

Summary of 1995 RI Sampling Program

4.1 Quarterly Sampling Activities

4.1.1 Description of Activities

EPA's RI monitoring wells in the San Fernando Valley Basin (SFVB) were sampled during four quarterly events conducted by CH2M HILL during 1995 (Table 4-1). Three of these events (January 24 through February 1, May 4 through May 15, and July 25 through August 3) consisted of collecting groundwater samples from between 48 to 50 RI monitoring wells for VOCs and nitrate/nitrite analyses (quarterly sample events). Two of these events (1st and 2nd quarter) are described in EPA (1995c). The annual sampling event, December 5 through 20, and the third quarter sample event are described in Sections 2 and 3 of this report. The annual sample event involved collecting groundwater samples from 80 RI monitoring wells for VOCs, metals, nitrate/nitrite and general water chemistry analyses.

Water levels were measured at each of the RI monitoring wells prior to sampling and monthly by LADWP with an electronic sounder. These data were incorporated into the GIS database and converted to elevations above MSL. A comparison of depth to water (bgs) and water level elevation (MSL) for the RI monitoring wells at the time of each quarterly sample event during 1995 is provided in Table 4-2.

During each sample event, each well was purged three to five well volumes prior to sampling. During purging, pH, temperature, electric conductivity, and turbidity of the groundwater were measured over time to ensure that these parameters stabilized prior to sampling. Table 4-3 presents a comparison of these parameters at each RI monitoring well during each quarterly sampling event conducted during 1995.

During the 1995 quarterly sampling events, circumstances led to one or more of the scheduled RI monitoring wells to be not sampled. During the first quarter, four wells (CS-C02-62, CS-C02-180, CS-C02-250 and CS-C02-335) were unable to be sampled due to extensive repair work conducted by LADWP in the vicinity of erosion around production wells. During the second and third quarters, NH-CO2-220 was not sampled due to a broken discharge pipe and PO-VPB-01 was not sampled due to the vault lid being paved over during street repairs. During the fourth quarter, the pump in RI Monitoring Well CS-VPB-01 was inoperable and the vault lid for NH-CO2-520 was unable to be removed.

Purge water, or investigative derived waste (IDW), was collected from each RI monitoring well in a vacuum truck and transported to purge water storage tanks located at LADWP's Crystal Springs yard. Approximately 40,375 gallons of IDW collected during the four sampling events completed in 1995 were transported to the Crystal Springs yard. VOC

concentrations in the IDW stored at the Crystal Springs yard were monitored and when observed to be below MCLs, the purge water was discharged into the storm drains.

4.1.2 TCE Concentrations

Reported TCE concentrations at RI monitoring wells sampled during 1995 remained generally consistent (Table 4-4). The number of RI monitoring wells exhibiting concentrations of TCE greater than the MCL of 5 µg/L remained fairly consistent, ranging from 29 monitoring wells in the first quarter to 34 monitoring wells in the fourth quarter. The difference in the total number of monitoring wells exceeding the MCL was dependent on whether the well was able to be sampled. For example, in the first quarter, the monitoring wells at CS-C02 cluster were not sampled due to construction activities, and in subsequent quarters they each exceeded the MCL. During the second and third quarters, NH-C02-220 and PO-VPB-01 were not sampled; however, in the first and fourth quarters they both exceeded the MCL. The same holds for NH-C02-520 and CS-VPB-01, although not sampled during the fourth quarter, they exceeded the MCL during events during which they were sampled.

Comparison of TCE concentrations at the RI monitoring wells shows three wells (CS-C03-465, NH-C01-325 and NH-C03-380) exhibiting an increase to above the MCL during 1995 (5 to 6 µg/L, 1 to 7 µg/L and 2 to 7 µg/L, respectively). Three wells, all in the North Hollywood area, exhibited a decrease to below the MCL: NH-CO4-240 (6 to 5 µg/L), NH-VPB-06 (7 to 3 µg/L) and NH-VPB-08 (10 to 4 µg/L). One well (NH-C06-160), also in the North Hollywood area, exhibited a significant decrease from 240 to 9 µg/L. This well had exhibited significant variations in TCE concentrations during 1994, fluctuating from 7 µg/L in the first quarter to 180 µg/L in the third quarter and returning to 20 µg/L in the fourth quarter.

4.1.3 PCE Concentrations

PCE concentrations at RI monitoring wells sampled during 1995 also exhibited little change throughout the year (Table 4-5). The number of RI monitoring wells exhibiting concentrations of PCE greater than the MCL of 5 µg/L ranged from 22 wells in the first quarter to a high of 28 wells in the third quarter then back to 25 wells in the fourth quarter. As was the case presented above, the variation in total monitoring wells exceeding the MCL was dependent on whether the wells was sampled. All of the RI monitoring wells exceeding the MCL for PCE also exceeded the MCL for TCE during each event with the exception of five wells. Three of these wells (CS-VPB-10, CS-VPB-11 and NH-VPB-07) consistently were above the MCL for PCE during each sample event but below the MCL for TCE. One well (NH-C01-325) consistently exceeded the MCL for PCE but only exceeded the MCL for TCE in the fourth quarter. The remaining well (VD-VPB-01 exceeded the MCL for PCE during the first three quarters only.

A review of PCE data obtained from RI monitoring wells during 1995 shows one well (NH-C02-235) exhibiting an increase to above the MCL (ND to 11 µg/L) during 1995. However, four monitoring wells exhibited significant increases: CS-C02-180, 43 to 55 µg/L; CS-CO2-250, 89 to 120 µg/L; NH-CO1-325, 13 to 43 µg/L; and

NH-VPB-14, 23 to 100 µg/L. One of these wells (NH-CO1-325) also showed significant increases in TCE. Two wells exhibited a decrease to below the MCL during 1995: CS-CO5-290, 7 to ND µg/L and CS-VPB-05, 6 to 2 µg/L.

4.1.4 Other VOCs

During 1995, VOCs other than TCE and PCE were observed above MCLs in 8 RI monitoring wells (Table 4-6). Compounds reported include: 1,1-dichloroethane at CS-CO3-100, CS-VPB-04, and CS-VPB-07; 1,1-dichloroethene at CS-CO3-100, CS-VPB-04, CS-VPB-05, CS-VPB-06, CS-VPB-07, PO-VPB-02, and PO-VPB-08; 1,2-dichloroethane at CS-VPB-04 (first quarter only), CS-VPB-07 (second quarter only); NH-VPB-05, and NH-VPB-14; carbon tetrachloride at CS-CO3-100, CS-VPB-04, and CS-VPB-07; and vinyl chloride at PO-VPB-08.

4.1.5 Nitrate

The number of RI monitoring wells exceeding the nitrate MCL of 45 mg/L (as NO₃) ranged from 15 to 20 during 1994 (Table 4-7). During the first and second quarter, there were 17 monitoring wells exceeding the MCL, with 15 in the third quarter and 20 during the fourth quarter. Three wells (NH-C05-320, NH-VPB-03 and NH-VPB-04) included in the triannual sampling program exceeded the MCL during the fourth quarter sampling. Due to a change of procedures at Region IX Laboratory, the results for nitrate during the fourth quarter were reported as unvalidated.

4.1.6 Other Analytical Parameters

During the fourth quarter sampling event, groundwater was analyzed for general water chemistry parameters including chloride, sulfate, total alkalinity, hardness, total dissolved solids (TDS) and total organic carbon (TOC) (Table 2-7). TDS values ranged from 263 to 1,340 mg/L. The secondary MCL (500 mg/L) for TDS was exceeded in 47 of the 80 RI monitoring wells during the fourth quarter (Table 2-7). Total alkalinity ranged from 119 mg/L to a high of 576 mg/L. All RI monitoring wells were below the secondary MCL for sulfate (250 mg/L), ranging from 37.5 mg/L to 232 mg/L.

Analysis of dissolved metals was conducted during the fourth quarter 1995 sampling event. Metals that were reported above primary and secondary MCLs included dissolved iron, dissolved manganese, dissolved nickel, dissolved thallium and dissolved chromium (Table 2-8). Iron and manganese were the most common dissolved metal reported in RI monitoring wells during this event. The presence of dissolved chromium in monitoring wells CS-VPB-04 and PO-VPB-02 remained comparable to the concentrations observed in these wells in the previous sample events.

4.2 Additional Special Sampling Activities

4.2.1 Hexavalent Chromium Sampling

4.2.1.1 Background

EPA's database currently contains metals data from various groundwater sources located in the SFVB. These sources include RI monitoring wells, production wells operated by LADWP, the cities of Burbank and Glendale, and La Crescenta Water District, and monitoring wells located at facilities as directed by the RWQCB. Historically, groundwater samples from selected RI monitoring wells and selected monitoring wells at certain facilities were collected and submitted for hexavalent chromium analysis in addition to TAL metals.

Following a review of metal data contained in the SFV GIS database, it was observed that several areas of potential chromium contamination exist along the "Golden State Freeway" corridor between the Burbank Airport and Los Feliz Street in Glendale, hereafter termed the study area (Figure 4-1). Authorization from EPA was received by CH2M HILL to conduct "Special Sampling Event No. 1." The objective of this sample event was to provide information to EPA in order to assist with the evaluation of these areas of potential chromium contamination. Supporting data for achieving this objective were to be obtained from three separate activities:

1. Review of historic data
2. Groundwater sampling of RI monitoring wells
3. Groundwater sampling of selected facility monitoring wells with assistance from RWQCB

The results of activities 1 and 2 were presented to EPA as a draft Technical Memorandum (TM) (EPA, 1995d). This draft TM allowed EPA to assess which (if any) facility monitoring wells are located in the upgradient and downgradient vicinities of detectable concentrations of hexavalent chromium prior to any interaction with RWQCB. The completion of activity 3 has been tentatively scheduled for Spring 1996 as "Special Sampling Event No. 4."

4.2.1.2 Description of Activities 1 and 2

EPA maintains a network of 84 RI monitoring wells in the SFVB Study Area, of which 66 are sampled annually (80 triannually) for dissolved metals. In addition to EPA's RI monitoring well network, additional data on groundwater quality are obtained from more than 100 facilities in the vicinity of the study area (Figure 4-2). Numerous monitoring wells at these facilities are sampled on a regular basis and the data is submitted to RWQCB). Each facility collects and submits groundwater for analysis independently, and based on the potential contaminants at each site, analysis for metals contamination may or may not be included. Concentrations of dissolved chromium from wells in this study area ranged from non-detect (ND) to 72,100 µg/L for BBL-W2.

Total and dissolved metals data from nine RI monitoring well sampling events have been incorporated into the SFV GIS. The most recently available data from these sampling events indicate three RI monitoring wells in the study area (NH-VPB-14, CS-VPB-04, and PO-VPB-02) contain dissolved chromium concentrations above the MCL of 50 mg/L (64.5, 178, and 713 µg/L, respectively).

Total and dissolved (i.e., unfiltered and filtered) metals data are available from 26 facilities in the study area. A presentation of these data may be found in EPA (1995e). Sixteen additional monitoring wells in the study area have reported historic dissolved chromium concentrations that exceed the MCL. These data tend to be located in three isolated subareas (Figure 4-1) of the study area. These subareas include:

- The vicinity southeast of the former Lockheed B-1 plant. Located in the northern portion of the study area, this subarea contains a large network of individual monitoring wells and cluster wells. Levels of chromium exceeding the MCL have been reported from eight of the sixteen wells in the vicinity of the former Lockheed B-1 Plant (Subarea 1) and contain concentrations of dissolved chromium ranging between 50 and 442 µg/L.
- The vicinity surrounding ITT Aerospace Control Design (Subarea 2). Located in the center of the study area, this subarea includes 13 monitoring wells that have been installed around this facility. Chromium concentrations in excess of 1,000 µg/L have been reported at 2 of these wells.
- The vicinity of Courtaulds Aerospace Industries and Brock Bus Lines. Located at the southern extent of the study area, this subarea eleven monitoring wells at three facilities. Elevated chromium concentrations have been reported at Six of these wells (Subarea 3) and contain the maximum reported concentrations of chromium (72,100 µg/L at BBL-W2).

Chromium concentrations exceeding the MCL at RI and facility monitoring wells in the study area appear to be somewhat localized. Activity 2 targeted 10 RI Monitoring Wells for additional hexavalent chromium analysis concurrently with the 3rd Quarter 1995 sample event. Results of this sampling indicated that elevated concentrations of hexavalent chromium are locally present. Five of the ten targeted wells indicated values ranging from 13.5 µg/L at CS-C03-100 to a high of 569 µg/L at PO-VPB-02. These areas of elevated concentration of hexavalent chromium correspond to the above mentioned subareas where elevated chromium concentrations at facilities have been observed.

4.2.2 Landfill-Areas Special Sampling Activities

4.2.2.1 Background

In the North Hollywood area of the SFVB there are several landfills, some in operation; however, most of which are currently inactive. Solid Waste Assessment Tests (SWATs) were completed on the inactive landfills and available monitoring well data submitted to the Los Angeles Regional Water Quality Control Board (LARWQCB). In this portion of the SFVB, these data are unsupported by other facility or RI monitoring well data. Therefore, the available landfill monitor well data have been incorporated into the interpretation of the concentration contour maps generated

during semi-annual report preparation. Much of this data currently is 6 years old, exceeding the decision criteria established at the beginning of the monitoring program for inclusion (Appendix B).

Information contained in EPA's GIS database included well location, well construction details and depth to water (dtw) for approximately 49 monitoring wells located at the Bradley Pit, Sheldon-Arleta, Penrose-Newberry-Strathern landfills as well as the Tuxford Pit, Hewitt Pit and Gregg Pit (Figure 4-3). As directed by EPA, 15 of these monitoring wells located at the Bradley Pit Landfill were to be excluded from this effort since recent (Fall 1994 and Spring 1995) groundwater data had been reported to the LARWQCB. Construction details for the monitoring wells included in special sampling event No. 2 (Groundwater Monitoring Well Assessment and Sampling) are described in EPA (1995e).

The activities and results associated with special sampling event No. 3 (Soil Gas Sampling) were, at EPA's direction, conducted concurrently with the groundwater sampling of this field effort. Soil gas sample collection at Bradley Pit Landfill and the Sheldon-Arleta Landfill were not included in this effort since recent data are available and are currently being reviewed. However, an unknown number of soil gas sampling ports were reportedly located at the Penrose-Newberry-Strathern landfills as well as Hewitt Pit and Gregg Pit landfill sites. Special sampling event No. 3 focused on obtaining representative data from these landfill sites.

The activities conducted during special sampling events No. 2 and No. 3 were performed in three separate operations: 1) Landfill Assessment, 2) Groundwater Sampling, and 3) Soil Gas Sampling.

4.2.2.2 Landfill Assessment

Prior to mobilization for groundwater and soil gas sampling activities, a preliminary field effort was conducted to assess the status of monitoring wells and soil gas ports at the various landfill sites. These efforts were conducted between September 5 and September 8, 1995.

At the conclusion of the "assessment phase," a total of 34 monitoring wells at (and around) the various landfill sites had been investigated (EPA, 1995f). Of these, 19 monitoring wells located in the vicinity of the Bradley, Sheldon-Arleta, Penrose-Newberry-Strathern-Tuxford, and Gregg landfills in the North Hollywood area were determined to be suitable for sampling and would be included in the next phase of this effort. In addition, a total of 31 soil gas sampling ports were investigated at the Penrose-Newberry-Strathern-Tuxford, Hewitt and Gregg landfills. Of these, approximately 13 locations were considered suitable for sample collection.

4.2.2.3 Groundwater Sampling

Groundwater samples were collected using a Grundfos 4-inch pump with an AMS truck-mounted sampling system provided by Hazco. This system allowed for efficient purging and collection of representative groundwater samples while minimizing the time needed for decontamination and moving between well sites.

Wells determined to have previously installed pumps were included in each day's activities. Throughout the course of the sampling activities, it was observed that several of the 19 monitoring wells, located at various landfill properties,

were inoperable or unable to be sampled (Table 4-1). Five of these monitoring wells presented mechanical or electrical problems similar to those observed in older RI monitoring wells (e.g., pump operating with no flow to the surface [4928C and 4918A] or pump starting then stopping after operating a short time [4918B and 4928B]). The pump in one well (4927) would not start.

Four monitoring wells (4917A, 4918, 4899, and 4909C) were unable to be sampled due to obstructions, broken pipe, or other reasons. Six of the remaining monitoring wells (4887B, 4897, 4897A, 4897B, 4897C, 4897D, and 4898) operated by the City of LA were determined to be abandoned. Monitoring Well SA-5 was not sampled due to problems encountered.

At the conclusion of this phase of work, groundwater samples from 5 of the 19 monitoring wells were collected and submitted to CH2M HILL's Quality Analytical Laboratory for volatile and semi-volatile organic compounds (VOCs and SVOCs), dissolved metals, inorganics, gross alpha and beta radioactivity, and radon analyses. Holding times were met on all samples, and based on the quality control summaries provided by the laboratory, all surrogate and spike recoveries were within specified criteria. Acetone and bis(2-ethylhexyl)phthalate (BEHP) were detected in samples; however, they are common laboratory contaminants and are not considered site related based on comparison with blanks. A complete presentation of the results are presented in Appendix I.

The key findings from an evaluation of the data indicate the following:

- Monitoring wells 4909F, 4917B and 4928A had detectable concentrations of VOCs (TCE [24 µg/L, 6 µg/L and ND, respectively] and PCE [22 µg/L, 4 µg/L and 2 µg/L, respectively]).
- SVOCs were not detected, with the exception of 1,4-dichlorobenzene estimated at 8 µg/L in SA-8.
- At each location all dissolved metals were reported either near the contract required detection limit (CRDL) or below the instrument detection limit (IDL).
- Nitrate/nitrite as N was detected below the MCL of 10 mg/L in all samples, ranging from 0.10 to 8.0 mg/L.
- TDS ranged from 397 to 564 mg/L with the exception of 1,230 µg/L at SA-8.

4.2.2.4 Soil Gas Sampling

Soil gas samples were collected, using an evacuation chamber, into 5-liter Tedlar bags at the Penrose and Hewitt landfill sites between September 21 and 28, 1995. Additional samples proposed for collection at the Tuxford, and Gregg Pit landfill sites were unable to be collected (see below). Prior to sample collection, field personnel inspected the sample probe, and, where possible, a new piece of Teflon tubing was used to connect the sample bag inside the evacuation chamber to the sample line from the soil gas probe. The samples were immediately stored in coolers to prevent photo-degradation and then submitted to CH2M HILL's QAL Corvallis Laboratory for VOC analysis.

VOC compounds were analyzed by method TO-14. A complete presentation of the results from the soil gas sampling phase of this effort are given in EPA (1995f). A brief summary of the soil gas sampling activities at each landfill site is discussed in the following sections.

Tuxford

Upon inspection of the sample ports at the Tuxford landfill, it was determined that the soil gas collection system was not under pressure. However, due to the size of the sample port (approximately 1/2 to 5/8 of an inch in diameter), an airtight seal was not able to be established. As a result, no samples were collected from the soil gas collection system.

Hewitt

At the Hewitt landfill a total of 14 samples (9 target samples, 2 duplicates, 1 MS/MSD, and 2 equipment blanks) were collected at the Hewitt site on September 22 and September 27, 1995. Sample collection at several other probes was attempted; however, sample gas would not flow from the probes when the evacuation chamber was under maximum vacuum.

The following discussion presents a comparative discussion of the organic compounds that were detected based on an arbitrary threshold value of 5 parts per billion by volume (ppbv). It should be noted that this threshold value is not based on a regulatory standard and was only used to facilitate the interpretation of the data. Table 4-2 presents a summary of the organic compounds that were detected in the soil gas samples collected at the Hewitt and Penrose Landfills. In general, the levels of organic compounds detected in the soil gas samples are low with the maximum of all samples being 299 ppbv of 1,1,1-trichloroethane at H-M6D.

The key findings of the soil gas evaluation at the Hewitt Landfill indicate the following:

- Twelve organic compounds were detected at least once at levels exceeding 5 ppbv with toluene being the most common exceedance in the soil gas.
- Toluene was found above 5 ppbv in all site soil gas sampling locations and ranged in concentration from 13 ppbv at H-M21 to 221 ppbv at H-M6C.
- The remaining eleven organic compounds exceeding the 5 ppbv threshold and the locations of the exceedance are:
 - 1,1,1-trichloroethane at 9 locations with concentrations ranging from 9 ppbv at H-M16A to 299 ppbv at H-M6D
 - Tetrachloroethane at 7 locations with concentrations ranging from 5.4 ppbv at H-M6C to 72 ppbv at H-M16A
 - Trichlorofluoromethane at 6 locations with concentrations ranging from 8.3 ppbv at H-M6B to 139 ppbv at H-M19QC
 - m,p-Xylene at 4 locations with concentrations ranging from 5.7 ppbv at H-M6B to 23 ppbv at H-M6C

- Organic compounds found at least once above 5 ppbv include; chloroform, 1,1-dichloroethene, methylene chloride, ethylbenzene, 1,2,4-trimethylbenzene, o-xylene, and styrene.

Penrose

At the Penrose landfill sites a total of 10 samples (9 target and 1 duplicate) from 5 multi-port soil gas locations were collected on September 22, 1995. An equal number of split samples for the facility were collected by Robin Wright-Pincini of Brown and Caldwell Consultants.

The key findings of the soil gas evaluation at the Penrose Landfill indicate the following:

- Nine organic compounds were detected at least once at levels exceeding 5 ppbv with toluene again being the most common exceedance in the soil gas samples.
- Toluene was found above 5 ppbv in all site soil gas sampling locations and ranged in concentration from 9.3 ppbv at S-80-1 to 62 ppbv at T-72-1.
- The remaining eight organic compounds exceeding the 5 ppbv cutoff and the locations of the exceedance are as follows:
 - Tetrachloroethane at 9 locations with concentrations ranging from 5.4 ppbv at S-80-1 to 85 ppbv at R-120-1.
 - Organic compounds found at least once above 5 ppbv include; vinyl chloride, dichlorofluoromethane, trichlorofluoromethane, chloroform, benzene, and 1,2-dichloro,1,1,2,2,-tetrafluoroethane, and 1,1,1-trichloroethane.