

SECTION 2

Second, Third, and Fourth Quarter 1997 Sampling Events

2.1 Description of Activities

Field sampling procedures followed the revised project Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) (EPA, 1995a and 1995b, respectively). Water levels were measured in each well immediately after accessing the well and prior to sampling. Measurements were also recorded to the nearest 0.01-foot, using an electronic sounder, by the City of Los Angeles Department of Water and Power (LADWP) and incorporated into the database. These values are presented in Table 2-1.

Well purging consisted of removing between three and five well volumes of water at a flow rate between 5 and 12 gallons per minute (gpm) and using the dedicated electric pumps. During purging, pH, temperature, electrical conductivity, and turbidity of the groundwater were measured over time (Table 2-2) to ensure that these parameters stabilized prior to sampling. Following purging, flow rates were lowered to approximately 1 gpm to minimize aeration prior to sampling. Purge water was collected in a vacuum truck and transported to a central location.

Samples were collected in appropriate containers from polyethylene tubing attached to an adjustable sampling valve. Samples were stored in coolers packed with ice and were shipped the day of sampling by overnight carrier to a laboratory designated by EPA's Contract Laboratory Program (CLP).

During the second and third quarter 1997 sample events, analytical parameters consisted of VOCs and N-nitrate/nitrite. Samples were also collected and submitted for methyl tertiary butyl ethylene (MTBE) analysis during the third quarter. In addition, samples were collected from selected (predominantly shallow cluster wells and VPBs) RI monitoring wells and submitted for 1,4-dioxane analysis during the third quarter. During the fourth quarter (annual) 1997 sample event, analytical parameters consisted of VOCs, metals, nitrate/nitrite, and additional general water chemistry parameters (chloride, sulfate, hardness, total alkalinity, total dissolved solids [TDS], and total organic carbon [TOC]). Samples collected during the second and third quarter sample events were analyzed through EPA's CLP. Samples collected during the fourth quarter sample event were analyzed through CH2M HILL'S Quality Analytical Laboratory Services (QAL). Modifications to the SAP during 1995 eliminated sample collection and analyses for semivolatile organic compounds (SVOCs) and radionuclides (CH2M HILL, 1995c).

State of California and federal maximum contaminant levels (MCLs) are listed in Table 2-3; Table 2-4 specifies the methods by which the parameters were analyzed and their respective target detection limits. Chain-of-custody procedures and sample documentation were conducted as outlined in the SAP and QAPP. Copies of chain-of-custody documentation for the second, third, and fourth quarter sample events are provided in Appendix D.

2.1.1 Second Quarter

During the second quarter, 51 monitoring wells were sampled. These quarterly monitoring wells consist of 28 VPBs and 23 cluster wells. A total of 65 samples were collected and analyzed,

including samples representing quality control (QC) samples (field blanks, laboratory blanks, and field duplicates). Samples collected by CH2M HILL were analyzed for VOCs, nitrate, and nitrite through EPA's CLP.

Purge water was collected in a vacuum truck at each monitoring well location where historic VOC concentration exceeded the MCL. The purge water was transported to the staging area at LADWP's Headworks Spreading Grounds and containerized in Baker tanks for disposal at a later date. Approximately 10,685 gallons of purge water were collected during the second quarter event.

2.1.2 Third Quarter

During the third quarter, 51 monitoring wells were sampled. These quarterly monitoring wells consist of 28 VPBs and 23 cluster wells. A total of 65 samples were collected and analyzed, including samples representing quality control (QC) samples (field blanks, laboratory blanks, and field duplicates). Samples collected by CH2M HILL were analyzed for VOCs, nitrate and nitrite, MTBE, and 1,4-dioxane through EPA's CLP.

Purge water was collected in a vacuum truck at each monitoring well location where historic VOC concentration exceeded the MCL. The purge water was transported to the staging area at LADWP's Headworks Spreading Grounds, and containerized in Baker tanks for disposal at a later date. Approximately 10,561 gallons of purge water were collected during the third quarter event.

2.1.3 Fourth Quarter

The fourth quarter 1997 sample event was designated as an annual event during which 61 RI monitoring wells were scheduled for sampling. A total of 57 monitoring wells were sampled. These monitoring wells consist of 31 VPBs and 26 cluster wells. A total of 73 samples were collected and analyzed, including 19 samples representing QC samples (field blanks, laboratory blanks, and field duplicates). During the fourth quarter sample event, approximately 12,508 gallons of purge water were collected and transported by vacuum truck to LADWP's Headworks Spreading Ground staging area.

Four additional monitoring wells that were scheduled to be included in this event were not sampled. Monitoring wells NH-VPB-13 and PO-VPB-10 were not sampled due to inoperable pumps. One monitoring well, NH-VPB-10, was not located due to repaving operations conducted by the City of Los Angeles; and, one monitoring well, PO-C02-53, was destroyed by construction of a new sidewalk.

2.2 Analytical Results

2.2.1 Second Quarter

Reported concentrations of TCE ranged from not detected to a high of 6,500 micrograms/liter ($\mu\text{g/L}$) during the second quarter. Thirty-three of the 51 RI

monitoring wells exhibited sample concentrations of TCE greater than the MCL of 5 $\mu\text{g/L}$. Thirteen of the wells had TCE concentrations greater than 100 $\mu\text{g/L}$, including two wells (CS-VPB-07 and CS-C03-100) with a concentration over 1,000 $\mu\text{g/L}$ (6,500 $\mu\text{g/L}$ and 3,800 $\mu\text{g/L}$, respectively).

Concentrations of PCE during the second quarter sampling event ranged from not detected to a high of 210 $\mu\text{g/L}$ (CS-C02-335). Of the 51 RI monitoring wells sampled, 26 had concentrations exceeding

the MCL of 5 µg/L. Five monitoring wells (CS-C01-105, CS-C01-285, CS-C02-250, CS-C02-335 and NH-VPB-01) exhibited concentrations of 100 µg/L or greater.

Nitrate (as NO₃) ranged from 4.0 mg/L at CS-C03-465 to 86.4 mg/L at NH-VPB-06. Fourteen of the 51 RI monitoring wells sampled during the second quarter exceeded the nitrate MCL of 45 mg/L (as NO₃).

Table 2-5 presents a summary table of TCE, PCE, and nitrate data from the second quarter sampling event. A complete listing of these data, as well as other VOCs for the second quarter sampling event, is located in Appendix E. Results of analyses of duplicates and field blanks for this sampling event are found in Appendix F.

2.2.2 Third Quarter

Reported concentrations of TCE ranged from not detected to a high of 7,200 µg/L during the third quarter. Thirty-three of the 51 RI monitoring wells exhibited sample concentrations of TCE greater than the MCL of 5 µg/L. Fourteen of the wells had TCE concentrations greater than 100 µg/L, including two wells (CS-VPB-07 and CS-C03-100) with a concentration over 1,000 µg/L (7,200 µg/L and 3,600 µg/L, respectively).

Concentrations of PCE during the third quarter sampling event ranged from not detected to a high of 260 µg/L (CS-C01-105). Of the 51 RI monitoring wells sampled, 25 had concentrations exceeding the MCL of 5 µg/L. Four monitoring wells (CS-C01-105, CS-C01-285, CS-C02-335 and NH-VPB-01) exhibited concentrations of 100 µg/L or greater.

During the third quarter, MTBE was detected at 2 monitoring wells (PO-C03-182 and PO-C03-235) with concentrations of 7 µg/L and 2 µg/L, respectively. 1,4-dioxane was detected at 6 monitoring wells with a maximum concentration of 29 µg/L at CS-C03-100. The remaining five wells exhibited concentrations less than 2 µg/L.

Nitrate (as NO₃) ranged from 4.1 mg/L at CS-C03-465 to 78.8 mg/L at NH-VPB-06. Eleven of the 57 RI monitoring wells sampled during the third quarter exceeded the nitrate MCL of 45 mg/L (as NO₃).

Table 2-6 presents a summary table of TCE, PCE, and nitrate data from the third quarter sampling event. A complete listing of these data, as well as other VOCs for the third quarter sampling event, is located in Appendix E. Results of analyses of duplicates and field blanks for this sampling event are found in Appendix F.

2.2.3 Fourth Quarter

In the 57 RI monitoring wells sampled during the fourth quarter sampling event, TCE concentrations ranged from not detected to 6,400 µg/L. Thirty-one of the wells had reported concentrations of TCE exceeding 5 µg/L (the MCL), including 10 with concentrations over 100 µg/L. Of these monitoring wells, two were over 1,000 µg/L (CS-VPB-07 with 6,400 µg/L and CS-C03-100 with 2,900 µg/L).

Reported concentrations of PCE ranged from not detected at 6 monitoring wells to a high of 130 µg/L at CS-C02-335. Twenty-six wells had concentrations above the detection limit but below the MCL. Concentrations of PCE above the MCL of 5 µg/L were reported in 25 of the 57 monitoring wells sampled during the fourth quarter event. Two of the wells (CS-C01-105 and CS-C02-335) had PCE concentrations above 100 µg/L. All of the monitoring wells exceeding the MCL for PCE also exceed the MCL for TCE with the exception of CS-VPB-10, CS-VPB-11, NH-C01-325, and NH-VPB-07.

During the fourth quarter, nitrate (as NO₃) concentrations ranged from 4.0 mg/L at CS-C03-465 to 65.4 mg/L at NH-VPB-14. Eighteen of the 57 wells sampled during this event exhibited concentrations greater than the MCL of 45 mg/L

TCE, PCE, and nitrate data from the fourth quarter sample event are presented in Table 2-7. Table 2-8 presents the results of the general water chemistry during the fourth quarter 1995. Additional VOCs detected at RI monitoring wells are reported in Section 4. Appendix E summarizes the complete analytical results for the wells sampled during the fourth quarter. Results of duplicate samples and field blanks for the fourth quarter sampling event are presented in Appendix F.

Dissolved metals exceeding primary and secondary MCLs were observed in 20 RI monitoring wells during the fourth quarter of 1997 (Table 2-9). Chromium exceeding the MCL was observed in one well (CS-VPB-04), consistent with previous annual events. Iron exceeded the secondary MCL of 300 mg/L in three wells (CS-VPB-09, PO-C03-325, and PO-VPB-05) during the fourth quarter of 1997. Four wells (CS-C02-180, PO-C02-205, PO-VPB-05 and PO-VPB-08) exceeded the secondary MCL of 50 mg/L for manganese. A total of 18 RI monitoring wells exceeded the MCL of 6 µg/L for antimony, with a maximum of 46.9 µg/L at NH-VPB-01 (Table 2-9).