0061477

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04-AMCP-0197

MAR 1 7 2004

Mr. Michael A. Wilson, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
1315 W. Fourth Avenue
Kennewick, Washington 99336

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Dear Mr. Wilson:

TRANSMITTAL OF THE BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER - DECEMBER 2003

The purpose of this letter is to transmit "Burial Ground Sampling and Analysis Results for October - December 2003" (attached). This quarterly letter report has been prepared in response to Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Settlement and Tentative Agreement Interim Milestone M-91-40 (M-91-40), requirement 2, paragraph 3.

The Sampling and Analysis Plan (SAP) identified in the M-91-40 Milestone was approved for the 218-W-4C Burial Ground by the State of Washington Department of Ecology on September 12, 2003, and implemented starting October 15, 2003. Step I (vent riser sampling) of the sampling design in the SAP was completed during the October - December 2003 quarter addressed by the attached report. The remaining steps of the SAP, steps II and III, will occur after removal of the waste when the asphalt pad is accessible and sampling will not interfere with retrieval operations. Vapor samples were collected through existing vent risers in trenches T-1, T-4, T-7, T-20 and T-29 and analyzed for volatile organic compounds using field screening instruments. The highest concentrations were detected at the east end of Trench T-04. Preliminary action levels are not applicable to these vapor samples because there are no vapor clean-up levels for volatile organic compounds. No contaminant releases to the environment were documented as a result of the vent riser sampling.

Results for vapor samples submitted for laboratory analysis are anticipated to be received during the next quarter (January - March 2004) and will be provided in the next quarterly letter report. Based on the sampling design in the SAP for the 218-W-4C Burial Ground, Step II sampling is planned following the retrieval of the suspect transuranic waste in this burial ground.

If you have questions, please contact me, or your staff may contact Matt McCormick, Assistant Manager for the Central Plateau, on (509) 373-9971.

Sincerely,

Jean F Schirer
for

Keith A. Klein
Manager

AMCP:GLS

Attachment

cc w/attach:
N. Ceto, EPA
L. J. Cusack. Ecology
F. C. Jamison, Ecology
M. Mills, Ecology
V. J. Rohay, FHI
R. T. Wilde, FHI
Admin Record

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER – DECEMBER 2003

SUMMARY

Step I of the sampling design in the sampling and analysis plan for the 218-W-4C Burial Ground was completed during the October – December 2003 quarter. Vapor samples were collected through existing vent risers in trenches T-01, T-04, T-07, T-20, and T-29 and analyzed for volatile organic compounds using field screening instruments. The highest concentrations were detected at the east end of trench T-04. Preliminary action levels are not applicable to these vapor samples. Other than incidental and unavoidable vapor releases to atmosphere associated with sampling at the vent risers, no contaminant releases to the environment were documented as a result of the vent riser vapor sampling.

Results for vapor samples submitted for laboratory analysis are anticipated to be received during the next quarter (January – March 2004) and will be provided in the next quarterly letter report. Based on the sampling design in the sampling and analysis plan for the 218-W-4C Burial Ground, Step II sampling is planned following retrieval of the retrievably stored waste.

1.0 INTRODUCTION

This quarterly letter report has been prepared in response to *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989) Settlement and Tentative Agreement Interim Milestone M-91-40, Requirement 2, paragraph 3. The sampling and analysis activities summarized in this quarterly letter report were conducted in accordance with DOE/RL-2003-48, *218-W-4C Burial Ground Sampling and Analysis Plan*, issued by the Washington State Department of Ecology on September 12, 2003 as an attachment to Skinnarland 2003, "Issuance of the Final 218-W-4C Sampling and Analysis Plan (SAP) in Conjunction with Administrative Order No. 03NWPKW-5494 Issued on April 20, 2003, by the Washington State Department of Ecology (Ecology) and Modified by Stipulation Approved on July 8, 2003, by the Washington State Pollution Control Hearings Board on July 8, 2003." This letter report covers the quarter from October through December 2003.

The 218-W-4C sampling and analysis plan (SAP) was developed to determine whether contaminants have been released to the vadose zone from retrievably stored waste[1] in the 218-W-4C Burial Ground in the 200 West Area of the Hanford Site. In the 218-W-4C Burial Ground, Trenches T-01, T-04, T-07, T-20, T-24, and T-29 contain suspect TRU[2] retrievable waste (Figure 1). The waste typically is contained in 208-L (55-gal) drums. A schematic cross section of a retrievable storage trench in the 218-W-4C Burial Ground is shown in Figure 2.

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[1] Retrievably stored for purposes of the *Atomic Energy Act of 1954*.

[2] Transuranic (waste materials contaminated with 100 nCi/g of transuranic materials having half-lives longer than 20 years).

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER – DECEMBER 2003

The 218-W-4C sampling design consists of three steps. Step I is vapor sampling through vent risers in the trenches before waste retrieval. Steps II and III are conducted following waste retrieval. Step II includes sampling the asphalt pad and adjacent soils. Step III involves assessing the data collected in Steps I and II, leading to potential characterization of the substrate soils beneath the asphalt pads.

The Step I sampling in the 218-W-4C Burial Ground was completed during the October – December 2003 quarter addressed by this letter report. As specified in the 218-W-4C SAP, the Step II and Step III sampling to characterize the substrate soils will be conducted when the asphalt pad in an entire trench has become accessible and sampling will not interfere with waste retrieval operations. The results of the Step I sampling will be used to focus the Step II sampling.

2.0 SAMPLING METHODOLOGY

Before waste retrieval began, 85 vent risers existed in trenches T-01, T-04, T-07, T-20, and T-29 in the 218-W-4C Burial Ground (Table 1). No vent risers existed in trench T-24. As stated in the SAP, sampling was limited to the existing vent risers that were accessible without posing health and safety risks to workers. During Step I, vapor samples were collected from 84 vent risers that generally were aligned with the centers of the engineered trenches.

Two types of vapor samples were collected. At each trench, vapor samples initially were collected from each riser and contained in Tedlar[3] bags for on-site analysis using a field-screening instrument. A vapor sample then was collected from the vent riser in that trench that had the highest carbon tetrachloride concentration, based on the field-screening results. This vapor sample was contained in a SUMMA[4] canister for laboratory analysis. A total of 91 vapor samples were collected. Of these, 84 samples were collected in Tedlar bags for field screening and 7 samples were collected in SUMMA canisters for laboratory analysis. The samples collected in SUMMA canisters include one from each trench, one duplicate, and one additional sample that was inadvertently collected from a vent riser that did not have the highest carbon tetrachloride concentration in that trench.

Vent riser sampling was initiated on October 15, 2003. Eighty-nine vapor samples were collected in Tedlar bags or SUMMA canisters between October 15 and October 22, 2003. The last two samples (one Tedlar bag and one SUMMA canister) were collected between December 8 and December 10, 2003.

All but two of the vent risers were sampled between October 15 and October 22, 2003. The steep sides of trench T-20 at the locations of vent risers T20-01 and T20-07 precluded access by foot. A vapor sample was collected from vent riser T20-01 on December 8, 2003 using an aerial

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[3] Tedlar is a registered trademark of E. I. du Pont de Nemours and Company, Wilmington, Delaware.

[4] SUMMA is a trademark of Moletrics, Inc., Cleveland, Ohio.

lift for access. However, a vapor sample could not be collected from vent riser T20-07 because of access limitations. The aerial lift could not be staged on the north side of the trench at this location because of uneven surface topography and was not staged on the south side of the trench because a road was being constructed adjacent to the trench for use in retrieval operations.

A sample location number (trench and riser) was established and recorded for each vent riser. The vent risers in each trench were numbered sequentially from east to west. If the vent riser was offset to the north or south of the center of the trench, a notation of "N" or "S" was added to the sample location number to indicate the direction of offset. For example, sample location "T1-06-N" signifies trench 1, vent riser 6, which is offset to the north of the trench centerline.

Before the vent riser cap was removed, the depth from the top of each vent riser to the ground surface was measured and recorded. After removing the vent riser cap, a 15.2-m- (50-ft-) long piece of TYGON[5] tubing was lowered to the bottom of the riser or until refusal. The tubing was 0.3-cm (0.125-in.) inside diameter and 0.6-cm (0.25-in.) outside diameter with a metal filter on the lower end. The tubing was marked at 0.3-m (1-ft) intervals so that depth from the top of the riser to the bottom could be measured. The depth-to-bottom from the top of the riser was typically 6.1 m (20 ft) (Table 2). The tubing then was pulled back approximately 0.2 m (0.5 ft) to lift the filter off of the bottom of the trench. A 2.54-cm (2-in.) diameter plastic disk was slid along the tubing to cover the top of the riser during purging and sampling. The vapor sampling method is shown schematically in Figure 2.

The sample tubing was connected to a sampling pump, which was used to pump vapor for one to two minutes to purge the tubing. Carbon tetrachloride concentrations at the outlet of the pump were monitored using a MIRAN SapphIRe Ambient Air Analyzer (MIRAN analyzer), an infrared detector calibrated to measure carbon tetrachloride. Purging then was continued until the concentration readings on the MIRAN analyzer stabilized or, at the discretion of the industrial hygienist, in the event that no organics were detected. A vapor sample then was collected in a 1 L Tedlar bag for analysis. Following sample collection, the sample tubing was removed from the riser and the cap was replaced.

Following sample collection, the filled Tedlar bags were stored in a clean cooler for transport to the onsite laboratory for analysis. The samples were analyzed using a field screening instrument within 6 hours of the collection time (Table 2).

After the Tedlar bag samples from all accessible risers in a trench had been analyzed, a vapor sample was collected in a SUMMA canister from the vent riser with the highest carbon tetrachloride concentration, based on field screening results. The sampling methodology was similar to that used for collecting Tedlar bag samples. Following the 1 to 2 minute purge, the valve on the canister was opened for 1 minute to allow vapor to flow into the 6 L canister. The SUMMA canisters were transported to the laboratory for analysis.

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[5] TYGON is a trademark of Norton Performance Plastics Corporation, a Saint-Gobain Company, Akron, Ohio.

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER – DECEMBER 2003

The locations of the vent risers in the 218-W-4C Burial Ground trenches were surveyed on November 11, 2003. Coordinates were recorded using NAVD88, *North American Vertical Datum of 1988*, and the Washington State plane (south zone) in NAD83, *North American Datum of 1983*, with the 1991 adjustment for horizontal coordinates. The survey data will allow the locations of the vent risers to be established following waste (and vent riser) retrieval. The relative locations of the vent risers are shown on Figure 3.

3.0 ANALYTICAL RESULTS

During Step I sampling at the 218-W-4C Burial Ground, vapor samples were collected from inside the engineered trenches through vent risers. Most of the samples were collected near the base of the trench, which is typically approximately 5 m (16 ft) below the engineered surface overlying the trench (Table 2).

The samples were collected in Tedlar bags for field screening using a Photovac 10S Plus[6] gas chromatograph equipped with a photoionization detector (11.7 eV lamp). The gas chromatograph is configured to analyze eight volatile organic compounds: carbon tetrachloride, chloroform, methylene chloride, 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), 1,1-dichloroethane (1,1-DCA), trichloroethylene (TCE), and tetrachloroethylene (PCE). Confirmatory analyses for carbon tetrachloride and chloroform were performed using the Innova[7] 1312 multi-gas analyzer to add a level of confidence to the gas chromatography data. The Innova multi-gas analyzer is configured to analyze only these two volatile organic compounds (VOC).

The practical quantitation limits used for the VOC analyses on the gas chromatograph were set at 0.25 parts per million by volume (p/mv) for 1,1-DCA and PCE, 0.20 p/mv for chloroform and carbon tetrachloride, 0.15 p/mv for 1,1,1-TCA, and 0.10 p/mv for methylene chloride, TCE, and 1,1,2-TCA. The Innova multi-gas analyzer has two carbon tetrachloride filters. Filter "A" is calibrated for concentrations exceeding 100 p/mv; filter "B" is calibrated for concentrations between 1 and 100 p/mv.

The results measured using the gas chromatograph and the Innova multi-gas analyzer field screening instruments for samples collected through 218-W-4C Burial Ground vent risers are provided in Table 3.

The confirmatory analyses on October 15 through October 20, 2003, showed good correlation between the gas chromatograph and the Innova multi-gas analyzer. During confirmatory analysis on October 21, 2003, an anomaly was discovered. Concentration data from the gas chromatograph for carbon tetrachloride and chloroform were consistently lower than concentration data from the Innova multi-gas analyzer. It is believed that the gas chromatograph

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[6] Photovac 10S Plus is a trademark of Photovac, Inc., Waltham, Massachusetts.

[7] Innova is a trademark of Innova AirTech Instruments A/S, Ballerup, Denmark

detector lamp had degraded and was no longer reliable for these two compounds and that the Innova multi-gas analyzer data are more representative.

Before the Tedlar bag samples were analyzed each day, a method library of eight compounds was calibrated using commercially prepared calibration gas mixes at concentrations of 1.0 p/mv. Instrument performance was checked before and after sample analysis using a calibration check standard containing six of the eight target analytes. Comparison of the initial and final calibration check results indicates that all six VOCs show good recoveries on each day of analysis (Table 4). Good agreement between the calibration and calibration check results would indicate that the data generated from these analyses are reliable. However, because no independently prepared standards were available to check the calibration (i.e., the calibration check gas is made up from the calibration standards), these calibration checks can identify detector drift or failure but not gradual loss of instrument response. The Innova data indicate that the carbon tetrachloride and chloroform results from the gas chromatograph were unrepresentative (i.e., concentrations were too low) on October 21, 2003, and subsequent days. The gas chromatograph lamp potentially was unreliable for the other VOCs as well. Although the gas chromatograph data on October 21 and October 22 may be unrepresentative, a positive detection of a compound still indicates that it is present in the sample. As a result, the gas chromatograph data still can be used to guide the Step II sampling, which was the basis for the Step I sampling in the sampling design. Affected data are shaded in Table 3.

The analyses of the SUMMA canister samples potentially can be used to check the gas chromatograph performance. The SUMMA canister samples for laboratory analysis were collected from vent risers T1-04 and T29-04-N on October 21, 2003, and from vent risers T29-01-S, T4-04, and T7-06 on October 22, 2003. A duplicate SUMMA canister sample was collected from vent riser T4-04 on October 22, 2003. (A SUMMA canister sample was collected from vent riser T29-04-N on October 21, 2003. However, the maximum carbon tetrachloride concentration in trench T-29 had not been detected at this vent riser, so a second SUMMA canister sample was collected in trench T-29 from vent riser T29-01-S on October 22, 2003 to correct this unintentional mistake. Both of these SUMMA canister samples were submitted for laboratory analysis.) The SUMMA canister sample for laboratory analysis was collected from vent riser T20-03 on December 10, 2003. The results of the SUMMA canister samples were not available by December 31, 2003 and will be included in a subsequent quarterly report.

The maximum concentrations of VOCs detected in each trench are summarized in Table 1. For each of these eight VOCs, the highest concentration was detected at the east end of trench T-04 (Table 3).

4.0 QUALITY CONTROL

For vent riser vapor samples collected either in Tedlar bags or SUMMA canisters, field quality control consisted of duplicate samples and equipment blank samples. For vent riser vapor samples collected in Tedlar bags, one duplicate sample was analyzed on each day of sampling (Table 3). As a result, one field duplicate was analyzed for every 20 samples, as required, with the exception of one day when 25 samples were collected. The duplicate samples were collected

to evaluate the performance of the analytical method by comparing two analyses of the vapor concentration in one Tedlar bag. Of the seven sample-duplicate pairs analyzed using the gas chromatograph, two pairs had no detectable VOCs in either the sample or the duplicate. For the five pairs with detections of at least one VOC in the sample and duplicate, the relative percent difference (RPD) was calculated for each pair of VOC results according to the formula:

$$RPD = \frac{(C_1 - C_2) x 100}{(C_1 + C_2)/2}$$

where:

C_1 = the larger of the two observed values

C_2 = the smaller of the two observed values.

The maximum RPD was 44 percent. In the 20 other VOC pairs, the RPD ranged from 0 to 12 percent (average 4 percent). The RPD was calculated only for VOC pairs in which both the sample and the duplicate result were unqualified (i.e., no data flags). With the exception of one VOC pair, these data met the required precision of 25 percent. These calculations indicate that the gas chromatograph analytical method produced repeatable measurements.

Of the four sample-duplicate pairs analyzed using the Innova multi-gas analyzer, all four pairs had detections of at least one VOC in the sample and duplicate. The maximum RPD was 29 percent. In the five other VOC pairs, the RPD ranged from 0 to 1 percent. With the exception of one VOC pair, these data met the required precision of 25 percent.

For the vent riser vapor samples collected in SUMMA canisters, one duplicate sample was collected from vent riser T4-04 in a separate SUMMA canister. Results are not yet available.

The purpose of collecting equipment blanks is to verify the adequacy of sampling equipment decontamination procedures. Because no Tedlar bags were decontaminated and reused during vent riser sampling, equipment blanks were not required. The SUMMA canisters are analyzed for cleanliness at the laboratory.

As discussed above, a gas calibration check standard containing six of the target VOCs was analyzed each day using the gas chromatograph (Table 4). The concentration of each VOC in the calibration check standard was 1.0 p/mv. The pairs of standard and measured VOC concentrations were used to evaluate the accuracy of the analyses conducted using the gas chromatograph. The percent recovery (%R) was calculated according to the formula:

$$\%R = 100x(C_m / C_s)$$

where

C_m = the measured concentration of carbon tetrachloride

C_s = is the standard.

The maximum %R was 105 percent and the minimum was 76 percent. These calculations indicate that the gas chromatograph analyses of the VOC concentrations were accurate within 25 percent, as required. These results indicate good recovery.

A gas calibration check standard of known carbon tetrachloride concentration was analyzed using the Innova multi-gas analyzer each day (Table 4). A gas standard concentration of 25.5 p/mv was used for the low-concentration "B" filter. A gas standard concentration of 200 p/mv was used for the high-concentration "A" filter. The pairs of standard and measured carbon tetrachloride concentrations for the low-concentration filter were used to evaluate the accuracy of the carbon tetrachloride analyses conducted using the Innova multi-gas analyzer. The maximum %R was 95 percent and the minimum was 89 percent. These calculations indicate that the Innova analyses of the carbon tetrachloride concentrations were accurate within 11 percent, meeting the requirement of 25 percent. These results indicate good recovery.

A blank sample of certified clean air was analyzed each day using the gas chromatograph. No VOCs were detected in the blanks (Table 5). Blank samples also were analyzed each day using the Innova multi-gas analyzer. With the exception of one detection of chloroform in one blank, the analytical results for the blank samples were all non-detect for carbon tetrachloride and chloroform (Table 5).

No holding times were exceeded during collection and field screening of vent riser vapor samples, with the exception of one duplicate sample.

Data validation of the field screening analytical results was performed at level C to ensure that the data are usable (BHI-01435, *Data Validation Procedure for Chemical Analysis*).

5.0 HEALTH AND SAFETY MONITORING AND RADIOLOGICAL FIELD SCREENING

Health and safety monitoring was conducted by industrial hygienists during the Step I sampling activities at the 218-W-4C Burial Ground. Before they removed the cap from each vent riser, the industrial hygienists would screen for carbon tetrachloride using a MIRAN analyzer and for combustible gases. (Note: Combustible gases were monitored to test the environment for intrinsic safeness for both equipment selection and breathing zone exposure.) The industrial hygienists surveyed for carbon tetrachloride again at the top of the riser following removal of the vent riser cap. Carbon tetrachloride concentrations were detected at 56 vent risers using the MIRAN analyzer (Table 2). The radiological control technician then surveyed for radiological contamination. After each riser was surveyed and monitored for entry, a vapor sample was collected for analysis. During the sampling activities, the industrial hygienists performed

continuous monitoring in the breathing zone and point source for carbon tetrachloride. Controls put in place to prevent exposure included restricted access to limit personnel entry to only those designated to perform the work. A vapor and gas barrier was placed at the top of the vent riser to prevent bypass during vapor sampling.

After the vent riser sample was collected, the radiological control technician wiped the tubing and filter with a cloth as it was retrieved to monitor for potential radiological contamination. Radiological field screening detected no radiological contamination at the vent risers in the 218-W-4C Burial Ground.

6.0 COMPARISON TO REGULATORY REQUIREMENTS

As noted in CP-16886, *Data Quality Objectives Summary Report for the 218-W-4C Burial Ground Contaminant Release Investigation*, preliminary action levels are not applicable to VOC vapor samples.

7.0 DOCUMENTED CONTAMINANT RELEASES TO THE ENVIRONMENT

Other than incidental and unavoidable vapor releases to atmosphere associated with sampling at the vent risers, no contaminant releases to the environment were documented as a result of the vent riser vapor sampling. The vent riser vapor samples were collected from within the engineered trench. The Step II and Step III characterization of the asphalt pad and vadose zone is designed to evaluate whether contaminants within the engineered trench were released to the environment.

8.0 PLANNED AND/OR SCHEDULED ADDITIONAL WORK

The field work associated with the Step I sampling at the 218-W-4C Burial Ground was completed during this quarter (October – December 2003). The analytical results of the SUMMA canister samples are anticipated to be provided during the next quarter (January – March 2004). These results will be evaluated and reported in the next quarterly report.

Based on the sampling design for the 218-W-4C Burial Ground, Step II sampling is planned following completion of Step I sampling and retrieval of the suspect TRU waste. The Step II characterization will be scheduled when the asphalt pad in an entire trench has become accessible and sampling will not interfere with waste retrieval operations.

9.0 REFERENCES

Atomic Energy Act of 1954, 42 USC 2011, et seq.

BHI-01435, 2000, *Data Validation for Chemical Analysis*, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

CP-16886, 2003, *Data Quality Objectives Summary Report for the 218-W-4C Burial Ground Contaminant Release Investigation*, Rev. 0, Fluor Hanford, Inc., Richland, Washington.

DOE/RL-2003-48, 2003, *218-W-4C Burial Ground Sampling and Analysis Plan*, Rev. 0, U.S. Department of Energy, Richland, Operations Office, Richland, Washington. Issued as an attachment to the Skinnarland letter listed below.

Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, as amended.

NAD83, 1991, *North American Datum of 1983*, National Geodetic Survey, Federal Geodetic Control Committee, Silver Spring, Maryland.

NAVD88, 1988, *North American Vertical Datum of 1988*, National Geodetic Survey, Federal Geodetic Control Committee, Silver Spring, Maryland.

Skinnarland, R., 2003, "Issuance of the Final 218-W-4C Sampling and Analysis Plan (SAP) in Conjunction with Administrative Order No. 03NWPKW-5494 Issued on April 20, 2003, by the Washington State Department of Ecology (Ecology) and Modified by Stipulation Approved on July 8, 2003, by the Washington State Pollution Control Hearings Board on July 8, 2003," (letter to K. A. Klein, U. S. Department of Energy, Richland Operations Office), Washington State Department of Ecology, Olympia, Washington, September 12. Attachment is DOE/RL-2003-48 listed above.

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER – DECEMBER 2003

Figure 1. Locations of Retrievably Stored Waste Trenches at the 218-W-4C Burial Ground.

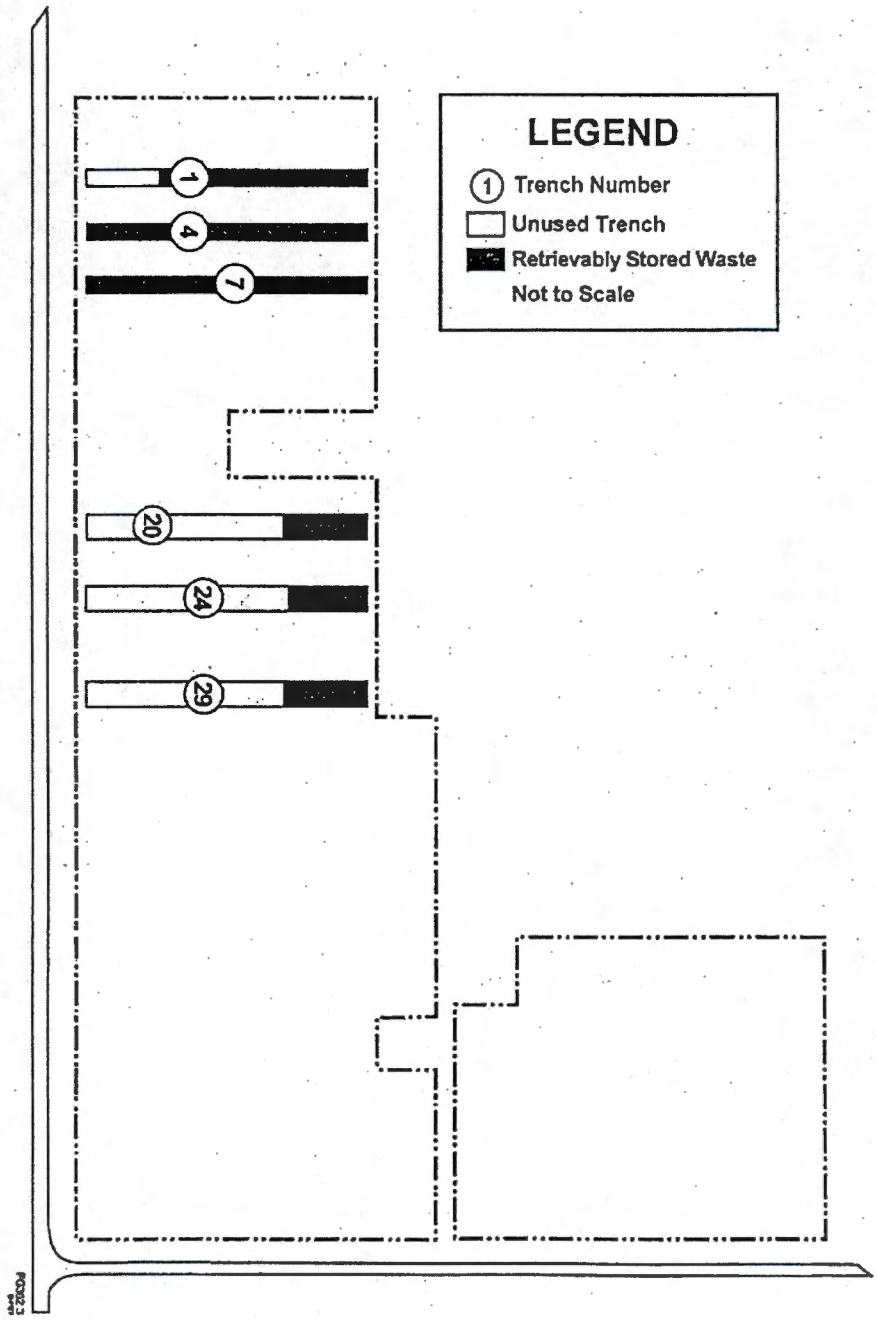

Figure 2. Schematic View of 218-W-4C Burial Ground Trench and Vent Riser Sampling Method.

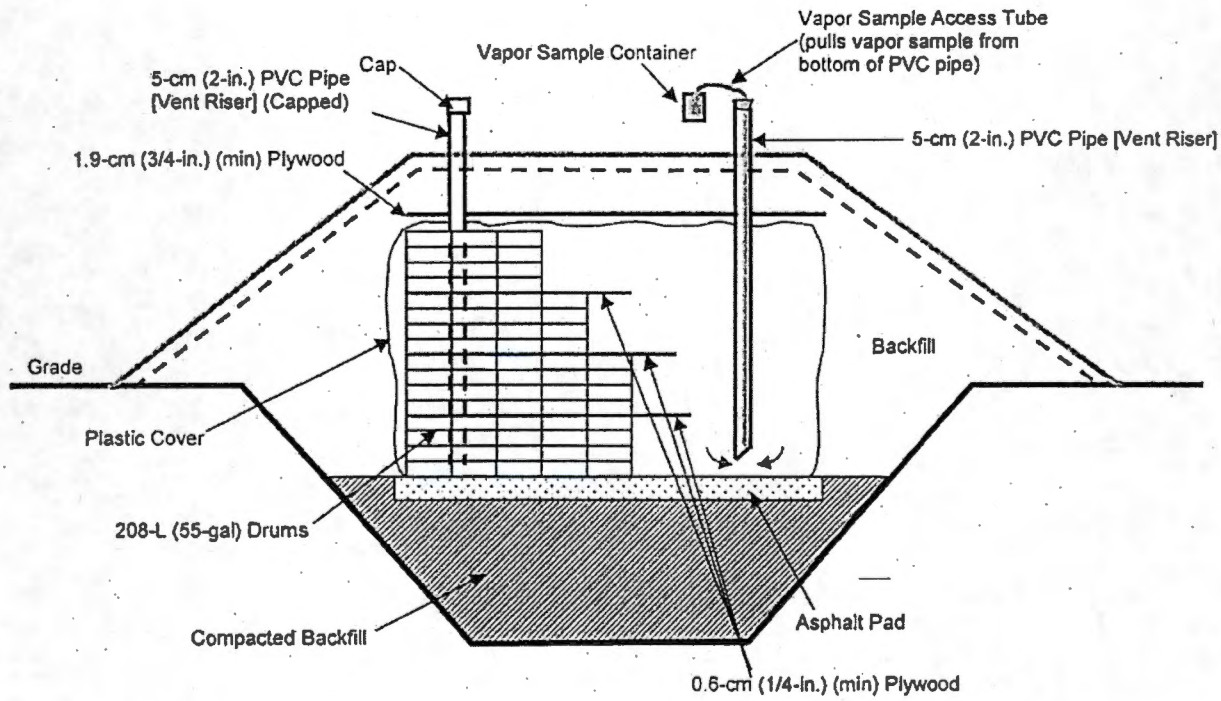

Figure 3. Locations of Vent Risers in 218-W-4C Burial Ground.

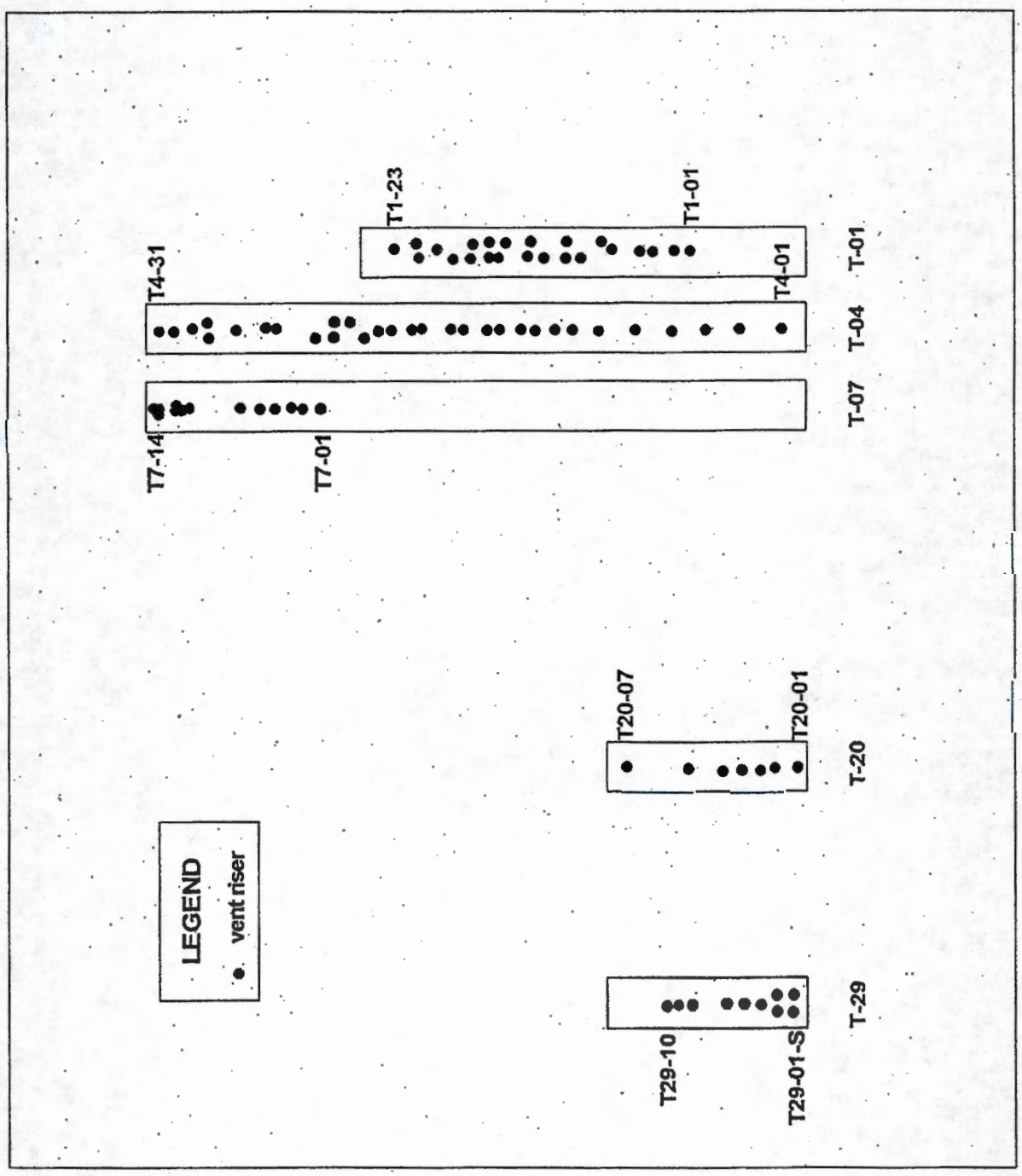

Table 1. Summary of 218-W-4C Burial Ground Step I Sampling.

Trench	# of Vent Risers	# of Vent Risers Sampled for Field Screening	# of SUMMA Canister Samples Collected[a]	Maximum Concentrations in Vent Riser Samples based on Field Screening							
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)
T-01	23	23	1	0.82	0.45	3.03	4.28	0.170j	1.30	< 0.10	5.50
T-04	31	31	2	4.71	28.1e	283	2,337e	668	25.5e	0.98	1,717e
T-07	14	14	1	0.81	< 0.25	42.4	1.08	13.5	1.56	0.031j	47.3e
T-20	7	6	1	< 0.10	< 0.25	4.32	1.00	33.1	< 0.10	< 0.10	8.00
T-29	10	10	2	< 0.10	< 0.25	3.37	1.52	0.62	< 0.10	< 0.10	< 0.25

[a] A duplicate SUMMA canister sample was collected from trench T-04. A second SUMMA canister sample was collected from trench T-29 because the first sample was not collected from the vent riser in trench T-29 with the highest carbon tetrachloride concentration, as required by the sampling design.

e = exceeds calibration range.
j = value less than practical quantitation limit.
p/mv = parts per million by volume.
1,1-DCA = 1,1-dichloroethane.
1,1,1-TCA = 1,1,1-trichloroethane.
1,1,2-TCA = 1,1,2-trichloroethane.
CCl_4 = carbon tetrachloride.
DCM = dichloromethane (methylene chloride).
PCE = tetrachloroethylene.
TCE = trichloroethylene.
TCM = trichloromethane (chloroform).

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER – DECEMBER 2003

Table 2. Field Measurements for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (4 Pages)

Sample Identifier	Sample Depth		Carbon Tetrachloride Concentration[a] (p/mv)	HEIS Number	Sample Date	Sample Time	Analysis Date	Analysis Time
	Below Top of Riser (m)	Below Surface (m)						
T1-01	6.1	5.2	NR	B17T85	10/16/2003	11:11	10/16/2003	12:21
T1-02	6.1	5.2	0	B17T86	10/16/2003	11:03	10/16/2003	12:36
T1-02 Duplicate	6.1	5.2	0	B17TC0	10/16/2003	11:03	10/16/2003	14:23
T1-03	3.0	2.0	0	B17T87	10/16/2003	10:54	10/16/2003	12:45
T1-04	3.0	1.9	0	B17T88	10/16/2003	10:44	10/16/2003	12:52
T1-05	6.1	5.0	0	B17T89	10/16/2003	10:35	10/16/2003	12:30
T1-06-N	6.1	4.9	0	B17T90	10/16/2003	10:26	10/16/2003	12:58
T1-07-N	6.1	4.7	0	B17T91	10/16/2003	10:16	10/16/2003	13:08
T1-08-S	6.1	4.6	0	B17T92	10/16/2003	10:07	10/16/2003	13:14
T1-09-S	6.1	4.8	0	B17T93	10/16/2003	9:58	10/16/2003	13:30
T1-10-S	6.1	5.2	0	B17T94	10/16/2003	9:50	10/16/2003	13:37
T1-11-S	4.3	4.2	0	B17T95	10/16/2003	9:43	10/16/2003	13:44
T1-12-N	6.1	4.8	0	B17T96	10/16/2003	9:35	10/16/2003	13:50
T1-13-N	6.1	5.1	0	B17T97	10/16/2003	9:24	10/16/2003	13:58
T1-14-S	6.1	5.3	0	B17T98	10/16/2003	9:15	10/16/2003	14:04
T1-15-S	6.1	5.4	0	B17TB8	10/16/2003	9:07	10/16/2003	14:10
T1-16-N	5.2	4.3	0	B17TB9	10/16/2003	8:59	10/16/2003	14:16
T1-17-N	4.3	3.7	0.15	B17TB0	10/15/2003	14:54	10/15/2003	16:04
T1-18-S	6.1	5.4	0.1	B17TB2	10/15/2003	14:46	10/15/2003	15:53
T1-18-S Duplicate	6.1	5.4	0.1	B17TB1	10/15/2003	14:46	10/15/2003	15:58
T1-19	6.1	5.4	0	B17TB3	10/15/2003	14:38	10/15/2003	15:48
T1-20	6.1	5.5	0	B17TB4	10/15/2003	14:25	10/15/2003	15:42
T1-21-S	6.1	5.2	0.4	B17TB5	10/15/2003	13:03	10/15/2003	15:37
T1-22-N	6.1	5.1	0	B17TB6	10/15/2003	12:55	10/15/2003	15:31
T1-23	6.1	4.0	0	B17TB7	10/15/2003	13:30	10/15/2003	15:26
T4-01	6.1	5.9	1.01	B17TJ3	10/21/2003	9:59	10/21/2003	14:20
T4-02	6.1	5.7	12.5	B17TJ4	10/21/2003	9:53	10/21/2003	14:07
T4-03	6.1	5.2	5.2	B17TJ5	10/21/2003	9:45	10/21/2003	13:59

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER – DECEMBER 2003

Table 2. Field Measurements for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (4 Pages)

Sample Identifier	Sample Depth		Carbon Tetrachloride Concentration[a] (p/mv)	HEIS Number	Sample Date	Sample Time	Analysis Date	Analysis Time
	Below Top of Riser (m)	Below Surface (m)						
T4-04	6.1	5.1	16.0	B17TJ6	10/21/2003	9:38	10/21/2003	13:42
T4-04 Duplicate	6.1	5.1	16.0	B17V84	10/21/2003	9:38	10/21/2003	17:07
T4-05	6.1	5.2	0.2	B17TJ7	10/21/2003	9:15	10/21/2003	13:36
T4-06	5.8	5.0	0.33	B17TJ8	10/21/2003	9:08	10/21/2003	13:26
T4-07	6.1	5.4	0.2	B17TJ9	10/21/2003	8:56	10/21/2003	13:11
T4-08	6.1	5.3	1.8	B17TK0	10/21/2003	8:50	10/21/2003	12:57
T4-09	4.6	4.2	0.22	B17TK1	10/21/2003	8:43	10/21/2003	13:18
T4-10	7.6	6.8	0.16	B17TK2	10/21/2003	8:37	10/21/2003	13:03
T4-11	6.1	5.3	1.3	B17TF4	10/20/2003	11:13	10/20/2003	12:35
T4-12	6.1	5.4	1.2	B17TF5	10/20/2003	11:07	10/20/2003	12:43
T4-13	6.1	5.2	0.8	B17TF6	10/20/2003	10:57	10/20/2003	12:50
T4-14	6.1	5.5	0.8	B17TF7	10/20/2003	10:49	10/20/2003	12:56
T4-15	4.3	3.7	0.12	B17TF8	10/20/2003	10:44	10/20/2003	13:04
T4-16	6.1	5.5	1.36	B17TF9	10/20/2003	10:36	10/20/2003	13:13
T4-17	6.1	5.3	0.95	B17TH0	10/20/2003	10:30	10/20/2003	13:20
T4-18	6.1	5.3	0.6	B17TH1	10/20/2003	10:25	10/20/2003	13:33
T4-19-S	6.1	5.2	0.04	B17TH2	10/20/2003	10:18	10/20/2003	13:40
T4-20-N	6.1	5.6	0.13	B17TH3	10/20/2003	9:58	10/20/2003	13:48
T4-21-N	6.1	5.6	0.05	B17TH4	10/20/2003	9:52	10/20/2003	13:55
T4-22-S	6.1	5.3	0.12	B17TH5	10/20/2003	9:45	10/20/2003	14:02
T4-23-S	6.1	5.3	0.05	B17TH6	10/20/2003	9:36	10/20/2003	14:16
T4-24	6.1	5.4	0.4	B17TH7	10/20/2003	9:28	10/20/2003	14:24
T4-25	6.1	5.5	1.4	B17TH8	10/20/2003	9:19	10/20/2003	14:31
T4-25 Duplicate	6.1	5.5	1.4	B17TH9	10/20/2003	9:19	10/20/2003	14:42
T4-26	6.1	5.3	0.08	B17TD4	10/19/2003	13:17	10/19/2003	14:39
T4-26 Duplicate	6.1	5.3	0.08	B17TF0	10/19/2003	13:17	10/19/2003	15:30
T4-27-S	6.1	5.4	0.2	B17TD5	10/19/2003	13:09	10/19/2003	14:46
T4-28-N	6.1	5.6	0.4	B17TD6	10/19/2003	13:00	10/19/2003	14:55

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER – DECEMBER 2003

Table 2. Field Measurements for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (4 Pages)

Sample Identifier	Sample Depth		Carbon Tetrachloride Concentration[a] (p/mv)	HEIS Number	Sample Date	Sample Time	Analysis Date	Analysis Time
	Below Top of Riser (m)	Below Surface (m)						
T4-29	6.1	5.5	1.8	B17TD7	10/19/2003	12:51	10/19/2003	15:06
T4-30	6.1	5.7	1.4	B17TD8	10/19/2003	12:41	10/19/2003	15:14
T4-31	6.1	5.4	1.7	B17TD9	10/19/2003	12:33	10/19/2003	15:23
T7-01	6.1	4.7	2.0	B17V61	10/21/2003	14:17	10/21/2003	16:17
T7-02	6.4	4.8	2.0	B17V62	10/21/2003	14:12	10/21/2003	16:10
T7-03	6.1	4.3	2.3	B17V63	10/21/2003	14:06	10/21/2003	15:56
T7-04	6.1	4.4	2.0	B17V64	10/21/2003	14:02	10/21/2003	16:48
T7-05	6.1	4.5	1.0	B17V65	10/21/2003	13:56	10/21/2003	15:34
T7-06	5.9	4.6	0	B17V66	10/21/2003	13:51	10/21/2003	16:41
T7-07	6.1	4.7	7.0	B17V67	10/21/2003	13:41	10/21/2003	15:41
T7-08	6.1	5.2	0.5	B17V68	10/21/2003	13:35	10/21/2003	16:24
T7-09-S	6.1	4.4	1.0	B17V69	10/21/2003	13:29	10/21/2003	16:03
T7-10	6.1	5.0	0	B17V70	10/21/2003	13:23	10/21/2003	15:11
T7-11-N	6.1	4.6	0.13	B17V71	10/21/2003	13:18	10/21/2003	16:57
T7-12	6.1	5.3	0.9	B17V72	10/21/2003	13:11	10/21/2003	15:19
T7-13	5.2	4.9	0	B17V73	10/21/2003	12:54	10/21/2003	15:48
T7-14-S	5.2	4.9	0	B17V74	10/21/2003	12:38	10/21/2003	16:32
T20-01	6.1	4.4	2.0	B186J3	12/8/2003	10:10	12/8/2003	10:21
T20-01 Duplicate	6.1	4.4	2.0	B186J4	12/8/2003	10:10	12/8/2003	10:23
T20-02	4.6	3.9	0.3	B17V79	10/22/2003	9:31	10/22/2003	12:28
T20-03	4.6	3.7	0.85	B17V80	10/22/2003	9:25	10/22/2003	12:35
T20-03 Duplicate	4.6	3.7	0.85	B17V81	10/22/2003	9:25	10/22/2003	12:45
T20-04	4.6	3.9	0.55	B17V82	10/22/2003	9:18	10/22/2003	12:53
T20-05	4.6	4.0	0.85	B17V83	10/22/2003	9:12	10/22/2003	13:02
T20-06	4.6	3.7	1.0	B17V75	10/21/2003	14:39	10/21/2003	15:26
T29-01-S	3.7	2.7	0.19	B17TC8	10/19/2003	10:15	10/19/2003	13:53
T29-02-S	2.7	1.8	0	B17TC9	10/19/2003	10:07	10/19/2003	14:00
T29-03-N	3.4	2.4	0.13	B17TD0	10/19/2003	10:01	10/19/2003	14:07
T29-04-N	3.7	2.7	0.16	B17TD1	10/19/2003	9:39	10/19/2003	14:14

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR OCTOBER – DECEMBER 2003

Table 2. Field Measurements for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (4 Pages)

Sample Identifier	Sample Depth		Carbon Tetrachloride Concentration[a] (p/mv)	HEIS Number	Sample Date	Sample Time	Analysis Date	Analysis Time
	Below Top of Riser (m)	Below Surface (m)						
T29-05	4.0	3.0	0.17	B17TD2	10/19/2003	9:31	10/19/2003	14:20
T29-06	4.3	3.7	0.12	B17TD3	10/19/2003	9:23	10/19/2003	14:25
T29-07	4.3	3.8	0.03	B17TC1	10/16/2003	14:34	10/16/2003	15:16
T29-08	4.9	4.2	0	B17TC2	10/16/2003	14:23	10/16/2003	15:23
T29-09	4.3	4.2	0	B17TC3	10/16/2003	14:14	10/16/2003	15:29
T29-10	4.3	3.7	0	B17TC4	10/16/2003	13:51	10/16/2003	15:35

[a] Measured at top of vent riser using MIRAN Analyzer.
HEIS = Hanford Environmental Information System.
MIRAN = MIRAN is a registered trademarks of Thermo Electron Corporation, Franklin, Massachusetts.
NR = Not recorded.
p/mv = parts per million by volume.

Table 3. Field-Screening Results for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (5 Pages)

Sample Identifier	HEIS Number	Sample Date	Sample Time	Photovac 10S Plus Gas Chromatograph								Innova Multi-gas Analyzer			
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)	CCl_4 "A" (p/mv)	CCl_4 "B" (p/mv)	TCM (p/mv)	Water Vapor (p/mv)
T1-01	B17T85	10/16/2003	11:11	0.82	0.44	0.120j	4.28	0.170j	1.30	<0.10	5.50	---	---	---	---
T1-02	B17T86	10/16/2003	11:03	0.62	0.36	0.089j	3.64	0.127j	0.92	<0.10	3.23	---	<1.0	1.20	9,370
T1-02 Duplicate	B17TC0	10/16/2003	11:03	0.64	0.38	0.092j	3.79	0.041j	0.95	<0.10	3.26	---	<1.0	1.60	9,310
T1-03	B17T87	10/16/2003	10:54	0.001j	0.021j	<0.20	<0.15	<0.20	<0.10	<0.10	0.087j	---	<1.0	2.83	9,310
T1-04	B17T88	10/16/2003	10:44	0.079j	0.45	<0.20	<0.15	0.24	<0.10	<0.10	0.089j	---	---	---	---
T1-05	B17T89	10/16/2003	10:35	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	---	---	---
T1-06-N	B17T90	10/16/2003	10:26	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	0.055j	---	<1.0	1.03	8,650
T1-07-N	B17T91	10/16/2003	10:16	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	8,580
T1-08-S	B17T92	10/16/2003	10:07	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	8,530
T1-09-S	B17T93	10/16/2003	9:58	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	0.036j	---	<1.0	<1.0	8,520
T1-10-S	B17T94	10/16/2003	9:50	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	8,390
T1-11-S	B17T95	10/16/2003	9:43	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	8,330
T1-12-N	B17T96	10/16/2003	9:35	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	8,340
T1-13-N	B17T97	10/16/2003	9:24	<0.10	<0.25	<0.20	0.25	<0.20	<0.10	<0.10	<0.25	---	<1.0	1.03	8,280
T1-14-S	B17T98	10/16/2003	9:15	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	8,240
T1-15-S	B17TB8	10/16/2003	9:07	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	8,260
T1-16-N	B17TB9	10/16/2003	8:59	<0.10	<0.25	<0.20	0.31	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	8,300
T1-17-N	B17TB0	10/15/2003	14:54	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	2.13	9,120
T1-18-S	B17TB2	10/15/2003	14:46	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	3.03	9,360
T1-18-S Duplicate	B17TB1	10/15/2003	14:46	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	---	---	---
T1-19	B17TB3	10/15/2003	14:38	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	2.63	9,140
T1-20	B17TB4	10/15/2003	14:25	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	2.45	9,020

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Table 3. Field-Screening Results for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (5 Pages)

Sample Identifier	HEIS Number	Sample Date	Sample Time	Photovac 10S Plus Gas Chromatograph								Innova Multi-gas Analyzer			
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)	CCl_4 "A" (p/mv)	CCl_4 "B" (p/mv)	TCM (p/mv)	Water Vapor (p/mv)
T1-21-S	B17TB5	10/15/2003	13:03	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	2.94	8,670
T1-22-N	B17TB6	10/15/2003	12:55	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	<1.0	11,500
T1-23	B17TB7	10/15/2003	13:30	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	---	---	---
T4-01	B17TJ3	10/21/2003	9:59	0.39	28.1e	2.58	2337e	15.5*	0.93	0.45	121e	---	25.3	30.4	16,600
T4-02	B17TJ4	10/21/2003	9:53	0.42	17.0	2.05	1772e	6.43*	1.42	0.98	186e	---	30.2	25.8	15,400
T4-03	B17TJ5	10/21/2003	9:45	1.67	22.2	5.51	2022e	33.1*	4.17	0.020j	491e	114	---	46.8	14,800
T4-04	B17TJ6	10/21/2003	9:38	4.71	2.88	7.50	985e	0.349*	15.2	0.19	1717e	668	---	125	15,600
T4-04 Duplicate	B17V84	10/21/2003	9:38	4.22	2.78	7.27	1081e	0.310*	25.5e	0.12	1392e	664	---	125	15,400
T4-05	B17TJ7	10/21/2003	9:15	<0.10	<0.25	<0.20	1.37	19.8	<0.10	<0.10	6.21	---	20.5	4.72	12,400
T4-06	B17TJ8	10/21/2003	9:08	0.21	2.20	<0.20	785e	0.563*	0.58	0.056j	98e	---	19.6	14.0	14,200
T4-07	B17TJ9	10/21/2003	8:56	<0.10	<0.25	<0.20	0.39	3.03	<0.10	<0.10	<0.25	---	3.10	283	12,500
T4-08	B17TK0	10/21/2003	8:50	<0.10	1.05	<0.20	0.67	1.07	0.23	<0.10	0.51	---	1.72	2.99	12,200
T4-09	B17TK1	10/21/2003	8:43	0.24	0.63	0.48	3.57	5.13	0.23	0.046j	3.68	---	5.42	41.1	14,000
T4-10	B17TK2	10/21/2003	8:37	<0.10	0.31	0.34	2.56	2.90	0.11	0.029j	2.06	---	3.01	23.4	13,400
T4-11	B17TF4	10/20/2003	11:13	0.58	0.85	<0.20	12.8	0.46	0.14	<0.10	1.24	---	<1.0	6.43	10,200
T4-12	B17TF5	10/20/2003	11:07	0.58	0.84	<0.20	12.6	0.43	0.11	<0.10	1.07	---	<1.0	5.74	10,300
T4-13	B17TF6	10/20/2003	10:57	0.31	0.024j	<0.20	2.49	0.31	0.15	<0.10	0.138j	---	<1.0	5.36	11,400
T4-14	B17TF7	10/20/2003	10:49	0.44	0.131j	<0.20	2.46	0.29	0.14	<0.10	<0.25	---	<1.0	5.94	11,200
T4-15	B17TF8	10/20/2003	10:44	<0.10	0.004j	0.28	2.32	1.31	0.001j	<0.10	0.037j	---	1.48	6.48	11,000
T4-16	B17TF9	10/20/2003	10:36	0.13	0.34	<0.20	2.36	1.56	0.14	0.077j	0.057j	---	1.87	6.89	10,800
T4-17	B17TH0	10/20/2003	10:30	<0.10	<0.25	<0.20	1.29	0.92	0.052j	<0.10	0.050j	---	1.30	7.14	10,600
T4-18	B17TH1	10/20/2003	10:25	<0.10	0.004j	0.34	1.77	1.71	0.11	<0.10	0.047j	---	2.30	7.36	11,200
T4-19-S	B17TH2	10/20/2003	10:18	<0.10	<0.25	0.27	1.59	1.37	0.080j	<0.10	0.034j	---	2.40	6.54	10,900

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Table 3. Field-Screening Results for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (5 Pages)

Sample Identifier	HEIS Number	Sample Date	Sample Time	Photovac 10S Plus Gas Chromatograph								Innova Multi-gas Analyzer			
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)	CCl_4 "A" (p/mv)	CCl_4 "B" (p/mv)	TCM (p/mv)	Water Vapor (p/mv)
T4-20-N	B17TH3	10/20/2003	9:58	<0.10	0.004j	<0.20	1.45	1.13	0.052j	<0.10	0.031j	---	2.10	5.76	10,800
T4-21-N	B17TH4	10/20/2003	9:52	<0.10	<0.25	0.31	1.76	1.61	0.081j	<0.10	0.060j	---	2.50	5.84	10,200
T4-22-S	B17TH5	10/20/2003	9:45	<0.10	<0.25	<0.20	0.95	0.69	0.04	<0.10	<0.25	---	1.30	7.13	11,000
T4-23-S	B17TH6	10/20/2003	9:36	0.038j	0.022j	0.40	1.95	1.93	0.10	<0.10	0.048j	---	2.60	7.61	11,300
T4-24	B17TH7	10/20/2003	9:28	0.53	<0.25	0.35	1.70	1.92	0.10	<0.10	0.045j	---	2.60	6.36	11,200
T4-25	B17TH8	10/20/2003	9:19	0.23	<0.25	0.46	2.39	2.29	0.12	<0.10	0.062j	---	3.50	5.43	11,800
T4-25 Duplicate	B17TH9	10/20/2003	9:19	0.23	0.007j	0.47	2.33	2.16	0.13	<0.10	0.082j	---	---	---	---
T4-26	B17TD4	10/19/2003	13:17	0.41	0.105j	0.57	2.97	3.19	0.12	<0.10	0.059j	---	3.27	6.99	11,700
T4-26 Duplicate	B17TF0	10/19/2003	13:17	0.38	0.098j	0.57	2.97	3.18	0.12	<0.10	0.051j	---	---	---	---
T4-27-S	B17TD5	10/19/2003	13:09	1.00	0.31	<0.20	1.38	2.05	0.51	<0.10	0.35	---	2.53	5.21	11,400
T4-28-N	B17TD6	10/19/2003	13:00	1.00	<0.25	0.55	2.86	3.09	0.11	<0.10	0.059j	---	3.15	7.41	11,200
T4-29	B17TD7	10/19/2003	12:51	1.50	0.097j	0.55	3.53	3.08	0.11	<0.10	0.069j	---	3.13	7.15	11,100
T4-30	B17TD8	10/19/2003	12:41	1.42	0.084j	0.55	3.22	2.96	0.11	<0.10	0.079j	---	3.11	6.93	10,000
T4-31	B17TD9	10/19/2003	12:33	1.53	0.075j	0.53	3.42	3.03	0.11	<0.10	0.057j	---	3.15	7.30	10,900
T7-01	B17V61	10/21/2003	14:17	<0.10	<0.25	0.109j	0.39	1.84	<0.10	<0.10	7.78	---	12.1	3.55	14,400
T7-02	B17V62	10/21/2003	14:12	<0.10	<0.25	<0.20	0.17	1.88	1.56	<0.10	7.99	---	12.0	3.89	14,400
T7-03	B17V63	10/21/2003	14:06	<0.10	<0.25	0.128j	0.42	1.84	<0.10	<0.10	8.74	---	12.1	3.59	14,000
T7-04	B17V64	10/21/2003	14:02	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	12.2	3.71	13,300
T7-05	B17V65	10/21/2003	13:56	<0.10	<0.25	0.123j	0.70	1.85	<0.10	<0.10	10.9	---	12.5	4.28	13,100
T7-06	B17V66	10/21/2003	13:51	<0.10	<0.25	<0.20	0.45	1.20	<0.10	<0.10	7.57	---	13.5	3.77	12,700
T7-07	B17V67	10/21/2003	13:41	0.22	<0.25	1.54	0.75	6.43	0.177j	<0.10	12.7	---	10.7	42.4	13,100
T7-08	B17V68	10/21/2003	13:35	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	5.98	9.12	13,200

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Table 3. Field-Screening Results for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (5 Pages)

Sample Identifier	HEIS Number	Sample Date	Sample Time	Photovac 10S Plus Gas Chromatograph								Innova Multi-gas Analyzer			
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)	CCl_4 "A" (p/mv)	CCl_4 "B" (p/mv)	TCM (p/mv)	Water Vapor (p/mv)
T7-09-S	B17V69	10/21/2003	13:29	0.81	<0.25	<0.20	0.55	1.54	0.170j	<0.10	15.9	---	3.05	7.28	13,000
T7-10	B17V70	10/21/2003	13:23	0.53	<0.25	<0.20	0.68	1.89	0.087j	<0.10	18.8	---	3.79	6.68	13,100
T7-11-N	B17V71	10/21/2003	13:18	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	10.9	14.2	12,900
T7-12	B17V72	10/21/2003	13:11	0.54	<0.25	<0.20	1.05	0.87	0.082j	<0.10	28.7e	---	4.17	4.76	11,600
T7-13	B17V73	10/21/2003	12:54	0.52	<0.25	<0.20	1.00	0.96	0.99	<0.10	32.8e	---	4.77	5.64	12,700
T7-14-S	B17V74	10/21/2003	12:38	0.19	<0.25	<0.20	1.08	0.38	0.070j	0.031j	47.3e	---	6.29	4.51	12,500
T20-01	B186J3	12/8/2003	10:10	NA	NA	NA	NA	NA	NA	NA	NA	---	9.43	<1.0	7,030
T20-01 Duplicate	B186J4	12/8/2003	10:10	NA	NA	NA	NA	NA	NA	NA	NA	---	9.48	<1.0	7,290
T20-02	B17V79	10/22/2003	9:31	<0.10	<0.25	<0.20	<0.15	0.135j	<0.10	<0.10	3.55	---	27.0	3.87	12,200
T20-03	B17V80	10/22/2003	9:25	<0.10	<0.25	<0.20	0.26	0.092j	<0.10	<0.10	4.24	---	33.1	4.32	12,100
T20-03 Duplicate	B17V81	10/22/2003	9:25	<0.10	<0.25	<0.20	0.23	0.180j	<0.10	<0.10	4.33	---	32.9	4.28	12,100
T20-04	B17V82	10/22/2003	9:18	<0.10	<0.25	<0.20	0.38	0.093j	<0.10	<0.10	5.20	---	32.7	4.31	12,300
T20-05	B17V83	10/22/2003	9:12	<0.10	<0.25	<0.20	0.16	0.098j	<0.10	<0.10	8.00	---	31.5	4.31	12,200
T20-06	B17V75	10/21/2003	14:39	<0.10	<0.25	<0.20	1.00	0.065j	<0.10	<0.10	7.57	---	21.2	4.03	15,300
T20-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	NS	NS	NS
T29-01-S	B17TC8	10/19/2003	10:15	<0.10	<0.25	<0.20	1.52	0.62	<0.10	<0.10	<0.25	---	<1.0	3.37	9,630
T29-02-S	B17TC9	10/19/2003	10:07	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	1.89	9,380
T29-03-N	B17TD0	10/19/2003	10:01	<0.10	<0.25	<0.20	1.36	0.56	<0.10	<0.10	<0.25	---	<1.0	3.2	9,590
T29-04-N	B17TD1	10/19/2003	9:39	<0.10	<0.25	<0.20	1.42	0.58	<0.10	<0.10	<0.25	---	<1.0	2.95	9,590
T29-05	B17TD2	10/19/2003	9:31	<0.10	<0.25	<0.20	1.20	0.47	<0.10	<0.10	<0.25	---	<1.0	2.66	9,730
T29-06	B17TD3	10/19/2003	9:23	<0.10	<0.25	<0.20	0.25	0.52	<0.10	<0.10	<0.25	---	<1.0	2.14	9,660
T29-07	B17TC1	10/16/2003	14:34	<0.10	<0.25	<0.20	<0.15	0.28	<0.10	<0.10	<0.25	---	<1.0	<1.0	11,200

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Table 3. Field-Screening Results for Samples Collected Through Vent Risers in the 218-W-4C Burial Ground Trenches. (5 Pages)

Sample Identifier	HEIS Number	Sample Date	Sample Time	Photovac 10S Plus Gas Chromatograph								Innova Multi-gas Analyzer			
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)	CCl_4 "A" (p/mv)	CCl_4 "B" (p/mv)	TCM (p/mv)	Water Vapor (p/mv)
T29-08	B17TC2	10/16/2003	14:23	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	1.06	11,300
T29-09	B17TC3	10/16/2003	14:14	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	1.14	11,000
T29-10	B17TC4	10/16/2003	13:51	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	---	<1.0	1.08	10,100

Shaded cells indicate data that is suspect-low because of gas chromatograph lamp degradation. However, positive detections indicate the presence of the compound in the sample.

* = unable to quantify due to large 1,1,1-TCA peak.
"A" = carbon tetrachloride filter calibrated for concentrations exceeding 100 p/mv.
"B" = carbon tetrachloride filter calibrated for concentrations between 1 and 100 p/mv.
CCl_4 = carbon tetrachloride.
DCM = dichloromethane (methylene chloride).
e = value exceeds calibration range.
j = value less than practical quantitation limit.
HEIS = Hanford Environmental Information System.
Innova = a trademark of Innova AirTech Instruments A/S, Ballerup, Denmark.
NA = not analyzed.
NS = not sampled.
p/mv = parts per million by volume.
PCE = tetrachloroethylene.
Photovac 10S Plus = a trademark of Photovac, Inc., Waltham, Massachusetts.
TCE = trichloroethylene.
TCM = trichloromethane (chloroform).
1,1-DCA = 1,1-dichloroethane.
1,1,1-TCA = 1,1,1-trichloroethane.
1,1,2-TCA = 1,1,2-trichloroethane.

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Table 4. Field-Screening Results for Calibration Standards. (2 Pages)

Analysis Type	HEIS Number	Analysis Date	Analysis Time	Photovac 10S Gas Chromatograph								Innova Multi-gas Analyzer			
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)	CCl_4 "A" (p/mv)	CCl_4 "B" (p/mv)	TCM (p/mv)	Water Vapor (p/mv)
Calibration Standard	B17TK8	10/15/2003	15:05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	NA	25.5	< 1.0	NA
Calibration Check	B17T99	10/15/2003	15:11	NA	0.97	0.99	0.97	0.94	1.00	NA	1.05	NA	23.0	<1.0	10,100
Calibration Check	B17T99	10/15/2003	16:09	NA	0.98	0.96	0.95	0.97	1.01	NA	1.04	NA	NA	NA	NA
Calibration Standard	B17KT5	10/16/2003	10:08	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	NA	25.5	< 1.0	NA
Calibration Check	B17KT4	10/16/2003	12:06	NA	0.97	0.96	0.96	0.96	1.03	NA	1.10	NA	22.8	<1.0	9,500
Calibration Check	B17KT4	10/16/2003	13:20	NA	0.96	0.95	0.95	0.87	1.03	NA	1.10	NA	NA	NA	NA
Calibration Check	B17KT4	10/16/2003	15:07	NA	0.95	0.92	0.90	0.86	1.02	NA	1.13	NA	NA	NA	NA
Calibration Check	B17KT4	10/16/2003	15:42	NA	0.93	0.94	0.95	0.87	1.02	NA	1.07	NA	NA	NA	NA
Calibration Standard	B17TC5	10/19/2003	13:19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	NA	25.5	< 1.0	NA
Calibration Check	B17TC6	10/19/2003	13:39	NA	0.94	0.87	0.82	0.95	0.94	NA	0.98	NA	23.2	<1.0	9,800
Calibration Check	B17TC6	10/19/2003	14:31	NA	0.91	0.86	0.86	0.95	0.94	NA	1.01	NA	NA	NA	NA
Calibration Check	B17TC6	10/19/2003	15:49	NA	0.87	0.83	0.80	0.87	0.97	NA	1.00	NA	NA	NA	NA
Calibration Standard	B17TF1	10/20/2003	12:10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	NA	25.5	< 1.0	NA
Calibration Check	B17TF2	10/20/2003	12:22	NA	0.92	1.02	1.02	0.99	1.05	NA	0.98	NA	23.1	<1.0	10,200

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Table 4. Field-Screening Results for Calibration Standards. (2 Pages)

Analysis Type	HEIS Number	Analysis Date	Analysis Time	Photovac 10S Gas Chromatograph								Innova Multi-gas Analyzer			
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)	CCl_4 "A" (p/mv)	CCl_4 "B" (p/mv)	TCM (p/mv)	Water Vapor (p/mv)
Calibration Check	B17TF2	10/20/2003	13:26	NA	0.85	0.88	0.86	0.82	0.98	NA	0.97	NA	NA	NA	NA
Calibration Check	B17TF2	10/20/2003	14:49	NA	0.80	0.78	0.80	0.76	0.96	NA	0.10	NA	NA	NA	NA
Calibration Standard	B17TJ0	10/21/2003	12:40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	200.0	25.5	< 1.0	NA
Calibration Check	B17TJ1	10/21/2003	12:49	NA	0.92	1.02	1.02	0.99	1.05	NA	0.98	198.0	24.1	<1.0	8,840
Calibration Check	B17TJ1	10/21/2003	15:00	NA	0.90	0.98	0.96	0.98	1.03	NA	0.96	NA	NA	NA	NA
Calibration Check	B17TJ1	10/21/2003	17:07	NA	0.81	0.79	0.83	0.79	0.95	NA	0.95	197	24.3	<1.0	9,000
Calibration Standard	B17V76	10/22/2003	11:59	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	NA	25.5	< 1.0	NA
Calibration Check	B17V77	10/22/2003	12:14	NA	0.92	1.02	1.02	0.99	1.05	NA	0.98	NA	24.3	<1.0	9,000
Calibration Check	B17V77	10/22/2003	13:09	NA	0.96	0.95	1.01	1.02	1.05	NA	1.02	NA	24.3	<1.0	9,100
Calibration Standard	B18JV1	12/8/2003	10:25	NA	NA	NA	NA	NA	NA	NA	NA	NA	25.5	< 1.0	NA
Calibration Check	B18JV1	12/8/2003	10:25	NA	NA	NA	NA	NA	NA	NA	NA	NA	23.8	< 1.0	9,400

"A" = carbon tetrachloride filter calibrated for concentrations exceeding 100 p/mv.
"B" = carbon tetrachloride filter calibrated for concentrations between 1 and 100 p/mv.
CCl_4 = carbon tetrachloride.
DCM = dichloromethane (methylene chloride).
HEIS = *Hanford Environmental Information System.*
Innova = a trademark of Innova AirTech Instruments A/S, Ballerup, Denmark.
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PCE = tetrachloroethylene.
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TCE = trichloroethylene.
TCM = trichloromethane (chloroform).
1,1-DCA = 1,1-dichloroethane.
1,1,1-TCA = 1,1,1-trichloroethane.
1,1,2-TCA = 1,1,2-trichloroethane.

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Table 5. Field-Screening Results for Blank Samples.

Quality Control Gas	HEIS Number	Analysis Date	Analysis Time	Photovac 10S Gas Chromatograph								Innova Multi-gas Analyzer			
				DCM (p/mv)	1,1-DCA (p/mv)	TCM (p/mv)	1,1,1-TCA (p/mv)	CCl_4 (p/mv)	TCE (p/mv)	1,1,2 TCA (p/mv)	PCE (p/mv)	CCl_4 "A" (p/mv)	CCl_4 "B" (p/mv)	TCM (p/mv)	Water Vapor (p/mv)
Certified Clean Air	B17KT7	10/15/2003	15:20	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	NA	<1.0	<1.0	7,760
Certified Clean Air	B17KT3	10/16/2003	12:15	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	NA	<1.0	<1.0	9,000
Certified Clean Air	B17TC7	10/19/2003	13:46	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	NA	<1.0	<1.0	7,800
Certified Clean Air	B17TF3	10/20/2003	12:29	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	NA	<1.0	<1.0	8,200
Certified Clean Air	B17TJ2	10/21/2003	12:57	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	NA	<1.0	<1.0	7,800
Certified Clean Air	B17V78	10/22/2003	12:21	<0.10	<0.25	<0.20	<0.15	<0.20	<0.10	<0.10	<0.25	NA	<1.0	1.25	15,000
Certified Clean Air	B18JV0	12/8/2003	10:19	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	<1.0	7,800

"A" = carbon tetrachloride filter calibrated for concentrations exceeding 100 p/mv.
"B" = carbon tetrachloride filter calibrated for concentrations between 1 and 100 p/mv.
CCl_4 = carbon tetrachloride.
DCM = dichloromethane (methylene chloride).
HEIS = *Hanford Environmental Information System*.
Innova = a trademark of Innova AirTech Instruments A/S, Ballerup, Denmark.
NA = not analyzed.
p/mv = parts per million by volume.
PCE = tetrachloroethylene.
Photovac 10S Plus = a trademark of Photovac, Inc., Waltham, Massachusetts.
TCE = trichloroethylene.
TCM = trichloromethane (chloroform).
1,1-DCA = 1,1-dichloroethane.
1,1,1-TCA = 1,1,1-trichloroethane.
1,1,2-TCA = 1,1,2-trichloroethane.

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