

Summary of 2000 Sampling Program and Discussion of Fourth Quarter 2000 Results

3.1 Comparison of Water Levels

Water levels were measured at each RI monitoring well sampled during each quarterly sampling event. A comparison of depth to water below ground surface (bgs) and groundwater elevations at the time of the quarterly samplings is provided in Table 2-1. Additionally, these measurements are incorporated into the GIS database, converted to elevations above mean sea level (MSL), and presented as hydrographs (Figure 3-1).

During the first quarter, water levels in the Crystal Springs (Area 2), Verdugo (Area 3), and Pollock (Area 4) showed drops on the order of 2 to 9 feet compared to the fourth quarter of 1999. In North Hollywood (Area 1), drops in water levels on the order of approximately 5 feet were evident in the vicinity of the North Hollywood extraction wells and in the area adjacent of the Whitnall wellfield. During the first quarter sample event, water levels in four monitoring wells (NH-VPB-06, NH-VPB-10, NH-VPB-11, and NH-VPB-13) were below the pump intake.

Comparison of water levels between the first quarter and the second quarter of 2000 showed water levels rising due to seasonal recharge and returning to approximately what they were during the fourth quarter of 1999. During the second quarter sample event, water levels in five monitoring wells (NH-VPB-06, NH-VPB-10, NH-VPB-11, NH-VPB-13, and NH-VPB-14) were below the pump intake.

During the third quarter, water levels in the Crystal Springs (Area 2), Verdugo (Area 3), and Pollock (Area 4) showed drops on the order of 2 to 6 feet compared to the second quarter of 2000. In North Hollywood (Area 1), drops in water levels on the order of 1 to 2 feet were common with the exception of wells in the vicinity of the North Hollywood extraction wells and in the area adjacent of the Whitnall wellfield where drops of approximately 5 feet were evident. During the third quarter sample event, water levels in five monitoring wells (NH-VPB-06, NH-VPB-10, NH-VPB-11, NH-VPB-13, and NH-VPB-14) were below the pump intake.

Comparison of water levels between the third quarter and the fourth quarter of 2000 showed water levels across the area dropping between 1 to 4 feet, with the exception of a few wells remaining approximately the same or showing an increase of a foot. These monitoring wells were in the vicinity of the North Hollywood extraction wellfield, possibly indicating a change of the level of activities in the wellfield. During the fourth quarter sample event, water levels in six monitoring wells (NH-VPB-06, NH-VPB-07, NH-VPB-10,

NH-VPB-11, NH-VPB-13, and NH-VPB-14) were below the pump intake. Each of these monitoring wells are in the vicinity of the Rinaldi-Toluca wellfield.

3.2 Comparison of Quarterly Analytical Results

Concentration data from the quarterly sampling events of 2000 are provided for trichloroethylene (TCE) in Tables 3-1, 3-2, 3-3, and 3-4; and for tetrachloroethylene (PCE) in Tables 3-6, 3-7, 3-8, and 3-9. Flags used in the "Current Value" columns indicate: 1) samples that contain reported TCE or PCE concentrations greater than the maximum contaminant level (MCL) of 5 µg/L, or 2) samples that exhibit a marked change in concentration during the current quarter from the previous quarter sampling. A "marked change" in concentration is considered a change in concentration between the following categories:

- 0 to 5 µg/L
- >5 to 50 µg/L
- >50 to 100 µg/L
- >100 to 500 µg/L
- >500 to 1,000 µg/L
- >1,000 to 5,000 µg/L
- >5,000 µg/L

For example, if a sample had a reported concentration of 550 µg/L TCE for the current quarter, but a reported concentration of 60 µg/L during the previous quarter, a flag of +2 would be present in the "Current Value" column of Tables 3-1 through 3-9. If the reported sample concentration had decreased to the next lower category, the flag would read -1. These concentration categories are the same as those used during preparation of basinwide TCE and PCE contaminant concentration maps.

Nitrate data for RI monitoring wells sampled during the first, second, third, and fourth quarters of 2000 are provided in Tables 3-15, 3-16, 3-17, and 3-18, respectively. Flags within the "Current Value" column of Tables 3-15 through 3-18 indicate: 1) samples that contain reported concentrations of nitrate greater than the MCL of 45 mg/L (as nitrate [NO₃]), and 2) samples that exhibit a marked change in reported nitrate concentration from the current quarter to the previous quarter. A marked change in nitrate concentration (as NO₃) is herein defined as a change in concentration between the following categories:

- 0 to 20 mg/L
- >20 to 45 mg/L
- >45 to 65 mg/L
- 65 mg/L

Numerical flags in the "Current Value" column of Tables 3-15 through 3-18 follow the same logic as described above: a reported nitrate concentration increase of one category relative to the previous quarter's sample will read +1; a decrease of two categories will read -2.

3.2.1 TCE Concentrations

TCE concentrations for each quarterly event of 2000, along with historic maximum and minimum concentrations, are presented in Tables 3-1, 3-2, 3-3 and 3-4. A comparative summary of the quarterly TCE concentrations is shown in Table 3-5.

Reported TCE concentrations at 41 of the 46 RI monitoring wells sampled during the first quarter of 2000 are typically not markedly changed relative to the previous values for these wells (Table 3-1). The number of RI monitoring wells exhibiting concentrations of TCE greater than the MCL of 5 µg/L remained the same at 27 wells. Data from the first quarter show that three wells, CS-VPB-05, CS-VPB08, and NH-C02-220, exhibited increases of one category (80 to 110 µg/L, 39 to 77 µg/L, and 1 to 6 µg/L, respectively). Two wells, CS-C03-100 and CS-VPB-01, exhibited a decrease of one category (930 to 150 µg/L and 120 to 95 µg/L, respectively).

Comparison of the TCE data for the second quarter with data from the first quarter shows 41 of the 45 RI monitoring wells sampled are typically not markedly changed relative to the values for these wells from the first quarter (Table 3-2). The number of RI monitoring wells exhibiting concentrations of TCE greater than the MCL of 5 µg/L decreased from 27 to 26 wells. Five monitoring wells during the second quarter, CS-C02-250, CS-C02-335, CS-C03-100, CS-VPB-10 and NH-C03-380, did exhibit an increase of TCE concentration of one category (100 to 130 µg/L, 100 to 140 µg/L, 150 to 990 µg/L, 5 to 6 µg/L and 2 to 9 µg/L, respectively). One monitoring well, PO-C03-235, exhibited a decrease of one category (6 to 5 µg/L).

Comparison of the TCE data for the third quarter with data from the second quarter shows a similar fluctuation in observed concentrations. The number of RI monitoring wells exhibiting concentrations of TCE greater than the MCL of 5 µg/L increased to 33 of the 52 wells sampled (Table 3-3). Minor fluctuation between the reported concentration categories was observed. Two monitoring wells, CS-C03-100 and CS-VPB-08, did exhibit an increase of TCE concentration of one category (990 to 1,200 µg/L and 64 to 150 µg/L, respectively). One monitoring well (CS-C05-180) exhibited a decrease of one category (53 to 41 µg/L).

The number of RI monitoring wells exhibiting concentrations of TCE greater than the MCL of 5 µg/L increased to 35 of the 75 wells sampled during the fourth quarter (Table 3-4). Six monitoring wells exhibited fluctuation in concentrations between categories. Three monitoring wells, CS-C05-160, CS-VPB-01, and CS-VPB-04 did exhibit an increase of TCE concentration of one category (41 to 69 µg/L, 100 to 140 µg/L and 1,000 to 1,500 µg/L, respectively). Two monitoring wells (CS-C03-100 and PO-VPB-07) exhibited a decrease of one category (1,200 to 850 µg/L and 160 to 36 µg/L, respectively).

Reported TCE concentrations at RI monitoring wells sampled during 2000 remained generally consistent (Table 3-5). The number of RI monitoring wells exhibiting concentrations of TCE greater than the MCL of 5 µg/L remained fairly consistent, ranging from 27 monitoring wells in the first quarter, 26 wells in the second quarter, 33 wells in the third quarter, and 35 wells in the fourth quarter. The increase in the number of monitoring

wells exceeding the MCL observed in the third quarter is due to maintenance activities at previously inoperable wells. Of the eleven wells with significant variation during 2000, three exhibited an upward trend during the year: CS-VPB-04 with 640 to 1,500 µg/L, CS-VPB-08 with 77 to 150 µg/L, and NH-C03-380 with 2 to 8 µg/L.

Historic concentration data acquired to date for TCE samples obtained for the RI wells are presented in Figure 3-2. The historic concentration data include the TCE data reported below laboratory detection limits. Concentrations that are reported below laboratory detection limits are plotted and indicated as "nondetected" concentrations in Figure 3-2.

3.2.2 PCE Concentrations

PCE concentrations for each quarterly event of 2000, along with historic maximum and minimum concentrations, are presented in Tables 3-6, 3-7, 3-8, and 3-9. A comparative summary of the quarterly PCE concentrations is shown in Table 3-10.

PCE data exhibited little change in the first quarter of 2000 compared to the fourth quarter of 1999. The number of wells with PCE concentrations greater than the MCL of 5 µg/L decreased to 21 (Table 3-6). At three wells, an increase of one category (82 to 130 µg/L at CS-C01-105, 87 to 160 µg/L at CS-C01-285, and ND to 30 µg/L at CS-C03-100) was observed. Three monitoring wells also exhibited a decrease of one category: 120 to 90 µg/L at CS-C02-335, 290 to 100 µg/L at CS-VPB-01, and 12 to 5 µg/L at NH-C01-325.

The number of RI monitoring wells exceeding the MCL for PCE during the second quarter of 2000 decreased from 21 to 20 wells (Table 3-7). In comparison to the previous quarter, four wells (CS-C01-105, CS-C01-285, NH-C02-325, and NH-C03-580) exhibited a decrease of one category (130 to 94 µg/L, 160 to 83 µg/L, 12 to 5 µg/L, and 10 to 2 µg/L, respectively). Three wells were observed to have increases of one category: 90 to 120 µg/L at CS-C02-335, 100 to 140 µg/L at CS-VPB-01, and 5 to 6 µg/L at NH-C03-380.

During the third quarter of 2000, the number of sampled RI monitoring wells exceeding the MCL for PCE decreased to 23 wells (Table 3-8). Comparison of PCE concentrations from the second to third quarter 2000 sample events shows increases in two wells: CS-C01-285 (83 to 140 µg/L) and NH-C03-580 (2 to 10 µg/L). Both wells had exhibited a decrease during the previous sampling event. There were no wells presenting a significant decrease in concentrations during this quarter.

The number of sampled RI monitoring wells exceeding the MCL for PCE during the fourth quarter of 2000 remained consistent at 23 wells (Table 3-9). Comparison of PCE concentrations from the third to fourth quarter sample events shows an increase of categories for three wells: CS-C02-180 (14 to 76 µg/L), CS-C02-250 (90 to 230 µg/L) and PO-VPB-03 (46 to 55 µg/L). Four wells (CS-C02-62, CS-C02-235, CS-C04-290, and CS-C05-290) exhibited a decrease of one category (61 to 12 µg/L, 320 to 47 µg/L, 10 to 5 µg/L, and 7 to 3 µg/L, respectively).

PCE concentrations at RI monitoring wells sampled during 2000 exhibited little change throughout the year (Table 3-10). The number of RI monitoring wells exhibiting

concentrations of PCE greater than the MCL of 5 µg/L ranged from 21 wells in the first quarter, 20 wells in the second quarter, and 23 wells in the third and fourth quarters. Of the 15 wells with variations of PCE concentrations during 2000, two exhibited a significant upward trend during the year: CS-C02-180 with 17 to 76 µg/L and CS-C02-250 with 64 to 230 µg/L. One well, CS-C02-335, showed a fluctuation from 90 µg/L up to 320 µg/L then back to 47 µg/L.

Historic data obtained by CH2M HILL to date for PCE concentrations in the RI wells are presented in Figure 3-3. Concentrations of PCE that are reported below laboratory detection limits are plotted and indicated as "nondetected" concentrations in Figure 3-3.

3.2.3 Other VOCs

Observations of VOCs other than TCE and PCE during the quarterly sample events were similar to those observed previously. During each quarterly event several nonchlorinated and chlorinated VOCs detected including acetone, 2-butanone, chloroform and methylene chloride were reported at concentrations below the CRQL (J-qualified). Acetone and 2-butanone are recognized as common laboratory contaminants and were eliminated as chemicals of potential concern (COPC). Methylene chloride is a common field blank and laboratory contaminant and chloroform was also B-qualified, therefore, these were eliminated as COPCs.

During the first quarter 2000 sample event, six wells (CS-VPB-04, CS-VPB-06, CS-C03-100, NH-C02-520, NH-VPB-14 and PO-VPB-08) exceeded the MCL for VOCs other than TCE and PCE (Table 3-11). Compounds detected in these wells include: 1,1-dichloroethene, 1,1-dichloroethane and cis-1,2-dichloroethene at CS-VPB-04; carbon tetrachloride and 1,1-dichloroethene at CS-VPB-06; carbon tetrachloride, 1,1-dichloroethene and 1,1-dichloroethane at CS-C03-100; cis-1,2-dichloroethene at NH-VPB-14; carbon tetrachloride at NH-C02-520 and, 1,1-dichloroethene at PO-VPB-08. One well, CS-VPB-07, in which VOCs other than TCE and PCE have historically been observed to exceed the MCLs was not included due to the pump being inoperable.

During this sampling event, MTBE concentrations between 1 and 34 µg/L were detected at seven monitoring wells: CS-VPB-06 with 3 µg/L, CS-VPB-04 with 5 µg/L, CS-VPB-05 with 12 µg/L, CS-C01-185 with 17 µg/L, CS-C02-180 with 17 µg/L, NH-VPB-01 with 34 µg/L, and PO-VPB-08 with 1 µg/L.

During the second quarter 2000 sample event, seven wells (CS-VPB-04, CS-VPB-06, CS-C03-100, NH-C01-105, NH-C01-285, NH-C02-520, and PO-VPB-08) exceeded the MCL for VOCs other than TCE and PCE (Table 3-12). Compounds detected in these wells include: 1,1-dichloroethene and 1,1-dichloroethane at CS-VPB-04; carbon tetrachloride and 1,1-dichloroethene at CS-VPB-06; 1,1-dichloroethene and 1,1-dichloroethane at CS-C03-100; cis-1,2-dichloroethene at NH-C01-105 and CS-C01-285; carbon tetrachloride at NH-C02-520; and 1,1-dichloroethene at PO-VPB-08. Again, CS-VPB-07 was not included due to the pump being inoperable.

MTBE concentrations between 1 and 33 µg/L were detected at four monitoring wells during the second quarter of 2000: CS-VPB-11 with 4 µg/L, CS-C01-185 with 8 µg/L, NH-VPB-01 with 33 µg/L and PO-C03-235 with 6 µg/L.

During the third quarter 2000 sample event, five wells (CS-VPB-04, CS-VPB-05, CS-VPB-06, NH-C02-520, and PO-VPB-02) exceeded the MCL for VOCs other than TCE and PCE (Table 3-13). Compounds detected in these wells include: 1,1-dichloroethene and 1,1-dichloroethane, cis-1,2-dichloroethene and carbon tetrachloride at CS-VPB-04; 1,1-dichloroethane at CS-VPB-05 and CS-VPB-06; carbon tetrachloride at NH-C02-520; and, 1,1-dichloroethene at PO-VPB-08.

MTBE concentrations between 1 and 33 µg/L were detected at seven monitoring wells during the third quarter of 2000: CS-C01-105 with 6 µg/L, CS-VPB-06 with 3 µg/L, CS-VPB-11 with 4 µg/L, NH-VPB-01 with 33 µg/L, PO-C03-235 with 6 µg/L, PO-VPB-08 with 1 µg/L, and PO-VPB-08 with 2 µg/L.

The fourth quarter 2000 sample event had six wells (CS-VPB-04, CS-VPB-05, CS-VPB-06, CS-VPB-07, NH-C02-520, and PO-VPB-02) exceeded the MCL for VOCs other than TCE and PCE (Table 3-14). Compounds detected in these wells include: 1,1-dichloroethene and cis-1,2-dichloroethene at CS-VPB-04 and CS-VPB-05; carbon tetrachloride and 1,1-dichloroethene at CS-VPB-07; 1,1-dichloroethene CS-VPB-06 and PO-VPB-02; and, carbon tetrachloride at NH-C02-520.

MTBE concentrations between 1 and 30 µg/L were detected at five monitoring wells during the fourth quarter of 2000: CS-C01-105 with 6 µg/L, CS-VPB-11 with 4 µg/L, NH-VPB-01 with 30 µg/L, PO-C03-235 with 6 µg/L, PO-VPB-08 with 1 µg/L, and VD-VPB-01 with 4 µg/L.

3.2.4 SVOCs and Perchlorate

During the annual sample event of 2000, no SVOCs were reported. Previously, only isolated detections at low concentration of phthalates have been observed and dismissed as they are common laboratory contaminants.

Samples were collected for perchlorate analysis during the annual sampling event. Perchlorate was observed above the detection limit at 34 of the 75 monitoring wells included in this event. All concentrations were below the California DHS action level of 8 µg/L, with the maximum observed concentration of 5.3 µg/L at NH-VPB-12. The distribution of wells with detectable concentrations of perchlorate was fairly even with eight monitoring wells in Area 1, 12 monitoring wells in Area 2, five monitoring wells in Area 3, and eight monitoring wells in Area 4.

3.2.5 Nitrate

Nitrate (as NO₃) concentrations for each quarterly event of 2000, along with historic maximum and minimum concentrations, are presented in Tables 3-15, 3-16, 3-17 and 3-18. A comparative summary of the quarterly nitrate concentrations is shown in Table 3-19.

Of the 46 RI monitoring wells sampled during the first quarter of 2000, 18 exhibited concentrations exceeding the nitrate MCL of 45 mg/L (as NO₃) compared to 24 during the fourth quarter of 1999 (Table 3-15). Three wells exhibited a category decrease in reported nitrate concentration from the previous sampling; however, one of those wells (NH-VPB-05 with 97.9 mg/L) still exceeded the MCL. Two wells exhibited a category increase of one category to exceed the MCL.

During the second quarter of 2000, nitrate concentrations greater than the MCL remained the same at 18 monitoring wells sampled (Table 3-16). Comparison of the values of nitrate for the first quarter with values from the second quarter shows that the values are markedly changed at two wells, CS-C03-100 and CS-VPB-02.

During the third quarter nitrate concentrations greater than the MCL were observed at 23 of the 52 monitoring wells sampled (Table 3-17). Comparison of the values of nitrate for the second quarter with values from the third quarter shows changes of one category at five wells (CS-C02-62, CS-VPB-05, PO-VPB-02, PO-VPB-07, and PO-VPB-10).

During the fourth quarter, nitrate concentrations greater than the MCL were observed at 24 of the 75 monitoring wells in the annual sample event (Table 3-18). Comparison of the values of nitrate for the fourth quarter with values from the third quarter shows changes of one category at six wells. Two RI monitoring wells (CS-VPB-04 and NH-VPB-01) exhibited a decrease of one category. Four RI monitoring wells (CS-VPB-01, CS-VPB-09, NH-VPB-02, and NH-VPB-03) exhibited an increase of one category.

Nitrate concentrations at RI monitoring wells sampled during 2000 remained consistent throughout the year (Table 3-19). The number of RI monitoring wells exhibiting concentrations of nitrate greater than the MCL of 45 mg/L ranged from 18 wells in the first and second quarters, to 23 wells in the third quarter, and 24 wells in the fourth quarter.

Figure 3-4 presents the historic data obtained for nitrate concentrations for the RI wells. Concentrations of nitrate that are reported below laboratory detection limits are plotted and indicated as "nondetected" concentrations in Figure 3-4.

3.2.6 Metals

Analysis of dissolved metals was conducted during the fourth quarter 2000 sampling event. Metals that were reported above primary and secondary MCLs included dissolved iron, dissolved manganese, dissolved antimony, dissolved chromium, dissolved thallium and dissolved aluminum (Table 2-10). Thallium was the most common dissolved metal reported during this event (seven monitoring wells exceeded 2 µg/L). Manganese and iron were observed in five monitoring wells. Aluminum and antimony were observed only in CS-VPB-10. The concentrations of dissolved chromium in monitoring well CS-VPB-04 and PO-VPB-02 remained comparable to the concentrations previously observed.

3.2.7 Hexavalent Chromium

Concentrations of hexavalent chromium exceeding the MDL of 0.2 µg/L were observed in 35 monitoring wells during the first quarter sample event (11 exceeding 5.0 µg/L). During

the second quarter the MDL was exceeded in 36 monitoring wells (13 exceeding 5.0 µg/L). With the previously inoperable wells repaired, during the third quarter sample event there were 41 wells over the MDL and 15 exceeding 5.0 µg/L. During the fourth quarter, 56 of the 75 wells sampled had detectable concentrations of hexavalent chromium with 16 wells exceeding 5.0 µg/L (Table 2-11).

3.2.8 Other Analytical Parameters

During the fourth quarter sampling event, groundwater was analyzed for general water chemistry parameters including chloride, sulfate, total alkalinity, hardness, TDS, and TOC (Table 2-9). TDS values ranged from 242 (NH-C02-681) to 1,610 mg/L (CS-VPB-09), with an average value of 542 mg/L. The secondary MCL (500 mg/L) for TDS was exceeded in 48 of the 75 RI monitoring wells during the fourth quarter (Table 2-9). Total alkalinity ranged from 116 mg/L (VD-VPB-06) to a high of 548 mg/L (CS-VPB-09). All RI monitoring wells were below the secondary MCL for sulfate (250 mg/L), with the exception of NH-C06-425, which had a concentration of 419 mg/L.

3.3 Concentration Contour Maps

TCE and PCE are common and widespread contaminants in the San Fernando Valley Basin, and may at least roughly reflect the distribution of other contaminants. To evaluate the lateral and vertical distribution of TCE, PCE, and nitrate in the SFV, depth-specific concentration contour maps were created using current data from CH2M HILL's GIS database (Figure 3-5). This database includes water quality and water level data for the RI wells and also data from local facilities in the SFV, transmitted by the California RWQCB and LASC. Data from local groundwater purveyors (LADWP, the Cities of Glendale and Burbank, and Crescenta Valley County Water District) were also incorporated into the GIS database.

3.3.1 Interval Selection

The depth intervals for the 2000 concentration contour maps are based on: 1) water level data from RI monitoring wells, facility wells, and production wells; 2) screened intervals in monitoring wells, facility wells, and production wells; and, 3) concentration values for TCE, PCE, and nitrate from the most recent sampling event. The concentration of TCE, PCE, and nitrate is typically greater in wells with screens at or near the water table, with groundwater contamination apparently attenuating with depth. Based on these data, two sets of depth-specific concentration contour maps were developed based upon wells that are screened: 1) within 50 feet of the water table, and 2) more than 50 feet below the water table.

Data from production wells, facility wells, and landfill monitoring wells are categorized in the same manner as the RI monitoring wells. Production wells with the top of their screened interval within 50 feet of the water table are in the upper interval, and wells with the top of their screen greater than 50 feet below the water table are in the lower zone. Production well data are posted on the concentration contour maps; however, the concentration of the contaminant within the well is considered only as an indicator on the upper zone maps

because the contaminants may be diluted with production of water from deeper, cleaner intervals.

3.3.2 Estimated Aerial Extent

The depth-specific concentration contour maps combine available water quality data with professional judgment to present a simplified, "smoothed" depiction of TCE, PCE, and nitrate contaminants in the eastern SFV (Figures 3-6 through 3-11). The figures were prepared by hand contouring the relative concentration contours onto GIS-generated maps depicting available TCE, PCE, and nitrate values.

For EPA RI monitoring wells, facility wells, and production wells incorporated in the SFV GIS, the areas of contamination are based on time-specific rationale for selection of the representative data. This rationale incorporates all available data while eliminating "old" data that may not be representative of current conditions. The criteria for this rationale are presented in Appendix B (Rationale for Selection of Representative Monitoring Well Data). Based on this rationale presented (elimination of data older than five years), approximately 200 "old" data points from monitoring and production wells were removed from the data set used in preparation of the concentration contour maps for 2000. The primary areas where the majority of the data were removed are in the northern portion of the North Hollywood OU, east of the Burbank Airport in the Burbank OU, and in the southern portion of the Glendale OU. This is most apparent on the concentration contour maps for the Shallow Zone, where data collected in the vicinity of several landfills in North Hollywood during a special sampling event in 1995 supported the extent of the plume past the Golden State Freeway. Although the current concentration contour maps differ from previous maps, due to the lack of current data areas outside the colored zones may also be contaminated.

The figures do not show the maximum contaminant concentrations known to have occurred at the wells. Using the most recent value, not the maximum or average value, does not significantly affect the interpretations shown in the concentration contour maps. This method, however, could potentially affect the locations of contours in areas where contaminant concentrations are near one of the dividing levels between concentrations.

Because the data incorporated into the GIS are obtained from various sources with varying schedules of sampling, the figures are not a "snapshot in time," but, rather, a representation of the most recently available contamination data observed at each location over several months.

The estimated direction and magnitude of groundwater flow are used to assist in estimating the shape and size of the downgradient extent of individual zones of contamination. These parameters are also used for approximating the lateral boundaries, although these boundaries are more readily determined from reported concentration values. The groundwater flow directions are fairly well understood but the downgradient margins of contamination are not as well understood.

TCE and PCE contaminant data from production wells in the LADWP North Hollywood Wellfield were reviewed to estimate the western extent of the "area of detectable concentration."

3.3.3 Upper Interval

Concentration contours throughout the shallow interval are based on available TCE, PCE and nitrate data (Figures 3-6 through 3-8). The 5- $\mu\text{g}/\text{L}$ concentration contour for both TCE and PCE is similar to previous maps in the majority of the area. This area covers the eastern and southern portions of the North Hollywood OU and the majority of the Burbank OU and Glendale OUs. In the vicinity of the landfills in the North Hollywood OU, areas previously shown above the 5- $\mu\text{g}/\text{L}$ concentration contour were removed. Removal of additional old data in the western portion of the Burbank OU and the southern portion of the Glendale OU allowed refinement of the 5- $\mu\text{g}/\text{L}$ concentration contour in these areas. Based on current available data, an estimate of the concentration contour enclosing an area above the laboratory detection limit of 0.5 $\mu\text{g}/\text{L}$ for TCE and PCE is drawn. This contour generally conforms to the shape of the 5- $\mu\text{g}/\text{L}$ concentration contour line.

Concentrations of TCE and PCE exceeding the 50 $\mu\text{g}/\text{L}$ contour interval in the upper interval occur in the following areas:

- An elongated area extending in a southeasterly direction beginning east of the Burbank Airport. For TCE, this elongated area is approximately five miles long and one mile wide (at its widest point) over much of the Burbank OU and northern portion of the Glendale OU; while for PCE, it is approximately three miles long and one mile wide in both OUs. Also, within the area of these OU's are several small, isolated areas in the vicinity of facility wells that exceed 50 $\mu\text{g}/\text{L}$ for both TCE and PCE. Within this area, TCE concentrations as high as 4,900 $\mu\text{g}/\text{L}$ and PCE concentrations as high as 3,200 $\mu\text{g}/\text{L}$ are observed.
- A southeasterly trending area is observed in the North Hollywood OU at facility monitoring wells in the vicinity of the North Hollywood extraction wells with isolated concentrations of TCE as high as 6,000 $\mu\text{g}/\text{L}$. Recent sampling also indicated an isolated area of TCE contamination exceeding the MCL in the vicinity of LADWP's Tujunga production well field. In this area, PCE is observed at much lower concentrations in several small isolated areas.
- For TCE, a southeasterly trending area, approximately one mile long by 1/2-mile wide, is observed in the southern portion of the Glendale OU. TCE concentration over 4,900 $\mu\text{g}/\text{L}$ is reported in a facility monitoring well in this area. At this well the PCE concentration was approximately 1,000 $\mu\text{g}/\text{L}$.
- In Area 4 (Pollock area), TCE and PCE in excess of the MCLs are observed in two areas; in the vicinity of LADWP's Pollock production wells and in the Taylor Yard south of the Pollock wellfield. The area in the vicinity of LADWP's Pollock well is approximately 1/2-mile long and 3/4-mile wide. The second area, located in the Taylor Yard, contains

small isolated areas of predominantly PCE contamination, with concentrations as high as 540 µg/L.

Additional details of the shallow interval TCE and PCE concentration contour maps are located in Appendixes G and H, respectively. These appendixes present each concentration contour map with well locations, shown with a grid network imposed over the area within the 0.5 µg/L contour line. Each grid square is presented as a separate plate showing greater detail of the larger TCE and PCE concentration contour maps.

In the central portion of the Verdugo NPL site, recent production well data and RI monitoring well data indicate elongated areas in the vicinity of one production well exceeding the MCL for PCE. Data from all other wells have detectable concentrations of PCE below the MCL. TCE is reported below the MCL in this area.

The nitrate concentration contour map of the upper interval shows nitrate exceeding the MCL of 45 mg/L based on available nitrate data (as NO₃). Somewhat similar to previous maps, there are several isolated elongated areas which cover a substantial portion of the North Hollywood OU and extends southeastward through the Burbank OU and the Glendale OU to the vicinity of the Pollock wellfield. A separate, elongated area of nitrate contamination in excess of the MCL covers a large portion of the Verdugo area extending southward.

3.3.4 Lower Interval

As discussed above, the concentrations of TCE and PCE appear to attenuate with depth (Figures 3-9 and 3-10). However, data for TCE and PCE from the lower interval are more limited. The area in the lower interval exceeding the 5-µg/L concentration contour for both TCE and PCE generally underlies the area of contamination in the upper interval; however, it is less widespread than the contaminated area in the upper interval. The concentration contour for the laboratory detection limit is also shown for the lower interval.

The area of TCE concentration exceeding the 5-µg/L concentration contour in the lower interval extends from south of the Burbank Airport to the southeast approximately 4-1/2 miles. Two isolated areas of concentrations exceeding 50 µg/L are present in the Burbank OU and the northern portion of the Glendale OU. Smaller areas of TCE exceeding the MCL in the Glendale OU are observed in southern portion of the Glendale OU and in the vicinity of the Pollock wellfield. In the North Hollywood OU isolated areas of TCE exceeding the MCL are located in the vicinity of the North Hollywood extraction wells, in small areas of the North Hollywood wellfield, and in the vicinity of the Tujunga wellfield.

The area of PCE exceeding the 5-µg/L concentration contour in the lower interval is similar to the one for TCE extending southeastward approximately five miles. Isolated areas of concentrations exceeding 50 µg/L are present in the northern portion of the Glendale OU. Smaller areas of PCE exceeding the MCL in the Glendale OU are observed in both OUs and in the vicinity of the Pollock wellfield. Areas in the North Hollywood OU where the concentration exceeds the MCL are comparable to the areas where TCE was observed. In the northern portion of the North Hollywood OU two additional small areas exceeding the MCL

are in the vicinity of the Rinaldi-Toluca wellfield. An additional area exceeding the MCL for PCE in the lower interval is located between the Glendale South OU and the Pollock OU.

Nitrate contamination in the lower interval is less extensive than observed in the upper interval (Figure 3-11). Several small, isolated areas exceeding the MCL are located in the North Hollywood OU.