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Spring 2009 Semiannual (III.H. and I.U.) Report for the HWMA/RCRA Post-Closure Permit for the INTEC Waste Calcining Facility at the INL Site

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May 2009

Prepared for the
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DOE Idaho Operations Office

ABSTRACT

The Waste Calcining Facility is located at the Idaho Nuclear Technology and Engineering Center. In 1999, the Waste Calcining Facility was closed under an approved Hazardous Waste Management Act/Resource Conservation and Recovery Act closure plan. Vessels and spaces were grouted and then covered with a concrete cap. The Idaho Department of Environmental Quality issued a final Hazardous Waste Management Act/Resource Conservation and Recovery Act post-closure permit on September 15, 2003, with an effective date of October 16, 2003. This permit sets forth procedural requirements for groundwater characterization and monitoring, maintenance, and inspections of the Waste Calcining Facility to ensure continued protection of human health and the environment. The post-closure permit also includes semiannual reporting requirements under Permit Conditions III.H. and I.U. These reporting requirements have been combined into this single semiannual report, as agreed between the Idaho Cleanup Project and Idaho Department of Environmental Quality.

The Permit Condition III.H. portion of this report includes a description of field methods associated with groundwater monitoring of the Waste Calcining Facility, and analytical results of groundwater sampling, maintenance of groundwater monitoring equipment, and inspections of the concrete cap, surveyed benchmarks, and monitoring well.

The Permit Condition I.U. portion of this report includes noncompliances not otherwise required to be reported under Permit Condition I.R. (advance notice of planned changes to facility activity which may result in a noncompliance) or Permit Condition I.T. (reporting of noncompliances which may endanger human health or the environment).

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ACRONYMS

CFR	Code of Federal Regulations
COC	chain of custody
DEQ	(Idaho) Department of Environmental Quality
DML	detection monitoring limit
EQL	estimated quantitation limit
GPS	groundwater protection standard
HWMA	Hazardous Waste Management Act
ICP	Idaho Cleanup Project
IDAPA	Idaho Administrative Procedures Act
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LNAPL	light nonaqueous phase liquid
NAPL	nonaqueous phase liquid
RCRA	Resource Conservation and Recovery Act
WCF	Waste Calcining Facility

Spring 2009 Semiannual (III.H. and I.U.) Report for the HWMA/RCRA Post-Closure Permit for the INTEC Waste Calcining Facility at the INL Site

1. INTRODUCTION

The Waste Calcining Facility (WCF) was closed to a landfill standard pursuant to Hazardous Waste Management Act/Resource Conservation and Recovery Act (HWMA/RCRA) requirements in 1999 and is entombed under a concrete cap. The facility is located within the Idaho Nuclear Technology and Engineering Center (INTEC) at the Idaho National Laboratory (INL) Site. A HWMA/RCRA post-closure permit for the WCF was issued by the Idaho Department of Environmental Quality (DEQ) on September 15, 2003, with an effective date of October 16, 2003 (DEQ 2007). This permit establishes requirements for groundwater characterization and monitoring, maintenance, and inspection procedures for the WCF to ensure continued protection of human health and the environment. The post-closure permit also includes semiannual reporting requirements under Permit Conditions III.H. and I.U. These reporting requirements have been combined into this single semiannual report, due to DEQ in June 2009.

1.1 Purpose and Scope

The purpose of this semiannual report is to satisfy the requirements of both Permit Conditions III.H. and I.U. of the WCF post-closure permit for the period October 16, 2008, to April 16, 2009. Permit Condition III.H. and its subsections require the following:

III.H. While in Detection or Compliance Monitoring Program(s), the permittee shall submit semi-annual reports to the Director that shall include, at a minimum:

III.H.1. A narrative summary of ground water monitoring data which has been collected to date, and a detailed listing of the monitoring and analytical data obtained not included in the previous report, including laboratory QA/QC information and all newly identified compounds from any required Appendix IX testing;

III.H.2. Analytical results from sampling and analysis, and a narrative summary of sampling data including laboratory QA/QC information;

III.H.3. A table summary of the ground water elevation and well depth data collected in accordance with Permit Condition III.E, the results of ground water flow rate and direction calculations, and parameters used to calculate ground water flow velocities and direction for the perched aquifer in accordance with Permit Condition III.B shall be submitted annually, including a summary/statement that either:

III.H.3.a. The monitoring network as described in this permit is still valid for the purpose of satisfying the requirements of IDAPA 58.01.05.008 (40 CFR §264.97(a)); or

III.H.3.b. An in-depth evaluation of the monitoring network is warranted and a proposal, including a schedule, for such will be submitted to the Director within ten (10) calendar days of the submittal of this summary.

III.H.4. Field sampling data, including:

- Sample collection procedures
- Amount of purge water collected at each well
- Sample preservation methods
- Observations of temperature, turbidity, pH, and specific conductance
- Chain of custody information
- Any anomalies that may have occurred during sampling and analysis.

III.H.5. A summary of maintenance work done on ground water monitoring equipment; and

III.H.6. A summary of deficiencies identified during the inspections of the monitoring wells, surveyed benchmarks, and WCF cap (see Permit Condition IV.C).

Sections 2 through 5 contain the required information for the Permit Condition III.H. semiannual report. The information required by Permit Condition III.H.3. is to be submitted on an annual basis and will be included in the fall 2009 semiannual report, consistent with Permit Condition III.E.2., which requires "the permittee shall measure monitoring well depths annually and report results in the fall semiannual report."

Permit Condition I.U. requires the following:

I.U. The permittee shall report all other instances of noncompliance not otherwise required to be reported, in accordance with Permit Condition I.R. and I.T. of this permit, on a semiannual basis from the effective date of the permit. The reports shall contain the information, as applicable, listed in Permit Condition I.T. of this permit. Reporting shall not constitute a defense for any noncompliance.

Section 6 contains the required information for the Permit Condition I.U. report for the October 16, 2008, to April 16, 2009, reporting period.

1.2 Background

Shallow perched groundwater beneath the WCF cap is routinely monitored through a detection monitoring program as outlined in the HWMA/RCRA post-closure permit. The WCF monitoring well network originally consisted of 11 wells in the vicinity of the WCF cap. The current WCF monitoring well network, which consists of 12 wells, is shown in Figure 1-1. All 11 original wells were monitored bimonthly for water levels; groundwater samples for laboratory analysis were required to be collected from five of these monitoring wells (MW-2, MW-5-2, MW-12-2, MW-18-2, and CPP-33-1).

As required by Permit Condition III.H.3.a., a Monitoring Well Network Compliance Statement was provided in the fall 2004 semiannual report (DOE-NE-ID 2005a). The compliance statement assessed whether the monitoring network as described in the WCF post-closure permit satisfied the requirements of Idaho Administrative Procedures Act (IDAPA) 58.01.05.008 (40 Code of Federal Regulations [CFR] 264.97(a)). Because monitoring Wells MW-12-2, MW-18-2, and CPP-33-1 had not consistently yielded a sufficient volume of water for sampling, the compliance statement proposed evaluating the monitoring network by adding MW-10-2 and CPP-55-06 for quarterly sampling to provide supplemental information.

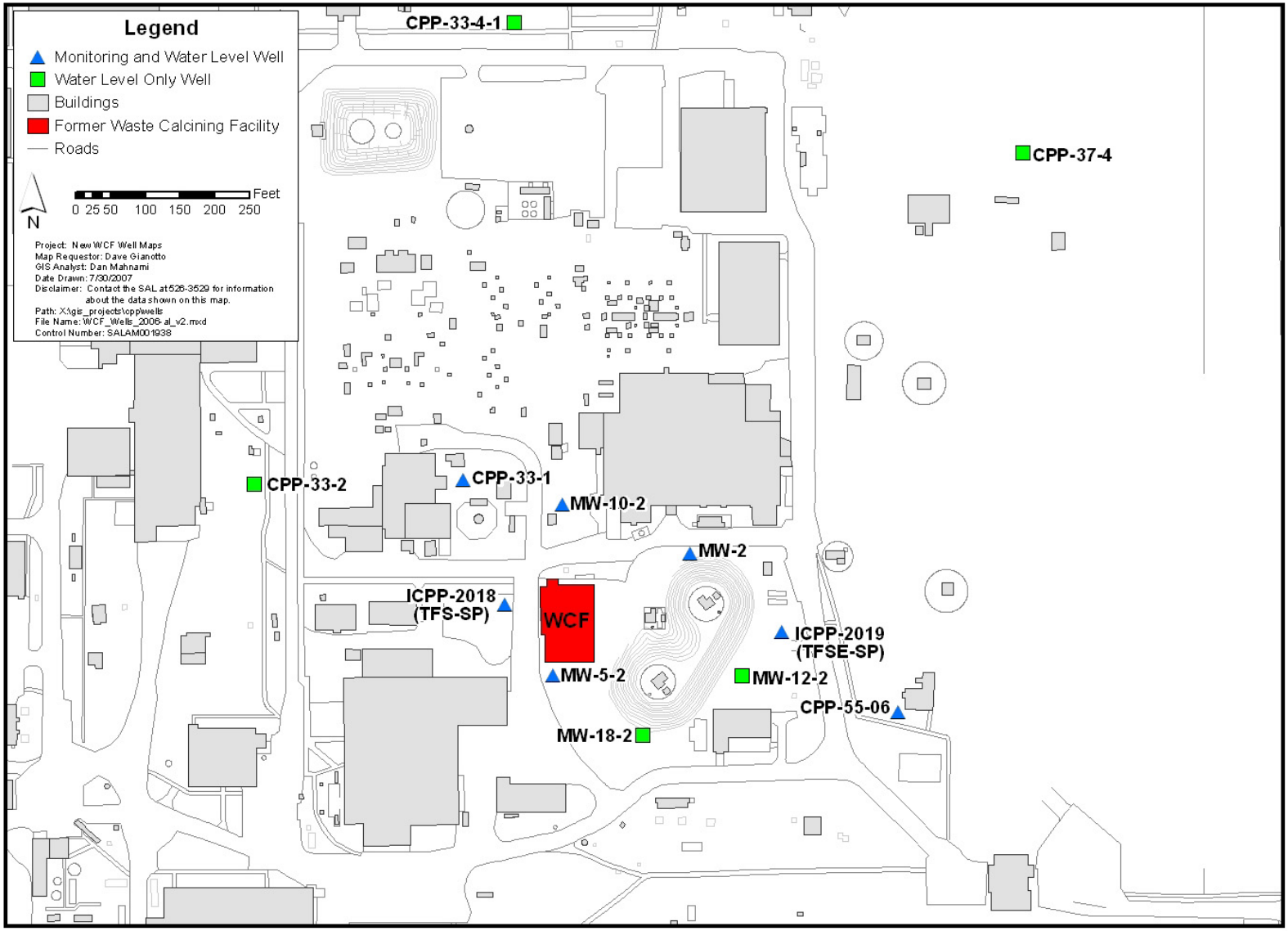

Figure 1-1. Waste Calcining Facility groundwater monitoring network.

As required by the permit, construction of two additional monitoring wells was completed on April 5, 2005. The two wells, identified as ICPP-2018 (alias TFS-SP for tank farm south-shallow perched) and ICPP-2019 (alias TFSE-SP for tank farm southeast-shallow perched), were first sampled during the May 10–12, 2005, sampling event.

A RCRA Class 2 permit modification request to modify the WCF monitoring well network was approved by DEQ on January 17, 2006 (Monson 2006). The permit was modified by adding Wells ICPP-2018, ICPP-2019, and MW-10-2 as monitoring wells, changing Well CPP-55-06 from a water elevation well to a monitoring well, removing Well MW-4-2 as a water elevation well, and changing the groundwater sampling and analysis procedures and monitoring schedule.

In previous semiannual reports, sample results from Wells CPP-55-06 and MW-10-2 were reported as supplemental wells as proposed in the response to the Comprehensive Ground Water Monitoring Evaluation for the WCF (Mascareñas 2004). As a result of the RCRA Class 2 permit modification request to modify the WCF monitoring well network, approved by DEQ on January 17, 2006, Wells CPP-55-06 and MW-10-2 are no longer considered supplemental wells but are now considered part of the permit monitoring network and have been considered monitoring wells, not supplemental wells, since the January–February 2006 sampling event (Monson 2006). The addition of these wells provided a total of 13 wells in the WCF monitoring network, three of which were background wells and six were point-of-compliance wells.

All data collected through August 2006 were used in a statistical analysis to establish background concentrations. This analysis was submitted to DEQ for the director's approval on December 11, 2006 (Medema 2006). The DEQ director provided approval of the Groundwater Statistics Report for the WCF on January 29, 2007 (Bullock 2007a).

A RCRA Class 3 permit modification request was submitted to DEQ on February 27, 2007 (Medema 2007), and was approved by DEQ on June 26, 2007 (Monson 2007). The permit was modified as follows: (a) established background concentrations based on the statistical analysis of data, (b) reduced the overall number of constituents to be analyzed from 33 to 19 constituents, (c) changed consistently dry monitoring Wells MW-12-2 and MW-18-2 from sampling to water levels only, (d) removed consistently dry Well MW-8 from the monitoring network, (e) stated that wells containing less than 1 ft of standing water have insufficient water for sampling, (f) reduced groundwater quality sampling frequency from quarterly to semiannually, (g) established groundwater quality sampling event dates, (h) reduced groundwater elevation measurement frequency from bimonthly to semiannually, (i) modified well purging and sampling methods, (j) removed permit conditions that are no longer applicable, and (k) incorporated other informational and administrative changes. The permit changes from the June 26, 2007, Class 3 permit modification request provided a total of 12 wells in the WCF monitoring network, three of which are background wells and four are point-of-compliance wells.

Even though two of the previous point-of-compliance wells (MW-12-2 and MW-18-2) continued to be dry and are now only monitored for water levels, the current WCF monitoring network is expected to continue to satisfy the requirements of IDAPA 58.01.05.008 (40 CFR 264.97(a)).

Fifteen quarterly groundwater sampling events and four semiannual sampling events have been conducted since the October 16, 2003, effective date of the post-closure permit:

- November 10, 2003, and February 4, 2004 (DOE-NE-ID 2004)
- May 10–12, 2004, and August 2–4, 2004 (DOE-NE-ID 2005a)

- November 1–2, 2004, and February 1–3, 2005 (DOE-NE-ID 2005b)
- May 3–11, 2005, and August 8–11, 2005 (DOE-ID 2006a)
- October 31–November 2, 2005, and January 30–February 1, 2006 (DOE-ID 2006b)
- May 1–4, 2006, and July 31–August 2, 2006 (DOE-ID 2007a)
- October 30–November 1, 2006, and February 5–7, 2007 (DOE-ID 2007b)
- April 30–May 3, 2007, and August 6–8, 2007 (DOE-ID 2007c)
- February 11–12, 2008 (DOE-ID 2008a)
- May 12, 2008, verification sampling, and August 4–5, 2008 (DOE-ID 2008b)
- October 14–20, 2008, verification sampling; December 15–17, 2008, sampling for Appendix IX constituents (Appendix IX sampling); and February 2–3, 2009, semiannual sampling (this report).

2. FIELD METHODS

This section describes the sample collection procedures for the October 2008 verification sampling, December 2008 Appendix IX sampling, and the February 2009 semiannual sampling of the WCF groundwater monitoring network. Specifically, it describes checking light nonaqueous phase liquid (LNAPL) levels, presampling activities, well purging and measuring water quality, collecting samples, preserving samples, and maintaining chain of custody.

2.1 Checking Light Nonaqueous Phase Liquid

A letter from DEQ (Bullock 2007b) states that because of the presence of LNAPL in one of the WCF monitoring network wells, all wells in the monitoring network must be checked for LNAPL before future groundwater samples are collected. During the October 2008 verification sampling, December 2008 sampling for Appendix IX constituents, and the February 2009 semiannual sampling events, all WCF wells were checked for the presence of LNAPL product with an interface probe before measuring water levels for purging. Section 3.1 discusses LNAPL results for this reporting period.

2.2 Presampling Activities

Prior to groundwater sampling, the following steps are performed at each WCF well:

1. The overall condition of the well is visually inspected
2. The static water level is measured, and a static well casing volume is calculated
3. The well is purged.

Wells that contain 1 ft of water column, or less, are considered by the permit to have insufficient water for sampling.

2.3 Purging and Water Quality Measurements

Purging consists of removing one to three well volumes while measuring specific conductance and pH. Samples for water quality analysis can be collected after a minimum of one well casing volume of water has been purged from the well and as soon as two consecutive measurements of pH and specific conductance fall within the following limits:

- pH ± 0.2 standard units
- Specific conductance ± 5% of reading.

If pH and specific conductance fail to stabilize within the above limits, purging continues until a maximum of three well casing volumes of water have been purged from the well, at which point sampling may begin regardless of parameter stabilization. Water temperature and turbidity are to be measured and recorded during well purging. Temperature and turbidity are influenced by the volume of water in the well and the rate of recharge; thus, they are not appropriate stability parameters for these low-yielding wells. Stable pH and specific conductance parameters are used as criteria for sampling.

When purging a well, if sufficient water is not available to complete the purging, the well is purged to dryness, allowed to recover overnight, and then sampled the next working day, at which point, no additional purging or stable parameters are required at the well. Section 3.2 provides well purging volumes, and Section 3.3 provides field measurements for this reporting period.

2.4 Sample Collection

After purging the well, the samplers collect the available water for analysis. The following is the preferred order for sample collection:

1. Metals (filtered)
2. Volatile organic compounds
3. Semivolatile organic compounds.

The sampler uses clean, waterproof gloves to protect sample bottles from contamination. The identification label is placed on the bottle with the appropriate information, such as sample identification number, name of project area/well, type of analysis, date, sampler, preservative, and collection time. Sufficient water, if available, is collected from the well to fill the required number of bottles. The water is transferred from the sampling equipment directly to the sample bottle. The bottle is filled to the neck. For samples that require volatile organic analysis, the bottle is filled until no air bubbles or headspace are left. Section 3.4 provides analytical results for samples collected for this reporting period.

2.5 Sample Preservation

Samples are preserved to minimize any chemical or physical changes that might occur between the time of sample collection and analysis. Preservation can be by physical means (e.g., kept at a certain temperature) or chemical means (e.g., by adding chemical preservatives). If a sample is not preserved properly, the levels of constituents of concern in the sample may be altered through chemical, biological, or photo-degradation or by leaching, sorption, or other chemical or physical reactions within the sample container. Applicable preservation requirements followed for these sampling activities, container types, and sample holding times are identified in Table 2-1.

Table 2-1. Summary of sampling analyses, holding times, and preservation requirements.

Analysis	Minimum Volume Required	Container Type	Holding Time	Preservative
Metals (filtered; SW 846 [EPA 1996] Methods 6010B, 200.9, 7470A, and Contract Laboratory Program ILM040-EPA 335.2)	1,800 mL	Plastic	28 days for mercury 180 days for all other metals	HNO_3 pH <2
Volatile organic compounds (SW-846 Method 8260B)	Three 40-mL vials	Glass vial	14 days	H_2SO_4 pH <2, cool to 4°C
Semivolatile organic compounds (SW-846 Method 8270)	1,000 mL	Amber glass	7 days extraction 40 days analysis	Cool to 4°C
Gamma screen	500 mL	High-density polyethylene or lab-supplied	30 days	No preservative
Polynuclear aromatic hydrocarbons (SW-846 Method 8310 or SW-846 Method 8270)	1,000 mL	Amber glass	7 days extraction 40 days analysis	Cool to 4°C

2.6 Chain of Custody

Chain of custody (COC) procedures begin immediately after collection of the first sample. After sample collection, the sampling team initiates COC forms to track the samples. All samples remain in custody of the sampling team until the custody is transferred to the analytical laboratory sample custodian. Upon receipt of samples at the laboratory, the sample custodian reviews the sample labels and the COC form to ensure completeness and accuracy. If discrepancies are noted during this review, immediate corrective action is sought with the sampling personnel identified on the COC relinquishing custody. Pending successful corrective action, the laboratory sample custodian signs and dates the COC signifying acceptance of delivery and custody of the samples.

3. RESULTS

This section summarizes groundwater sampling results for the October 2008 verification, December 2008 Appendix IX, and February 2009 semiannual sampling events. It includes results of:

- Light nonaqueous phase liquids (LNAPL)
- Purge water volumes
- Field measurements (temperature, turbidity, pH, and specific conductance)
- Groundwater sample analyses
- Polynuclear aromatic hydrocarbons.

3.1 Light Nonaqueous Phase Liquid in Well ICPP-2018

The presence of LNAPL in Well ICPP-2018 during the August 2007 WCF sampling event was previously communicated to DEQ (DOE-ID 2007c). Monitoring and other activities related to LNAPL in Well ICPP-2018 were discussed in the fall 2007 semiannual report (DOE-ID 2007c), and the spring and fall 2008 semiannual reports (DOE-ID 2008a; DOE-ID 2008b). Portions of those discussions are repeated here to provide continuity with activities that occurred during the spring 2009 WCF reporting period.

On August 6, 2007, the LNAPL layer in Well ICPP-2018 was measured with the interface probe at 12 in. (1.0 ft) thick and was sampled with a hydrocarbon bailer. The LNAPL sample was sent to the analytical laboratory for a diesel-range organic analysis. The sampling pump was reinstalled on August 6, and the well water was sampled for the scheduled WCF fall 2007 semiannual sampling event.

Analytical results indicate the LNAPL collected from Well ICPP-2018 on August 6, 2007, is essentially pure diesel-range organic, with diesel-range organic concentrations of 901,000 µg/mL and 1,040,000 µg/mL. The LNAPL is believed to be a weathered diesel-range organic because chromatograms do not pattern-match any of the classical diesel-range product standards. Well MW-5-2 is directly downgradient and about 120 ft from Well ICPP-2018. It was theorized (DOE-ID 2007c) that the biofilm observed in Well MW-5-2 during the May 2007 sampling event may have been due to bacteria biodegrading fuel hydrocarbons at the anaerobic-aerobic interface in the vicinity of Well MW-5-2. But Well MW-5-2 had less than 1 ft of water, and hydrocarbons were not detected there during the August 2007 WCF sampling event. Well MW-5-2 had less than 1 ft of water again during the February 11–12, 2008, sampling event.

A letter from DEQ (Bullock 2007b) states that because of the presence of a LNAPL in one of the WCF monitoring network wells, all wells in the monitoring network must be checked for LNAPL before future groundwater samples are collected. On November 19, 2007, a pump test was performed on Well ICPP-2018, following methods described by Hampton (2003), to determine the extent of LNAPL product recovery in this well. Results of the LNAPL pump-down test were submitted to DEQ (DOE-ID 2008a).

Light nonaqueous phase liquid thickness in Well ICPP-2018 was measured at 1.21 ft thick on March 24, 2008, and had declined to 0.17 ft thick by April 14, 2008. On April 17, 2008, a passive skimmer was placed in the well to recover hydrocarbon free product liquid. The LNAPL that accumulated in the passive skimmer was emptied several times during the current reporting period. Light nonaqueous

phase liquid thickness measurements taken using the interface probe in Well ICPP-2018 are summarized in Table 3-1 and are shown in Figure 3-1.

Table 3-1. Light nonaqueous phase liquid thickness measured with interface probe in Well ICPP-2018.

Date Measured	Light Nonaqueous Phase Liquid Thickness (ft)	Date Measured	Light Nonaqueous Phase Liquid Thickness (ft)
June 27, 2007	0.2	July 15, 2008	0.02
July 16, 2007	0.5	August 5, 2008	0.1
August 6, 2007	1.0	September 4, 2008	0.2
August 15, 2007	1.6	September 22, 2008	0.1
August 16, 2007	1.8	September 29, 2008	0.1
September 6, 2007	4.0	October 6, 2008	0.2
September 19, 2007	5.0	October 20, 2008	0.4
October 15, 2007	2.6	October 27, 2008	0.01
October 25, 2007	2.6	November 10, 2008	2.2
November 1, 2007	2.7	November 17, 2008	3.2
November 19, 2007	2.7	November 18, 2008	1.8
November 19, 2007	0.6	November 19, 2008	1.1
November 20, 2007	0.6	November 24, 2008	1.7
November 28, 2007	0.0	November 25, 2008	1.3
December 13, 2007	0.2	December 2, 2008	1.0
January 16, 2008	0.25	December 3, 2008	0.63
February 12, 2008	0.65	December 4, 2008	0.57
March 24, 2008	1.21	December 9, 2008	0.20
April 9, 2008	0.23	December 10, 2008	0.16
April 14, 2008	0.17	December 15, 2008	0.01
April 17, 2008	0.21	January 6, 2009	0.1
April 24, 2008	0.01	January 21, 2009	0.2
May 8, 2008	0.10	January 27, 2009	0.1
May 12, 2008	0.07	February 11, 2009	0.2
May 21, 2008	0.06	February 23, 2009	0.2
June 2, 2008	0.01	March 9, 2009	0.2
June 19, 2008	0.07	March 24, 2009	0.01

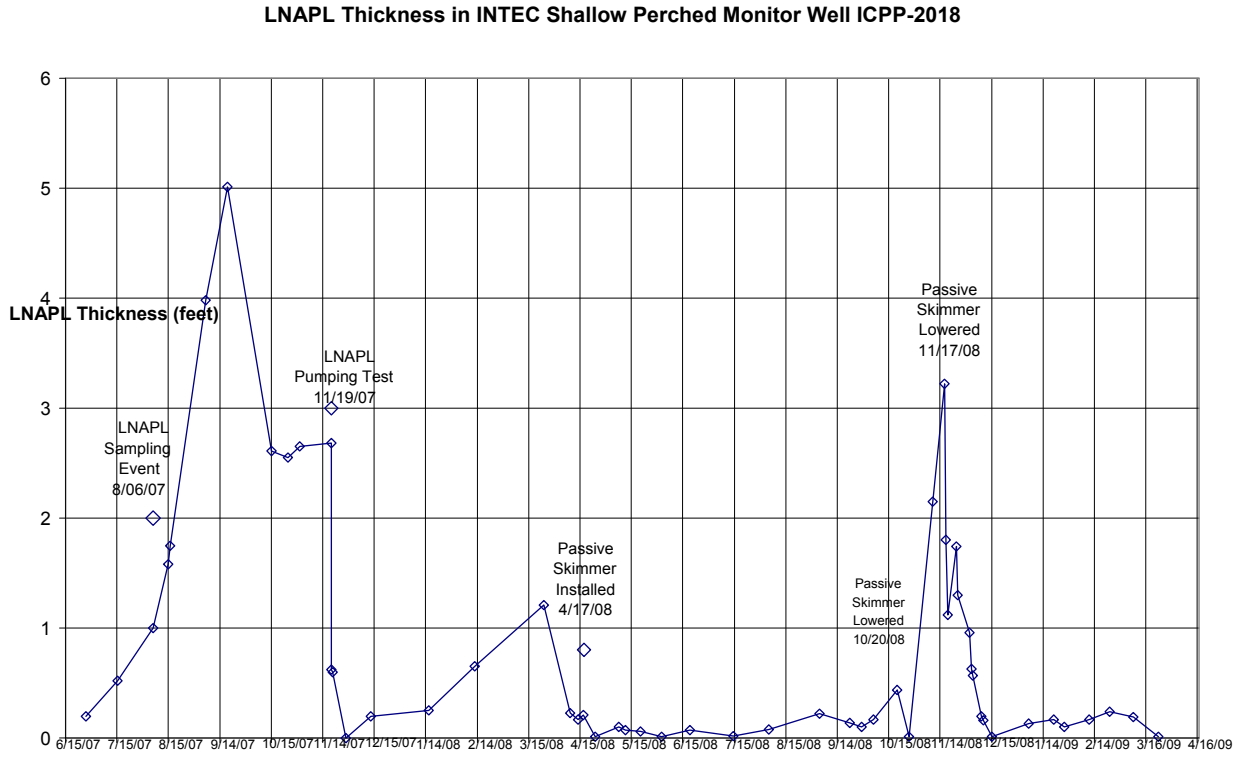

Figure 3-1. Light nonaqueous phase liquid thickness measured with the interface probe in Well ICPP-2018.

During the October 2008 verification sampling, December 2008 Appendix IX sampling, and the February 2009 sampling events, all WCF wells were checked for the presence of nonaqueous phase liquid (NAPL) product with an interface probe before measuring water levels for purging. About 0.03 ft of free NAPL product was measured in Well ICPP-2018 during the February 2009 sampling event, and about 0.75 L of LNAPL was removed from the skimmer in Well ICPP-2018 at that time. Nonaqueous phase liquid product was not detected in any other WCF well during the February 2009 sampling event.

Idaho Cleanup Project personnel continue to investigate the LNAPL layer and the potential source of this layer through the DEQ-approved Corrective Action/Groundwater Monitoring Plan for Well ICPP-2018 (Short 2009; ICP 2009).

3.2 Purge Water

Purging consists of removing one to three well volumes while measuring specific conductance and pH. Table 3-2 shows the one-well volume amount of purge water calculated for the October 2008 verification sampling, December 2008 Appendix IX sampling, and the February 2009 semiannual sampling events.

Table 3-2. One-well purge volumes calculated for October 2008 verification sampling, December 2008 Appendix IX sampling, and February 2009 semiannual sampling events.

Monitoring Well	Date	Purge Volume (gal)
October 2008 Verification Sampling		
CPP-55-06 Sample #1	October 14, 2008	0.946
CPP-55-06 Sample #2	October 14, 2008	0.933
MW-5-2 Sample #1	October 14, 2008	0.562
MW-5-2 Sample #2	October 20, 2008	0.528
December 2008 Appendix IX Sampling		
CPP-55-06	December 15, 2008	1.59
MW-5-2	December 16, 2008	0.306
February 2009 Semiannual Sampling		
CPP-55-06	February 2, 2009	1.78
ICPP-2019	February 2, 2009	2.57
MW-2	February 2, 2009	1.189
MW-10-2	February 2, 2009	0.715
MW-5-2	February 3, 2009	Dry[a]
ICPP-2018	February 3, 2009	1.478
CPP-33-1	February 3, 2009	Dry

a. Well had less than 1 ft of water.

3.3 Field Measurements

The permit requires field observations of groundwater temperature, turbidity, pH, and specific conductance that were recorded during WCF well purging to be submitted to DEQ in the semiannual report. This information is provided in Appendix A, which contains copies of the field sampling logbooks for the wells that were sampled during the October 2008 verification, December 2008 Appendix IX, and February 2009 semiannual sampling events.

During the December 2008 and the February 2009 sampling events, turbidity was measured with a Hach DR/890 instrument[a] rather than the Hydrolab because the Hydrolab turbidity unit was not working correctly during these sample events. During the December 2008 and February 2009 sampling events, a single turbidity reading was taken when samples were collected, and recorded in the sample logbook for each well that had sufficient water for sampling, rather than on the purge form. During the December 2008 sampling event, purge water turbidity at Well CPP-55-06 was 0 formazin attenuation units (fau), and at Well MW-5-2, turbidity was 233 fau. During the February 2009 sampling event, the turbidity of the purge water was 0 fau at all wells that had water except for Well ICPP-2018 where the turbidity at the time of sampling was 217 fau.

3.4 Analytical Results

This section summarizes groundwater analytical results of groundwater samples that were collected during the October 2008 verification, December 2008 Appendix IX, and February 2009 semiannual sampling events. Tables 3-3 and 3-4 list the constituents, estimated quantitation limits (EQLs), groundwater protection standards (GPSs), and detection monitoring limits (DMLs) that were in effect for these sampling events. The unqualified analytical results were compared to the constituent analyte list and associated GPS identified in Table 3-1 (Module III) of the HWMA/RCRA WCF post-closure permit in this report as a preliminary overview. Copies of all COC forms for the October 2008 verification sampling, December 2008 Appendix IX sampling, and February 2009 semiannual sampling events are included in Appendix B. Waste Calcining Facility HWMA/RCRA post-closure permit-required sampling results are reported in Appendix C. Polynuclear aromatic hydrocarbon results are reported in Section 3.5 and Appendix D. Sample duplicate results and other quality assurance/quality control data are provided in Section 3.4.2.4 (for December 2008 Appendix IX sampling) and in the data compact disc that accompanies this report.

a. Mention of specific commercial products and/or manufacturers herein implies neither endorsement or preference, nor disapproval by the U.S. Government, any of its agencies, or any INL Site contractors of the use of a specific product for any purpose.

Table 3-3. Constituent analyte list, associated estimated quantitation limits, groundwater protection standards, and Waste Calcining Facility detection monitoring limits.

Constituent	EQL (µg/L)	GPS (µg/L)	DML (µg/L)	Constituent	EQL (µg/L)	GPS (µg/L)	DML (µg/L)
Arsenic	5	20	5	Trichloroethene	1	10	2
Barium	20	4,000	—[a]	Tetrachloroethene	1	10	—[a]
Cadmium	1	10	1	Carbon disulfide	1	2,000	2
Chromium	10	200	12	Toluene	1	2,000	—[a]
Lead	3	30	3	Pyridine	5	720	5
Mercury	0.2	4	0.7	Methyl ethyl ketone	5	38,000	5
Selenium	20	100	20	Benzene	1	10	1
Silver	10	200	10	Chloroform	1	200	1
1,1,1-trichloroethane	1	400	1	Methylene chloride	1	86	1
Carbon tetrachloride	1	10	1				

a. The well-specific DMLs for barium, tetrachloroethene, and toluene are shown in Table 3-4.

DML = detection monitoring limit
EQL = estimated quantitation limit
GPS = groundwater protection standard

Table 3-4. Detection monitoring limits for constituents that differ among wells.

	Well						
Constituent	CPP-33-1	CPP-55-06	ICPP-2018	ICPP-2019	MW-2	MW-5-2	MW-10-2
Barium (µg/L)	270	312	429	277	366	1,821	298
Tetrachloroethene (µg/L)	1	1	1	1	1	1	4.8
Toluene (µg/L)	1	1	1	1	3	1	146

3.4.1 October 2008 Verification Sampling

As previously reported (Hutchison 2008a; DOE-ID 2008b), chromium was detected in the August 2008 semiannual sample from Well MW-5-2 at a level of 16.2 µg/L, and toluene was detected at levels of 4.5 µg/L, 22 µg/L, and 32 µg/L in the August 2008 semiannual samples from Wells MW-5-2, CPP-55-06, and CPP-55-06 (duplicate), respectively. These levels are above the WCF permit DMLs for chromium and toluene for the respective wells, and therefore required that two verification samples be collected from each of the affected wells (MW-5-2 and CPP-55-06) per WCF Permit Condition III.F.4.a.2.

Both permit-required verification sample sets were collected from Well CPP-55-06 on October 14, 2008. The first of two verification sample sets was collected from Well MW-5-2 on October 14, after which the well went dry. The second verification sample set was collected from Well MW-5-2 on October 20, 2008. As reported to DEQ (Hutchison 2008b) and as discussed in the following paragraphs and shown in Appendix C, chromium and toluene were detected during the

October 2008 verification sampling. As reported to DEQ (Hutchison 2008c), no laboratory quality assurance/quality control problems were identified from the analysis of the October 2008 verification sampling event.

3.4.1.1 Chromium

As reported to DEQ (Hutchison 2008b), chromium was detected at 22.8 µg/L in the first sample collected from Well MW-5-2 during the October verification sampling event. This chromium detection is above the WCF permit 12-µg/L DML for chromium. Chromium was not detected in the second verification sample from Well MW-5-2.

The October 2008 verification samples from Well MW-5-2 were collected by bailing. Black suspended solids that appeared to be sediments from the bottom of the well were noted in the samples collected from Well MW-5-2 during the October 2008 verification sampling event and the previous August 2008 semiannual sampling event. However, the metals sample collected from Well MW-5-2 could not be filtered at the wellhead because bailing does not produce sufficient pressure to force water through a standard 0.45-micron filter. Due to radiological concerns, vacuum filtering could not be done at the wellhead and would have to be done on a radiological bench top to minimize radiological exposure to the sampling crew. Because the October verification metals samples were not filtered at the wellhead, nitric acid sample preservative was not added to the sample bottles at the wellhead. The analytical laboratory was requested to and did filter and then acidify the samples prior to analysis to maintain method consistency.

It is possible that the fine black sediment observed during sampling may contain bio-accumulated metals (including chromium) from the biofilm that was observed and videotaped in April and May 2007 and which was reported in the Fall 2007 WCF Semiannual Report (DOE-ID 2007a). During the periodic water level fluctuations in the perched water at Well MW-5-2, biofilm may have sloughed off the interior of the well screen and casing, fallen to the bottom of the well, and mixed with the well-bottom sediments. If this occurred, the presence of bio-accumulated metals less than the 0.45-micron filter may have biased the chromium results from Well MW-5-2. If sampling by bailing is necessary during future WCF sampling events, the Idaho Cleanup Project (ICP) plans to have the analytical laboratory filter and acidify the metals sample as was done for the October 2008 sampling event.

Chromium was detected and reported in adjacent WCF monitoring network wells during the baseline-setting WCF quarterly monitoring period. Several chromium detections during this period were above the 12-µg/L DML. Thus, chromium is a known background constituent in perched water near the WCF.

3.4.1.2 Toluene

Toluene was detected in the verification samples from Well CPP-55-06 at 150 µg/L (at a five-times dilution) and 26 µg/L during the October 2008 verification sampling event. These results are above the WCF permit 1-µg/L DML for toluene in this well. Toluene was not detected in either of the verification samples collected at Well MW-5-2.

Toluene was detected and reported in adjacent WCF monitoring network Wells MW-2 and MW-10 during the baseline-setting WCF quarterly monitoring period. A validated, unqualified result of 600 µg/L toluene was detected at Well MW-10-2 during the November 2005 sampling event. Validated, unqualified results of 95 and 92 µg/L toluene were detected at Well MW-10-2 during the January 2006 sampling event. Detection monitoring limits of 3 µg/L and 146 µg/L for Wells MW-2 and MW-10,

respectively, were determined by the statistical analysis of the quarterly data. Thus, toluene is a known background constituent in perched water near the WCF.

3.4.2 December 2008 Sampling for Appendix IX Constituents

The detection of chromium in Well MW-5-2 and toluene in Well CPP-55-06 above their respective DMLs during the August 2008 sampling event and October 2008 verification sampling event required that samples be collected and analyzed from both these wells for the full suite of constituents listed in 40 CFR 264, Appendix IX (Appendix IX sampling). Sampling for these constituents occurred during the week of December 15, 2008, per WCF Permit Condition III.F.4.b. Those results were submitted to DEQ (Hutchison 2009a) and are discussed in this section and are shown in Appendix C.

Purging and sample collection at Well CPP-55-06 occurred on December 15, 2008, and all Appendix IX samples were collected at this well. Sampling at Well MW-5-2 began on December 16, 2008, by purging with a bailer. The bailer returned empty on the fourth and fifth bailing attempts, so purging ceased on December 16, 2008, because the well was dry. Sampling at Well MW-5-2 resumed on December 17, 2008. Only a partial metals sample could be collected at this well before it went dry again.

Because the December 2008 Appendix IX sample from Well MW-5-2 was bailed, it was not filtered at the wellhead, and nitric acid was not added to the MW-5-2 sample bottles at the wellhead. Black suspended solids that appeared to be sediments from the bottom of the well were noted in the sample. The analytical laboratory was requested to and did filter and then acidify the metals sample prior to analysis to maintain method consistency.

The following subsections discuss chromium and toluene detections and laboratory quality assurance/quality control problems identified for the December 2008 sampling of Appendix IX constituents.

3.4.2.1 Chromium

Chromium was detected at 7.4 µg/L and 6.6 µg/L at Wells CPP-55-06 and MW-5-2, respectively, during the December 2008 Appendix IX sampling. Both results are below the 12-µg/L DML for chromium.

Chromium was previously detected and reported in WCF monitoring network wells during the baseline-setting WCF quarterly monitoring period. Several chromium detections during this period were above the 12-µg/L DML. Specifically, chromium was detected at 59.6 µg/L at MW-2 on February 4, 2004, at 16 µg/L at Well CPP-33-1 on November 1, 2004, at 12.7 µg/L at Well CPP-33-1 on May 11, 2005, and at 14.7 µg/L at Well CPP-55-06 on May 3, 2005. Thus, chromium is a known background constituent in perched water near the WCF.

Recent low water level and recharge conditions at Well MW-5-2 have required sampling by bailing rather than by pumping. Sampling by bailing may cause turbulence which may entrain more well bottom sediments into the sample than may occur during pumping. If sampling by bailing is necessary during future WCF sampling events, and if field filtration of the metals sample continues to be untenable due to the potential for radionuclide exposure, ICP plans to have the analytical laboratory filter and acidify the metals sample as was done during the October 2008 and December 2008 sampling events.

3.4.2.2 Toluene

Toluene was detected at 68 µg/L at Well CPP-55-06 during the December 2008 Appendix IX sampling event. This result is above the WCF permit 1-µg/L DML for toluene in this well. As discussed previously, Well MW-5-2 went dry during sampling before a sample could be taken for toluene analysis.

As discussed in Section 3.4.1.2, toluene is a known background constituent in perched water near the WCF.

3.4.2.3 Chromium and Toluene Conclusion

Because chromium and toluene are known background constituents at very low levels in the perched water near WCF, ICP believes no further actions are necessary to address these detections. Therefore, ICP requested DEQ concurrence and approval to continue to monitor the WCF wells under the WCF Permit Detection Monitoring Program and not to continue sampling for the constituents identified in IDAPA 58.01.05.008 (40 CFR 264, Appendix IX) as discussed in Permit Condition III.F.4.b (Hutchison 2009a).

3.4.2.4 Quality Assurance/Quality Control Issues

The limitations and validation reports for the December 2008 Appendix IX sampling event were received by February 9, 2009 and were evaluated. Permit Condition III.D.5 requires notifying DEQ of quality assurance/quality control issues. The DEQ was notified on February 23, 2009 (Hutchison 2009b). The following paragraphs discuss the laboratory quality assurance/quality control problems identified from the analyses of the groundwater samples collected from Monitoring Wells MW-5-2 and CPP-55-06 for Appendix IX constituents. No quality assurance/quality control problems were identified from the analyses of the October 2008 verification or February 2009 semiannual sampling events.

The matrix spike and matrix spike duplicate results for thallium (42.3% and 52.4%, respectively) were outside the 75–125% acceptance criteria. Consequently, thallium in all samples was qualified with a "UJ" validation flag to denote the sample results are non-detect at the reported values and are estimated due to poor matrix spike and matrix spike duplicate recoveries. The remaining matrix spike and matrix spike duplicate results were within the 75–125% acceptance criteria.

The cyanide result was qualified with a "UJ" flag to denote that the material was analyzed for, and was not detected at or above the applicable detection limit. However, the associated value is only an estimate due to low matrix spike recovery. The recovery (74.4%) of total cyanide in the matrix spike of sample WCF28401C2 was outside of the recovery limits (75–125%).

The non-detect results for p-Phenylenediamine and 3,3'-Dimethylbenzidine were qualified as estimated quantities with a "UJ" flag because the percent relative standard deviation values in the initial calibration failed the acceptance criteria of <15% relative standard deviation.

The diallate result was qualified with a "UJ" flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate because the initial calibration percent relative standard deviation criteria were not met. The aldrin result was qualified with a "UJ" validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to low laboratory control sample recovery. The result for beta-BHC was qualified with an "NJ" validation flag to denote presumptive evidence of its presence at an estimated concentration due to noted interference and high relative percent difference between columns.

Dalapon was reported from the 10x dilution analysis on column two. Dalapon was qualified with an "NJ" validation flag to denote there is presumptive evidence of its presence at an estimated concentration due to high relative percent difference between columns, exceeded continuing calibration criteria, and high laboratory control sample recovery.

Sulfotep, phorate, and disulfoton were qualified with a "UJ" validation flag to denote the reported concentration is non-detect in the sample, and the sample quantitation limit is an estimate because the initial calibration percent relative standard deviation criterion was not met.

Dimethoate was non-detect in the sample and was qualified with an "R" rejected validation flag because the initial calibration relative response factor criterion was not met.

With the exception of toluene and chromium, the Appendix IX constituents that were previously discussed in the February 23, 2009, Permit Condition III.D.5. notification letter to DEQ are not expected to be associated with the WCF, based on the characterization of the waste previously treated in the WCF. Therefore, no corrective actions were proposed for the identified quality assurance/quality control issues.

3.4.3 February 2009 Semiannual Sampling

During the February 2009 semiannual WCF sampling event, complete WCF sample sets were collected from monitoring Wells CPP-55-06, ICPP-2019, MW-2, and ICPP-2018. Well MW-10-2 was purged, and a partial sample set consisting of metals, volatile organic compounds, half a bottle for semivolatile organic compound, and no polynuclear aromatic hydrocarbons was collected over the two-day sampling period before the well went dry on the second day. Well CPP-33-1 was dry, and Well MW-5-2 had 0.12 feet of water, which per the permit is insufficient to sample.

Groundwater samples were analyzed for the constituent analyte list in Table 3 of the WCF post-closure permit. Results for constituents that were detected at or above the permit-required EQL during the February 2008 sampling event are shown in Table 3-5. A letter to DEQ, (Hutchison 2009c) discussed that no laboratory quality assurance/quality control problems were identified from the analysis of February 2009 groundwater samples, as required under Permit Condition III.D.5.

Table 3-5. Validated unqualified detections in Waste Calcining Facility wells for February 2009.

Constituent	Well	Detection (µg/L)	Groundwater Protection Standard (µg/L)
Arsenic	ICPP-2018	13	20
Barium	CPP-33-1	NS[a]	4,000
	CPP-55-06	168	
	ICPP-2018	295	
	ICPP-2019	150	
	MW-2	210	
	MW-5-2	NS[a]	
	MW-10-2	261	
Tetrachloroethene	MW-10-2	3.8	10
Toluene	CPP-55-06	38	2,000

a. NS = no sample was available for this sampling event.

The barium detections listed in Table 3-5 for the February 2009 sampling event were all below the respective well DMLs. The 3.8-µg/L tetrachloroethene detection in Well MW-10-2 is below the 4.8-µg/L DML for this well. Chromium, which had been detected above the EQL in Well MW-5-2 in August 2008 and for which verification sampling was performed in October 2008 (see Section 3.4.1.1), was not detected above the 10-µg/L EQL in any WCF well during the February 2009 sampling event. The following paragraphs discuss arsenic and toluene detection during the February 2009 sampling event.

3.4.3.1 Arsenic

As shown in Table 3-5, arsenic was detected at 13 µg/L in a groundwater sample collected from WCF Well ICPP-2018 during the February 2009 sampling event. This result is above the arsenic DML for Well ICPP-2018. Arsenic has been detected at this well above the respective DML in the recent past and reported to DEQ. Permit Condition III.F.4.a.1 requires notifying DEQ upon detection of any constituents that exceed the detection monitoring criteria specified in Table 1 of the WCF post-closure permit. Accordingly, DEQ was notified on April 2, 2009 (Hutchison 2009c).

Arsenic was previously detected and reported at levels of 7.1 µg/L and 8.2 µg/L in two groundwater samples collected from WCF Well ICPP-2018 during the February 2008 WCF sampling event (DOE-ID 2008a). The DEQ review of these findings (Bullock 2008) concurred that it appears this arsenic detection was not the result of releases from the WCF but rather from the conditions produced by the floating free petroleum product present in this well. DEQ agreed that requiring Appendix IX sampling did not appear justified at the time. The ICP has continued to collect purged groundwater dissolved oxygen data to document that the arsenic detection is due to anoxic conditions in Well ICPP-2018.

During the August 2008 sampling event, arsenic was detected at levels of 6.7 µg/L and 6.6 µg/L in two groundwater samples obtained from WCF Well ICPP-2018. At that time, it was reported that it appears the arsenic detection is not the result of releases from the WCF, but rather from the conditions produced by the floating free petroleum product (LNAPL) present in this well. Dissolved oxygen levels in the purge water from Well ICPP-2018 were below 1.07 mg/L, whereas the dissolved oxygen levels in purge water from other WCF wells were generally above 4.5 mg/L during the August 2008 sampling event. These results further support the premise that the hydrocarbons present in Well ICPP-2018 consume oxygen in the groundwater, causing the observed anaerobic (reducing) conditions at this location, and the elevated arsenic. Measured dissolved oxygen levels in the purge water from Well ICPP-2018 during the February 2009 sampling event ranged from 0.66 mg/L to 1.47 mg/L and were lower than those measured at other WCF wells during this sampling event. Thus, the February 2009 arsenic detection at Well ICPP-2018 is believed to be due to a source other than the WCF. ICP personnel continue to monitor the LNAPL layer through the DEQ-approved Corrective Action/Groundwater Monitoring Plan for Well ICPP-2018 (Short 2009; ICP 2009).

WCF Permit Condition III.F.4.a.2. requires that when detection monitoring limits are exceeded, two verification samples be collected from each of the affected wells (ICPP-2018). Because the arsenic detection is believed, with DEQ concurrence, to be due to a source other than the WCF, ICP believes no further actions are necessary to address the February 2009 WCF arsenic detection. Therefore, the ICP plans to continue to monitor the WCF wells under the WCF Permit Detection Monitoring Program and not to perform verification sampling as described in Permit Condition III.F.4.a.2. or perform sampling for the constituents identified in IDAPA 58.01.05.008 (40 CFR 264, Appendix IX) as discussed in Permit Condition III.F.4.b.

3.4.3.2 Toluene

During the February 2009 sampling event, a grab and a duplicate sample were collected from Well CPP-55-06. Toluene was detected in the February 2009 WCF grab sample (sample WCF31101VA) at 38 µg/L and in the duplicate sample (sample WCF31102VA) at 41 µg/L. These levels are above the WCF permit 1-µg/L detection monitoring limit for toluene for Well CPP-55-06.

Permit Condition III.F.4.a.1 requires notifying DEQ upon detection of any constituents that exceed the detection monitoring criteria specified in Table 1 of the WCF post-closure permit. Accordingly, DEQ was notified on April 2, 2009 (Hutchison 2009c).

Toluene has been detected at this well above the respective DML in the recent past and reported to DEQ. Toluene was detected at levels of 4.5 µg/L, 22 µg/L, and 32 µg/L in the August 2008 semiannual samples from Wells MW-5-2, CPP-55-06, and CPP-55-06 (duplicate), respectively. Toluene was detected in two samples at 150 µg/L (at a five times dilution) and 26 µg/L collected from Well CPP-55-06 during the October 2008 verification sampling event. Toluene was detected at 68 µg/L at Well CPP-55-06 during the December 2008 Appendix IX sampling event. Toluene was also previously detected and reported in WCF monitoring network Wells MW-2 and MW-10 during the baseline-setting WCF quarterly monitoring period as discussed in previous sections and is a known background constituent in perched water near the WCF.

WCF Permit Condition III.F.4.a.2. requires that when detection monitoring limits are exceeded, two verification samples be collected from each of the affected wells (CPP-55-06). Because toluene is a known background constituent at very low levels in the perched water near the WCF, ICP believes no further actions are necessary to address the February 2009 WCF toluene detections. Therefore, ICP plans to continue to monitor the WCF wells under the WCF Permit Detection Monitoring Program and not to perform verification sampling as described in Permit Condition III.F.4.a.2. or perform sampling for the constituents identified in IDAPA 58.01.05.008 (40 CFR 264, Appendix IX) as discussed in Permit Condition III.F.4.b.

3.5 Polynuclear Aromatic Hydrocarbons

In addition to the constituents required by the WCF HWMA/RCRA permit, samples were also collected from all WCF wells that had sufficient water for polynuclear aromatic hydrocarbon analyses during the February 2009 sampling event. These samples for polynuclear aromatic hydrocarbon analyses were collected in response to the January 17, 2008, DEQ Leaking Underground Storage Tank Program request (Hutchison 2008d). The polynuclear aromatic hydrocarbon results are reported in Appendix D of this report.

Results were undetected at or below 0.1 µg/L for all polynuclear aromatic hydrocarbon constituents analyzed except for those from Well ICPP-2018. Sample WCF30901KH (from Well ICPP-2018) had 0% recoveries for the surrogate benzo(a)anthracene-d12 and for the internal standard acenaphthene-d10. Additionally, a retention time shift was noted for phenanthrene-d10, and the internal standard chrysene-d12 exceeded the recovery range. An examination of the raw data revealed the presence of unknown contamination that distorted the sample chromatogram for the majority of the analysis. Manual integrations of internal standards and surrogate areas were performed by the laboratory in response to the unknown contaminants present in the sample. The laboratory reanalyzed the sample within the hold time at a 20-times dilution to improve chromatography and to get the internal standards within the recovery range. As a result of the 20-times dilution, the internal standard areas in the dilution analysis were acceptable, the surrogates were diluted out, and detection limits were increased by the same factor. Therefore, due to the poor chromatography associated with the undiluted analysis, the diluted sample was

used for validation, and the polynuclear aromatic hydrocarbon results for Well ICPP-2018 are reported as undetected at 2 µg/L.

4. MAINTENANCE OF GROUNDWATER MONITORING EQUIPMENT

The overall condition of a monitoring well is visually inspected at each visit to the well, including during sampling events and the water level surveys. Maintenance problems encountered at any well location are addressed following their identification. Examples of possible maintenance problems at monitoring wells could include inoperable locks, cracked surface casings, and damaged cement pads. Table 4-1 summarizes maintenance performed on groundwater monitoring wells and equipment during this semiannual reporting period. No other well maintenance problems were identified during this semiannual reporting period.

Table 4-1. Installation of groundwater monitoring equipment.

Date	Monitoring Well	Description of Maintenance Activity
September 4, 2008–April 1, 2009	ICPP-2018 (TFS-SP)	LNAPL skimmer removed from well, emptied, and reinstalled several times to optimize removal of hydrocarbon layer and for sampling. Sampling pump installed to sample Well ICPP-2018 and then removed on February 3, 2009. A passive skimmer has been installed in this well since April 17, 2008, to absorb hydrocarbons.
January 15, 2009	ICPP-2018 (TFS-SP)	Broken impingement post was temporarily replaced with a jersey barrier until weather improves to replace the post.

LNAPL = light nonaqueous phase liquid

TFS-SP = tank farm south-shallow perched

5. INSPECTIONS

Inspections are required under Permit Condition IV.C.1. and described in Attachment 2, Section D, of the post-closure permit. Inspections of the WCF landfill cap and two brass surveyed benchmarks are required semiannually. The current WCF monitoring network includes 12 wells, all of which were inspected during the reporting period. Inspection forms are completed for these inspections; examples of the forms are included in Attachment 2 of the post-closure permit.

5.1 Waste Calcining Facility Landfill Cap

No deficiencies were identified during the March 19, 2009, semiannual inspection of the WCF landfill cap.

5.2 Surveyed Benchmarks

No deficiencies were identified during the March 19, 2009, semiannual inspection of surveyed benchmarks associated with the WCF landfill cap.

5.3 Monitoring Wells

A steel impingement post at Well ICPP-2018 had been knocked over during the winter and was temporarily replaced by a jersey barrier to protect the well. The replacement of the impingement post is planned when weather permits. No other deficiencies were identified during inspections of monitoring network wells for this semiannual reporting period, as required by Permit Condition III.H.6.

6. OTHER NONCOMPLIANCE (I.U.)

Permit Condition I.U. requires reporting all instances of noncompliance not otherwise required to be reported under Permit Condition I.R. (i.e., planned changes in the facility or activity that may result in noncompliance with the requirements of this permit) or Permit Condition I.T. (i.e., noncompliance that may endanger human health or the environment).

No “other noncompliance” occurred during this semiannual reporting period.

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Appendix A

Field Observations of Groundwater Temperature, Turbidity, Oxidation Reduction Potential, pH, and Specific Conductance

Appendix A

Field Observations of Groundwater Temperature, Turbidity, Oxidation Reduction Potential, pH, and Specific Conductance – October 2008

Integrated Earth Science Well Purge Form

Well Name: 55-06 #1 Project: WCF Date: 10/14/08

Pre-purge Water Level: 107.29 Depth of Well: 113.10 Column Height: 5.81

Well Diameter: 2 Conversion: 0.0833

Purge Volume Calculation: Radius² 0.0069 x 3.14= 0.02179

x Height of Water Column: 0.1205 x 7.48= 0.946 x # of well evacuations(3) = 2.84g

Person Calculating the Purge Volume: [illegible] Flow Rate: 1 lpm

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
1049	12.13	7.65	0.654	4.23	58.8	169	27.6
1050	12.76	7.52	0.688	4.99	62.2	161	25.1
1051	13.09	7.45	0.704	5.03	72.8	134	15.0
1052	13.32	7.45	0.704	5.05	74.2	133	15.0
1053	14.56	7.35	0.706	5.30	76.0	129	14.6
1054	14.59	7.35	0.703	5.35	80.3	120	12.3

Pump On 1046 Water @ Surface 1049

Sample Time 1055 Pump Off 1101

Stable Parameter Criteria: (2 successive readings) Specific conductance ±5% pH ±0.2

Observations: _____

Recorded By: [illegible] QA Check: [signature]

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Integrated Earth Science Well Purge Form

Well Name: 55-06 #2 Project: WCF Date: 10/14/08

Pre-purge Water Level: 107.37 Depth of Well: 113.1 Column Height: 5.73

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .02179

x Height of Water Column: 0.1248 x 7.48= 0.933 x # of well evacuations(3) = 2.801

Person Calculating the Purge Volume: Tiffany Park Flow Rate: 1 Lpm

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
1110	13.65	7.48	0.662	7.33	103.5	149	84.7
1111	14.11	7.42	.634	7.10	101.3	137	26.8
1112	14.24	7.36	.695	7.13	102.6	113	17.1
1113	14.86	7.29	.712	7.20	104.8	97	10.2
1114	14.88	7.28	.700	7.18	104.6	99	10.1

Pump On 1109 Water @ Surface 1110

Sample Time 1115 Pump Off 1121

Stable Parameter Criteria:
(2 successive readings)
- Specific conductance ± 5%
- pH ± 0.2

Observations: 109.35 - WL

Recorded By: T. Park QA Check:

DATE (DDMMMYY)

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Integrated Earth Science Well Purge Form

Well Name: MW-5 #1 Project: WCF Date: 10/14/08

Pre-purge Water Level: 123.05 Depth of Well: 126.5 Column Height: 3.45

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .02179

x Height of Water Column: .075 x 7.48= 0.562 x # of well evacuations(3) = 1.686

Person Calculating the Purge Volume: Tiffany Lack Flow Rate: Bail

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
1315	19.64	6.99	1.182	5.30	70.0	224	7.55
1318	18.83	6.86	1.176	4.56	78.5	185	86.5
1321	18.79	6.91	1.170	4.55	77.2	184	86.0

Bail ~~Pump On~~ 1310 Water @ Surface 1312

1325

Sample Time ~~1330~~ 10/14/08 Pump Off NA

10/14/08

Stable Parameter Criteria:
(2 successive readings)
- Specific conductance ± 5%
- pH ± 0.2

Observations: Water started clear + became dirty w/ sediment reading 100-200 counts on RAE meter.

Recorded By: Tiffany Lack QA Check:

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 cas.

SAMPLING AND ANALYSIS PLAN FOLLOWED: NO (__) YES (X) IF NO LIST DEVIATIONS ON DRR SHEET.

Integrated Earth Science Well Purge Form

Well Name: MW-5 #2 Project: WCF Date: ~~10/19/08~~ 10/20/08

Pre-purge Water Level: 123.26 Depth of Well: 126.5 Column Height: 3.24

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .02179

x Height of Water Column: .070 x 7.48= .528 x # of well evacuations(3) = 1.58

Person Calculating the Purge Volume: Tiffany Flack Flow Rate: Bail

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
0932	18.05	6.88	1.178	3.17	3.03	245	25.0
0937	18.35	6.96	1.179	1.26	22.3	249	66.2
0939	18.10	6.97	1.174	1.34	22.7	260	1089
0943	18.45	7.00	1.175	1.82	28.2	268	330

~~Pump On~~ Bail 0931 Water @ Surface 0932

Sample Time 0955 Pump Off NA

Stable Parameter Criteria:*
(2 successive readings)
- Specific conductance ±5%
- pH ± 0.2

Observations: _____

Recorded By: Tiffany Flack QA Check: Danielle Mullen

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

42A

Field Observations of Groundwater Temperature, Oxidation Reduction Potential, pH, and Specific Conductance – December 2008

Integrated Earth Science Well Purge Form

Well Name: 55-06 Project: WCF Date: 12/15/08

Pre-purge Water Level: 104.81 Depth of Well: 114.6 Column Height: 9.79

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .0217

x Height of Water Column: .213 x 7.48= 1.59 x # of well evacuations(3) = 4.78

Person Calculating the Purge Volume: Tiffany Falk Flow Rate: 1 Lpm

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
1314	13.65	7.77	.560	5.36	59	45	
1315	13.65	7.77	.557	5.53	54.3	52	
1316	14.03	7.76	.557	5.78	56.8	57	
1317	14.25	7.74	.555	5.95	58.8	62	

Pump On 1305 Water @ Surface 1308

Sample Time 1318 Pump Off 1340

Stable Parameter Criteria:
(2 successive readings)
Specific conductance ± 5%
pH ± 0.2

Observations: _____

Recorded By: D. Millward QA Check: Tiffany Falk

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Integrated Earth Science Well Purge Form

Well Name: MW-5 Project: WCF Date: 12/16/03

Pre-purge Water Level: 125.36 Depth of Well: 127.24 Column Height: 1.88

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .0217

x Height of Water Column: .0109 x 7.48=0.306 x # of well evacuations(3) = 0.919

Person Calculating the Purge Volume: Tiffany Lack Flow Rate: Bail

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
1240	16.91	7.27	.997	2.38	2.71	203	
1243	16.31	7.33	1.002	2.29	22.2	221	
1249	17.99	7.40	0.996	2.08	19.8	220	
1252	17.63	7.39	0.995	1.79	18.7	223	

Pump ~~On~~ Bail 1235 Water @ Surface 1237

Sample Time _____ Bailing ceased ~~Pump Off~~ 1257

Stable Parameter Criteria:
(2 successive readings)
Specific conductance ± 5%
pH ± 0.2

Observations: 127.72 - WL empl | TD - 127.6 @ imp
1st bail was clear w/ dark sediment | 2nd & 3rd bails were dark w/ sediment
4th & 5th bails were empty. At 1257 Bailing ceased.

Recorded By: N. Hutton QA Check: Tiffany Lack

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Field Observations of Groundwater Temperature, Oxidation Reduction Potential, pH, and Specific Conductance – February 2009

Integrated Earth Science Well Purge Form

Well Name: SS-CL Project: WCF Date: 2/2/09

Pre-purge Water Level: 103.63 Depth of Well: 114.6 Column Height: 10.97

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .00069 x 3.14= .0217

x Height of Water Column: .239 x 7.48= 1.78 x # of well evacuations(3) = 5.36

Person Calculating the Purge Volume: Tiffany Falk Flow Rate: 1 lpm

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
1033	11.68	7.93	.460	3.57	52.1	35	
1035	12.72	7.88	.444	4.91	70.4	45	
1037	13.20	7.86	.443	5.41	76.8	48	

Pump On 1029 Water @ Surface 1030

Sample Time 1038 Pump Off 1050

Stable Parameter Criteria:
(2 successive readings)
- Specific conductance ± 5%
- pH ± 0.2

Observations: Pump On 1027 WTS-103.

Recorded By: D. Hawley QA Check: Tiffany Falk

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Integrated Earth Science Well Purge Form

Well Name: ICPP-2019 Project: WCF Date: 2/2/09

Pre-purge Water Level: 104.31 Depth of Well: 120.2 Column Height: 15.89

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .0217

x Height of Water Column: .3448 x 7.48= 2.57 x # of well evacuations(3) = 7.73

Person Calculating the Purge Volume: [signature] Flow Rate: 1 Lpm

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
11.14	13.73	7.74	.412	6.51	92.8	104	
11.16	15.06	7.71	.412	6.47	94.5	76	
11.18	15.57	7.70	.412	6.43	94.9	75	

[initials]

Pump On 1109 Water @ Surface 1110

Sample Time 1120 Pump Off 1130

Stable Parameter Criteria:
(2 successive readings)
- Specific conductance ± 5%
- pH ± 0.2

Observations: 106.91 10 L = 1 vol.
Pump on - 1109 WS 1110

Recorded By: D. Hawley QA Check: [signature]

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Integrated Earth Science Well Purge Form

Well Name: MW-2 Project: WCF Date: 2/2/09

Pre-purge Water Level: 104.67 Depth of Well: 112 Column Height: 7.33

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .0217

x Height of Water Column: 1.590 x 7.48= 1.189 x # of well evacuations(3) = 3.56

Person Calculating the Purge Volume: Tiffany Flack Flow Rate: 1 lpm

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
~~1254~~	~~19.26~~	~~7.54~~					
1254	19.26	7.54	.472	2.64	42.2	88	
1255	20.20	7.51	.467	2.56	41.3	82	
1256	20.21	7.50	.466	2.45	39.4	76	
1257	20.93	7.49	.468	2.30	37.7	72	

MW-2 Purged

Pump On 1252 Water @ Surface 1253

Sample Time 1259 Pump Off 1305

Stable Parameter Criteria:
(2 successive readings)
- Specific conductance ± 5%
- pH ± 0.2

Observations: 107.20 - 5L for 1 vol
P.O. 1252 WTS - 1253

Recorded By: Cassandra McShane QA Check: Tiffany Flack

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Integrated Earth Science Well Purge Form

Well Name: MM-10 Project: WCF Date: 2/2/09

Pre-purge Water Level: 146.59 Depth of Well: 151 Column Height: 4.41

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .0217

x Height of Water Column: .0956 x 7.48= 0.715 x # of well evacuations(3) = 2.14

Person Calculating the Purge Volume: Tiffany Falk Flow Rate: 1 lpm

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
1326	16.27	7.62	.707	5.49	75.7	122	
1327	16 59	7.61	.704	4.91	73.4	122	
1328	16.60	7.61	.701	4.77	73.3	122	
1329	17.30	7.60	.699	4.61	72.4	122	

Natural Purge

Pump On 1323 Water @ Surface 1324

Sample Time 1331 Pump Off 1340

Stable Parameter Criteria:
(2 successive readings)
- Specific conductance: ± 5%
- pH: ± 0.2

Observations: 149.27
PUMP ON - 1323 WTS - 1324

Recorded By: [signature] QA Check: Tiffany Falk

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Integrated Earth Science Well Purge Form

Well Name: ICPP-2018 Project: WCF Date: 2/3/09

Pre-purge Water Level: 108.39 Depth of Well: 117.5 Column Height: 9.11

Well Diameter: 2 Conversion: .0833

Purge Volume Calculation: Radius² .0069 x 3.14= .0217

x Height of Water Column: .1976 x 7.48= 1.478 x # of well evacuations(3) = 4.436

Person Calculating the Purge Volume: [signature] Flow Rate: 1/2 lpm

Time	Temp (°C)	pH	SpecCon(mS/cm)	D.O. (mg/L)	D.O. %	ORP (mV)	Turbidity
1028	17.73	7.53	.911	1.47	18.8	-81	
1029	18.21	7.34	.913	.72	13.2	-84	
1030	18.57	7.27	.911	.66	10.3	-8	

Pump On 1025 Water @ Surface 1028

Sample Time 1040 Pump Off 1044

Stable Parameter Criteria:
(2 successive readings)
- Specific conductance ± 5%
- pH ± 0.2

Observations: WTS-1028 -

Recorded By: [signature] QA Check: [signature]

* If parameters are not stable after 1 casing evacuation, purging shall continue till parameters are stable, but not to exceed 3 casing volumes.

Appendix B

Chain of Custody Information

Appendix B

Chain of Custody Information—October 2008

49424

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11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

S002927

Sampler (Printed): Park, Tiffany	Sampler (signature): Tiffany Park	Project Name: WCF FALL 2008 VERIFICATION SAMPLING, OCTOBER 2008	
Laboratory Shipped To: Southwest Research Institute		Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3220

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF300012X	10/14/2008 13:25	MW-5-2 #1	106.5 - 126.5	GROUND WATER	Metal Set #1 Filtered (Filtered)	HNO3 to pH<2 ~100cm	1 - 1 L Glass or Plastic
WCF302012X	10/14/2008 10:55	CPP-55-6 #1	93.1 - 113.1	GROUND WATER	Metal Set #1 Filtered (Filtered)	HNO3 to pH<2 OK 10/14/08 1	1 - 1 L Glass or Plastic
WCF303012X	10/14/2008 11:15	CPP-55-6 #2	93.1 - 113.1	GROUND WATER	Metal Set #1 Filtered (Filtered)	HNO3 to pH<2	1 - 1 L Glass or Plastic
WCF304012X	10/14/2008 10:40	FIELD BLANK - FBLK	NA	WATER	Metal Set #1 Filtered (Filtered)	HNO3 to pH<2 <2 OK 10/16/08	1 - 1 L Glass or Plastic

10/15/08 DP

Client: CH2M-WG Idaho (CWI) / INL
Project #11543.64.00X
VTSR: 10/16/08 0846
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 & 22.0 °C/#027

SRR #33981
Case: ER-TOS-S3220
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: ~100 cpm

Comments: NOTE: Sample ID#WCF300012X needs to be filtered AND preserved with HNO3 when it arrives at SWRI.
See the enclosed radiological screening results for the samples as they may have possible contamination.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Park, Tiffany	Tiffany Park	10/15/2008 07:11	Dru Rowan		10/16/08	0846

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11/13/2006
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CHAIN OF CUSTODY FORM

49424

S002928

Sampler (Printed):	Sampler (signature):	Project Name: WCF FALL 2008 VERIFICATION SAMPLING, OCTOBER 2008	
Park, Tiffany	Tiffany Park	Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3220
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF30001V9	10/14/2008 13:25	MW-5-2 #1	106.5 - 126.5	GROUND WATER	SVOC	4°C ~100 cpm DR	1 - 1 L Amber Glass
WCF30201V9	10/14/2008 10:55	CPP-55-6 #1	93.1 - 113.1	GROUND WATER	SVOC	4°C 10/16/08	1 - 1 L Amber Glass
WCF30301V9	10/14/2008 11:15	CPP-55-6 #2	93.1 - 113.1	GROUND WATER	SVOC	4°C	3 - 1 L Amber Glass (Extra QC Volume)
WCF30401V9	10/14/2008 10:40	FIELD BLANK - FBLK	NA	WATER	SVOC	4°C	1 - 1 L Amber Glass

10/15/08

Client: CH2M-WG Idaho (CWI) / INL
Project #11543.64.00X
VTSR: 10/16/08 0846
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 & 22.0 °C/#027

SRR #33981
Case: ER-TOS-S3220
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: ~100 cpm

Comments: Please see enclosed radiological screening results as samples may have possible contamination.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Park, Tiffany	Tiffany Park	10/15/2008 07:14	Ann Romm		10/16/08	0846

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CHAIN OF CUSTODY FORM

49424
S002929

Sampler (Printed):	Sampler (signature):	Project Name: WCF FALL 2008 VERIFICATION SAMPLING, OCTOBER 2008	
Park, Tiffany	Tiffany Park	Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3220
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF30001VA	10/14/2008 13:25	MW-5-2 #1	106.5 - 126.5	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF30201VA	10/14/2008 10:55	CPP-55-6 #1	93.1 - 113.1	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF30301VA	10/14/2008 11:15	CPP-55-6 #2	93.1 - 113.1	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	9 - 40 mL Glass Vials (Extra QC Volume)
WCF30401VA	10/14/2008 10:40	FIELD BLANK - FBLK	NA	WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF30501VA	10/14/2008 09:00	TRIP BLANK - TBLK	NA	WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials

OK 10/14/08 ~100 cpm

TP 10/15/08

Client: CH2M-WG Idaho (CWI) / INL
Project #11543.64.00X
VTSR: 10/16/08 0846
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 & 22.0 °C/#027

SRR #33981
Case: ER-TOS-S3220
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: ~100 cpm

Comments: **Please see the enclosed radiological screening results as the samples may have possible contamination.**

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Park, Tiffany	Tiffany Park	10/15/2008 07:16	Dina Roman		10/16/08	0846

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CHAIN OF CUSTODY FORM

49606
30101

See Instructions On Back

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[1] Sampler (Printed):	[2] Sampler (Signature):	[3] Project Name:	
Tiffany Park	Tiffany Park	WCF Verification Sampling	
[4] Laboratory Shipped To: SWRI		[5] Sampling & Analysis Plan Number: PLN-1373	[6] TOS/SOW/PSR Number: ER-TOS-S3220

[7] Sample ID#	[8] Sample Date	[9] Sample Time	[10] Sample Location	[11] Depth	[12] Sample Matrix	[13] Analysis Type No(s)	[14] Preservative	[15] Remarks
WCF 301 0IV9	10/20/08	0955	MW-5-2	106.5	groundwater	SVOC	4°C	1X1L ~100cpm
0I2X	↓	↓	↓	↓	↓	metals set #1 - Filt	HNO3 pH<2	↓ ~300cpm
0IVA	↓	↓	↓	↓	↓	VOC	H2SO4 pH<2, Y2	3X40ml ~100cpm
WCF 3010 0IVA	↓	0800	Trip Blank	na	water	↓	↓	↓

TP 10/20/08

Client: CH2M-WG Idaho (CWI) / INL
Project #11543.64.00X
VTSR: 10/21/08 0802
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 °C/#027

SRR #34038
Case: ER-TOS-S3220
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: ~100-~300 cpm

[16] Comments: See enclosed ship screens. Samples have potential Rad Contamination. The metals sample needs filtered + preserved at SWRI.

Cooler Number(s):

[17] Relinquished By (Printed)	[18] Relinquished By (Signature)	[19] Date	[20] Time	[21] Received By (Printed)	[22] Received By (Signature)	[23] Date	[24] Time
Tiffany Park	Tiffany Park	10/20/08	1140	Russ Norman		10/21/08	0802

Distribution: Original & Yellow: Accompany Shipment To Laboratory Pink: Forward To Sample Management Green: Retained By Project

000115

Chain of Custody Information—December 2008

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

53104

S003042

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800008

Sampler (Printed):	Sampler (signature):	Project Name: WCF FALL 2008 VERIFICATION SAMPLING - APPENDIX IX	
Park, Tiffany	Tiffany Park	Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3240
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF28401PC	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	PEP-A-008	4°C	3 - 1 L Amber Glass, TFE-lne (Extra QC Volume)
WCF28401KU	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	IPEP-A-012	4°C	3 - 1 L Amber Glass, TFE-lne (Extra QC Volume)

12/17/08 <100 cpm

12/17/08 <100 cpm

DH 12/16/08

Client: CH2M-WG Idaho
Project #11543.64.00X
VTSR: 12/17/08 0858
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 °C/#027

SRR #34642
Case: ER-TOS-S3240
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - 180

Comments: Historical data shows radiological levels of 463,000 gross beta from this area. See included screening results.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Park, Tiffany	Tiffany Park	12/16/2008 07:40	Dina Ramon		12/17/08	0858

600000

436.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

53104

S003041

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Sampler (Printed):	Sampler (signature):	Project Name: WCF FALL 2008 VERIFICATION SAMPLING - APPENDIX IX	
Perk, Tiffany	Tiffany Perk	Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3240
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF284017L	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	IPEP-A-001	4°C	3- 1 L Amber Glass, TFE-lined cap
WCF28401HN	12/16/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	ISVO-A-019	4°C	3 - 1 L Amber Glass, TFE-lined (Extra QC Volume)
WCF28401S3	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	WCH-A-038	Zinc Acetate, NaOH to pH>9, 4°C,No	1 - 1 L Amber Glass or Plastic

DH 12/17/08

DH 12/16/08

Client: CH2M-WG Idaho
Project #11543.64.00X
VTSR: 12/17/08 0858
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 °C/#027

SRR #34642
Case: ER-TOS-S3240
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - 180

Comments: Historical data shows radiological levels of 463,000 gross beta from this area. See included screening results.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Perk, Tiffany	Tiffany Perk	12/16/2008 07:37	[illegible]	[illegible]	12/16/08	0858

435.20
11/13/2006
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CHAIN OF CUSTODY FORM

53104

S003043

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Sampler (Printed):	Sampler (signature):	Project Name: WCF FALL 2008 VERIFICATION SAMPLING - APPENDIX IX	
Park, Tiffany	Tiffany Park	Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3240
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF28401D9	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	IDXF-A-007	4°C	3 - 1 L Amber Glass, TFE-lne (Extra QC Volume)
WCF28401JP	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	IPEP-A-003	4°C	3 - 1 L Amber Glass, TFE-lne (Extra QC Volume)

12/17/08 <100 cpm <100 cpm

Client: CH2M-WG Idaho
Project #11543.64.00X
VTSR: 12/17/08 0858
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 °C/#027

SRR #34642
Case: ER-TOS-S3240
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - 180

Comments: Historical data shows radiological levels of 463,000 gross beta from this area. See included screening results.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Park, Tiffany	Tiffany Park	12/16/2008 07:43	Dino Rowan		12/17/08	0858

S 3104

435.20
11/13/2006
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CHAIN OF CUSTODY FORM

S003044

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000011

Sampler (Printed):	Sampler (signature):	Project Name: WCF FALL 2008 VERIFICATION SAMPLING - APPENDIX IX	
Park, Tiffany	Tiffany Park	Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3240
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF28401UH	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	IHER-A-001	4°C	3 - 250 mL Glass (Extra QC Volume) <100 cpm
WCF28401C2	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	IWCH-A-002	See method	3 - 500 mL Glass or Plastic ~100 - 180 cpm

Client: CH2M-WG Idaho
Project #11543.64.00X
VTSR: 12/17/08 0858
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 °C/#027

SRR #34642
Case: ER-TOS-S3240
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - 180

Comments: Historical data shows radiological levels of 463,000 gross beta from this area. See included screening results.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Park, Tiffany	Tiffany Park	12/16/2008 08:04	Dino Roman		12/17/08	0858

5 5283

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

S003046

600000

Sampler (Printed):	Sampler (signature):	Project Name: WCF FALL 2008 VERIFICATION SAMPLING - APPENDIX IX	
Park, Tiffany	Tiffany Park	Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3240
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF28401AV ✔	12/15/2008 13:18	CPP-55-6	93.1 - 113.1	GROUND WATER	IVOA-A-060	H2SO4 to pH<2, No Headspace, 4°C	6 - 40 mL Glass Vials (Extra QC Volume)
WCF28501AV ✔	12/17/2008 10:20	FIELD BLANK - FBLK	NA	WATER	IVOA-A-060	H2SO4 to pH<2, No Headspace, 4°C	2 - 40 mL Glass Vials
WCF28601AV ✔	12/15/2008 10:00	TRIP BLANK - TBLK	NA	WATER	IVOA-A-060	H2SO4 to pH<2, No Headspace, 4°C	2 - 40 mL Glass Vials

TP to 12/17/08

Client: CH2M-WG Idaho
Project # 11543.64.00X
VTSR: 12/10/08 12:30
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 °C/#027

SRR #34661
Case: ER-TOS-S3240
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: ~100 - 400

Comments: Historical data shows radiological levels of 463,000 gross beta from this area. Please see included screening results.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Park, Tiffany	Tiffany Park	12/17/2008 13:02	Rico Ramon		12/17/08	0847

S 3233

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

S003047

0000018

Sampler (Printed):	Sampler (Signature):	Project Name: WCF FALL 2008 VERIFICATION SAMPLING - APPENDIX IX	
Park, Tiffany	Tiffany Park	Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/RSR Number: ER-TOS-S3240
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF28301M5	12/17/2008 10:27	MW-5-2	106.5 - 126.5	GROUND WATER	IMET-A-007 (Filtered)	None ~ 400 cpm	1 x .75 L Glass or Plastic
WCF28401M5	12/15/2008 13:16	CPP-55-6	93.1 - 113.1	GROUND WATER	IMET-A-007 (Filtered)	HNO3 to pH<2 ~ 100 cpm	2 - 1 L Glass or Plastic
WCF28501M5	12/17/2008 10:20	FIELD BLANK - FBLK	NA	WATER	IMET-A-007 (Filtered)	HNO3 to pH<2 <2	2 - 1 L Glass or Plastic

DR 12/18/08

TP 12/17/08

Client: CH2M-WG Idaho
Project # 11543.64.08X
VTSR: 12/10/08 12:30
Battery Check: Y
Cooler Wipe: <100 cpm
Temp.: 3.0 °C/#027

SRR #34661
Case: ER-TOS-S3240
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: ~100 - 400

Comments: Historical data shows radiological levels of 463,000 gross beta from this area. Please see included screening results.
SAMPLE WCF28301M5 HAS NOT BEEN FILTERED OR PRESERVED. PLEASE FILTER AND PRESERVE THIS SAMPLE WITH HN03.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Park, Tiffany	Tiffany Park	12/17/2008 13:08	Dino Roman		12/18/08	0847

Chain of Custody Information—February 2009

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CHAIN OF CUSTODY FORM

55692
S003062

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Sampler (Printed):	Sampler (signature):	Project Name: WCF SEMIANNUAL GROUND WATER MONITORING - FEBRUARY 2009	
Millward, Danielle		Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3247
Laboratory Shipped To: Southwest Research Institute			

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative		Remarks
WCF31001KH	02/02/2009 11:20	TFSE-SP (2019)	96.2 - 120.2	GROUND WATER	ISVO-A-013	4°C	140	1 - 1 L Amber Glass, TFE-lined cap
WCF31002KH	02/02/2009 11:20	TFSE-SP (2019)	96.2 - 120.2	GROUND WATER	ISVO-A-013	4°C	200	1 - 1 L Amber Glass, TFE-lined cap
WCF31102KH	02/02/2009 10:38	CPP-55-06	93.1 - 113.1	GROUND WATER	ISVO-A-013	4°C		1 - 1 L Amber Glass, TFE-lined cap
WCF31301KH	02/02/2009 13:15	QC	NA	WATER	ISVO-A-013	4°C	180	1 - 1 L Amber Glass, TFE-lined cap

02/03/09

SRR #35060
Case: ER-TOS-S3247
Sample(s) Received Intact
Background Checks: <100 cpm
Total CPM: <100 - -320

Client: CH2M-WG Idaho(CWI) / INL
Project # 113543.81.00X
VTSR: 02/04/09 0830
Battery Check: Y
Cooler Wipe: <80 cpm
Temp.: 3.0 °C/#027

RECEIVED
FEB 04 2009

Comments: Samples are potentialy RAD contaminated. See shipping screen results.

Cooler Number(s): #11 RED

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Millward, Danielle		02/03/2009 08:11	Emily Gramoz		2/4/9	08:30

000013

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

55692
S003063

Sampler (Printed): Millward, Danielle	Sampler (signature):	Project Name: WCF SEMIANNUAL GROUND WATER MONITORING - FEBRUARY 2009	
Laboratory Shipped To: Southwest Research Institute		Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3247

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative		Remarks
WCF30801KH	02/02/2009 12:58	MW-2	102 - 112	GROUND WATER	ISVO-A-013	4°C	120	1 - 1 L Amber Glass, TFE-lined cap
WCF31101KH	02/02/2009 10:38	CPP-55-06	93.1 - 113.1	GROUND WATER	ISVO-A-013	4°C	140	3 - 1 L Amber Glass, TFE-line (Extra QC Volume)
								1 container of 3 received broken, all volume was lost. Plmz 2/4/09

2/3/09

Client: CH2M-WG Idaho(CWI) / INL
Project # 31543.81.00X
VTSR: 02/04/09 0630
Battery Check: Y
Cooler Wipe: <80 cpm
Temp.: 3.0 °C/#027

SRR #35060
Case: ER-TOS-S3247
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - -320

RECEIVED
FEB 04 2009

000017

Comments: Samples are potentialy RAD contaminated. See shipping screen results.

Cooler Number(s): #58 RED

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Millward, Danielle		02/03/2009 08:17	Emilio Gomez		2/4/9	08:30

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

55692
S003064

Sampler (Printed): Millward, Danielle	Sampler (signature):	Project Name: WCF SEMIANNUAL GROUND WATER MONITORING - FEBRUARY 2009	
Laboratory Shipped To: Southwest Research Institute		Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3247

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative		Remarks
WCF30801V9	02/02/2009 12:59	MW-2	102 - 112	GROUND WATER	SVOC	4°C	ZOO	1 - 1 L Amber Glass
WCF31101V9	02/02/2009 10:38	CPP-55-06	93.1 - 113.1	GROUND WATER	SVOC	4°C	ZOO	3 - 1 L Amber Glass (Extra QC Volume)

2/3/09

Client: CH2M-WG Idaho(CWI) / INL
Project # 115431.01.02
VTSR: 02/04/09 0830
Battery Check: Y
Cooler Wiper: <80 cpm
Temp: 3.0 °C/#027

SDR #35060
Case: ER-TOS-S3247
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - -320

RECEIVED
FEB 04 2009

000022

Comments: samples are potentially RAD contaminated. See shipping screen results.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Millward, Danielle		02/03/2009 08:42	Emilio Ramez		2/4/9	08:30

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

55692
S003065

Sampler (Printed): Millward, Danielle	Sampler (signature):	Project Name: WCF SEMIANNUAL GROUND WATER MONITORING - FEBRUARY 2009	
Laboratory Shipped To: Southwest Research Institute		Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3247

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF31001V9	02/02/2009 11:20	TFSE-SP (2019)	96.2 - 120.2	GROUND WATER	SVOC	4°C 160	1 - 1 L Amber Glass
WCF31002V9	02/02/2009 11:20	TFSE-SP (2019)	96.2 - 120.2	GROUND WATER	SVOC	4°C 180	1 - 1 L Amber Glass
WCF31102V9	02/02/2009 10:39	CPP-55-06	93.1 - 113.1	GROUND WATER	SVOC	4°C 146	1 - 1 L Amber Glass
WCF31301V9	02/02/2009 13:15	QC	NA	WATER	SVOC	4°C	1 - 1 L Amber Glass

2/3/09

Client: CH2M-WG Idaho(CWI) / INL
Project # 11543.01.00X
VTSR: 02/04/09 0830
Battery Check: Y
Cooler Wipes: <60 cpm
Temp.: 3.0 °C/#027

SRR #35060
Case: ER-TOS-S3247
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - <320

RECEIVED
FEB 04 2009

Comments: samples are potentialy RAD contaminated. See shipping screen results.

Cooler Number(s):

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Millward, Danielle		02/03/2009 13:32	Emilio Gomez		2/4/9	08370

000026

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

55692
S003066

Sampler (Printed): Millward, Danielle	Sampler (signature):	Project Name: WCF SEMIANNUAL GROUND WATER MONITORING - FEBRUARY 2009	
Laboratory Shipped To: Southwest Research Institute		Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3247

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF308012X	02/02/2009 12:59	MW-2	102 - 112	GROUND WATER	Metal Set #1 - Filtered (Filtered)	HNO3 to pH<2 320	1 - 1 L Glass or Plastic
WCF309012X	02/03/2009 10:40	TFS-SP (2018)	97.9 - 117.9	GROUND WATER	Metal Set #1 - Filtered (Filtered)	HNO3 to pH<2 260	1 - 1 L Glass or Plastic
WCF310012X	02/02/2009 11:20	TFSE-SP (2019)	96.2 - 120.2	GROUND WATER	Metal Set #1 - Filtered (Filtered)	HNO3 to pH<2 240	1 - 1 L Glass or Plastic
WCF310022X	02/02/2009 11:20	TFSE-SP (2019)	96.2 - 120.2	GROUND WATER	Metal Set #1 - Filtered (Filtered)	HNO3 to pH<2 220	1 - 1 L Glass or Plastic
WCF311012X	02/02/2009 10:38	CPP-55-06	93.1 - 113.1	GROUND WATER	Metal Set #1 - Filtered (Filtered)	HNO3 to pH<2 220	1 - 1 L Glass or Plastic
WCF311022X	02/02/2009 10:38	CPP-55-06	93.1 - 113.1	GROUND WATER	Metal Set #1 - Filtered (Filtered)	HNO3 to pH<2 220	1 - 1 L Glass or Plastic
WCF312012X	02/02/2009 13:31	MW-10-2	141 - 151	GROUND WATER	Metal Set #1 - Filtered (Filtered)	HNO3 to pH<2 160	1 - 1 L Glass or Plastic
WCF313012X	02/02/2009 13:15	QC	NA	WATER	Metal Set #1 - Filtered (Filtered)	HNO3 to pH<2 ✓	1 - 1 L Glass or Plastic

2/1
2/3/09

SRR #35060
Case: ER-TOS-S3247
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - ~320

Client: CH2M-WG Idaho(CWI) / INL
Project # 11543.01.00X
VTSR: 02/04/09 0830
Battery Check: Y
Cooler Wipe: <80 cpm
Temp: 3.0 °C/#027

RECEIVED
FEB 04 2009

Comments: Samples ar potentially RAD contaminated. See shipping screen results.

Cooler Number(s): # 85 BLUE

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Millward, Danielle		02/03/2009 13:42		Emilio Gamez	2/4/9	0855

000030

B-17

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

55692
S003067

Sampler (Printed): Millward, Danielle	Sampler (Signature): [signature]	Project Name: WCF SEMIANNUAL GROUND WATER MONITORING - FEBRUARY 2009
Laboratory Shipped To: Southwest Research Institute		Sampling & Analysis Plan Number: PLN-1373 / TOS/SOW/PSR Number: ER-TDS-S3247

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF30901KH	02/03/2009 10:40	TFS-SP (2018)	97.9 - 117.9	GROUND WATER	ISVO-A-018	4°C 180	1 - 1 L Amber Glass, TFE-lined cap
WCF30901V9	02/03/2009 10:40	TFS-SP (2018)	97.9 - 117.9	GROUND WATER	SVOC	4°C	1 - 1 L Amber Glass
WCF31201V9	02/03/2009 09:23	MW-10-2	141 - 151	GROUND WATER	SVOC	4°C 180	1 - 500 ml Amber Glass

DM 2/3/09

Client: CH2M-WG Idaho(CWI) / INL
Project # 11543.81.L00X
VTSR: 02/04/09 0830
Battery Check: Y
Cooler Wipe: <80 cpm
Temp.: 3.0 °C/#027

SRR #35060
Case: ER-TDS-S3247
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - ~320

RECEIVED
FEB 04 2009

Comments: Samples are potentially RAD contaminated. See shipping screen results.

Cooler Number(s): #399 #-695 BLUE

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Millward, Danielle	[signature]	02/03/2009 13:48	Emilio Gamez	[signature]	2/4/9	08:30

000034

435.20
11/13/2006
Rev. 03

CHAIN OF CUSTODY FORM

55692
S003068

Sampler (Printed): Millward, Danielle	Sampler (signature):	Project Name: WCF SEMIANNUAL GROUND WATER MONITORING - FEBRUARY 2009	
Laboratory Shipped To: Southwest Research Institute		Sampling & Analysis Plan Number: PLN-1373	TOS/SOW/PSR Number: ER-TOS-S3247

Sample ID#	Sample Date Time	Sample Location	Depth	Sample Matrix	Analysis Type No(s)	Preservative	Remarks
WCF30801VA	02/02/2009 12:59	MW-2	102 - 112	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF30901VA	02/03/2009 10:40	TFS-SP (2016)	97.9 - 117.9	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF31001VA	02/02/2009 11:20	TFSE-SP (2019)	96.2 - 120.2	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF31002VA	02/02/2009 11:20	TFSE-SP (2019)	96.2 - 120.2	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF31101VA	02/02/2009 10:38	CPP-55-06	93.1 - 113.1	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	9 - 40 mL Glass Vials (Extra QC Volume)
WCF31102VA	02/02/2009 10:38	CPP-55-06	93.1 - 113.1	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF31201VA	02/03/2009 09:23	MW-10-2	141 - 151	GROUND WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF31301VA	02/02/2009 13:15	QC	NA	WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials
WCF31401VA	02/02/2009 09:45	QC	NA	WATER	VOC	H2SO4 to pH<2, No Headspace, 4°C	3 - 40 mL Glass Vials

2/4
2/3/09

SRR #35060
Case: ER-TOS-S3247
Sample(s) Received Intact
Background Check: <100 cpm
Total CPM: <100 - 520

Client: CH2M-WG Idaho(CWI) / INL
Project # 11543.01.00X
VTSR: 02/04/09 0830
Battery Check: Y
Cooler Wipe: <50 cpm
Temp: 3.0 °C/#027

RECEIVED
FEB 04 2009

Comments: samples are potentially RAD contaminated. See shipping results.

Cooler Number(s): RED POLK A DOT

Relinquished By (Printed)	Relinquished By (Signature)	Date Time	Received By (Printed)	Received By (Signature)	Date	Time
Millward, Danielle		02/03/2009 14:06	Emilio Gomez		2/4/9	08:30

000037

Appendix C

Groundwater Analytical Data and Quality Assurance/Quality Control Information

Appendix C

Groundwater Analytical Data and Quality Assurance/Quality Control Information for October 2008

Table C-1. Groundwater analytical data for October 2008 verification sampling event.

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Arsenic	2.5	MW-5-2	U		10/14/08	11/11/08	WCF300012X	7440-38-2
Arsenic	2.5	MW-5-2	U		10/20/08	11/11/08	WCF301012X	7440-38-2
Arsenic	2.5	CPP-55-06	U		10/14/08	11/11/08	WCF302012X	7440-38-2
Arsenic	2.5	CPP-55-06	U		10/14/08	11/11/08	WCF303012X	7440-38-2
Barium	267	MW-5-2			10/14/08	11/11/08	WCF300012X	7440-39-3
Barium	401	MW-5-2			10/20/08	11/11/08	WCF301012X	7440-39-3
Barium	224	CPP-55-06			10/14/08	11/11/08	WCF302012X	7440-39-3
Barium	231	CPP-55-06			10/14/08	11/11/08	WCF303012X	7440-39-3
Benzene	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	71-43-2
Benzene	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	71-43-2
Benzene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	71-43-2
Benzene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	71-43-2
Cadmium	1	MW-5-2	U		10/14/08	11/11/08	WCF300012X	7440-43-9
Cadmium	1	MW-5-2	U		10/20/08	11/11/08	WCF301012X	7440-43-9
Cadmium	1	CPP-55-06	U		10/14/08	11/11/08	WCF302012X	7440-43-9
Cadmium	1	CPP-55-06	U		10/14/08	11/11/08	WCF303012X	7440-43-9
Carbon disulfide	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	75-15-0
Carbon disulfide	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	75-15-0
Carbon disulfide	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	75-15-0
Carbon disulfide	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	75-15-0

Table C-1. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Carbon tetrachloride	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	56-23-5
Carbon tetrachloride	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	56-23-5
Carbon tetrachloride	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	56-23-5
Carbon tetrachloride	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	56-23-5
Chloroform	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	67-66-3
Chloroform	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	67-66-3
Chloroform	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	67-66-3
Chloroform	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	67-66-3
Chromium	22.8	MW-5-2			10/14/08	11/11/08	WCF300012X	7440-47-3
Chromium	2.5	MW-5-2	U		10/20/08	11/11/08	WCF301012X	7440-47-3
Chromium	7.7	CPP-55-06	B		10/14/08	11/11/08	WCF302012X	7440-47-3
Chromium	6.9	CPP-55-06	B		10/14/08	11/11/08	WCF303012X	7440-47-3
Ethylbenzene	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	100-41-4
Ethylbenzene	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	100-41-4
Ethylbenzene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	100-41-4
Ethylbenzene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	100-41-4
Lead	2.5	MW-5-2	U		10/14/08	11/11/08	WCF300012X	7439-92-1
Lead	2.5	MW-5-2	U		10/20/08	11/11/08	WCF301012X	7439-92-1
Lead	2.5	CPP-55-06	U		10/14/08	11/11/08	WCF302012X	7439-92-1
Lead	2.5	CPP-55-06	U		10/14/08	11/11/08	WCF303012X	7439-92-1
Mercury	0.2	MW-5-2	U		10/14/08	10/28/08	WCF300012X	7439-97-6
Mercury	0.2	MW-5-2	U		10/20/08	10/28/08	WCF301012X	7439-97-6
Mercury	0.2	CPP-55-06	U		10/14/08	10/28/08	WCF302012X	7439-97-6
Mercury	0.2	CPP-55-06	U		10/14/08	10/28/08	WCF303012X	7439-97-6
Methyl ethyl ketone (2-Butanone)	2.3	MW-5-2			10/14/08	10/23/08	WCF30001VA	78-93-3
Methyl ethyl ketone (2-Butanone)	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	78-93-3

Table C-1. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Methyl ethyl ketone (2-Butanone)	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	78-93-3
Methyl ethyl ketone (2-Butanone)	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	78-93-3
Methylene chloride	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	75-09-2
Methylene chloride	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	75-09-2
Methylene chloride	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	75-09-2
Methylene chloride	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	75-09-2
Pyridine	5	MW-5-2	U		10/14/08	10/28/08	WCF30001V9	110-86-1
Pyridine	2.5	MW-5-2	U		10/20/08	10/28/08	WCF30101V9	110-86-1
Pyridine	2.5	CPP-55-06	U		10/14/08	10/28/08	WCF30201V9	110-86-1
Pyridine	2.6	CPP-55-06	U		10/14/08	10/28/08	WCF30301V9	110-86-1
Selenium	5	MW-5-2	U		10/14/08	11/11/08	WCF300012X	7782-49-2
Selenium	5	MW-5-2	U		10/20/08	11/11/08	WCF301012X	7782-49-2
Selenium	5	CPP-55-06	U		10/14/08	11/11/08	WCF302012X	7782-49-2
Selenium	5	CPP-55-06	U		10/14/08	11/11/08	WCF303012X	7782-49-2
Silver	2.5	MW-5-2	U		10/14/08	11/11/08	WCF300012X	7440-22-4
Silver	2.5	MW-5-2	U		10/20/08	11/11/08	WCF301012X	7440-22-4
Silver	2.5	CPP-55-06	U		10/14/08	11/11/08	WCF302012X	7440-22-4
Silver	2.5	CPP-55-06	U		10/14/08	11/11/08	WCF303012X	7440-22-4
Tetrachloroethene	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	127-18-4
Tetrachloroethene	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	127-18-4
Tetrachloroethene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	127-18-4
Tetrachloroethene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	127-18-4
Toluene	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	108-88-3
Toluene	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	108-88-3
Toluene	150	CPP-55-06	D		10/14/08	10/23/08	WCF30201VA	108-88-3
Toluene	26	CPP-55-06			10/14/08	10/23/08	WCF30301VA	108-88-3

Table C-1. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
1,1,1-Trichloroethane	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	71-55-6
1,1,1-Trichloroethane	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	71-55-6
1,1,1-Trichloroethane	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	71-55-6
1,1,1-Trichloroethane	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	71-55-6
Trichloroethene	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	79-01-6
Trichloroethene	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	79-01-6
Trichloroethene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	79-01-6
Trichloroethene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	79-01-6
Xylene	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	1330-20-7
Xylene	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	1330-20-7
Xylene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	1330-20-7
Xylene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	1330-20-7
o-Xylene	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	95-47-6
o-Xylene	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	95-47-6
o-Xylene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	95-47-6
o-Xylene	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	95-47-6
Xylene, meta and/or para isomers	1	MW-5-2	U		10/14/08	10/23/08	WCF30001VA	179601-23-1
Xylene, meta and/or para isomers	1	MW-5-2	U		10/20/08	10/23/08	WCF30101VA	179601-23-1
Xylene, meta and/or para isomers	1	CPP-55-06	U		10/14/08	10/23/08	WCF30201VA	179601-23-1
Xylene, meta and/or para isomers	1	CPP-55-06	U		10/14/08	10/23/08	WCF30301VA	179601-23-1

Groundwater Analytical Data and Quality Assurance/Quality Control Information for December 2008

Table C-2. Groundwater analytical data for December 2008 Appendix IX sampling event at Well CPP-55-06.

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Acenaphthene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	83-32-9
Acenaphthylene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	208-96-8
Acetone	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	67-64-1
Acetophenone	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	98-86-2
Acetonitrile	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-05-8
2-Acetylaminofluorene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	53-96-3
Acrolein	5	µg/L	U		12/15/08	12/23/08	WCF28401AV	107-02-8
Acrylonitrile	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	107-13-1
Aldrin	0.005	µg/L	U	UJ	12/15/08	1/5/09	WCF284017L	309-00-2
Allyl chloride	2	µg/L	U		12/15/08	12/23/08	WCF28401AV	107-05-1
4-Aminobiphenyl	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	92-67-1
Aniline	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	62-53-3
Anthracene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	120-12-7
Antimony	0.25	µg/L	U		12/15/08	1/7/09	WCF28401M5	7440-36-0
Aramite	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	140-57-8
Arsenic	2.5	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-38-2
Barium	162	µg/L	B		12/15/08	1/2/09	WCF28401M5	7440-39-3
Benzene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	71-43-2
Benzo(a)anthracene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	56-55-3
Benzo(b)fluoranthene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	205-99-2
Benzo(k)fluoranthene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	207-08-9
Benzo(g,h,i)perylene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	191-24-2
Benzo(a)pyrene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	50-32-8
Benzyl alcohol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	100-51-6

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Beryllium	0.5	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-41-7
alpha-BHC	0.005	µg/L	U		12/15/08	1/5/09	WCF284017L	319-84-6
beta-BHC	0.0136	µg/L	Q		12/15/08	1/5/09	WCF284017L	319-85-7
delta-BHC	0.005	µg/L	U		12/15/08	1/5/09	WCF284017L	319-86-8
gamma-BHC (Lindane)	0.005	µg/L	U		12/15/08	1/5/09	WCF284017L	58-89-9
Bis(2-Chloroethoxy) methane	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	111-91-1
bis(2-Chloroethyl) ether	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	111-44-4
2,2'-Oxybis(1-chloropropane)	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	108-60-1
bis(2-Ethylhexyl) phthalate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	117-81-7
Bromodichloromethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-27-4
Bromoform	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-25-2
4-Bromophenyl phenyl ether	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	101-55-3
Butylbenzylphthalate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	85-68-7
Cadmium	1	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-43-9
Carbon disulfide	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-15-0
Carbon tetrachloride	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	56-23-5
Chlordane	0.1	µg/L	U		12/15/08	1/5/09	WCF28401KU	57-74-9
4-Chloroaniline	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	106-47-8
Chlorobenzene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	108-90-7
Chlorobenzilate	0.1	µg/L	U		12/15/08	1/5/09	WCF284017L	510-15-6
4-Chloro-3-methylphenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	59-50-7
Chloroethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-00-3
Chloroform	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	67-66-3
2-Chloronaphthalene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	91-58-7
2-Chlorophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	95-57-8
4-Chlorophenyl phenyl ether	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	7005-72-3
Chloroprene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	126-99-8
Chromium	7.4	µg/L	B		12/15/08	1/2/09	WCF28401M5	7440-47-3
Chrysene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	218-01-9

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Cobalt	2.5	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-48-4
Copper	1	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-50-8
Methylphenol, (3 and 4)[a]	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	65794-96-9
2-Methylphenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	95-48-7
Cyanide	5	µg/L	UN	UJ	12/15/08	12/20/08	WCF28401C2	57-12-5
2,4-D	0.39	µg/L	U		12/15/08	12/31/08	WCF28401UH	94-75-7
4,4'-DDD	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	72-54-8
4,4'-DDE	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	72-55-9
4,4'-DDT	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	50-29-3
Diallate	0.1	µg/L	U	UJ	12/15/08	1/5/09	WCF284017L	2303-16-4
Dibenz(a,h)anthracene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	53-70-3
Dibenzofuran	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	132-64-9
Chlorodibromomethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	124-48-1
1,2-Dibromo-3-chloropropane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	96-12-8
1,2-Dibromoethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	106-93-4
Di-n-butylphthalate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	84-74-2
1,2-Dichlorobenzene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	95-50-1
1,3-Dichlorobenzene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	541-73-1
1,4-Dichlorobenzene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	106-46-7
3,3'-Dichlorobenzidine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	91-94-1
trans-1,4-Dichloro-2-butene	2	µg/L	U		12/15/08	12/23/08	WCF28401AV	110-57-6
Dichlorodifluoromethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-71-8
1,1-Dichloroethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-34-3
1,2-Dichloroethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	107-06-2
1,1-Dichloroethene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-35-4
trans-1,2-Dichloroethene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	156-60-5
2,4-Dichlorophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	120-83-2
2,6-Dichlorophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	87-65-0
1,2-Dichloropropane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	78-87-5

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
cis-1,3-Dichloropropene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	10061-01-5
trans-1,3-Dichloropropene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	10061-02-6
Dieldrin	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	60-57-1
Diethylphthalate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	84-66-2
Thionazin	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	297-97-2
Dimethoate	0.25	µg/L	U	R	12/15/08	1/2/09	WCF28401JP	60-51-5
4-Dimethylaminoazobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	60-11-7
7,12-Dimethylbenz(a)anthracene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	57-97-6
3,3'-Dimethylbenzidine	2.5	µg/L	U	UJ	12/15/08	1/2/09	WCF28401HN	119-93-7
alpha,alpha-Dimethylphenethylamine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	122-09-8
2,4-Dimethylphenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	105-67-9
Dimethyl phthalate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	131-11-3
1,3-Dinitrobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	99-65-0
4,6-Dinitro-2-methylphenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	534-52-1
2,4-Dinitrophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	51-28-5
2,4-Dinitrotoluene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	121-14-2
2,6-Dinitrotoluene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	606-20-2
2-sec-Butyl-4,6-dinitrophenol	4.9	µg/L	U		12/15/08	1/2/09	WCF28401HN	88-85-7
Di-n-octyl phthalate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	117-84-0
1,4-Dioxane	2.2	µg/L			12/15/08	12/23/08	WCF28401AV	123-91-1
N-nitrosodiphenylamine/ Diphenylamine[b]	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	86-30-6/ 122-39-4
Disulfoton	0.25	µg/L	U	UJ	12/15/08	1/2/09	WCF28401JP	298-04-4
Endosulfan I	0.005	µg/L	U		12/15/08	1/5/09	WCF284017L	959-98-8
Endosulfan II	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	33213-65-9
Endosulfan sulfate	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	1031-07-8
Endrin	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	72-20-8
Endrin aldehyde	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	7421-93-4

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Ethylbenzene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	100-41-4
Ethyl methacrylate	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	97-63-2
Ethyl methanesulfonate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	62-50-0
Famphur	4.9	µg/L	U		12/15/08	1/2/09	WCF28401HN	52-85-7
Fluoranthene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	206-44-0
Fluorene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	86-73-7
Heptachlor	0.005	µg/L	U		12/15/08	1/5/09	WCF284017L	76-44-8
Heptachlor epoxide	0.005	µg/L	U		12/15/08	1/5/09	WCF284017L	1024-57-3
Hexachlorobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	118-74-1
Hexachlorobutadiene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	87-68-3
Hexachlorocyclopentadiene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	77-47-4
Hexachloroethane	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	67-72-1
Hexachlorophene	25	µg/L	U		12/15/08	1/2/09	WCF28401HN	70-30-4
Hexachloropropene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	1888-71-7
2-Hexanone	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	591-78-6
Indeno(1,2,3-cd)pyrene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	193-39-5
Isobutyl alcohol	5	µg/L	U		12/15/08	12/23/08	WCF28401AV	78-83-1
Isodrin	0.01	µg/L	U		12/15/08	1/5/09	WCF284017L	465-73-6
Isophorone	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	78-59-1
Isosafrole	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	120-58-1
Kepone	0.05	µg/L	U		12/15/08	1/5/09	WCF284017L	143-50-0
Lead	0.68	µg/L	B		12/15/08	1/7/09	WCF28401M5	7439-92-1
Mercury	0.2	µg/L	U		12/15/08	12/29/08	WCF28401M5	7439-97-6
Methylacrylonitrile	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	126-98-7
Methapyrilene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	91-80-5
Methoxychlor	0.05	µg/L	U		12/15/08	1/5/09	WCF284017L	72-43-5
Bromomethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	74-83-9
Chloromethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	74-87-3
3-Methylcholanthrene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	56-49-5

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Dibromomethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	74-95-3
Methylene chloride	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-09-2
2-Butanone	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	78-93-3
Iodomethane	2	µg/L	U		12/15/08	12/23/08	WCF28401AV	74-88-4
Methyl methacrylate	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	80-62-6
Methyl methanesulfonate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	66-27-3
2-Methylnaphthalene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	91-57-6
Methyl parathion	0.25	µg/L	U		12/15/08	1/2/09	WCF28401JP	298-00-0
4-Methyl-2-pentanone	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	108-10-1
Naphthalene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	91-20-3
1,4-Naphthoquinone	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	130-15-4
1-Naphthylamine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	134-32-7
2-Naphthylamine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	91-59-8
Nickel	60.1	µg/L			12/15/08	1/2/09	WCF28401M5	7440-02-0
2-Nitroaniline	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	88-74-4
3-Nitroaniline	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	99-09-2
4-Nitroaniline	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	100-01-6
Nitrobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	98-95-3
2-Nitrophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	88-75-5
4-Nitrophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	100-02-7
4-Nitroquinoline-1-oxide	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	56-57-5
N-Nitroso-di-n-butylamine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	924-16-3
N-Nitrosodiethylamine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	55-18-5
N-Nitrosodimethylamine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	62-75-9
N-Nitroso-di-n-propylamine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	621-64-7
N-Nitrosomethylethylamine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	10595-95-6
N-Nitrosomorpholine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	59-89-2
N-Nitrosopiperidine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	100-75-4
N-Nitrosopyrrolidine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	930-55-2

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
2-Amino-4-nitrotoluene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	99-55-8
Parathion	0.25	µg/L	U		12/15/08	1/2/09	WCF28401JP	56-38-2
Aroclor-1016	0.5	µg/L	U		12/15/08	12/31/08	WCF28401PC	12674-11-2
Aroclor-1221	0.5	µg/L	U		12/15/08	12/31/08	WCF28401PC	11104-28-2
Aroclor-1232	0.5	µg/L	U		12/15/08	12/31/08	WCF28401PC	11141-16-5
Aroclor-1242	0.5	µg/L	U		12/15/08	12/31/08	WCF28401PC	53469-21-9
Aroclor-1248	0.5	µg/L	U		12/15/08	12/31/08	WCF28401PC	12672-29-6
Aroclor-1254	0.5	µg/L	U		12/15/08	12/31/08	WCF28401PC	11097-69-1
Aroclor-1260	0.5	µg/L	U		12/15/08	12/31/08	WCF28401PC	11096-82-5
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	0.0171	ng/L	U		12/15/08	1/7/09	WCF28401D9	35822-46-9
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0208	ng/L	U		12/15/08	1/7/09	WCF28401D9	39227-28-6
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0202	ng/L	U		12/15/08	1/7/09	WCF28401D9	57653-85-7
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0184	ng/L	U		12/15/08	1/7/09	WCF28401D9	19408-74-3
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0307	ng/L	U		12/15/08	1/7/09	WCF28401D9	40321-76-4
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0255	ng/L	U		12/15/08	1/7/09	WCF28401D9	1746-01-6
Heptachlorobenzo-p-dioxin[c]	ND	ng/L	U		12/15/08	1/7/09	WCF28401D9	37871-00-4
Hexachlorodibenzo-p-dioxin	ND	ng/L	U		12/15/08	1/7/09	WCF28401D9	34465-46-8
Octachlorodibenzo-p-dioxin	0.0285	ng/L	U		12/15/08	1/7/09	WCF28401D9	3268-87-9
Pentachlorodibenzo-p-dioxin	ND	ng/L	U		12/15/08	1/7/09	WCF28401D9	36088-22-9
Tetrachlorodibenzo-p-dioxins	ND	ng/L	U		12/15/08	1/7/09	WCF28401D9	41903-57-5
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.0105	ng/L	U		12/15/08	1/7/09	WCF28401D9	67562-39-4
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.012	ng/L	U		12/15/08	1/7/09	WCF28401D9	55673-89-7
1,2,3,4,7,8-	0.011	ng/L	U		12/15/08	1/7/09	WCF28401D9	70648-26-9

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Hexachlorodibenzofuran								
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00984	ng/L	U		12/15/08	1/7/09	WCF28401D9	57117-44-9
1,2,3,7,8,9-Hexachlorodibenzofuran	0.012	ng/L	U		12/15/08	1/7/09	WCF28401D9	72918-21-9
1,2,3,7,8-Pentachlorodibenzofuran	0.0238	ng/L	U		12/15/08	1/7/09	WCF28401D9	57117-41-6
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0111	ng/L	U		12/15/08	1/7/09	WCF28401D9	60851-34-5
2,3,4,7,8-Pentachlorodibenzofuran	0.0225	ng/L	U		12/15/08	1/7/09	WCF28401D9	57117-31-4
2,3,7,8-Tetachlorodibenzofuran	0.0166	ng/L	U		12/15/08	1/7/09	WCF28401D9	51207-31-9
Heptachlorodibenzofuran[c]	ND	ng/L	U		12/15/08	1/7/09	WCF28401D9	38998-75-3
Hexachlorodibenzofuran	ND	ng/L	U		12/15/08	1/7/09	WCF28401D9	55684-94-1
Octachlorodibenzofuran	0.0248	ng/L	U		12/15/08	1/7/09	WCF28401D9	39001-02-0
Pentachlorodibenzofuran	ND	ng/L	U		12/15/08	1/7/09	WCF28401D9	30402-15-4
Tetrachlorodibenzofuran	ND	ng/L	U		12/15/08	1/7/09	WCF28401D9	30402-14-3
Pentachlorobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	608-93-5
Pentachloroethane	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	76-01-7
Pentachloronitrobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	82-68-8
Pentachlorophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	87-86-5
Phenacetin	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	62-44-2
Phenanthrene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	85-01-8
Phenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	108-95-2
1,4-Phenylenediamine	2.5	µg/L	U	UJ	12/15/08	1/2/09	WCF28401HN	106-50-3
Phorate	0.25	µg/L	U	UJ	12/15/08	1/2/09	WCF28401JP	298-02-2
2-Picoline	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	109-06-8
Pronamide	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	23950-58-5
Propionitrile	5	µg/L	U		12/15/08	12/23/08	WCF28401AV	107-12-0
Pyrene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	129-00-0
Pyridine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	110-86-1
Safrole	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	94-59-7

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Selenium	2.5	µg/L	U		12/15/08	1/2/09	WCF28401M5	7782-49-2
Silver	2.5	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-22-4
2,4,5-TP (Silvex)	0.39	µg/L	U		12/15/08	12/31/08	WCF28401UH	93-72-1
Styrene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	100-42-5
Sulfide	10	µg/L	U		12/15/08	12/22/08	WCF28401S3	18496-25-8
2,4,5-T	0.39	µg/L	U		12/15/08	12/31/08	WCF28401UH	93-76-5
1,2,4,5-Tetrachlorobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	95-94-3
1,1,1,2-Tetrachloroethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	630-20-6
1,1,2,2-Tetrachloroethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	79-34-5
Tetrachloroethene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	127-18-4
2,3,4,6-Tetrachlorophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	58-90-2
Sulfotep	0.25	µg/L	U	UJ	12/15/08	1/2/09	WCF28401JP	3689-24-5
Thallium	0.25	µg/L	U	UJ	12/15/08	1/7/09	WCF28401M5	7440-28-0
Tin	10	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-31-5
Toluene	68	µg/L			12/15/08	12/23/08	WCF28401AV	108-88-3
o-Toluidine	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	95-53-4
Toxaphene	0.2	µg/L	U		12/15/08	1/5/09	WCF284017L	8001-35-2
1,2,4-Trichlorobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	120-82-1
1,1,1-Trichloroethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	71-55-6
1,1,2-Trichloroethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	79-00-5
Trichloroethene	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	79-01-6
Trichlorofluoromethane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-69-4
2,4,5-Trichlorophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	95-95-4
2,4,6-Trichlorophenol	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	88-06-2
1,2,3-Trichloropropane	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	96-18-4
O,O,O-Triethyl phosphorothioate	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	126-68-1
1,3,5-Trinitrobenzene	2.5	µg/L	U		12/15/08	1/2/09	WCF28401HN	99-35-4
Vanadium	2.5	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-62-2
Vinyl acetate	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	108-05-4

Table C-2. (continued).

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Vinyl chloride	1	µg/L	U		12/15/08	12/23/08	WCF28401AV	75-01-4
Xylene	2	µg/L	U		12/15/08	12/23/08	WCF28401AV	1330-20-7
Zinc	5	µg/L	U		12/15/08	1/2/09	WCF28401M5	7440-66-6

a. M-cresol and p-cresol are reported as co-eluting isomers of methylphenol (3 and 4).

b. N-nitrosodiphenylamine degrades in the injection port to diphenylamine and is reported as diphenylamine per SW-846 Method 8270C.

c. Results for total hepta-, hexa-, penta-, and tetra-chlorobenzo-p-dioxins and total hepta-, hexa-, penta-, and tetra-chlorodibenzofurans were not detected and are reported as "ND."

Table C-3. Groundwater analytical data for the December 2008 Appendix IX sampling event at Well MW-5-2.

Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier	Date Collected	Date Analyzed	Sample Number	CAS Number
Antimony	0.58	µg/L	B		12/17/08	1/7/09	WCF28301M5	7440-36-0
Arsenic	2.5	µg/L	U		12/17/08	1/2/09	WCF28301M5	7440-38-2
Barium	335	µg/L			12/17/08	1/2/09	WCF28301M5	7440-39-3
Beryllium	0.5	µg/L	U		12/17/08	1/2/09	WCF28301M5	7440-41-7
Cadmium	1	µg/L	U		12/17/08	1/2/09	WCF28301M5	7440-43-9
Chromium	6.6	µg/L	B		12/17/08	1/2/09	WCF28301M5	7440-47-3
Cobalt	2.5	µg/L	U		12/17/08	1/2/09	WCF28301M5	7440-48-4
Copper	2.6	µg/L			12/17/08	1/2/09	WCF28301M5	7440-50-8
Lead	0.25	µg/L	U		12/17/08	1/7/09	WCF28301M5	7439-92-1
Mercury	0.2	µg/L	U		12/17/08	12/29/08	WCF28301M5	7439-97-6
Nickel	2.6	µg/L	B		12/17/08	1/2/09	WCF28301M5	7440-02-0
Selenium	2.5	µg/L	U		12/17/08	1/2/09	WCF28301M5	7782-49-2
Silver	2.5	µg/L	U		12/17/08	1/2/09	WCF28301M5	7440-22-4
Thallium	0.25	µg/L	U	UJ	12/17/08	1/7/09	WCF28301M5	7440-28-0
Tin	10	µg/L	U		12/17/08	1/2/09	WCF28301M5	7440-31-5
Vanadium	2.5	µg/L	U		12/17/08	1/2/09	WCF28301M5	7440-62-2
Zinc	12.8	µg/L	B		12/17/08	1/2/09	WCF28301M5	7440-66-6

Groundwater Analytical Data and Quality Assurance/Quality Control Information for February 2009

Table C-4. Groundwater analytical data for February 2009 semiannual sampling event.

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Arsenic	2.5	MW-2	U		2/2/09	2/16/09	WCF308012X	7440-38-2
Arsenic	13	TFS-SP (2018)			2/3/09	2/16/09	WCF309012X	7440-38-2
Arsenic	2.5	TFSE-SP (2019)	U		2/2/09	2/16/09	WCF310012X	7440-38-2
Arsenic	2.5	TFSE-SP (2019)	U		2/2/09	2/16/09	WCF310022X	7440-38-2
Arsenic	2.5	CPP-55-06	U		2/2/09	2/16/09	WCF311012X	7440-38-2
Arsenic	2.5	CPP-55-06	U		2/2/09	2/16/09	WCF311022X	7440-38-2
Arsenic	2.5	MW-10-2	U		2/2/09	2/16/09	WCF312012X	7440-38-2
Barium	210	MW-2			2/2/09	2/16/09	WCF308012X	7440-39-3
Barium	295	TFS-SP (2018)			2/3/09	2/16/09	WCF309012X	7440-39-3
Barium	150	TFSE-SP (2019)			2/2/09	2/16/09	WCF310012X	7440-39-3
Barium	150	TFSE-SP (2019)			2/2/09	2/16/09	WCF310022X	7440-39-3
Barium	168	CPP-55-06			2/2/09	2/16/09	WCF311012X	7440-39-3
Barium	167	CPP-55-06			2/2/09	2/16/09	WCF311022X	7440-39-3
Barium	261	MW-10-2			2/2/09	2/16/09	WCF312012X	7440-39-3
Benzene	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	71-43-2
Benzene	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	71-43-2
Benzene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	71-43-2
Benzene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	71-43-2
Benzene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	71-43-2
Benzene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	71-43-2
Benzene	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	71-43-2
Cadmium	1	MW-2	U		2/2/09	2/13/09	WCF308012X	7440-43-9

Table C-4. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Cadmium	1	TFS-SP (2018)	U		2/3/09	2/13/09	WCF309012X	7440-43-9
Cadmium	1	TFSE-SP (2019)	U		2/2/09	2/13/09	WCF310012X	7440-43-9
Cadmium	1	TFSE-SP (2019)	U		2/2/09	2/13/09	WCF310022X	7440-43-9
Cadmium	1	CPP-55-06	U		2/2/09	2/13/09	WCF311012X	7440-43-9
Cadmium	1	CPP-55-06	U		2/2/09	2/13/09	WCF311022X	7440-43-9
Cadmium	1	MW-10-2	U		2/2/09	2/13/09	WCF312012X	7440-43-9
Carbon disulfide	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	75-15-0
Carbon disulfide	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	75-15-0
Carbon disulfide	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	75-15-0
Carbon disulfide	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	75-15-0
Carbon disulfide	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	75-15-0
Carbon disulfide	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	75-15-0
Carbon disulfide	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	75-15-0
Carbon tetrachloride	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	56-23-5
Carbon tetrachloride	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	56-23-5
Carbon tetrachloride	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	56-23-5
Carbon tetrachloride	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	56-23-5
Carbon tetrachloride	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	56-23-5
Carbon tetrachloride	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	56-23-5
Carbon tetrachloride	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	56-23-5
Chloroform	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	67-66-3
Chloroform	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	67-66-3
Chloroform	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	67-66-3
Chloroform	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	67-66-3
Chloroform	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	67-66-3
Chloroform	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	67-66-3
Chloroform	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	67-66-3

Table C-4. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Chromium	6	MW-2	B		2/2/09	2/16/09	WCF308012X	7440-47-3
Chromium	2.7	TFS-SP (2018)	B		2/3/09	2/16/09	WCF309012X	7440-47-3
Chromium	7.6	TFSE-SP (2019)	B		2/2/09	2/16/09	WCF310012X	7440-47-3
Chromium	7.3	TFSE-SP (2019)	B		2/2/09	2/16/09	WCF310022X	7440-47-3
Chromium	6.4	CPP-55-06	B		2/2/09	2/16/09	WCF311012X	7440-47-3
Chromium	7.1	CPP-55-06	B		2/2/09	2/16/09	WCF311022X	7440-47-3
Chromium	2.5	MW-10-2	U		2/2/09	2/16/09	WCF312012X	7440-47-3
Ethylbenzene	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	100-41-4
Ethylbenzene	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	100-41-4
Ethylbenzene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	100-41-4
Ethylbenzene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	100-41-4
Ethylbenzene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	100-41-4
Ethylbenzene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	100-41-4
Ethylbenzene	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	100-41-4
Lead	2.5	MW-2	U		2/2/09	2/13/09	WCF308012X	7439-92-1
Lead	2.5	TFS-SP (2018)	U		2/3/09	2/13/09	WCF309012X	7439-92-1
Lead	2.5	TFSE-SP (2019)	U		2/2/09	2/13/09	WCF310012X	7439-92-1
Lead	2.5	TFSE-SP (2019)	U		2/2/09	2/13/09	WCF310022X	7439-92-1
Lead	2.5	CPP-55-06	U		2/2/09	2/13/09	WCF311012X	7439-92-1
Lead	2.5	CPP-55-06	U		2/2/09	2/13/09	WCF311022X	7439-92-1
Lead	2.5	MW-10-2	U		2/2/09	2/13/09	WCF312012X	7439-92-1
Mercury	0.2	MW-2	U		2/2/09	2/9/09	WCF308012X	7439-97-6
Mercury	0.2	TFS-SP (2018)	U		2/3/09	2/9/09	WCF309012X	7439-97-6
Mercury	0.2	TFSE-SP (2019)	U		2/2/09	2/9/09	WCF310012X	7439-97-6
Mercury	0.2	TFSE-SP (2019)	U		2/2/09	2/9/09	WCF310022X	7439-97-6
Mercury	0.2	CPP-55-06	U		2/2/09	2/9/09	WCF311012X	7439-97-6
Mercury	0.2	CPP-55-06	U		2/2/09	2/9/09	WCF311022X	7439-97-6

Table C-4. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Mercury	0.2	MW-10-2	U		2/2/09	2/9/09	WCF312012X	7439-97-6
Methyl ethyl ketone (2-Butanone)	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	78-93-3
Methyl ethyl ketone (2-Butanone)	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	78-93-3
Methyl ethyl ketone (2-Butanone)	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	78-93-3
Methyl ethyl ketone (2-Butanone)	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	78-93-3
Methyl ethyl ketone (2-Butanone)	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	78-93-3
Methyl ethyl ketone (2-Butanone)	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	78-93-3
Methyl ethyl ketone (2-Butanone)	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	78-93-3
Methylene chloride	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	75-09-2
Methylene chloride	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	75-09-2
Methylene chloride	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	75-09-2
Methylene chloride	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	75-09-2
Methylene chloride	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	75-09-2
Methylene chloride	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	75-09-2
Methylene chloride	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	75-09-2
Pyridine	2.4	MW-2	U		2/2/09	2/10/09	WCF30801V9	110-86-1
Pyridine	2.4	TFS-SP (2018)	U		2/3/09	2/10/09	WCF30901V9	110-86-1
Pyridine	2.5	TFSE-SP (2019)	U		2/2/09	2/10/09	WCF31001V9	110-86-1
Pyridine	2.5	TFSE-SP (2019)	U		2/2/09	2/10/09	WCF31002V9	110-86-1
Pyridine	2.4	CPP-55-06	U		2/2/09	2/10/09	WCF31101V9	110-86-1
Pyridine	2.4	CPP-55-06	U		2/2/09	2/10/09	WCF31102V9	110-86-1

Table C-4. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Pyridine	4.7	MW-10-2	U		2/3/09	2/10/09	WCF31201V9	110-86-1
Selenium	5	MW-2	U		2/2/09	2/13/09	WCF308012X	7782-49-2
Selenium	5	TFS-SP (2018)	U		2/3/09	2/13/09	WCF309012X	7782-49-2
Selenium	5	TFSE-SP (2019)	U		2/2/09	2/13/09	WCF310012X	7782-49-2
Selenium	5	TFSE-SP (2019)	U		2/2/09	2/13/09	WCF310022X	7782-49-2
Selenium	5	CPP-55-06	U		2/2/09	2/13/09	WCF311012X	7782-49-2
Selenium	5	CPP-55-06	U		2/2/09	2/13/09	WCF311022X	7782-49-2
Selenium	5	MW-10-2	U		2/2/09	2/13/09	WCF312012X	7782-49-2
Silver	5	MW-2	U		2/2/09	2/16/09	WCF308012X	7440-22-4
Silver	5	TFS-SP (2018)	U		2/3/09	2/16/09	WCF309012X	7440-22-4
Silver	5	TFSE-SP (2019)	U		2/2/09	2/16/09	WCF310012X	7440-22-4
Silver	5	TFSE-SP (2019)	U		2/2/09	2/16/09	WCF310022X	7440-22-4
Silver	5	CPP-55-06	U		2/2/09	2/16/09	WCF311012X	7440-22-4
Silver	5	CPP-55-06	U		2/2/09	2/16/09	WCF311022X	7440-22-4
Silver	5	MW-10-2	U		2/2/09	2/16/09	WCF312012X	7440-22-4
Tetrachloroethene	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	127-18-4
Tetrachloroethene	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	127-18-4
Tetrachloroethene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	127-18-4
Tetrachloroethene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	127-18-4
Tetrachloroethene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	127-18-4
Tetrachloroethene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	127-18-4
Tetrachloroethene	3.8	MW-10-2			2/3/09	2/6/09	WCF31201VA	127-18-4
Toluene	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	108-88-3
Toluene	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	108-88-3
Toluene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	108-88-3
Toluene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	108-88-3
Toluene	38	CPP-55-06			2/2/09	2/6/09	WCF31101VA	108-88-3

Table C-4. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Toluene	41	CPP-55-06			2/2/09	2/6/09	WCF31102VA	108-88-3
Toluene	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	108-88-3
1,1,1-Trichloroethane	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	71-55-6
1,1,1-Trichloroethane	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	71-55-6
1,1,1-Trichloroethane	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	71-55-6
1,1,1-Trichloroethane	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	71-55-6
1,1,1-Trichloroethane	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	71-55-6
1,1,1-Trichloroethane	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	71-55-6
1,1,1-Trichloroethane	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	71-55-6
Trichloroethene	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	79-01-6
Trichloroethene	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	79-01-6
Trichloroethene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	79-01-6
Trichloroethene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	79-01-6
Trichloroethene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	79-01-6
Trichloroethene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	79-01-6
Trichloroethene	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	79-01-6
Xylene	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	1330-20-7
Xylene	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	1330-20-7
Xylene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	1330-20-7
Xylene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	1330-20-7
Xylene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	1330-20-7
Xylene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	1330-20-7
Xylene	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	1330-20-7
o-Xylene	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	95-47-6
o-Xylene	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	95-47-6
o-Xylene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	95-47-6
o-Xylene	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	95-47-6

Table C-4. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
o-Xylene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	95-47-6
o-Xylene	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	95-47-6
o-Xylene	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	95-47-6
Xylene, meta and/or para isomers	1	MW-2	U		2/2/09	2/6/09	WCF30801VA	179601-23-1
Xylene, meta and/or para isomers	1	TFS-SP (2018)	U		2/3/09	2/6/09	WCF30901VA	179601-23-1
Xylene, meta and/or para isomers	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31001VA	179601-23-1
Xylene, meta and/or para isomers	1	TFSE-SP (2019)	U		2/2/09	2/6/09	WCF31002VA	179601-23-1
Xylene, meta and/or para isomers	1	CPP-55-06	U		2/2/09	2/6/09	WCF31101VA	179601-23-1
Xylene, meta and/or para isomers	1	CPP-55-06	U		2/2/09	2/6/09	WCF31102VA	179601-23-1
Xylene, meta and/or para isomers	1	MW-10-2	U		2/3/09	2/6/09	WCF31201VA	179601-23-1

Table C-5. Result qualifier and validation flag definitions.

Compound	Flag	Definition
		Result Qualifier (lab-assigned flags)
Metals	U	Analyte was analyzed for but not detected. Analyte was below the contract-required detection limits.
	N	The associated matrix spike sample and/or the matrix spike duplicate sample had a reported recovery outside of control limits (80–120%).
	W	The associated analytical spike sample (the post-digestion spike sample) had a reported recovery outside of control limits (80–120%).
	B	Value less than contract-required detection limit, but greater than or equal to the instrument detection limit.
Volatile organic compounds	U	Analyte was analyzed for but not detected. Analyte result was below the contract-required detection limit.
	J	Estimated value, greater than method detection limit but less than EQL.
Semivolatile organic compounds	U	Analyte was analyzed for but not detected. Analyte was below the contract-required detection limit.
Other	D	Results indicate the value is from a diluted analysis.
	J	Estimated value, greater than method detection limit but less than EQL.
	P	Results indicate that the percent difference between the reporting column and the confirmation column exceeds quality control limits.
	U	Analyte was analyzed for but not detected. Analyte result was below the contract-required detection limit.
		Validation (validator-assigned flags)
Metals	R	The accuracy of the data is so questionable that it is recommended the data not be used.
	U	The constituent was analyzed for and was detected at or above the applicable detection limit. However, the associated value was less than 5 times the highest positive amount in any laboratory blank.
	J	The constituent was analyzed for and was detected at or above the applicable detection limit. The associated value is an estimate and may be inaccurate or imprecise.
Volatile organic compounds	R	The accuracy of the data is so questionable that it is recommended the data not be used.
	UJ	The constituent was analyzed for but was not detected. The sample quantitation limit is an estimated value.
Semivolatile organic compounds	UJ	The constituent was analyzed for but was not detected. The sample quantitation limit is an estimated value.
Other	U	Analyte was analyzed for and was detected at or above the applicable detection limit but was qualified as nondetected at the reporting limit because the value was less than the blank action level.
	J	The constituent was analyzed for, and the result is an estimated value.

Appendix D

Polynuclear Aromatic Hydrocarbon Sampling Results

Appendix D

Polynuclear Aromatic Hydrocarbon Sampling Results

Table D-1. Polynuclear aromatic hydrocarbon sampling results for February 2009 semiannual sampling event.

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Acenaphthene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	83-32-9
Acenaphthene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	83-32-9
Acenaphthene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	83-32-9
Acenaphthene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	83-32-9
Acenaphthene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	83-32-9
Acenaphthene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	83-32-9
Acenaphthylene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	208-96-8
Acenaphthylene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	208-96-8
Acenaphthylene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	208-96-8
Acenaphthylene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	208-96-8
Acenaphthylene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	208-96-8
Acenaphthylene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	208-96-8
Anthracene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	120-12-7
Anthracene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	120-12-7
Anthracene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	120-12-7
Anthracene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	120-12-7
Anthracene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	120-12-7
Anthracene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	120-12-7

Table D-1. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Benzo(a)anthracene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	56-55-3
Benzo(a)anthracene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	56-55-3
Benzo(a)anthracene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	56-55-3
Benzo(a)anthracene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	56-55-3
Benzo(a)anthracene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	56-55-3
Benzo(a)anthracene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	56-55-3
Benzo(a)pyrene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	50-32-8
Benzo(a)pyrene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	50-32-8
Benzo(a)pyrene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	50-32-8
Benzo(a)pyrene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	50-32-8
Benzo(a)pyrene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	50-32-8
Benzo(a)pyrene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	50-32-8
Benzo(b)fluoranthene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	205-99-2
Benzo(b)fluoranthene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	205-99-2
Benzo(b)fluoranthene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	205-99-2
Benzo(b)fluoranthene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	205-99-2
Benzo(b)fluoranthene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	205-99-2
Benzo(b)fluoranthene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	205-99-2
Benzo(g,h,i)perylene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	191-24-2
Benzo(g,h,i)perylene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	191-24-2
Benzo(g,h,i)perylene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	191-24-2
Benzo(g,h,i)perylene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	191-24-2

Table D-1. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Benzo(g,h,i)perylene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	191-24-2
Benzo(g,h,i)perylene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	191-24-2
Benzo(k)fluoranthene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	207-08-9
Benzo(k)fluoranthene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	207-08-9
Benzo(k)fluoranthene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	207-08-9
Benzo(k)fluoranthene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	207-08-9
Benzo(k)fluoranthene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	207-08-9
Benzo(k)fluoranthene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	207-08-9
Chrysene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	218-01-9
Chrysene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	218-01-9
Chrysene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	218-01-9
Chrysene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	218-01-9
Chrysene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	218-01-9
Chrysene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	218-01-9
Dibenz(a,h)anthracene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	53-70-3
Dibenz(a,h)anthracene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	53-70-3
Dibenz(a,h)anthracene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	53-70-3
Dibenz(a,h)anthracene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	53-70-3
Dibenz(a,h)anthracene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	53-70-3
Dibenz(a,h)anthracene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	53-70-3
Fluoranthene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	206-44-0
Fluoranthene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	206-44-0

Table D-1. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Fluoranthene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	206-44-0
Fluoranthene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	206-44-0
Fluoranthene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	206-44-0
Fluoranthene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	206-44-0
Fluorene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	86-73-7
Fluorene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	86-73-7
Fluorene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	86-73-7
Fluorene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	86-73-7
Fluorene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	86-73-7
Fluorene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	86-73-7
Indeno(1,2,3-cd)pyrene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	193-39-5
Indeno(1,2,3-cd)pyrene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	193-39-5
Indeno(1,2,3-cd)pyrene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	193-39-5
Indeno(1,2,3-cd)pyrene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	193-39-5
Indeno(1,2,3-cd)pyrene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	193-39-5
Indeno(1,2,3-cd)pyrene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	193-39-5
Naphthalene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	91-20-3
Naphthalene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	91-20-3
Naphthalene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	91-20-3
Naphthalene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	91-20-3
Naphthalene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	91-20-3
Naphthalene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	91-20-3

Table D-1. (continued).

Constituent	Concentration (µg/L)	Location	Lab Qualifier	Validation Qualifier	Date Collected	Analysis Date	Sample Number	CAS Number
Phenanthrene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	85-01-8
Phenanthrene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	85-01-8
Phenanthrene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	85-01-8
Phenanthrene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	85-01-8
Phenanthrene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	85-01-8
Phenanthrene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	85-01-8
Pyrene	0.098	MW-2	U		2/2/09	2/12/09	WCF30801KH	129-00-0
Pyrene	2	TFS-SP (2018)	U		2/3/09	2/12/09	WCF30901KH	129-00-0
Pyrene	0.098	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31001KH	129-00-0
Pyrene	0.099	TFSE-SP (2019)	U		2/2/09	2/12/09	WCF31002KH	129-00-0
Pyrene	0.096	CPP-55-06	U		2/2/09	2/12/09	WCF31101KH	129-00-0
Pyrene	0.094	CPP-55-06	U		2/2/09	2/13/09	WCF31102KH	129-00-0