796.	172788.	23426.	0.
Little Dalton S.G.	11471.	0.	0.	140892.	28992.	0.	1065.	3920.	0.	0.
Citrus S.G.	0.	0.	0.	120903.	109965.	25313.	23716.	83054.	7405.	0.
Forbes S.G.	52514.	41721.	27878.	179564.	469964.	580316.	278687.	39543.	402301.	551276.
Big Dalton S.G.	31605.	0.	0.	159865.	53143.	6631.	0.	159865.	67663.	0.
Walnut Creek S.G.	0.	208023.	424468.	424952.	54208.	84700.	202796.	178112.	312180.	139392.
Ben Lomond S.G.	70228.	0.	206232.	890173.	589948.	70664.	328975.	278252.	4211.	0.
San Gabriel Canyon S.G.	3076498.	287060.	962434.	2006132.	2110192.	971533.	168771.	1596038.	385119.	20909.
Buena Vista S.B.	11180.	12245.	105512.	136972.	105028.	53724.	28024.	48981.	17327.	23716.
Irwindale/Manning S.G.	0.	0.	378004.	1087064.	2269960.	1969880.	633508.	332169.	1458340.	1979996.
Peck Road S.B.	55370.	384635.	754120.	2853519.	89346.	437246.	164415.	230965.	63694.	44286.
Eaton S.B.	0.	27201.	129857.	881461.	75746.	60403.	64324.	188470.	49078.	81118.
Sawpit S.G.	65388.	0.	68147.	323602.	118386.	28701.	63065.	64033.	58661.	0.
Santa Fe Diversion Channel	33638.	33638.	310099.	310099.	310099.	310099.	13455.	13455.	13891.	13891.
Whittier Narrows to Valley Boulevard	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Valley Boulevard to Santa Fe Dam	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Santa Fe Dam to Foothill Boulevard	971243.	971243.	1418846.	1418846.	1418846.	1418846.	513040.	513040.	513040.	513040.
Foothill Boulevard to Morris Dam	1092316.	1092316.	738028.	738028.	738028.	738028.	1432688.	1432710.	1432688.	1432688.

Quarterly Spreading Basin Applied Recharge (cont)
(cubic feet per day)

Spreading Basin	1987-4Q	1988-1Q	1988-2Q	1988-3Q	1988-4Q	1989-1Q	1989-2Q	1989-3Q	1989-4Q	1990-1Q
Santa Fe S.G.	2751056.	6456075.	46851.	0.	3378030.	8767175.	1106182.	0.	0.	2514864.
San Dimas S.G.	39301.	80150.	208507.	46077.	24926.	285608.	23668.	0.	0.	8857.
Little Dalton S.G.	28266.	30347.	16359.	0.	0.	43657.	2517.	0.	0.	5421.
Citrus S.G.	82716.	75504.	73132.	3727.	78166.	63549.	15730.	10648.	19312.	43076.
Forbes S.G.	64517.	73229.	312567.	545468.	64517.	73229.	312567.	249744.	110836.	56628.
Big Dalton S.G.	18344.	68728.	60936.	1646.	1258.	102947.	13600.	3049.	0.	0.
Walnut Creek S.G.	232320.	178209.	204732.	203280.	402494.	149266.	158607.	147959.	167464.	211508.
Ben Lomond S.G.	138279.	361548.	885720.	323651.	60936.	69115.	41672.	3436.	0.	111320.
San Gabriel Canyon S.G.	972840.	1769020.	2509056.	1194996.	1664960.	1208548.	694540.	517396.	1326644.	2663936.
Buena Vista S.B.	251061.	201901.	177744.	114234.	21683.	15972.	8809.	7938.	51256.	68723.
Irwindale/Manning S.G.	353078.	538692.	440440.	457864.	352836.	220026.	188954.	273944.	171336.	211992.
Peck Road S.B.	533078.	450507.	1974478.	49271.	431728.	386038.	62872.	43608.	43270.	439182.
Eaton S.B.	254584.	190454.	119984.	41527.	178402.	176031.	15101.	44528.	45496.	271524.
Sawpit S.G.	123952.	161946.	1258.	9293.	74197.	160543.	57596.	0.	18392.	101156.
Santa Fe Diversion Channel	0.	97.	484000.	290.	0.	0.	145684.	0.	0.	0.
Whittier Narrows to Valley Boulevard	0.	0.	0.	0.	0.	0.	0.	0.	2372762.	6451236.
Valley Boulevard to Santa Fe Dam	0.	66308.	48.	214896.	117128.	351868.	0.	0.	0.	108416.
Santa Fe Dam to Foothill Boulevard	142780.	159720.	48400.	196020.	206958.	1202740.	902660.	695508.	1144466.	275493.
Foothill Boulevard to Morris Dam	1960200.	1939872.	1965282.	412610.	1114168.	1968428.	1001154.	530706.	1101632.	1873080.

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Quarterly Spreading Basin Applied Recharge (cont)
(cubic feet per day)

Spreading Basin	1990-2Q	1990-3Q	1990-4Q	1991-1Q	1991-2Q	1991-3Q	1991-4Q	1992-1Q	1992-2Q	1992-3Q
Santa Fe S.G.	2551164.	1514920.	1277760.	1072544.	1485880.	3142612.	0.	9781640.	11625680.	2541000.
San Dimas S.G.	52611.	0.	0.	320795.	639364.	11713.	1162.	375245.	534336.	238806.
Little Dalton S.G.	58.	0.	0.	62920.	19360.	0.	387.	174966.	96074.	271427.
Citrus S.G.	387.	2517.	6373.	88572.	34364.	2904.	25410.	101156.	75988.	2623.
Forbes S.G.	377036.	230384.	145200.	176176.	141328.	108900.	132616.	98252.	135036.	105996.
Big Dalton S.G.	0.	0.	0.	66792.	76811.	0.	0.	164560.	36784.	0.
Walnut Creek S.G.	132132.	133100.	57451.	208120.	191180.	135036.	27927.	440440.	232320.	108416.
Ben Lomond S.G.	90653.	2565.	32428.	80150.	228932.	208120.	79376.	424468.	743908.	419144.
San Gabriel Canyon S.G.	837804.	131164.	0.	1439416.	1039148.	1486364.	632588.	1902120.	2081200.	1495076.
Buena Vista S.B.	64469.	65398.	59435.	170562.	50626.	97574.	75552.	105028.	9680.	0.
Irwindale/Manning S.G.	73084.	0.	3243.	279578.	612260.	2245712.	7148680.	3116960.	5415960.	4297920.
Peck Road S.B.	130874.	4646.	20860.	1310285.	99026.	2063969.	712448.	6058230.	3722783.	266248.
Eaton S.B.	80876.	39204.	38236.	420112.	32912.	33396.	148588.	668404.	182468.	33106.
Sawpit S.G.	45012.	13068.	0.	156332.	50336.	16843.	13068.	301048.	229900.	45012.
Santa Fe Diversion Channel	0.	0.	0.	0.	0.	3004333.	141328.	319440.	2931104.	2296580.
Whittier Narrows to Valley Boulevard	4362243.	5320612.	5100296.	14086431.	1223891.	2868910.	6951402.	17296416.	1605089.	2700042.
Valley Boulevard to Santa Fe Dam	0.	0.	0.	1924432.	142296.	5430480.	1286956.	9689680.	8779760.	3557400.
Santa Fe Dam to Foothill Boulevard	127824.	179564.	33396.	495616.	219736.	1648988.	131648.	3347828.	3453340.	1135948.
Foothill Boulevard to Morris Dam	878436.	2815501.	1151460.	1993838.	765954.	3996146.	449757.	1611478.	1142240.	1108699.

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Quarterly Spreading Basin Applied Recharge (cont)
(cubic feet per day)

Spreading Basin	1992-4Q	1993-1Q	1993-2Q	1993-3Q	1993-4Q	1994-1Q	1994-2Q
Santa Fe S.G.	3563692.	12696770.	15250840.	4075280.	3441240.	0.	6640480.
San Dimas S.G.	86636.	597256.	712932.	71632.	168916.	299596.	183436.
Little Dalton S.G.	0.	565796.	170368.	4550.	145.	20957.	4840.
Citrus S.G.	121000.	790856.	463672.	476740.	570152.	329120.	26620.
Forbes S.G.	89540.	177144.	340252.	364452.	114224.	154880.	36784.
Big Dalton S.G.	0.	111804.	180048.	23426.	0.	16311.	52272.
Walnut Creek S.G.	498036.	305404.	540628.	138424.	136004.	29040.	169884.
Ben Lomond S.G.	953964.	603064.	536756.	703736.	863940.	541596.	484968.
San Gabriel Canyon S.G.	1519276.	1013012.	115192.	217316.	0.	0.	476740.
Buena Vista S.B.	76956.	118580.	16940.	2904.	34848.	60500.	8228.
Irwindale/Manning S.G.	1795640.	2400640.	2032800.	1611720.	1186526.	1038180.	900724.
Peck Road S.B.	1149016.	1465552.	1598652.	293304.	515460.	454960.	151008.
Eaton S.B.	151492.	654368.	173272.	38236.	85910.	82764.	4356.
Sawpit S.G.	113740.	509168.	496100.	220220.	182468.	103382.	160688.
Santa Fe Diversion Channel	387200.	484000.	314600.	275880.	469480.	0.	0.
Whittier Narrows to Valley Boulevard	3214244.	4356000.	3341536.	553212.	564828.	145200.	0.
Valley Boulevard to Santa Fe Dam	5739757.	10398741.	5303672.	3037101.	363968.	475288.	283140.
Santa Fe Dam to Foothill Boulevard	2594240.	3978964.	2811556.	2273348.	2655708.	713900.	4323572.
Foothill Boulevard to Morris Dam	2341108.	5657960.	3450920.	1669316.	607178.	178596.	674696.

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