

September 9, 2009

Mr. Lee Pivonka
Remediation and Restoration Unit
Federal Facilities Program
Hazardous Materials and Waste Management Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South, B2
Denver, CO 80246-1530

**Results for the July 2009 Semiannual
Closure / Performance Groundwater Monitoring Program
Main TCE Plume, Operable Unit 5
Former Lowry Air Force Base, Colorado**

Dear Mr. Pivonka,

This letter report presents the results of the July 2009 semiannual closure/performance groundwater monitoring event completed for the Operable Unit 5 (OU 5) Main Trichloroethene (TCE) Plume at the former Lowry Air Force Base, Colorado (Lowry). This work was completed by Lowry Assumption, LLC (LAC) as set forth in the CDPHE-approved *Closure/Performance Groundwater Monitoring Program (GMP) Main TCE Plume, Operable Unit 5 Former Lowry Air Force Base* (LAC, 2007) and subsequent letter modifications. The Closure/Performance GMP is being implemented to support the eventual regulatory closure of the Main TCE Plume and to be consistent with the requirements of Consent Agreement No. 01-08/-07-02 between the CDPHE, the Lowry Economic Redevelopment Authority (LRA), and LAC.

A discussion providing background information on each of the general areas sampled in the Main TCE Plume Area is included in the *Closure/Performance Groundwater Monitoring Program (GMP) Main TCE Plume, Operable Unit 5 Former Lowry Air Force Base* (LAC, June 2007). Descriptions of the sampling methodology, analytical methods, quality assurance (QA)/quality control (QC) procedures, investigation-derived waste (IDW) handling procedures, and equipment decontamination procedures are also included in the referenced document.

Closure/Performance Monitoring – July 2009

The semiannual Closure/Performance GMP sampling event for the Main TCE Plume was conducted between July 6 and July 23, 2009. Field work for this sampling event was conducted by LT Environmental, Inc. (LTE) on behalf of LAC. As set forth in a letter to CDPHE dated June 16, 2009 (Modification to Work Plan for the Semiannual Closure / Performance Groundwater Monitoring Program Main TCE Plume), the proposed July 2009 Closure/Performance GMP monitoring network in the Main TCE Plume consisted of 59 alluvial monitoring wells. Based on

field conditions encountered during the sampling event, there were several variations to the letter work plan as submitted to CDPHE. One temporary alluvial piezometer located in the ONB-2 area (TWOFR-02) was not sampled because of the presence of a very high concentration of potassium permanganate (KMnO_4) (deep purple color) in the well. Three monitoring wells located in ONB-6 also were not sampled due to the presence of very high KMnO_4 concentrations in the well bore, including performance monitoring wells FA-3 and IRAMW02, and closure monitoring well MWCM06. Monitoring well MWOB01 (in OFB-1) was covered with approximately 6-inches of asphalt during recent paving operations on E. 11th Avenue and could not be accessed. Monitoring well MWOB22 (in OFB-2) was found to be dry and the total depth measured in the field indicates the well casing is likely compromised and filled with sediment. Lastly, monitoring well MWOFR04 located in ONB-2 immediately downgradient of the OFR Source Area was added to the performance monitoring network at the end of the field sampling event. As discussed below, MWOFR04 was re-sampled because of the detection of an unexpected analyte; during the resample KMnO_4 was encountered in the purge water from the well. The net result from these changes resulted in a total of 54 monitoring wells that were sampled for the July 2009 Main Plume GMP Event, which are summarized in Table 1 and Table 2.

The 54 alluvial monitoring wells and temporary piezometers (Plate 1) sampled during the July 2009 event included:

- Fifteen (15) alluvial closure monitoring wells (Table 1)
- Thirty-nine (39) alluvial performance monitoring wells (Table 2)

Groundwater samples were collected via low-flow methods using either a dedicated submersible pump or a peristaltic pump with dedicated tubing set in shallower wells. Measurements of temperature, pH, electrical conductivity (EC), dissolved oxygen (DO) concentration, and oxygen reduction potential (ORP) were collected and each monitoring well was sampled after the parameters had stabilized (i.e., readings within +/- 10 percent of the previous reading). Field parameters were measured using a YSI 556® Multi-Probe Field Meter (YSI 556® Meter).

The groundwater samples were submitted to LTE's contract laboratory under chain-of-custody protocols and were analyzed for volatile organic compounds (VOCs) using U.S. Environmental Protection Agency (EPA) method 8260B. Because of an unexpected detection of tetrahydrofuran in the original sample collected from well MWOFR04 on July 23, 2009, the well was re-sampled on August 6, 2009. During the resample the purge water turned deep purple as KMnO_4 entered the well bore indicating influence from the recent bedrock injections completed in the OFR Source Area. Despite the high concentration of KMnO_4 in the sample, it was submitted to the laboratory for analysis by EPA Method 8260B. Groundwater samples from six of the monitoring wells were also analyzed for 1,4-dioxane using EPA Method 8270, the results for which were submitted to CDPHE in a separate report dated August 4, 2009.

Field sampling data sheets for the July 2009 GMP event are provided on the enclosed CD-ROM disc as Attachment A.

Results

In the three months prior to conducting the July 2009 GMP event, KMnO_4 injections were completed in the OFR Source Area (ONB-1 bedrock), the Building 1432/Outfall Source Area (ONB-5 bedrock and alluvium), ONB-6 (alluvium), and OFB-3/OFB-4 (alluvium). The injections in the alluvium at the Building 1432/Outfall Source Area occurred after the July 2009 sampling was completed and was based on preliminary results from the sampling event. Planned injections in the alluvium at OFB-4 (Stapleton area) were delayed to September 2009 pending the resolution of access issues for that area. A summary report for the Main TCE Plume injections completed in Spring/Summer 2009 will be submitted to the CDPHE under separate cover.

The VOC results for the 54 alluvial wells and temporary piezometers sampled in July 2009 as well as the results from the previous semiannual long-term and performance monitoring sampling rounds conducted by LAC and others are presented in Table 3. The results presented for each well include only those chlorinated VOCs historically detected at least once in a specific well where the detected concentration exceeded the chemical-specific regulatory standard. At the prior request of CDPHE, all detections of *cis*- and *trans*-1,2-dichloroethene (DCE) are included on Table 3. Where analytes are non-detect for any given well, i.e., "less than the chemical specific" method detection limit (MDL), the results for such occurrences are left blank on Table 3. Non-detected analytes are shown on laboratory analytical reports as "less than the laboratory reporting limit" (RL). The laboratory data sheets for the July 2009 sampling event are provided on the enclosed CD-ROM disc as Attachment B.

Plate 1 illustrates the interpreted extent of the Main TCE Plume in alluvium as of July 2009 and includes a partial compilation of historical GMP data or available data for each well sampled. The current interpretation is based on the most recent GMP data for the Main TCE Plume and changes observed during the last several semiannual GMP events. Beginning with the July 2009 GMP event, the isoconcentration contour intervals for TCE have been modified to reflect the cleanup objective concentrations at which no additional active remediation will be necessary as set forth in the Draft Final Cleanup Objectives Report (LAC, July 2009). The TCE isoconcentration contour values for Plate 1 are 5 micrograms per liter ($\mu\text{g}/\text{l}$) (i.e., Colorado Basic Groundwater Standard for TCE), 14 $\mu\text{g}/\text{l}$ which coincides with the off-base cleanup objective for ceasing active remediation, 35 $\mu\text{g}/\text{l}$ which coincides with the on-base cleanup objective for ceasing active remediation, and greater than 100 $\mu\text{g}/\text{l}$. The on-base and off-base areas that exceed their respective cleanup objective have been shaded on Plate 1 to visually convey those areas that will be addressed further via active remediation efforts. Note that for those wells in which high concentrations of KMnO_4 (deep purple color) were observed during the recent sampling event (i.e., MWCM06, FA-3, IRAMW02, and MWOFR04 resample), it is interpreted that TCE would be non-detect at a concentration less than 5 $\mu\text{g}/\text{l}$. This is consistent with the result from the re-sample at well MWOFR04 in which TCE was non-detect at a method reporting limit of 2 $\mu\text{g}/\text{l}$.

Since active remediation efforts were initiated in 2004, the extent of the Main TCE Plume has contracted with concurrent decreases in dissolved-phase TCE concentrations in the alluvium (see *Remedial Progress Assessment and Scope of Work for 2008*, LAC, April 2008). The July 2009 groundwater data presented herein demonstrate further decreases in both plume extent and overall TCE concentrations throughout the alluvial water-bearing interval of the Main TCE Plume when compared to the historical GMP data set.

Off-Base Plume Area

In the off-base portion of the Main TCE Plume (i.e., north of 11th Avenue), the overall TCE concentrations in alluvial groundwater observed in July 2009 decreased when compared to the data from the last several semiannual GMP events (Plate 1). The detected TCE concentrations for the July 2009 event in the off-base portion of the Main TCE Plume ranged from 3.3 to 30 µg/l with an average detected TCE concentration of 13 µg/l, down from a range of 4.4 to 37 µg/l and an average detected concentration of 17 µg/l in January 2009. As highlighted on Plate 1 (i.e., yellow shading), there are three off-base areas which currently exceed the recommended cleanup objective of 14 µg/l set forth in the Draft Final Cleanup Objectives Report (LAC, July 2009). The first area, in the vicinity of 12th Avenue (OFB-1/OFB-2), displays a range of detected TCE concentration of 4.2 to 22 µg/l with an average detected concentration of 13 µg/l in July 2009 compared to a range of 12 to 24 µg/l with an average detected concentration of 17 µg/l in January 2009. There were no KMnO₄ injections directly in this area during the recent injection event though it is located immediately downgradient of the injections just completed in ONB-6.

The second off-base area, located in OFB-3/OFB-4 between Colfax Avenue and Montview Boulevard, was included in the recent injection program and though it is too early to discern the full effect from those injections completed in early June 2009, TCE concentrations within this area have decreased since January 2009. The range of detected concentrations in July 2009 within this area was 3.3 to 18 µg/l with an average detected concentration of 13 µg/l, down from a range of 6.1 to 27 µg/l and an average detected concentration of 17 µg/l in January 2009. The third and northernmost area which still exceeds the off-base cleanup objective is located on the former Stapleton property to the north of Montview Boulevard. The detected TCE concentrations in July 2009 for this portion of the Main TCE Plume range from 5.4 to 30 µg/l with an average detected concentration of 17 µg/l as compared to a range of 7.5 to 37 µg/l and an average detected concentration of 19 µg/l in January 2009. With the exception of the result from well MWCM12, the TCE concentrations in this area decreased since the January 2009 monitoring event. As noted above, the KMnO₄ injections planned for this area were delayed until September 2009 pending the resolution of access issues.

On-Base Plume Area

In the on-base portion of the Main TCE Plume (i.e., south of 11th Avenue), the detected TCE concentrations for the July 2009 event ranged from 3.1 to 520 µg/l with an average detected concentration of 68 µg/l. As shown on Plate 1, the highest residual concentrations in the alluvium are adjacent to the contaminant source areas for the Main TCE Plume, specifically the OFR Source Area (ONB-1) and the Building 1432/Outfall Source Area (ONB-5). Also, highlighted on Plate 1 (i.e., blue shading) are the on-base areas that currently exceed the recommended on-base cleanup objective of 35 µg/l set forth in the Draft Final Cleanup Objectives Report (LAC, July 2009).

In the northern portion of the on-base Main TCE Plume located between 8th and 11th Avenues (ONB-6), the detected TCE concentrations ranged from 7.6 to 49 µg/l with an average detected concentration of 31 µg/l, down from a range of 23 to 63 µg/l and an average detected concentration of 38 µg/l in January 2009. KMnO₄ injections were completed in the alluvium within ONB-6 in May 2009 and there were visible KMnO₄ impacts observed in three wells on the downgradient end (north) of this area (Plate 1) during the July 2009 sampling event. Though there appears to have been an initial impact on TCE concentrations in this area from the recent

injections, the fuller effect of those injections is not likely to be apparent until the January 2010 semiannual GMP sampling event.

In the vicinity of the Building 1432/Outfall Source Area (ONB-5), the detected TCE concentrations in the alluvium ranged from 4.2 to 520 µg/l. Although the recent KMnO₄ injections in the source area were focused in the bedrock, after receiving the preliminary laboratory results for well IRAMW17 (520 µg/l) LAC modified the injection scheme to place approximately 14,000 gallons of 4 percent KMnO₄ solution into the alluvium between wells MWMF02A and IRAMW17. The impacts of these injections will be assessed in the January 2010 GMP event.

In the southern portion of the on-base Main TCE Plume extending from well IRAMW24 near Bonfils Blood Center (Bonfils) to well MWCA06R near the OFR Source Area (Plate 1), there are several areas in which the TCE concentrations currently exceed the on-base cleanup objective of 35 µg/l. In the vicinity of Bonfils (ONB-4), the range of detected TCE concentrations was 3.1 to 53 µg/l with an average detected concentration of 21 µg/l in July 2009. With the exception of the lone isolated area near Bonfils that remains in excess of the on-base cleanup objective (well MWBF02), the TCE concentrations in ONB-4 have gradually decreased over the last several semiannual monitoring periods. In ONB-2, the detected TCE concentrations in July 2009 ranged from 3.4 to 280 µg/l with an average detected concentration of 83 µg/l. Several small areas remain above the on-base cleanup objective as a result of stratigraphic influences on sorbed contaminant mass. The last direct KMnO₄ injections within the saturated alluvium in ONB-2 occurred in April/May 2008 with injections immediately downgradient of the OFR Source Area (ONB-1) (Plate 1 – Detail A). TCE concentrations within ONB-2 continue to reflect a downward trend in response to the 2008 injections with the maximum TCE concentrations along the plume axis having dropped from a range from 410 to 800 µg/l prior to those injections to the current maximum TCE concentration of 230 µg/l nearest the source area discharge. Also, the June 2009 injections within the bedrock interval of the OFR Source Area have apparently impacted the southernmost portion of the Main TCE Plume as two wells sampled there in July 2009 (MWCA06R and MWOFR04) exhibited the presence of KMnO₄. It is likely that KMnO₄ injected into the bedrock is discharging from the erosional face on the bedrock surface into the alluvium immediately adjacent to the head of the Main TCE Plume. (Note: 128,000 gallons of KMnO₄ were injected into the bedrock at the OFR Source Area). Also, high concentrations of KMnO₄ persist in temporary piezometer TWOFR02 toward the distal end of this area suggesting that active degradation may still be occurring locally.

As noted earlier, tetrahydrofuran was unexpectedly detected in the initial groundwater sample collected from well MWOFR04 which is located adjacent to the former OFR Source Area. The concentration reported for the initial sample collected on July 23, 2009 was 5,500 µg/l whereas the results from the second sample collected two weeks later indicated that the concentration of tetrahydrofuran had decreased to 830 µg/l; likely due to the presence of KMnO₄ noted in the purge water while collecting the later sample. (Note: KMnO₄ was not present in the wellbore during the initial sampling event on July 15, 2009.) There were no detections of tetrahydrofuran in any other wells sampled during the July 2009 event, particularly those located immediately upgradient or downgradient of MWOFR04. The project database was reviewed and there were no other detections of tetrahydrofuran in any samples collected at Lowry, either on-base or off-base, since it was first included on the EPA Method 8260B reporting list in 2007. A review of the historical project records (i.e., OU5 RI Report, Versar, 2001) indicated neither a likely source for tetrahydrofuran nor any known occurrences at Lowry. Tetrahydrofuran has not been an

identified contaminant of concern at Lowry and it does not appear to be a regulated compound based on a review of the Colorado Basic Standards for Groundwater (5CCR 1002-41). Incidentally, an internet literature search conducted for demonstrated effects of KMnO_4 on tetrahydrofuran indicated that KMnO_4 is an effective treatment for that compound; notably ARCADIS is using KMnO_4 to successfully treat tetrahydrofuran at a chemical manufacturing site in Memphis-Shelby County, Tennessee.

Recommendations

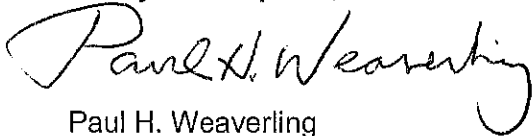
Evaluation of the current GMP monitoring well network for the January 2010 sampling event will be concurrent with the development of remediation plans for 2010. Recommendations for additional remedial activities and modification of the GMP monitoring network will be set forth to the CDPHE at a later date.

Schedule

The next semiannual Closure/Performance groundwater sampling event for the Main TCE Plume is scheduled to commence in early January 2010. LAC will prepare and submit a letter to CDPHE summarizing the intended monitoring well network for that event in early December 2009.

If you have questions concerning this document or its contents please contact me at (303) 972-6633.

Sincerely,
Lowry Assumption, LLC



Paul H. Weaverling
Senior Project Manager

Attachments

Distribution:

Joe Aiken – LAC
Tom Berger – LRA
David Erickson – CCD DEH
Stanley Pehl (2) – AFCEE
Roger Pennifill – AIG
Don Roche - Aurora
Pat Smith – EPA Region 8
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Lowry Project File

Tables

TABLE 1
CLOSURE MONITORING NETWORK
MAIN TCE PLUME GROUNDWATER MONITORING PROGRAM
JULY 2009 RESULTS

Well ID	Remediation Area	Screened Zone	Screen Interval (ft bgs)	Date Sampled	July 2009 TCE Concentration (ug/L)	Total Depth (ft bgs)	Depth to Water (ft bgs)
MWCM01	ONB-2	Alluvium	7 - 17	7/7/2009	16	16.93	8.15
MWCM02	ONB-2	Alluvium	8-18	7/6/2009	22	17.65	10.3
MWCM03	ONB-2	Alluvium	8-18	7/9/2009	140	17.91	9.76
MWBF01	ONB-4	Alluvium	10 - 20	7/14/2009	3.1	22.67	12.88
MWBF02	ONB-4	Alluvium	15 - 25	7/9/2009	53	21.13	15.45
MWCM04	ONB-6	Alluvium	17 - 27	7/10/2009	7.6	26.56	19.20
MWCM05	ONB-6	Alluvium	13.5 - 23.5	7/10/2009	49	22.76	17.80
MWCM06	ONB-6	Alluvium	15.4-25.4	NS	KMnO4 in well	24.84	17.69
IM-7A	OFB-1	Alluvium	15 - 25	7/10/2009	11	25.81	20.14
CP-56	OFB-3	Alluvium/Bedrock	42 - 47	7/13/2009	3.3	46.85	37.23
MWCM07	OFB-3	Alluvium	39 - 49	7/10/2009	15	47.07	38.61
MWCM08	OFB-3	Alluvium	32 - 42	7/15/2009	<2.0	NA	33.01
MWCM09	OFB-4	Alluvium	36 - 46	7/13/2009	14	44.44	36.42
MWCM10	OFB-4	Alluvium	37 - 47	7/13/2009	19	46.55	33.35
MWCM11	OFB-4	Alluvium	32 - 42	7/14/2009	5.4	40.10	29.60
MWCM12	OFB-4	Alluvium	41 - 51	7/9/2009	16	50.60	41.78

Notes:

Results in **bold type** indicate a concentration in excess of the applicable Colorado Groundwater Standard
Samples analyzed for VOCs - Volatile organic compounds by EPA Method 8260

- ft bgs - feet below ground surface
- KMnO₄ - Potassium permanganate
- N/A - Not available
- NS - Not Sampled
- OFB - Off-base
- ONB - On-base
- ug/L - micrograms per liter
- TCE - Trichloroethene

TABLE 2
PERFORMANCE MONITORING NETWORK
MAIN TCE PLUME GROUNDWATER MONITORING PROGRAM
JULY 2009 RESULTS

Well ID	Remediation Area	Screened Zone	Screen Interval (ft bgs)	Date Sampled	July 2009 TCE Concentration (ug/L)	Total Depth (ft bgs)	Depth to Water (ft bgs)
MWWCP03R	ONB-2	Alluvium	18.5 - 28.5	7/7/2009	95	24.21	11.49
TWLRA-014A	ONB-2	Alluvium	19 - 24	7/7/2009	140	25.04	14.05
TWLRA-015A	ONB-2	Alluvium	11 - 16	7/6/2009	34	17.76	13.25
TWLRA-020A	ONB-2	Alluvium	17 - 22	7/6/2009	3.4	21.77	13.83
TWLRA-021A	ONB-2	Alluvium	22 - 27	7/6/2009	26	28.35	13.74
TWLRA-026A	ONB-2	Alluvium	13 - 18	7/6/2009	4.8	20.05	14.57
TWLRA-027A	ONB-2	Alluvium	17 - 22	7/6/2009	<2.0	23.07	15.26
TWLRA-09A	ONB-2	Alluvium	8 - 13	7/7/2009	10	15.12	12.39
TWOFR-01	ONB-2	Alluvium	6 - 16	7/7/2009	280	18.07	11.11
TWOFR-02	ONB-2	Alluvium	6 - 16	NS	KMnO ₄ in well	18.56	11.77
MWCA06R	ONB-2	Alluvium	18.5 - 28.5	7/6/2009	<2.0	28.15	21.30
MWOFR04	ONB-2	Alluvium	26 - 36	7/23/2009	36	36.66	23.97
MWOFR04	ONB-2	Alluvium	26 - 36	8/6/2009	<2.0 (KMnO ₄ in well)	36.66	24.54
MWOFR04R	ONB-2	Alluvium	9 - 19	7/6/2009	230	18.53	10.50
MWMCP02R	ONB-3	Alluvium	10 - 25	7/7/2009	5.6	23.85	6.58
MWCA05	ONB-4	Alluvium	8 - 18	7/9/2009	20	18.55	10.99
MWMF01	ONB-5	Alluvium	10.4 - 25.4	7/8/2009	<2.0	27.95	9.36
MWMF02A	ONB-5	Alluvium	16 - 26	7/7/2009	150	31.71	10.42
MWMF03	ONB-5	Alluvium	18 - 33	7/9/2009	<2.0	32.20	9.37
MWMF07A	ONB-5	Alluvium	17 - 27	7/7/2009	<2.0	34.94	13.67
IRAMW17	ONB-5	Alluvium	NA	7/9/2009	520	25.72	11.46
IRAMW18	ONB-5	Alluvium	10 - 15	7/8/2009	8.1	15.15	3.69
MWCA04	ONB-5/6	Alluvium	7 - 17	7/8/2009	4.2	17.58	2.59
MWCT01A	ONB-6	Alluvium	13 - 23	7/8/2009	<2.0	18.74	0
IMBA01	ONB-6	Alluvium	10 - 20	7/8/2009	19	19.92	10.65
IMBA02	ONB-6	Alluvium	12 - 22	7/8/2009	42	21.70	10.04
IRAMW04	ONB-5/6	Alluvium	7.5 - 17.5	7/15/2009	2.8	NA	5.62
IRAMW01	ONB-6	Alluvium	5.7 - 20.7	7/8/2009	2.0	23.71	4.54
IRAMW02	ONB-6	Alluvium	15.5 - 25.5	NS	KMnO ₄ in well	28.29	18.34
IRAMW09R	ONB-6	Alluvium	15.5 - 25.5	7/10/2009	38	26.23	16.68
IRAMW24	ONB-6	Alluvium/Bedrock	5 - 15	7/9/2009	7.0	16.41	6.72
FA-3	ONB-6	Alluvium	16 - 31	NS	KMnO ₄ in well	30.60	22.14
MWOB01	OFB-1	Alluvium	19.5 - 29.5	NS	Well paved over	NA	NA
MWHE05	OFB-1	Alluvium	21.3 - 26.3	7/10/2009	9.5	24.27	20.52
B-1	OFB-1	Alluvium	16 - 26	7/9/2009	22	25.76	19.81
IM-10	OFB-2	Alluvium	13 - 23	7/10/2009	4.2	23.22	18.40
IM-11	OFB-2	Alluvium	NA	7/10/2009	<2.0	22.02	17.59
MWOB04	OFB-2	Alluvium	17.5 - 27.5	7/13/2009	5.3	27.93	22.21
MWOB21	OFB-2	Alluvium	19.7 - 24.7	7/10/2009	20	24.64	22.76
MWOB22	OFB-2	Alluvium	21.8 - 26.8	7/10/2009	Dry-sediment in well	18.32	NA
MWCA12	OFB-2	Alluvium	N/A	7/13/2009	4.6	28.79	23.30
MWCA02	OFB-3	Alluvium	29 - 39	7/13/2009	14	39.39	30.38
B66-93-05	OFB-4	Alluvium	31 - 41	7/13/2009	15	41.85	30.00
IRAMW30	OFB-4	Alluvium/Bedrock	45 - 55	7/14/2009	18	39.82	32.61
MWCA01AR	OFB-4	Alluvium	37 - 67	7/13/2009	30	42.61	36.16

Notes:

Results in **bold type** indicate a concentration in excess of the applicable Colorado Groundwater Standard

Samples analyzed for VOCs - Volatile organic compounds by EPA Method 8260

Data qualifier: J - compound detected above the Method Detection Limit but below the Method Reporting Limit; the reported value is estimated

ft bgs - feet below ground surface

NA - Not available

OFB - Off-base

ug/L - micrograms per liter

KMnO₄ - Potassium permanganate

NS - Not sampled

ONB - On-base

TCE - Trichloroethene

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	Trans-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLORO METHANE	DIBROMOCHLORO METHANE
Regulatory Standard ^a			200	5		5	7	5	5	70	100	2			5	4.7	5		
MAIN TCE PLUME AREA																			
ONB- 182																			
MWCM01	CM	5-Jul-07																	
MWCM01	CM	24-Jan-08																	
MWCM01	CM	10-Jul-08																	
MWCM01	CM	6-Jan-09																	
MWCM01	CM	7-Jul-09																	
MWCM02	CM	6-Jul-07																	
MWCM02	CM	24-Jan-08																	
MWCM02	CM	8-Jul-08																	
MWCM02	CM	7-Jan-09																	
MWCM02	CM	6-Jul-09																	
MWCM03	CM	6-Jul-07																	
MWCM03	CM	24-Jan-08																	
MWCM03	CM	7-Jul-08																	
MWCM03	CM	7-Jan-09																	
MWCM03	CM	9-Jul-09																	
MWCA06R	PM	22-Jan-08																	
MWCA06R	PM	8-Jul-08																	
MWCA06R	PM	6-Jan-09																	
MWCA06R	PM	6-Jul-09																	
MWWCP03R	PM	22-Jan-08																	
MWWCP03R	PM	7-Jul-08																	
MWWCP03R	PM	6-Jan-09																	
MWWCP03R	PM	7-Jul-09																	
MWOFR04	PM	31-Oct-00																	
MWOFR04	PM	15-Feb-01																	
MWOFR04	PM	9-May-01																	
MWOFR04	PM	14-Aug-01																	
MWOFR04	PM	31-Mar-04																	
MWOFR04	PM	10-Jul-07																	
MWOFR04	PM	22-Jan-08																	
MWOFR04	PM	23-Jul-09																	
MWOFR04	PM	6-Aug-09																	
MWOFR04R	PM	22-Jan-08																	
MWOFR04R	PM	8-Jul-08																	

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																	
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLOROMETHANE	DIBROMOCHLOROMETHANE	
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5			
MWOFR04R	PM	6-Jan-09																		
MWOFR04R	PM	6-Jul-09																		
ONB- 384																				
MWWCP02R	PM	16-Dec-08																		
MWWCP02R	PM	13-Jan-09																		
MWWCP02R	PM	7-Jul-09																		
MWCA05	PM	29-Mar-05																		
MWCA05	PM	21-Jun-05					0.48	J	0.46	J										
MWCA05	PM	5-Dec-05																		
MWCA05	PM	29-Jun-06																		
MWCA05	PM	27-Nov-06					0.36	J	0.26	J										
MWCA05	PM	6-Jul-07					0.22	J												
MWCA05	PM	24-Jan-08																		
MWCA05	PM	8-Jul-08																		
MWCA05	PM	7-Jan-09																		
MWCA05	PM	9-Jul-09																		
MWBF01	CM	18-Nov-00					0.58	R	0.57	J										
MWBF01	CM	20-Feb-01					0.97	J	0.53	J										
MWBF01	CM	14-May-01					0.90	J	0.56	J										
MWBF01	CM	20-Aug-01					0.64	J	0.51	J										
MWBF01	CM	3-Jul-07																		
MWBF01	CM	24-Jan-08																		
MWBF01	CM	28-Jul-08																		
MWBF01	CM	7-Jan-09																		
MWBF01	CM	14-Jul-09																		
MWBF02	CM	7-Nov-00																		
MWBF02	CM	21-Feb-01																		
MWBF02	CM	10-May-01																		
MWBF02	CM	20-Aug-01																		
MWBF02	CM	6-Jul-07																		
MWBF02	CM	24-Jan-08																		
MWBF02	CM	8-Jul-08	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
MWBF02	CM	7-Jan-09																		
MWBF02	CM	9-Jul-09																		

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																							
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLOROMETHANE	DIBROMOCHLOROMETHANE							
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5									
ONB-5&6																										
MWMF01	PM	18-Aug-03					2.3					0.25	J						0.28	J						
MWMF01	PM	9-Aug-07					1.5	J																		
MWMF01	PM	12-Nov-07					2.5																			
MWMF01	PM	14-Feb-08																								
MWMF01	PM	12-Aug-08																								
MWMF01	PM	8-Jul-09											3.7													
MWMF02A	PM	19-Aug-03	140	J	2.6		7.7		4.3		160	J	0.8	J	4600	71	J	4.2		0.43	J			0.35	J	
MWMF02A	PM	15-Sep-05	13				1.8	J	4.4	J	14				520	53								27		
MWMF02A	PM	20-Dec-05	6.4				1.6	J			16	J			470	8.3										
MWMF02A	PM	29-Jun-06	130								120				3400	29								170	B	
MWMF02A	PM	7-Nov-06	44	J							42	J			1300	37										
MWMF02A	PM	27-Nov-06	34	J							45	J			1300	29	J									
MWMF02A	PM	25-Jan-08													330											
MWMF02A	PM	8-Jul-08					4.6	J	4.2	J				140	160		14									
MWMF02A	PM	9-Jan-09					5.8		4.6	J				130	6.9											
MWMF02A	PM	7-Jul-09					3.7		5.0					150	74		9.7									
MWMF03	PM	19-Aug-03				0.23	J	0.72	J	0.25	J			5.0	11		3.3			0.38	J					
MWMF03	PM	5-Dec-06						0.61	J						0.32	J										
MWMF03	PM	28-Nov-07																								
MWMF03	PM	14-Feb-08																								
MWMF03	PM	12-Aug-08														2.7										
MWMF03	PM	9-Jul-09																								
MWMF07A	PM	29-Jun-04	1.9		0.32		1.1		2.2		22			570	21		13		1.2							
MWMF07A	PM	7-Jul-09	6.2																							
IRAMW17	PM	13-Nov-97	5.6	J							7.7	J		330	24		9.4	J								
IRAMW17	PM	10-Jun-98	na		na		na		na		0.45	J	1400	47		na		na		na		na		na		na
IRAMW17	PM	24-Sep-98	79		1.1		na		4.7		50	R	na	na		na		6.8								
IRAMW17	PM	9-Dec-98	na		na		na		na		0.57	J	1510	56		na		na		na		na		na		na
IRAMW17	PM	17-Dec-99	15		0.63	J	3.1		4.0		27	J	0.26	J	730	J	110		6.0							
IRAMW17	PM	15-Nov-00	0.57	J			0.38	J	2.7		1.2			48	J	40		24		1.6	J					
IRAMW17	PM	22-Feb-01	0.26	J			0.25	J	3.7		0.7	J		29		37		20		2.2						

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																	
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLOROMETHANE	DIBROMOCHLOROMETHANE	
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5			
IRAMW17	PM	10-May-01			0.19	J	3.6	0.54	J			23	29	15						
IRAMW17	PM	20-Aug-01					4.0					22	24	12	1.9					
IRAMW17	PM	9-Jul-09	8.4		3.8		2.4	17				520	180	25						
IRAMW18	PM	13-Nov-97	75							7.8	J	920	21		10	R				
IRAMW18	PM	15-Nov-00	0.31	J	1.3		2.0	2.1		1.4		68	J	48	1.5	J				
IRAMW18	PM	26-Feb-01	0.28	J	1.2		2.3	2.2		1.3		66			1.6					
IRAMW18	PM	10-May-01			1.3		2.8	2.4		1.9		77								
IRAMW18	PM	20-Aug-01	0.61	J	1.5		2.8	2.4		1.6		107			2.0					
IRAMW18	PM	4-Dec-03						12	J			300	30				7.8	J		
IRAMW18	PM	6-Jul-07			0.32	J	2.3	1.1		0.64	J	44	4.2	0.66	J			0.35	J	
IRAMW18	PM	25-Jan-08					2.0	J				29	8.2							
IRAMW18	PM	8-Jul-08										22								
IRAMW18	PM	9-Jan-09										12	10							
IRAMW18	PM	8-Jul-09										8.1								
MWCA04	PM	29-Mar-05					2.5			0.55	J	5.4	2.2							
MWCA04	PM	21-Jun-05					2.1	0.28	J	0.54	J	5.1	2.0							
MWCA04	PM	6-Dec-05					2.8	0.11	J	0.42	J	4.9	1.9							
MWCA04	PM	29-Jun-06			0.13	J	2.8	0.45	J	0.60	J	11	1.7							
MWCA04	PM	27-Nov-06					3.1	0.30	J	0.52	J	4.0	1.5							
MWCA04	PM	6-Jul-07					1.8	0.15	J	0.30	J	2.9	1.3				0.38	J		
MWCA04	PM	25-Jan-08					2.0	J				4.8	J							
MWCA04	PM	8-Jul-08										4.1	J							
MWCA04	PM	9-Jan-09										6.0								
MWCA04	PM	8-Jul-09										4.2								
IRAMW04	PM	17-Apr-95	1.2				4.0	4.8		3.2		55								
IRAMW04	PM	19-Apr-95	1.6				5.1	5.2		3.9		138								
IRAMW04	PM	8-Sep-95	1.2				4.7	5.9		3.5		135	17.4	1.6						
IRAMW04	PM	8-Dec-98	0.57	J			6.9	3.1	J	2.4		45	J	8.4	J					
IRAMW04	PM	13-Dec-99	0.25	J	0.49	J	4.2	1.1		1.6		38	J	7.2	J	0.48	J			
IRAMW04	PM	28-Jul-03					8.8	J	3.6	J	4.2	J	83	5.9	J					
IRAMW04	PM	4-Dec-03					9.7	J	3.6	J	4.5	J	74	4.8	J			2.1	BJ	
IRAMW04	PM	15-Jul-09										2.8								

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																	
			1,1,1-TRICHLORO ETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLORO ETHENE	TETRACHLOROETHENE	TRICHLORO ETHENE	CIS-1,2-DICHLOROETHENE	Trans-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLORO METHANE	DIBROMOCHLORO METHANE	
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5			
IRAMW24	PM	1-Dec-04			0.40	J	2.3	0.92	J	1.1		23	7.9		0.27	J				
IRAMW24	PM	31-Mar-05					1.9	0.35	J	0.58	J	13	3.9							
IRAMW24	PM	22-Jun-05					1.1	0.43	J	0.61	J	8.1	2.3							
IRAMW24	PM	9-Dec-05			0.25	J	0.69	J	0.43	J	0.46	J	16	7.2	0.16	J				
IRAMW24	PM	29-Jun-06			0.31	J	2.3	1.2	J	0.86	J	28	3.2	0.14	J					
IRAMW24	PM	28-Nov-06			0.22	J	0.81	J	0.56	J	0.52	J	21	5.2	0.12	J	0.16	J		
IRAMW24	PM	6-Jul-07					1.0	0.22	J			6.8	3.9							
IRAMW24	PM	25-Jan-08										24	3.2	J						
IRAMW24	PM	10-Jul-08					3.2	J				36	6.1							
IRAMW24	PM	9-Jan-09										11	5.5							
IRAMW24	PM	9-Jul-09										7.0								
IRAMW01	PM	26-Jun-03					2.8						0.37	J						
IRAMW01	PM	20-Jan-04					1.7	0.24	J	6.0		5.8	0.58	J						
IRAMW01	PM	29-Jun-04					1.3	0.30	J	3.3		4.9	0.57	J						
IRAMW01	PM	2-Dec-04			0.16	J	1.8	0.22	J	5.2		6.0	0.66	J						
IRAMW01	PM	21-Jun-05					0.58	J	0.31	J	3.7	4.7								
IRAMW01	PM	12-Dec-05					0.98	J	0.14	J	4.7	6.1	0.34	J						
IRAMW01	PM	29-Jun-06					1.3			0.75	J	5.1	0.37	J						
IRAMW01	PM	27-Nov-06					1.3			2.4		5.1	0.59	J						
IRAMW01	PM	6-Jul-07					0.76	J		2.5		3.4	0.40	J						
IRAMW01	PM	25-Jan-08										2.9	J							
IRAMW01	PM	9-Jul-08								2.2	J	2.5	J							
IRAMW01	PM	13-Jan-09								2.6	J	3.6	J							
IRAMW01	PM	8-Jul-09										2.0								
MWCT01A	PM	5-Jul-06			0.14	J	2.2	0.6	J			13	0.65	J						
MWCT01A	PM	11-Oct-06					0.75	J	0.095	J	0.28	J	4.2	0.35	J					
MWCT01A	PM	28-Nov-06					0.38	J			0.16	J	2.4							
MWCT01A	PM	30-May-08										0.7								
MWCT01A	PM	16-Jul-08																		
MWCT01A	PM	5-Aug-08																		
MWCT01A	PM	8-Jul-09																		
IMBA01	PM	2-Dec-04					6.0	1.6		2.5		65	3.4				1.5			
IMBA01	PM	6-Jul-07			0.27	J	1.2	0.24	J	0.55	J	15	1.4							

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																	
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLOROMETHANE	DIBROMOCHLOROMETHANE	
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5			
IMBA01	PM	25-Jan-08																		
IMBA01	PM	10-Jul-08																		
IMBA01	PM	13-Jan-09																		
IMBA01	PM	8-Jul-09																		
IMBA02	PM	29-Mar-05	1.1		2.7	5.8	11	9.2	430	15	1.1	1.6			0.60	J				
IMBA02	PM	22-Jun-05					7.7	J	5.9	J	210	11								
IMBA02	PM	15-Sep-05	0.37	J	1.2	4.9	7.7	4.7	94	6.0		0.85	J		2.8					
IMBA02	PM	6-Dec-05			0.94	J	2.4	2.4	71	4.8		0.68	J		1.1	J				
IMBA02	PM	5-Jul-06			1.9	J	3.7	J	7.8	J	6.0	J	210	12			9.6	JB		
IMBA02	PM	28-Nov-06	0.26	J	0.81	J	4.2	3.2	77	4.1	0.39	J	0.47	J	4.4					
IMBA02	PM	25-Jan-08					2.5	J		3.1	J	48	1.8	J						
IMBA02	PM	10-Jul-08							3.1	J	33									
IMBA02	PM	13-Jan-09								3.2	J									
IMBA02	PM	8-Jul-09								4.2	J									
IRAMW09	PM	28-Nov-06			0.74	J	5.5	2.8	78	3.6					1.1	J				
IRAMW09	PM	6-Jul-07			0.29	J	3.0	0.83	J	2.1	30	1.8				0.33	JB			
IRAMW09	PM	28-Jan-08							18	2.1	J									
IRAMW09	PM	20-May-08							12											
IRAMW09R	PM	20-May-08				2.8	J		1.8	J	16	1.4	J							
IRAMW09R	PM	10-Jul-08							17											
IRAMW09R	PM	8-Jan-09				3.8	J		2.7	J	26									
IRAMW09R	PM	10-Jul-09				3.9			38											
MWCM04	CM	5-Jul-07			0.86	J	1.5	J	2.4	2.6	83	5.0								
MWCM04	CM	25-Jan-08							3.2	J	44	2.4	J							
MWCM04	CM	10-Jul-08							14											
MWCM04	CM	8-Jan-09							3.0	J	30	2.0	J							
MWCM04	CM	10-Jul-09							7.6											
MWCM05	CM	5-Jul-07			0.19	J	0.36	J	0.50	J	0.93	J	18	5.4	0.27	J				
MWCM05	CM	25-Jan-08							58		5.8									
MWCM05	CM	10-Jul-08							26	2.1	J									
MWCM05	CM	8-Jan-09							2.5	J	52	7.3								
MWCM05	CM	10-Jul-09							49	4.1										
MWCM06	CM	5-Jul-07							1.6											
MWCM06	CM	28-Jan-08							19											

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Main TCE Plume Closure/Performance Groundwater Monitoring Program

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			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLOROMETHANE	DIBROMOCHLOROMETHANE				
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5						
MWCM06	CM	10-Jul-08																					
MWCM06	CM	8-Jan-09																					
MWCM06	CM	10-Jul-09	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns			
IRAMW02	PM	26-Jun-03			0.87	J	0.68	J	2.6		2.7												
IRAMW02	PM	19-Jan-04									0.52	J											
IRAMW02	PM	30-Jun-04						0.50	J		0.48	J											
IRAMW02	PM	15-Dec-04									0.16	J											
IRAMW02	PM	31-Mar-05									0.16	J											
IRAMW02	PM	22-Jun-05						0.50	J		0.38	J											
IRAMW02	PM	15-Dec-05									0.22	J											
IRAMW02	PM	7-Jul-06									0.22	J											
IRAMW02	PM	28-Nov-06																					
IRAMW02	PM	6-Jul-07																					
IRAMW02	PM	28-Jan-08																					
IRAMW02	PM	10-Jul-08																					
IRAMW02	PM	8-Jan-09																					
IRAMW02	PM	10-Jul-09	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns			
MWOB01	PM	14-Oct-96	0.58	J					2		4.2												
MWOB01	PM	12-Dec-96	0.85	J																			
MWOB01	PM	30-May-97	0.64	J																			
MWOB01	PM	17-Nov-97	3.1						0.94	J													
MWOB01	PM	29-May-98																		0.57	J		
MWOB01	PM	14-Dec-98	0.48	J																	1.2	J	
MWOB01	PM	14-Dec-98							1.2	J												0.27	J
MWOB01	PM	10-Jul-09	Well not accessible - covered during street resurfacing activities by the City of Denver - not sampled																				
FA-3	PM	11-Jul-08																					
FA-3	PM	8-Jan-09																					
FA-3	PM	10-Jul-09	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
OFB- 1,2,3&4																							
MWHE05	PM	15-Dec-99	0.96	J	0.49	J	4.2		0.63	J													
MWHE05	PM	6-Jul-07																					
MWHE05	PM	28-Jan-08																					
MWHE05	PM	11-Jul-08																					
MWHE05	PM	8-Jan-09																					
MWHE05	PM	10-Jul-09																					

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																		
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	Trans-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLOROMETHANE	DIBROMOCHLOROMETHANE		
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5				
B-1	PM	3-Dec-04						1.7	J	82	7.1										
B-1	PM	31-Mar-05			0.97	J		1.7		3.0	83	7.3	0.33	J						0.80	J
B-1	PM	22-Jun-05					0.85	J	1.4	36	2.3										
B-1	PM	9-Dec-05			0.4	J		0.95	J	1.6	48	2.7									
B-1	PM	28-Jun-06			0.18	J		0.58	J	0.82	22	1.0									
B-1	PM	4-Dec-06					0.40	J	0.78	J	31	0.91	J								
B-1	PM	6-Jul-07					0.35	J	0.59	J	15	0.77	J			0.34	JB				
B-1	PM	28-Jan-08									19	1.2	J								
B-1	PM	11-Jul-08									26										
B-1	PM	13-Jan-09									24										
B-1	PM	9-Jul-09									22										
IM-7A	CM	5-Dec-06					0.28	J	0.91	J	33	0.86	J								
IM-7A	CM	6-Jul-07					0.49	J	0.77	J	25	0.92	J								
IM-7A	CM	28-Jan-08									2.4	J									
IM-7A	CM	11-Jul-08									13										
IM-7A	CM	13-Jan-09									14										
IM-7A	CM	10-Jul-09									11										
MWOB21	PM	29-Jun-04						0.88	J	42	4.4	J				1.3	BJ				
MWOB21	PM	4-Dec-06					0.36	J	0.96	J	36	1.4									
MWOB21	PM	13-Jan-09									12										
MWOB21	PM	10-Jul-09									20										
MWOB22	PM	8-Jul-98									13	J	0.37	J		1.6	J				
MWOB22	PM	4-Nov-98									15										
MWOB22	PM	16-Dec-98									12										
MWOB22	PM	20-Apr-99					0.3	J			11										
MWOB22	PM	15-Dec-99						0.29	J	9.5	J	0.28	J								
MWOB22	PM	4-Dec-06									8.9										
MWOB22	PM	10-Jul-09	well damaged - screen interval covered with silt/sand - not sampled																		
IM-10	PM	29-Jun-04						0.37	J	11	0.58	J				0.27	BJ		2.5	0.33	J
IM-10	PM	30-Mar-05								8.1	0.37	J				0.96	J		5.6	1.2	
IM-10	PM	5-Dec-06						0.38	J	22	0.41	J							0.19	J	
IM-10	PM	12-Mar-07			0.23	J		0.38	J	0.67	J	26	0.97	J					0.51	J	
IM-10	PM	13-Jan-09																	5.0		
IM-10	PM	10-Jul-09									4.2										

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																		
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	Trans-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLOROMETHANE	DIBROMOCHLOROMETHANE		
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5				
IM-11	PM	29-Jun-04						0.33	J	6.6	0.50	J				0.23	BJ		1.9		
IM-11	PM	13-Mar-07			0.23	J		0.26	J	0.63	J	23	0.86	J					0.4	J	
IM-11	PM	13-Jan-09																	6.2		
IM-11	PM	10-Jul-09																			
MWCA12	PM	13-Mar-07			0.19	J		0.27	J	0.52	J	21	0.63	J							
MWCA12	PM	14-Jan-09										4.6							5.1		
MWCA12	PM	13-Jul-09										4.6									
MWOB04	PM	22-Jun-05								0.63		17	0.62	J					1.5	0.34	J
MWOB04	PM	9-Dec-05			0.25	J				0.82	J	27	1.2						0.43	J	
MWOB04	PM	23-Aug-06			0.30	J				1.0	J	37	1.2	J							
MWOB04	PM	4-Dec-06								0.93	J	41	1.3								
MWOB04	PM	6-Jul-07			0.20	J		0.29	J	0.70	J	27	1.2				0.32	JB	0.19	J	
MWOB04	PM	28-Jan-08										12									
MWOB04	PM	11-Jul-08										9.1									
MWOB04	PM	14-Jan-09										4.4	J								
MWOB04	PM	13-Jul-09										5.3									
MWCM07	CM	6-Jul-07			0.16	J		0.18	J	0.60	J	27	0.69	J							
MWCM07	CM	28-Jan-08										35									
MWCM07	CM	11-Jul-08										21									
MWCM07	CM	14-Jan-09										23									
MWCM07	CM	10-Jul-09										15									
CP-56	PM	3-Dec-04								0.22	J	7.7									
CP-56	PM	31-Mar-05										7.5									
CP-56	PM	23-Jun-05								0.21	J	6.7									
CP-56	PM	15-Dec-05								0.17	J	5.2									
CP-56	PM	6-Jul-06								0.37	J	11							0.15	J	
CP-56	PM	5-Dec-06										6.7									
CP-56	CM	6-Jul-07								0.44	J	14								0.24	J
CP-56	CM	29-Jan-08										2.3	J						5.4		
CP-56	CM	11-Jul-08										5.1							3.7	J	
CP-56	CM	13-Jan-09										6.1									
CP-56	CM	13-Jul-09										3.3									

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Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																	
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	Trans-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLORO METHANE	DIBROMOCHLORO METHANE	
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5			
MWCA02	PM	6-Apr-05						0.57	J	26	0.56	J								
MWCA02	PM	23-Jun-05						0.72	J	25										
MWCA02	PM	16-Dec-05						0.76	J	28										
MWCA02	PM	6-Jul-06						0.73	J	28	0.45	J				1.9	JB			
MWCA02	PM	5-Dec-06						0.63	J	36	0.16	J								
MWCA02	PM	10-Jul-07					0.43	J	0.63	J	26	0.43	J						0.34	J
MWCA02	PM	29-Jan-08								30										
MWCA02	PM	11-Jul-08								15										
MWCA02	PM	14-Jan-09								11										
MWCA02	PM	13-Jul-09								14										
IRAMW30	PM	23-Jun-05						0.49	J	28										
IRAMW30	PM	19-Dec-05			0.16	J		0.92	J	39										
IRAMW30	PM	6-Jul-06						0.73	J	34	0.23	J							0.23	J
IRAMW30	PM	5-Dec-06						0.6	J	37										
IRAMW30	PM	6-Jul-07						0.52	J	22				0.19	J					
IRAMW30	PM	29-Jan-08								55										
IRAMW30	PM	11-Jul-08								26										
IRAMW30	PM	14-Jan-09								27										
IRAMW30	PM	14-Jul-09								18										
B66-93-05	PM	7-Feb-05			0.23	J		0.33	J	1.1	0.66	J							0.18	J
B66-93-05	PM	6-Apr-05						0.32	J	1.1	0.87	J								
B66-93-05	PM	23-Jun-05						0.40	J	1.2	0.44	J								
B66-93-05	PM	19-Dec-05			0.20	J		0.20	J	1.2	0.37	J							0.33	J
B66-93-05	PM	6-Jul-06								0.80	0.45	J			2.0	B			0.26	J
B66-93-05	PM	4-Dec-06						0.94	J	46	0.30	J								
B66-93-05	PM	30-Jan-08								24										
B66-93-05	PM	11-Jul-08								17										
B66-93-05	PM	14-Jan-09								19										
B66-93-05	PM	13-Jul-09								15										

Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																		
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	Trans-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLOROMETHANE	DIBROMOCHLOROMETHANE		
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5				
MWCM09	CM	6-Jul-07						0.32	J	12											
MWCM09	CM	29-Jan-08								15											
MWCM09	CM	11-Jul-08								13											
MWCM09	CM	15-Jan-09								16											
MWCM09	CM	13-Jul-09								14											
MWCM10	CM	6-Jul-07					0.16	J	0.56	J	28	0.30	J							0.52	J
MWCM10	CM	29-Jan-08								31											
MWCM10	CM	11-Jul-08								22											
MWCM10	CM	15-Jan-09								22											
MWCM10	CM	13-Jul-09								19											
MWCM11	CM	6-Jul-07								6.2											
MWCM11	CM	30-Jan-08								10											
MWCM11	CM	11-Jul-08								8.2											
MWCM11	CM	16-Jan-09								7.5											
MWCM11	CM	14-Jul-09								5.4											
MWCA01A	PM	1-Apr-05								1.1											
MWCA01A	PM	23-Jun-05								1.1	J										
MWCA01A	PM	19-Dec-05								1.4											
MWCA01A	PM	6-Jul-06								1.4	J										
MWCA01A	PM	4-Dec-06								0.96	J					4.5	B				
MWCA01A	PM	29-Jan-08								72											
MWCA01AR	PM	11-Jul-08								29											
MWCA01AR	PM	15-Jan-09								37											
MWCA01AR	PM	13-Jul-09								30											

**Table 3 - Analytical Results for Alluvial Monitoring Wells - July 2009
Main TCE Plume Closure/Performance Groundwater Monitoring Program**

Well Name	Well Network	Date Collected	Chlorinated VOCs Detected at Concentrations Exceeding Regulatory Standards																	
			1,1,1-TRICHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	1,1-DICHLOROETHENE	TETRACHLOROETHENE	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	Trans-1,2-DICHLOROETHENE	VINYL CHLORIDE	CHLOROMETHANE	CHLOROETHANE	CARBON TETRACHLORIDE	METHYLENE CHLORIDE	1,2-DICHLOROPROPANE	BROMODICHLORO METHANE	DIBROMOCHLORO METHANE	
Regulatory Standard^a			200	5		5	7	5	5	70	100	2			5	4.7	5			
MWCM12	CM	6-Jul-07																		
MWCM12	CM	29-Jan-08																		
MWCM12	CM	11-Jul-08																		
MWCM12	CM	15-Jan-09																		
MWCM12	CM	9-Jul-09																		

Notes

^(a) Regulatory standards shown represent the more conservative of either USEPA or CDPHE standards

^(b) Sample collected from bottom of well screen for comparative purposes

All concentrations shown are in ug/L

Concentrations exceeding regulatory standards are highlighted in bold

Shaded rows indicate July 2009 data

Shaded rows indicate well not found or destroyed

Water-Bearing Zone Sampled

Units

A - Alluvium

A/D - Alluvium-Denver

D - Denver

ft bgs - feet below ground surface

ug/L - micrograms per liter

na - data not available

ns - Well not sampled due to very high residual potassium permanganate in well annulus

Explanation of Qualifiers

CM - closure monitoring program

PM - performance monitoring program

Explanation of Qualifiers

B: This flag is used when the analyte is detected in the associated method blank as well as in the sample.

It indicates probable blank contamination and warns the data user.

This flag is also used if the analyte was also detected in the trip blank.

J: This flag indicates an estimated value.

E: This flag indicates an estimated value

**Attachments
(on CD-ROM Disk)**