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2012 Annual Industrial Wastewater Reuse Report for the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Pond

February 2013

The INL is a U.S. Department of Energy National Laboratory
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Idaho National Laboratory
Idaho Falls, Idaho 83415

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ABSTRACT

This report describes conditions, as required by the state of Idaho Industrial Wastewater Reuse Permit (#LA-000161-01, Modification B), for the wastewater land application site at the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Pond from November 1, 2011 through October 31, 2012. The report contains the following information:

- Facility and system description
- Permit required effluent monitoring data and loading rates
- Groundwater monitoring data
- Status of compliance activities
- Noncompliance issues
- Discussion of the facility's environmental impacts.

During the 2012 permit year, approximately 183 million gallons of wastewater were discharged to the Cold Waste Pond. This is well below the maximum annual permit limit of 375 million gallons. As shown by the groundwater sampling data, sulfate and total dissolved solids concentrations are highest near the Cold Waste Pond and decrease rapidly as the distance from the Cold Waste Pond increases. Although concentrations of sulfate and total dissolved solids are elevated near the Cold Waste Pond, both parameters are below the Ground Water Quality Rule Secondary Constituent Standards in the down gradient monitoring wells.

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ACRONYMS

Al	Aluminum
ATR	Advanced Test Reactor
CFR	Code of Federal Regulations
CWP	Cold Waste Pond
DEQ	Idaho Department of Environmental Quality
Fe	Iron
gpd	gallons per day
IDAPA	Idaho Administrative Procedures Act
INL	Idaho National Laboratory
IWRP	Industrial Wastewater Reuse Permit
MG	Million gallons
Mn	Manganese
MS	Monitoring Services
NA	Not Applicable
PCS	Primary Constituent Standard
SCS	Secondary Constituent Standard
SwRI	Southwest Research Institute
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TN	total nitrogen
TSS	total suspended solids
USGS	United States Geological Survey

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1. INTRODUCTION

The Advanced Test Reactor (ATR) Complex Cold Waste Pond (CWP) is an industrial wastewater reuse facility operated by Battelle Energy Alliance, LLC at the Idaho National Laboratory (INL) under Industrial Wastewater Reuse Permit (IWRP) #LA-000161-01 issued by the State of Idaho Department of Environmental Quality (DEQ) on February 26, 2008, and will expire on February 25, 2013 (Johnston 2008). The permit was modified (Modification B) on August 20, 2008 (Eager 2008).

An application for renewal of the IWRP was submitted to the DEQ on August 21, 2012 (Stenzel 2012). The application was determined "substantially complete" (Rackow 2012) and the preliminary decision to prepare a draft permit (Rackow 2012a) was made by the DEQ on October 12, 2012.

Following the Section 2 CWP facility, system, and operation description, this report presents the status of effluent and groundwater monitoring data, compliance activities, noncompliances, and environmental impacts of the CWP operation during the 2012 permit year (November 1, 2011 through October 31, 2012).

2. FACILITY, SYSTEM DESCRIPTION, AND OPERATION

The ATR Complex (see Figure 1) is located on approximately 100 acres in the southwestern portion of the INL, approximately 47 miles west of Idaho Falls, Idaho, in Butte County. The ATR Complex consists of buildings and structures utilized to conduct research associated with developing, testing, and analyzing materials used in nuclear and reactor applications and both radiological and nonradiological laboratory analyses.

The CWP is located approximately 450 ft from the southeast corner of the ATR Complex compound (see Figure 1) and approximately 3/4 of a mile southwest of the Big Lost River channel (see Figure 2). The existing CWP was excavated in 1982. It consists of two cells, each with dimensions of 180 × 430 ft across the top of the berms, and a depth of 10 ft. Total surface area for the two cells at the top of the berms is approximately 3.55 acres. Maximum capacity is approximately 10,220,000 gal (31.3 acre ft).

Wastewater discharged to the CWP consists primarily of noncontact cooling tower blowdown, once-through cooling water for air conditioning units, coolant water from air compressors, secondary system drains, and other nonradioactive drains throughout the ATR Complex. The wastewater flows through collection piping to the TRA-764 Cold Waste Sample Pit (see Figure 1) where the flow rate is recorded and compliance monitoring samples are collected. The wastewater then flows to the Cold Waste Sump Pit (TRA-703). The sump pit contains submersible pumps that route the water to the appropriate CWP cell through 8 in. valves.

Wastewater enters the pond through concrete inlet basins located near the west end of each cell. Most of the water percolates into the porous ground within a short distance from the inlet basins. The entire floor of a cell is rarely submerged. If the water level rises significantly in a cell (e.g., 5 ft) the flow would be diverted to the adjacent cell, allowing the first cell to dry out. An overflow pipe connects the two cells at the 9-ft level.

Normal operation is to route the wastewater to one cell at a time. On September 9, 2012, the flow was switched from the north cell to the south cell.

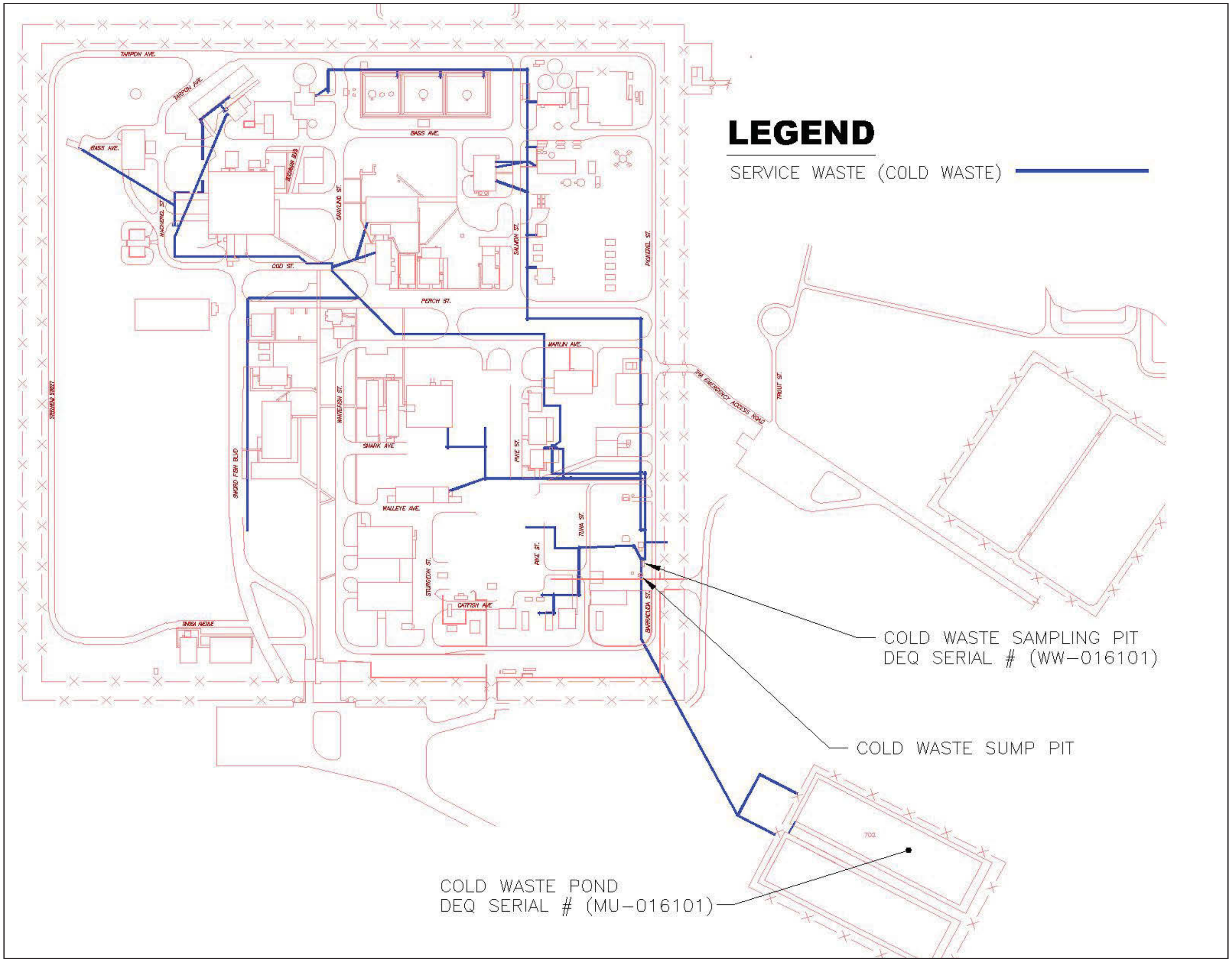

Figure 1. Advanced Test Reactor Complex Cold Waste system flow schematic.

3. COLD WASTE POND EFFLUENT MONITORING

This section describes the sampling and analytical methods used in the ATR Complex CWP effluent monitoring program. Effluent monitoring and flow data of wastewater discharged to the ATR Complex CWP is provided.

3.1 Sampling Program and Analytical Methods

Battelle Energy Alliance, LLC Monitoring Services (MS) personnel monitor effluent discharges at the ATR Complex CWP. The MS program involves sampling, analysis, and data interpretation carried out under a quality assurance program.

MS conducts monthly effluent monitoring as required in Section G of the permit. Effluent samples were collected from the TRA-764 Cold Waste Sample Pit (sampling location WW-016101) prior to discharge to the CWP. All samples were collected according to established programmatic sampling procedures.

Effluent samples were typically taken during a preselected week each month following a randomly generated sampling schedule to represent normal operating conditions. The sampling event scheduled for June 19 was moved to June 12 to accommodate staff schedules. Analytical methods specified in 40 Code of Federal Regulations (CFR) 141, "National Primary Drinking Water Regulations"; 40 CFR 143, "National Secondary Drinking Water Regulations"; 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants"; or those approved by DEQ were used for analysis of all permit-required parameters.

Permit required effluent conductivity analyses are performed at the time of sample collection by MS personnel using a calibrated meter. All other permit required samples are submitted under full chain of custody to Southwest Research Institute's (SwRI) Analytical and Environmental Chemistry Department located in San Antonio, Texas, for analyses.

3.2 Effluent Monitoring Results

The permit year covered in this report is November 1, 2011 through October 31, 2012.

Effluent samples were collected monthly from the TRA-764 Cold Waste Sample Pit (prior to discharge to the CWP) during the permit year. Effluent samples were collected as 24-hour flow proportional composite samples.

All samples were collected and analyzed as required by the permit. Table 1 summarizes the effluent sampling results.

Section F of the IWRP specifies effluent permit limits based on a 30-day average for total nitrogen (TN) and total suspended solids (TSS) of 20 mg/L and 100 mg/L, respectively. Total nitrogen is calculated as the sum of total Kjeldahl nitrogen (TKN) and nitrate plus nitrite nitrogen. The high for TN occurred in the January field duplicate sample at 3.199 mg/L (see Table 1) with a low of <0.965 mg/L in August. All TSS results were below the laboratory instrument detection limit of 4 mg/L.

There are no effluent permit limits for total dissolved solids (TDS) or sulfate. However, a summary comparison of these parameters with the Ground Water Quality Rule Secondary Constituent Standards (SCS) found in the Idaho Administrative Procedures Act (IDAPA) 58.01.11.200.01.b. is provided in the following paragraphs:

The TDS SCS is 500 mg/L. The concentration in the effluent to the CWP ranged from 239 mg/L in the May sample to 912 mg/L in the March sample (see Table 1). Concentrations of TDS in the effluent were above the SCS level in four out of the twelve months.

Similar to the TDS effluent levels, sulfate concentrations were above the SCS of 250 mg/L in four of the twelve monthly samples (see Table 1). Sulfate ranged from a minimum of 21.7 mg/L in the August sample to a maximum of 431 mg/L in the November sample.

The ATR evaporative cooling process evaporates approximately one-half of the water volume and concentrates naturally occurring dissolved solids in the blowdown discharged to the CWP. Elevated sulfate levels are generated by reactions between sulfuric acid additives placed in the cooling water and calcium and magnesium carbonates in the water.

The metals concentrations in the CWP effluent remained at low levels (see Table 1). Concentrations of several metals in the effluent were consistently below the laboratory instrument detection levels.

Table 1. Advanced Test Reactor Complex Cold Waste Pond effluent data (WW-016101).

Sample Month	November	December	January[a]	February	March	April	May	June	July	August	September	October
Sample Date	11/02/11	12/14/11	01/04/12	02/22/12	03/08/12	04/11/12	05/22/12	06/12/12	07/24/12	08/15/12	09/18/12	10/11/12
Nitrite + nitrate as nitrogen (mg/L)	2.45	0.895	2.34 [2.34]	0.959	2.36	2.35	0.872	0.864	0.844	0.865	0.846	0.883
Total Kjeldahl nitrogen (mg/L)	0.614	0.136	0.3 [0.859]	0.12	0.27	0.262	0.1 U	0.207	0.136	0.1 U	0.189	0.138
Total nitrogen[b] (mg/L)	3.064	1.031	2.64 [3.199]	1.079	2.63	2.612	<0.972	1.071	0.98	<0.965	1.035	1.021
Total suspended solids (mg/L)	4.0 U[c]	4.0 U	4.0 U [4.0 U]	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Total dissolved solids (mg/L)	885	294	873 [875]	247	912	844	239	241	270	270	258	256
Chloride (mg/L)	31.5	14.6	33.6 [33.8]	11.9	32.4	34.2	10.2	10.4	12	10.6	11.8	12.1
Electrical conductivity (µS/cm)	1,189	494	1,272	448	1,165	1,166	439	429	434	477	456	482
Arsenic (mg/L)	0.0066	0.005 U	0.005 U [0.005 U]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Barium (mg/L)	0.127	0.0598	0.131 [0.130]	0.0472	0.124	0.129	0.042	0.0481	0.0499	0.0456	0.0483	0.0482
Cadmium (mg/L)	0.001 U	0.001 U	0.001 U [0.001 U]	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chromium (mg/L)	0.009	0.0043	0.0085 [0.006]	0.0033	0.0075	0.0063	0.0031	0.0039	0.0038	0.0032	0.0036	0.0029
Cobalt (mg/L)	0.0025 U	0.0025 U	0.0025 U [0.0025 U]	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
Copper (mg/L)	0.003	0.0027	0.005 [0.0034]	0.001 U	0.0055	0.0074	0.001 U	0.0016	0.0022	0.001 U	0.0018	0.0016
Fluoride (mg/L)	0.414	0.259	0.415 [0.426]	0.205	0.389	0.411	0.188	0.191	0.186	0.171	0.173	0.167
Iron (mg/L)	0.201	0.0572	0.161 [0.137]	0.0815	0.150	0.154	0.025 U	0.0981	0.0908	0.025 U	0.0774	0.0705
Manganese (mg/L)	0.0048	0.0025 U	0.0032 [0.0028]	0.0025 U	0.0025	0.0025	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
Mercury (mg/L)	0.0002 U	0.0002 U	0.0002 U [0.0002 U]	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Selenium (mg/L)	0.0034	0.0013	0.0039 [0.0039]	0.0014	0.0037	0.003	0.0011	0.0011	0.0012	0.0011	0.00093	0.0013

Sample Month	November	December	January[a]	February	March	April	May	June	July	August	September	October
Sample Date	11/02/11	12/14/11	01/04/12	02/22/12	03/08/12	04/11/12	05/22/12	06/12/12	07/24/12	08/15/12	09/18/12	10/11/12
Silver (mg/L)	0.005 U	0.005 U	0.005 U [0.005 U]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sulfate (mg/L)	431	60.7	416 [416]	33.8	404	396	22.2	22.4	29.6	21.7	29.5	31.9

a. Values in brackets are the result from analyses performed on the field duplicate sample.

b. Total nitrogen is calculated as the sum of the TKN, nitrite nitrogen, and nitrate nitrogen. For results reported below the instrument detection limit, the detection limit for that parameter is used in the calculation. The resulting total nitrogen is then reported as a less than (<) number.

c. U flag indicates that the result was reported as below the instrument detection limit by the analytical laboratory.

3.3 Flow Volumes and Hydraulic Loading Rates

Daily flow readings were taken by ATR Complex CWP Operations during the 2012 permit year, as required by Section G of the permit, at the TRA-764 Cold Waste Sample Pit (WW-016101). All flow readings were recorded in gallons per day (gpd).

The November 10, 2011 through November 14, 2011 flow volumes were estimated due to a tree root mass that became lodged in the effluent weir, resulting in artificially high flow meter readings. The flow total for those five days was adjusted downward by a total of 2,192,448 gallons. Flow total for November 14, 2011 was adjusted down to 4,962 gallons. The total is significantly lower than expected and is likely due to the assumptions used to correct the flows and the variability in the time the operators collected the flow readings. Section 5.2 provides additional information on this issue.

Table 2 summarizes monthly and annual flow data. Daily effluent flow data is provided in Appendix A.

Table 2. Cold Waste Pond flow summaries.

	Effluent to Cold Waste Pond (WW-016101)			
Month	Average (gpd[a])	Minimum (gpd)	Maximum (gpd)	Total (MG[b])
November 2011[c]	281,155	4,962[d]	526,740	8.43
December 2011	335,136	173,020	567,390	10.39
January 2012	239,260	206,400	265,250	7.42
February 2012	394,312	212,200	580,680	11.44
March 2012	307,471	147,350	588,200	9.53
April 2012	294,786	148,050	718,410	8.84
May 2012	540,048	259,200	731,540	16.74
June 2012	547,847	380,070	872,010	16.44
July 2012	575,528	393,090	707,290	17.84
August 2012	765,627	455,130	1,151,310	23.73
September 2012	900,050	587,520	1,147,010	27.00
October 2012	821,232	629,310	1,122,600	25.46
Yearly summary	500,720	147,350[e]	1,151,310	183.26

a. gpd—gallons per day.
b. MG—million gallons.
c. Daily flow volumes for November 10 through November 14, 2011 are estimated.
d. Flows were estimated from 2:30 PM on November 10, 2011 through 2:40 PM on November 14, 2011. The low flow of 4,962 on November 14, 2011 was likely due to the assumptions used to estimate the flows and the time of day the operators obtained the flow readings.
e. The estimated flows for the period of November 10 through November 14, 2011 were not used to determine the yearly minimum.

The permit (Section F) specifies the following:

Application season is year round.

Maximum hydraulic loading rate is 300 million gallons (MG) as a 5-year annual average, not to exceed 375 MG annually.

Daily influent flow averaged 500,720 gpd. Daily flow ranged from a low of 147,350 gpd and a high of 1,151,310 gpd for the permit year (Table 2).

Total effluent flow volume was 183.26 MG for the 2012 permit year and significantly less than the maximum permit limit of 375 MG annually.

3.3.1 Flow Meter Calibration

Section G of the IWRP requires calibration of all flow meters and pumps used directly or indirectly to measure all wastewater applied to the CWP. The flow meter used to measure the flow volume to the CWP is located in the TRA-764 Cold Waste Sample Pit. The flow meter was calibrated on August 16, 2012, by the ATR Complex maintenance organization. The calibration was performed to +/- 2% of full scale (full scale = 1400 gpm). During the annual calibration, the calibration appeared to have changed more than expected. The cold waste pond system engineer and electrical engineer are coordinating with ATR Complex maintenance to determine if the calibration should be performed more frequently (e.g., quarterly) in order to assess whether the instrumentation is drifting more than is acceptable.

4. GROUNDWATER MONITORING

The groundwater monitoring sections provide information concerning the INL sampling program, analytical methods used, monitoring results, and water table information.

4.1 Sampling Program

The ATR Complex CWP IWRP identifies five INL compliance wells. The permit requires that groundwater samples be collected from these five compliance wells semiannually during April and October.

The MS personnel performed the April and October 2012 groundwater sampling. The MS personnel use project-specific sampling and analysis plans and procedures that govern sampling activities and quality control protocols. The permit identifies a specified list of parameters that are to be analyzed in the groundwater samples. Constituent concentrations in the compliance wells are limited by primary constituent standards (PCS) and SCS specified in IDAPA 58.01.11, “Ground Water Quality Rule.”

Permit-required samples were collected as unfiltered samples. In addition, filtered samples were collected for aluminum (Al), iron (Fe), and manganese (Mn).

The Ground Water Quality Rule allows the use of dissolved (filtered) concentrations for SCS to be used for permit compliance provided the requestor demonstrates that doing so will not adversely affect human health and the environment or other situations authorized by the DEQ in writing. The INL submitted a request on October 8, 2009 (Stenzel 2009). The DEQ (Rackow 2010) responded with the following statement: “Filtered ground water samples may be collected for secondary constituents and the dissolved concentration results from those filtered samples will be used to determine compliance with the Ground Water Quality Rule numerical standards for those secondary constituents listed in Table III, IDAPA 58.01.11.200.01.b.” Therefore, filtered sample results for Al, Fe, and Mn will be used to demonstrate compliance with the SCS for these parameters.

Groundwater pH analyses are performed at the time of sample collection by MS personnel using a calibrated meter. All other permit required groundwater samples are submitted under full chain of custody to SwRI’s Analytical and Environmental Chemistry Department located in San Antonio, Texas, for analyses.

4.2 Analytical Methods

Analytical methods specified in 40 CFR 141, “National Primary Drinking Water Regulations”; 40 CFR 143, “National Secondary Drinking Water Regulations”; 40 CFR 136, “Guidelines Establishing Test Procedures for the Analysis of Pollutants”; or those approved by DEQ were used for analysis of all permit-required parameters.

4.3 Monitoring Wells

To measure potential impacts to groundwater from the ATR Complex CWP, the permit requires that groundwater samples be collected from five monitoring wells located in the Snake River Plain Aquifer (see Figure 2):

- USGS-065 (GW-016102)
- TRA-07 (GW-016103)
- USGS-076 (GW-016104)
- TRA-08 (GW-016105)
- Middle-1823 (GW-016106).

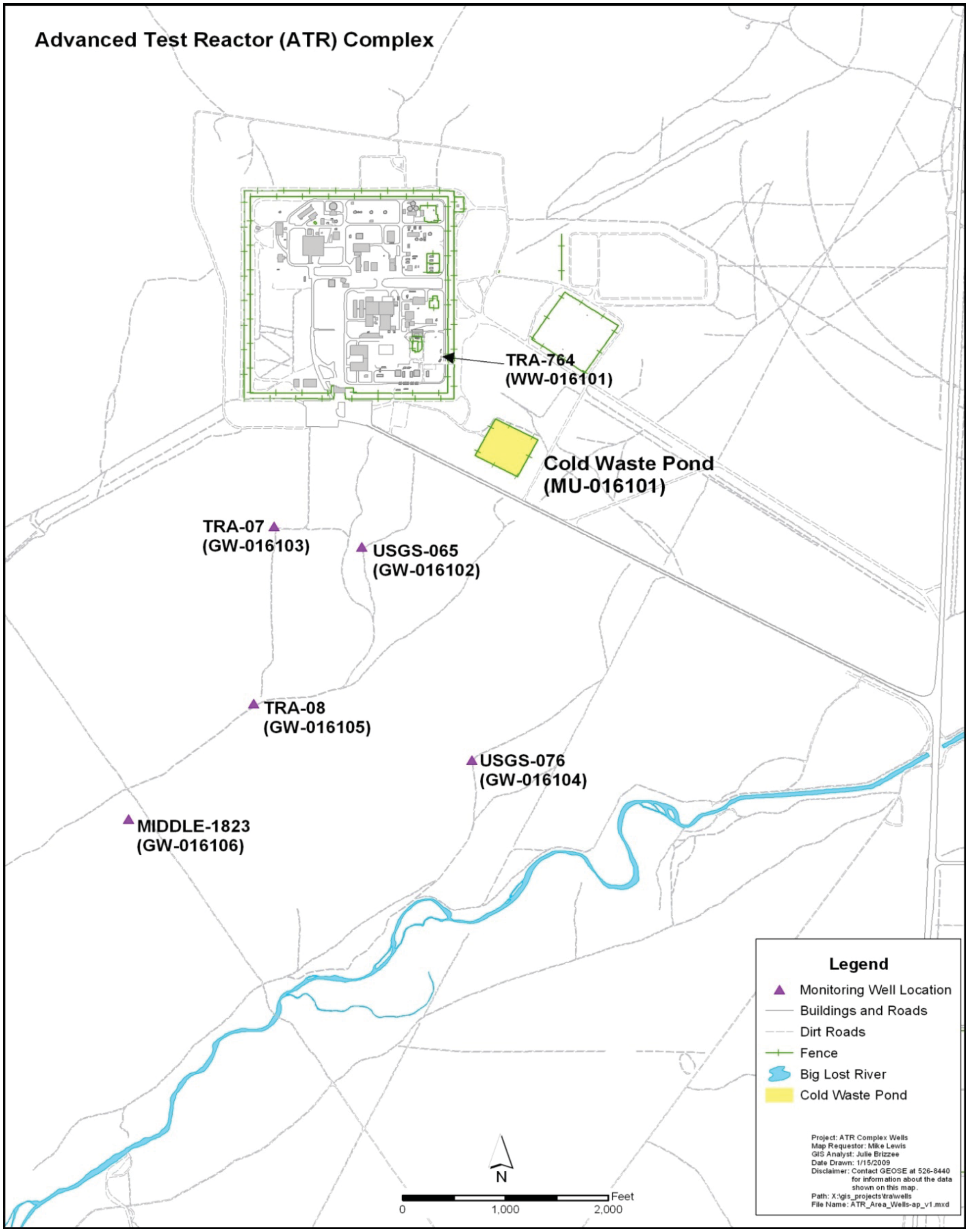

Figure 2. Locations of the Advanced Test Reactor Complex Cold Waste Pond Industrial Wastewater Reuse Permit monitoring wells.

All five wells are IWRP compliance points. Wells with sufficient water volume are purged to a minimum of three casing volumes or one well volume, provided the field measurements meet the conditions specified in Section G.5 of the IWRP. For 2012, all five wells yielded enough water to allow samples to be collected in April and October.

4.4 Groundwater Monitoring Results

Table 3 shows the 2012 reporting year water table elevations and depth to water table, determined prior to purging and sampling, and the analytical results for all parameters specified by the permit for the five aquifer wells.

As shown in Table 3, the permit-required parameters were below their respective Ground Water Quality Rule (IDAPA 58.01.11) PCSs or SCSs (permit compliance unfiltered and/or filtered concentrations) during the 2012 reporting year for all wells associated with the ATR Complex CWP.

However, both the Al and Fe concentrations were above their respective SCSs in the unfiltered samples collected from wells TRA-07 and TRA-08 during the April and October sampling events (Table 3). In comparison, the April- and October-filtered Al and Fe sample results, those used for determining permit compliance, were well below their SCSs in the two wells.

The SCS for Mn of 0.05 mg/L was exceeded in well TRA-08 in the unfiltered April and October samples. The October sample result of 0.0678 mg/L was lower than the April sample result of 0.191 mg/L. The filtered Mn sample results found in well TRA-08 for both April and October 2012 were significantly lower than the SCS. The filtered sample results for Mn were used for determining permit compliance in well TRA-08.

The unfiltered sample result, collected from well USGS-065 in October 2012 was above the Fe SCS of 0.3 mg/L at 0.315 mg/L. The unfiltered field duplicate was slightly below the SCS at 0.293 mg/L. The filtered sample and field duplicate sample results, used for determining compliance, were well below the SCS for Fe.

Monitoring well USGS-065 and TRA-07 are located southwest of the CWP. Both wells show similar elevated levels of sulfate and TDS in the April and October 2012 samples (see Table 3). The SCS for sulfate and TDS are 250 mg/L and 500 mg/L, respectively. Both the April and October 2012 sample results from these two wells were below the sulfate and TDS SCS limits.

4.5 Water Table Information

Depth to water and water table elevations for the April and October sampling events are shown in Figure 3 and Figure 4, respectively. The elevations are presented in North American Vertical Datum of 1988 (NAVD 88). In addition, the figures show the inferred general groundwater flow direction in the vicinity of the ATR Complex. In this area, the flow is in a south to southwest direction. The general groundwater flow direction at the INL Site is to the southwest.

Table 3. Advanced Test Reactor Complex Cold Waste Pond aquifer monitoring well unfiltered and filtered data for the 2012 reporting year.

WELL NAME	USGS-065 (GW-016102)		TRA-07 (GW-016103)		USGS-076 (GW-016104)		TRA-08 (GW-016105)		Middle-1823 (GW-016106)		PCS/SCS[a]
Sample Date	04/12/12	10/08/12	04/09/12	10/09/12	04/12/12	10/08/12	04/18/12	10/08/12	04/09/12	10/09/12	
Water Table Depth (ft below ground surface)	474.49	475.86	482.9	484.17	482.02	483.24	487.83	489.22	491.73	493.06	NA[b]
Water Table Elevation (above mean sea level in ft)[c]	4454.03	4452.66	4452.18	4450.91	4451.19	4449.97	4450.60	4449.21	4451.14	4449.81	NA
pH	7.62	7.74	7.75	8.04	7.82	8.0	7.84	8.01	7.8	8.04	6.5 to 8.5 (SCS)
Total Kjeldahl nitrogen (mg/L)	0.1 U[d]	0.138 [0.146][e]	0.1 U	0.11	0.1 U	0.113	0.1 U	0.163	0.1 U	0.144	NA
Nitrite nitrogen (mg/L)	0.05 U	0.05 U [0.05 U]	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	1 (PCS)
Nitrate nitrogen (mg/L)	1.42	1.46 [1.47]	1.13	1.06	1.02	1.04	0.99	1.0	0.948	0.971	10 (PCS)
Total nitrogen[f] (mg/L)	<1.57	<1.648 [<1.666]	<1.28	<1.22	<1.17	<1.203	<1.14	<1.213	<1.098	<1.165	NA
Total dissolved solids (mg/L)	471	450 [429]	468	435	304	274	316	285	293	262	500 (SCS)
Aluminum (mg/L)	0.006 U (0.0038 U)[g,h]	0.0046 [0.0057] (0.0021) [(0.0024)]	**1.910**[i] (0.0035 U)	**0.637** (0.0015)	0.0042 U (0.0041 U)	0.0036 (0.003)	**12.300** (0.0531)	**7.480** (0.0141)	0.130 (0.0026 U)	0.0909 (0.0012)	0.2 (SCS)
Antimony (mg/L)	0.0004 U	0.0004 U [0.0004 U]	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.006 (PCS)
Arsenic (mg/L)	0.0011	0.0013 [0.0013]	0.001	0.0013	0.0018	0.0017	0.0028	0.0022	0.0014	0.0018	0.05 (PCS)
Barium (mg/L)	0.0488	0.0427 [0.0426]	0.104	0.0669	0.0759	0.0671	0.537	0.198	0.0675	0.062	2 (PCS)
Cadmium (mg/L)	0.00025 U	0.00025 U [0.00025 U]	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.005 (PCS)
Chloride (mg/L)	19.6	19.2 [19.2]	20.7	20.5	13.8	14.1	11.8	12.5	11.3	12.2	250 (SCS)

WELL NAME	USGS-065 (GW-016102)		TRA-07 (GW-016103)		USGS-076 (GW-016104)		TRA-08 (GW-016105)		Middle-1823 (GW-016106)		PCS/SCS[a]
Sample Date	04/12/12	10/08/12	04/09/12	10/09/12	04/12/12	10/08/12	04/18/12	10/08/12	04/09/12	10/09/12	
Cobalt (mg/L)	0.0025 U	0.0025 U [0.0025 U]	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0054	0.0025 U	0.0025 U	0.0025 U	NA
Copper (mg/L)	0.0025 U	0.0025 U [0.0025 U]	0.0133	0.0052	0.0025 U	0.0025 U	0.350	0.0204	0.0025 U	0.0025 U	1.3 (PCS)
Fluoride (mg/L)	0.242	0.219 [0.21]	0.233	0.212	0.192	0.167	0.216	0.198	0.191	0.167	4 (PCS)
Iron (mg/L)	0.155 (0.050 U)	**0.315** [0.293] (0.0639) [(0.0672)]	**1.620** (0.050 U)	**0.571** (0.0586)	0.0538 (0.050 U)	0.083 (0.0516)	**4.960** (0.050 U)	**3.260** (0.0871)	0.125 (0.050 U)	0.100 (0.0718)	0.3 (SCS)
Manganese (mg/L)	0.0025 U (0.0025 U)	0.0025 U [0.0025 U] (0.0025 U) [(0.0025 U)]	0.025 (0.0025 U)	0.0086 (0.0025 U)	0.0025 U (0.0025 U)	0.0025 U (0.0025 U)	**0.191** (0.0025 U)	**0.0678** (0.0025 U)	0.0052 (0.0027)	0.0041 (0.0025 U)	0.05 (SCS)
Mercury (mg/L)	0.0002 U	0.0002 U [0.0002 U]	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.002 (PCS)
Selenium (mg/L)	0.002	0.002 [0.0021]	0.0014	0.0017	0.0015	0.0014	0.0013	0.002	0.0013	0.0013	0.05 (PCS)
Silver (mg/L)	0.005 U	0.005 U [0.005 U]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.1 (SCS)
Sulfate (mg/L)	163	162 [162]	160	155	33	32.7	50.4	49.5	34.1	35.6	250 (SCS)

a. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in the Ground Water Quality Rule, IDAPA 58.01.11.200.01.a and b.

b. NA- Not applicable.

c. Elevation data provided using the North American Vertical Datum of 1988 (NAVD 88).

d. U flag indicates that the result was reported as below the instrument detection limit by the analytical laboratory.

e. Results shown in brackets are the results from field duplicate samples.

f. Total nitrogen is calculated as the sum of the TKN, nitrite nitrogen, and nitrate nitrogen. For results reported below the instrument detection limit, the detection limit for that parameter is used in the calculation. The resulting total nitrogen is then reported as a less than (<) number.

g. Results shown in parentheses are from filtered samples used for comparison with the SCS.

h. Filtered sample results for aluminum, iron, and manganese, shown in parentheses, are used for permit compliance determinations.

i. Concentrations shown in bold are above the Ground Water Quality Rule SCS.

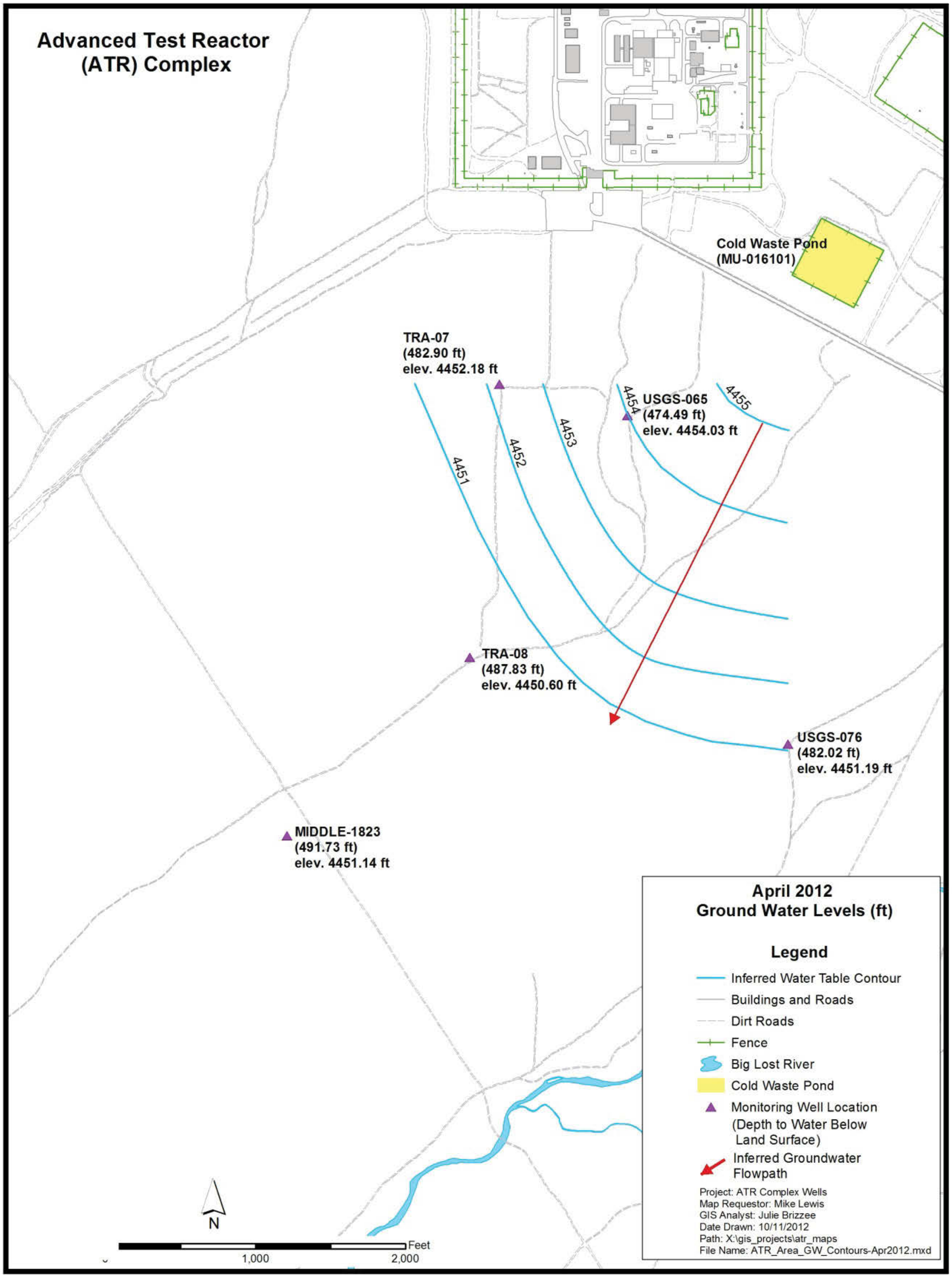

Figure 3. Groundwater contour map based on the April 2012 water level measurements.

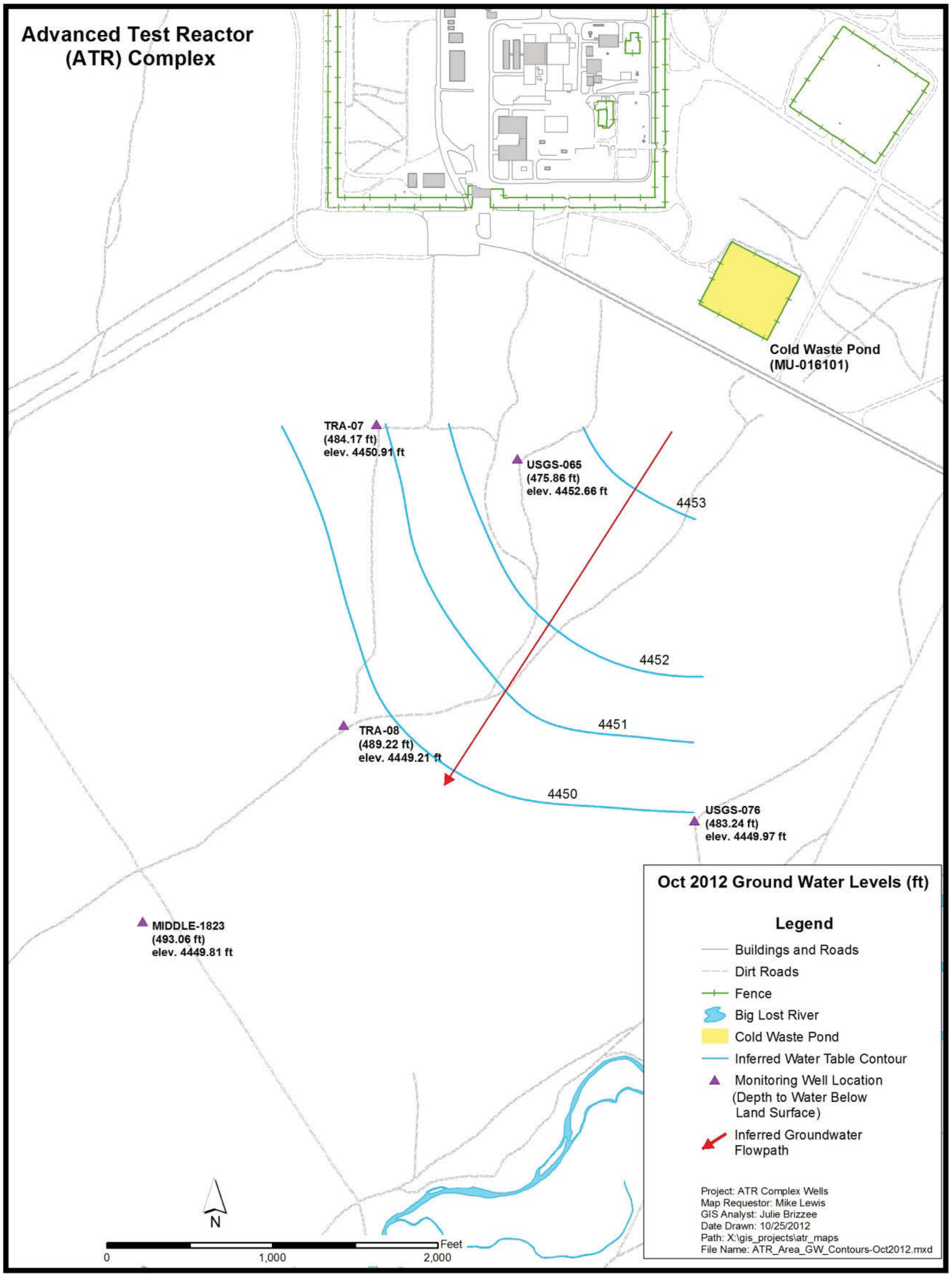

Figure 4. Groundwater contour map based on the October 2012 water level measurements.

5. PERMIT YEAR SUMMARIES

This section provides information and status associated with permit required compliance activities. Noncompliance issues are also addressed in this section.

5.1 Status of Permit Required Compliance Activity

Section E of the current ATR Complex IWRP identified one compliance activity (CA-161-01) and specified the completion date. This compliance activity, to submit a Plan of Operation, was reported as complete in the 2009 Annual Report.

5.2 Noncompliance Issues

The TRA-764 cold waste sample pit (WW-016101) flow integrator recorded artificially high effluent discharge from November 10, 2011 to November 14, 2011 as the result of a partially blocked weir.

On November 10, 2011, ATR Operations had a subcontractor (Roto Rooter) clean a cold wastewater service line from TRA-609 that discharges into the cold wastewater collection system. Unknown to ATR Operations at the time, the cleaning had dislodged a tree root mass large enough to subsequently become lodged in the weir used to measure effluent flow to the cold waste pond. The blocked weir was discovered during operator rounds on November 14, 2011. The root mass was removed by 2:50 p.m. the same day.

Due to the root mass blocking the weir, the weir water depth was artificially higher than it would be if the weir was not blocked. This resulted in artificially high effluent flows to the CWP being recorded.

Upon discovery of the blockage, ATR operations reviewed the effluent flow chart recorder data which showed a sudden flow increase beginning at approximately 3:50 p.m. on November 10, 2011. ATR operations estimated that the flow increase due to the weir blockage to be approximately 350 gallons per minute. Therefore, the respective log sheets have been annotated as necessary and adjusted downward to compensate for the 350 gallons per minute increase. Copies of the respective log sheets are enclosed in Appendix B.

Also, as a result of the blockage, the effluent values based on the integrator readings for the month of November 2011 and the annual total have been adjusted downward 2,192,448 gallons (see Table 2).

During a conference call (Griffin 2011), the DEQ was informed of the issue and that it would be documented in the 2012 annual report.

No other noncompliance issues were identified.

6. ENVIRONMENTAL IMPACTS

The IWRP allows 300 MG/year as a five-year annual average, not to exceed 375 MG annually. The total volume discharged to the CWP for this period (November 1, 2011, through October 31, 2012) was 183.26 MG. The average daily flow during the 2012 permit year was 500,720 gallons. No runoff occurred from the application area.

High effluent concentrations of TSS have the potential to reduce the infiltration capacity of the soil. Section F of the IWRP specifies a TSS effluent limit of 100 mg/L. All effluent monthly TSS concentrations were below the laboratory instrument detection limit of 4 mg/L (see Table 1). No negative impacts to the soil infiltration capacity from TSS loading are expected.

The IWRP effluent limit for TN is 20 mg/L. The monthly effluent TN concentrations were below the permit limit ranging from <0.965 mg/L to 3.199 mg/L (see Table 1). Nitrogen can be lost or removed from the soil by leaching, ammonia volatilization, and denitrification. Total nitrogen in the nearest down gradient well (USGS-065) from the CWP was <1.57 mg/L and <1.666 mg/L in the April and October

2012 samples, respectively (see Table 3). Although there is not a groundwater quality standard for TN, there is a standard for nitrate (10 mg/L) and nitrite (1 mg/L). The April and October 2012 USGS-065 nitrate sample results were 1.42 and 1.47, respectively. Both sample results were significantly less than their respective groundwater quality standards.

Sulfate and TDS concentrations (see Table 1) in the effluent have the potential to impact groundwater. Sulfate has high solubility and tends to move at a similar velocity as the groundwater (DEQ 2007). Sulfate concentrations in the 2012 permit year effluent monthly samples ranged from a low of 21.7 mg/L to a high of 431 mg/L. The TDS concentrations ranged from a low of 239 mg/L to a high of 912 mg/L. There are no IWRP effluent limits for sulfate and TDS. However, there are groundwater quality standards for these two parameters.

Monitoring well USGS-065 and TRA-07 are located southwest of the CWP. Both wells show similar elevated levels of sulfate and TDS in the April and October 2012 samples. The SCS for sulfate and TDS are 250 mg/L and 500 mg/L, respectively. Maximum sulfate concentrations in USGS-065 and TRA-07 were 163 mg/L and 160 mg/L, respectively. The maximum TDS concentration for well USGS-065 was 471 mg/L in the April 2012 sample. Well TRA-07 had a maximum TDS concentration of 468 mg/L in the April 2012 sample. The 2012 sulfate results were similar to the April and October 2011 sulfate concentrations in these wells. The maximum 2011 sulfate concentration in well USGS-065 was 162 mg/L and 158 mg/L in well TRA-07. The 2012 TDS concentrations are higher than the 2011 concentrations and approaching the SCS limits. The maximum 2011 TDS concentration in well USGS-065 was 439 mg/L and 444 mg/L in well TRA-07.

Elevated sulfate and TDS concentrations in the groundwater can be seen near the CWP, which quickly dissipates with distance from the pond. This can be seen when comparing the sulfate and TDS concentrations found in well USGS-065 and Middle-1823. Well Middle-1823, located approximately 4,000 ft down gradient from the CWP had a maximum 2012 sulfate and TDS concentration of 35.6 mg/L and 293 mg/L, respectively. Well USGS-065, located approximately 1,200 ft down gradient of the CWP had a maximum 2012 sulfate concentration of 163 mg/L and a TDS concentration of 471 mg/L. The concentrations of sulfate and TDS in well Middle-1823 are similar to the concentrations in the up/cross gradient well USGS-076 (Table 3).

As stated above, sulfate and TDS have SCSs for groundwater quality. The SCSs are generally based on aesthetic qualities including odor, taste, color, and foaming (EPA 1992). Sulfate is listed for causing a "salty taste" in drinking water. Total dissolved solids are listed for "hardness deposits, colored water, staining, and salty taste." The nearest drinking water well is located approximately three miles down gradient of the CWP. Since the higher level of contaminants remain, and are expected to continue to remain localized near the CWP and since they are regulated because of their aesthetic qualities, impacts to human health and the environment are expected to be minimal.

For the April and October 2012 groundwater sampling events, unfiltered sample results for Al in wells TRA-07 and TRA-08 were above their respective SCSs (Table 4). Unfiltered sample results for Fe were above the respective SCS in one October sample from well USGS-065 and in wells TRA-07 and TRA-08 in April and October. In addition, the Mn concentration in well TRA-08 was above the SCS in the April and October samples (Table 4). All filtered sample results for these parameters were well below the applicable SCSs.

Table 4. Comparison of 2012 results from unfiltered and filtered samples collected from wells TRA-07, TRA-08, and USGS-065.

WELL NAME	TRA-07 (GW-016103)		TRA-08 (GW-016105)		USGS-065 (GW-016102)		SCS[a]
Sample Date	04/09/12	10/09/12	04/18/12	10/08/12	04/12/12	10/08/12	
Aluminum (mg/L)	**1.910**[b] (0.0035 U)[c]	**0.637** (0.0015)	**12.300** (0.0531)	**7.480** (0.0141)	0.006 U[d] (0.0038 U)	0.0046 [0.0057][e] (0.0021) [(0.0024)]	0.2
Iron (mg/L)	**1.620** (0.050 U)	**0.571** (0.0586 U)	**4.960** (0.050 U)	**3.260** (0.0871)	0.155 (0.050 U)	**0.315** [0.293] (0.0639) [(0.0672)]	0.3
Manganese (mg/L)	0.0025 (0.025 U)	0.0086 (0.0025 U)	**0.191** (0.0025 U)	**0.0678** (0.0025 U)	0.0025 U (0.0025 U)	0.0025 U [0.0025 U] (0.0025 U) [(0.0025 U)]	0.05

a. Secondary constituent standards (SCS) in groundwater referenced in the Ground Water Quality Rule, IDAPA 58.01.11.200.01.b.
b. Concentrations shown in bold are above the Ground Water Quality Rule SCS.
c. Results shown in parentheses are from filtered samples and are used for permit compliance determination with SCS.
d. U flag indicates that the result was reported as below the instrument detection limit by the analytical laboratory.
e. Results shown in brackets are the results from field duplicate samples.

Concentrations of Al, Fe, and Mn in samples from the effluent that are discharged to the CWP indicate that discharges to the CWP are not expected to be the direct cause of the elevated Al, Fe, and Mn in wells TRA-07, TRA-08, and USGS-065. It is likely that the higher concentrations of these metals in TRA-07, TRA-08, and TRA-065 are due to suspended solids found within the well.

The October Fe result from well USGS-065 was the first time the concentration of this parameter was above the SCS. Information in the sampling logbook for well USGS-065 indicates there was more particulate matter observed in the October sample than in the April sample. Iron is a common element in the minerals in the basalt which comprises the major rock formation of the Eastern Snake River Plain aquifer. Aluminum and Mn remained at low levels in this well.

All three metals can have an impact on color of the water. At high concentrations, both iron and manganese can cause staining and a metallic taste. However, similar to the sulfate and TDS concentrations in the groundwater near the CWP, impacts to human health and the environment from concentrations of Al in wells TRA-07 and TRA-08, Fe in wells TRA-07, TRA-08, and USGS-065, and Mn in well TRA-08 are expected to be minimal.

There are positive impacts to the environment associated with the operation of the CWP. These include returning a significant portion of the industrial wastewater to the aquifer and providing needed water for several native animal species in an otherwise arid environment.

7. REFERENCES

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Appendix A

Daily Discharge Volumes to the Advanced Test Reactor Complex Cold Waste Pond

Appendix A

Daily Discharge Volumes to the Advanced Test Reactor Complex Cold Waste Pond

Table A-1. Daily discharge volumes to the ATR Complex CWP for the 2012 permit year.

Date	Daily Discharge Volume (gallons)
11/01/11	200,510
11/02/11	238,220
11/03/11	257,840
11/04/11	217,620
11/05/11	250,970
11/06/11	274,450
11/07/11	180,930
11/08/11	241,120
11/09/11	344,900
11/10/11	467,580[a]
11/11/11	404,050[a]
11/12/11	114,920[a]
11/13/11	271,560[a]
11/14/11	4,962[a.b]
11/15/11	240,010
11/16/11	271,460
11/17/11	249,410
11/18/11	202,820
11/19/11	248,140
11/20/11	237,930
11/21/11	241,030
11/22/11	242,560
11/23/11	253,200
11/24/11	252,090
11/25/11	245,040
11/26/11	438,020
11/27/11	418,580
11/28/11	526,740
11/29/11	417,850
11/30/11	480,130
12/01/11	442,490
12/02/11	478,000
12/03/11	425,270
12/04/11	479,470
12/05/11	397,580
12/06/11	432,110

Date	Daily Discharge Volume (gallons)
12/07/11	510,950
12/08/11	359,180
12/09/11	384,420
12/10/11	565,790
12/11/11	447,820
12/12/11	409,820
12/13/11	361,370
12/14/11	180,770
12/15/11	174,900
12/16/11	214,700
12/17/11	177,170
12/18/11	220,800
12/19/11	230,760
12/20/11	235,700
12/21/11	232,370
12/22/11	266,290
12/23/11	229,230
12/24/11	213,050
12/25/11	567,390
12/26/11	502,010
12/27/11	437,070
12/28/11	173,020
12/29/11	198,310
12/30/11	208,410
12/31/11	233,000
01/01/12	243,790
01/02/12	251,030
01/03/12	218,430
01/04/12	249,150
01/05/12	246,550
01/06/12	230,520
01/07/12	252,310
01/08/12	216,200
01/09/12	235,060
01/10/12	246,130
01/11/12	235,250
01/12/12	242,690

Date	Daily Discharge Volume (gallons)
01/13/12	225,890
01/14/12	238,370
01/15/12	245,210
01/16/12	248,760
01/17/12	246,210
01/18/12	241,290
01/19/12	265,250
01/20/12	206,400
01/21/12	236,320
01/22/12	249,880
01/23/12	254,880
01/24/12	218,170
01/25/12	257,350
01/26/12	256,940
01/27/12	226,660
01/28/12	207,580
01/29/12	258,760
01/30/12	233,930
01/31/12	232,090
02/01/12	244,260
02/02/12	239,970
02/03/12	212,200
02/04/12	246,300
02/05/12	233,400
02/06/12	236,110
02/07/12	235,730
02/08/12	245,930
02/09/12	270,380
02/10/12	340,430
02/11/12	355,620
02/12/12	493,230
02/13/12	433,480
02/14/12	518,530
02/15/12	467,630
02/16/12	475,320
02/17/12	526,170
02/18/12	419,270
02/19/12	548,640
02/20/12	411,180
02/21/12	496,590
02/22/12	491,740
02/23/12	435,160
02/24/12	580,680
02/25/12	324,000

Date	Daily Discharge Volume (gallons)
02/26/12	541,550
02/27/12	406,440
02/28/12	519,470
02/29/12	485,630
03/01/12	239,340
03/02/12	164,630
03/03/12	186,980
03/04/12	171,650
03/05/12	258,110
03/06/12	226,740
03/07/12	236,500
03/08/12	239,980
03/09/12	255,370
03/10/12	192,920
03/11/12	235,060
03/12/12	237,850
03/13/12	239,620
03/14/12	243,000
03/15/12	233,510
03/16/12	231,430
03/17/12	236,440
03/18/12	253,500
03/19/12	216,020
03/20/12	239,460
03/21/12	290,100
03/22/12	588,200
03/23/12	529,380
03/24/12	587,050
03/25/12	147,350
03/26/12	249,700
03/27/12	475,430
03/28/12	580,170
03/29/12	480,500
03/30/12	536,210
03/31/12	529,410
04/01/12	513,810
04/02/12	526,950
04/03/12	718,410
04/04/12	501,550
04/05/12	393,680
04/06/12	587,010
04/07/12	162,600
04/08/12	148,050
04/09/12	253,100

Date	Daily Discharge Volume (gallons)
04/10/12	239,470
04/11/12	258,520
04/12/12	212,390
04/13/12	228,370
04/14/12	241,860
04/15/12	212,400
04/16/12	262,510
04/17/12	231,600
04/18/12	251,000
04/19/12	228,780
04/20/12	251,400
04/21/12	244,520
04/22/12	287,180
04/23/12	198,830
04/24/12	242,970
04/25/12	248,710
04/26/12	270,210
04/27/12	287,110
04/28/12	182,730
04/29/12	263,070
04/30/12	194,800
05/01/12	259,200
05/02/12	259,710
05/03/12	284,960
05/04/12	269,060
05/05/12	589,620
05/06/12	644,420
05/07/12	661,240
05/08/12	637,290
05/09/12	448,950
05/10/12	575,820
05/11/12	607,820
05/12/12	617,230
05/13/12	731,540
05/14/12	513,670
05/15/12	416,300
05/16/12	575,760
05/17/12	537,420
05/18/12	477,520
05/19/12	504,140
05/20/12	642,240
05/21/12	480,200
05/22/12	624,700
05/23/12	676,070

Date	Daily Discharge Volume (gallons)
05/24/12	534,340
05/25/12	613,670
05/26/12	614,400
05/27/12	622,700
05/28/12	582,710
05/29/12	617,320
05/30/12	724,440
05/31/12	397,020
06/01/12	408,010
06/02/12	518,280
06/03/12	516,490
06/04/12	493,570
06/05/12	539,130
06/06/12	464,230
06/07/12	566,800
06/08/12	511,220
06/09/12	504,040
06/10/12	538,640
06/11/12	400,610
06/12/12	558,900
06/13/12	564,300
06/14/12	524,160
06/15/12	530,100
06/16/12	556,200
06/17/12	673,150
06/18/12	380,070
06/19/12	568,600
06/20/12	581,720
06/21/12	661,260
06/22/12	519,520
06/23/12	518,500
06/24/12	653,190
06/25/12	746,000
06/26/12	533,200
06/27/12	484,120
06/28/12	872,010
06/29/12	450,600
06/30/12	598,790
07/01/12	430,800
07/02/12	612,050
07/03/12	575,340
07/04/12	546,310
07/05/12	588,320
07/06/12	651,000

Date	Daily Discharge Volume (gallons)
07/07/12	664,000
07/08/12	687,190
07/09/12	706,130
07/10/12	539,750
07/11/12	701,010
07/12/12	641,840
07/13/12	589,320
07/14/12	707,290
07/15/12	614,770
07/16/12	467,630
07/17/12	613,680
07/18/12	624,930
07/19/12	475,320
07/20/12	515,300
07/21/12	534,780
07/22/12	644,660
07/23/12	456,740
07/24/12	477,930
07/25/12	568,120
07/26/12	664,610
07/27/12	393,090
07/28/12	564,200
07/29/12	467,100
07/30/12	707,230
07/31/12	410,930
08/01/12	566,790
08/02/12	567,600
08/03/12	485,790
08/04/12	526,680
08/05/12	572,740
08/06/12	671,000
08/07/12	455,130
08/08/12	698,540
08/09/12	469,040
08/10/12	560,530
08/11/12	554,780
08/12/12	521,250
08/13/12	620,620
08/14/12	605,270
08/15/12	797,440
08/16/12	834,250
08/17/12	815,080
08/18/12	834,500
08/19/12	878,810

Date	Daily Discharge Volume (gallons)
08/20/12	1,047,430
08/21/12	834,620
08/22/12	933,540
08/23/12	1,044,250
08/24/12	980,730
08/25/12	896,610
08/26/12	1,029,410
08/27/12	958,000
08/28/12	996,310
08/29/12	1,000,900
08/30/12	1,151,310
08/31/12	825,500
09/01/12	1,028,000
09/02/12	986,000
09/03/12	843,120
09/04/12	1,045,800
09/05/12	881,870
09/06/12	905,500
09/07/12	874,000
09/08/12	1,147,010
09/09/12	607,700
09/10/12	990,700
09/11/12	790,040
09/12/12	812,890
09/13/12	868,040
09/14/12	880,730
09/15/12	782,180
09/16/12	890,610
09/17/12	1,035,310
09/18/12	927,050
09/19/12	905,640
09/20/12	977,810
09/21/12	846,000
09/22/12	587,520
09/23/12	872,230
09/24/12	856,130
09/25/12	749,010
09/26/12	922,200
09/27/12	877,610
09/28/12	1,087,590
09/29/12	965,360
09/30/12	1,057,850
10/01/12	704,610
10/02/12	740,260

Date	Daily Discharge Volume (gallons)
10/03/12	1,122,600
10/04/12	673,620
10/05/12	997,410
10/06/12	739,080
10/07/12	822,080
10/08/12	811,630
10/09/12	802,450
10/10/12	884,850
10/11/12	1,043,570
10/12/12	726,700
10/13/12	901,220
10/14/12	752,340
10/15/12	795,730
10/16/12	690,020
10/17/12	874,810

Date	Daily Discharge Volume (gallons)
10/18/12	835,000
10/19/12	939,700
10/20/12	887,310
10/21/12	832,500
10/22/12	817,990
10/23/12	830,170
10/24/12	727,900
10/25/12	946,950
10/26/12	810,000
10/27/12	802,000
10/28/12	629,310
10/29/12	750,030
10/30/12	853,660
10/31/12	712,690

a. Estimated flow volume, see Appendix B for applicable daily log sheet.

b. The total daily flow is less than the normal flow and is likely due to the assumptions used to estimate the corrected flows and the variability in the time when operations personnel obtain the flow readings. However, as noted on the logsheet for November 14, 2011, the estimated average flow (in gpm) over the five-day period (November 10-14, 2011) was approximately 176 gpm, which was +/- 10 gpm of the instantaneous flow rates recorded the day before the weir became blocked by a root and after the root was removed (see Appendix B).

Appendix B

Daily Log Sheets Showing Estimated Flows for November 10, 2011 through November 14, 2011

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ATR PROGRAMS

ATR COMPLEX WASTE SYSTEMS DATA SHEET (1)

INTEGRATOR READINGS				
Take Integrator Readings 0700-1900 Daily	Cold Waste Total Flow (Gallons) (11)	Cold Waste Pumps Run Time (Hours)		
		No. 1	No. 2	No. 3
Todays Reading	58782963	32419.2	36125.5	7602.7
Previous Day	58716825	32419.2	36117.7	7597.9
Total	* 66,138 0	0	7.8	4.8

NON-CWP DATA REDACTED

* at 1530 on 11/10/11 a flow Blockage at the cold waste weir occurred due to a tree Root. flow went from approximately 170 GPM TO 550 GPM this Blockage occurred from 11/10/11 at 1530 to 11/14/11 at 1540. flow returned to approximately 170 GPM flow differential for 11/11/11 is ~~24~~ 10 hours 8.5 hours at 380 GPM for a total of ~~547,200~~ 193,800 flow ~~total~~ for the day would Be ~~114,180~~ gallons. 467,580

**

COLD WASTE SAMPLING STATION TRA-764		
Flow to Cold Waste Sump (gpm)	Building Temperature (3)	CW Sample (6)
	>45°F	Initial
545	68	
552		NA

NON-CWP DATA REDACTED

PF/LSRAO REVIEW (NOTE 2) MIDS: ______ DAYSHIFT: ______ ROTATING DAYS: ______

** Sheet corrected 12/17/12 to reflect Error made on original Sheets

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ATR PROGRAMS

ATR COMPLEX WASTE SYSTEMS DATA SHEET (1)

INTEGRATOR READINGS				
Take Integrator Readings 0700-1900 Daily	Cold Waste Total Flow (Gallons) (11)	Cold Waste Pumps Run Time (Hours)		
		No. 1	No. 2	No. 3
Todays Reading	58878888	32419 2	36132.8	7607.2
Previous Day	58782963	32419 2	36125.5	7402 7
Total	* 11-12-11 BHJ ~~859350~~ 985,250	0	7.3	4.5

NON-CWP DATA REDACTED

* at 1530 on 11/10/11 a flow Blockage occurred at the cold waste weir due to a Tree Root. flow went from approximately 350 170 GPM to 550 GPM. the Blockage occurred from 11/10/11 at 1530 until 11/14/11 at 1640 flow returned to approximately 170 GPM. flow differential for 11/12/11 is 24 hours at 380 GPM for a total of 547,200. flow total for 11/12/11 would Be 404,050 Gallons **

NON-CWP DATA REDACTED

COLD WASTE SAMPLING STATION TRA-764		
Flow to Cold Waste Sump (gpm)	Building Temperature (3)	CW Sample (6)
	>45°F	Initial
577	70	
568		NA

PF/LSRAO REVIEW (NOTE 2) MIDS: GJ DAYSHIFT: PAW ROTATING DAYS: PAW

** Sheet corrected 12/17/12 to reflect Error Made on original sheet

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ATR PROGRAMS

ATR COMPLEX WASTE SYSTEMS DATA SHEET (1)

INTEGRATOR READINGS				
Take Integrator Readings 0700-1900 Daily	Cold Waste Total Flow (Gallons) (11)	Cold Waste Pumps Run Time (Hours)		
		No. 1	No. 2	No. 3
Todays Reading	58944300	32419 2	36139 1	7610 8
Previous Day	58878088	32419 2	36132 8	7607 2
Total	* 66212 0	0	6 3	3 6

NON-CWP DATA REDACTED

* at 1530 on 11/10/11 a flow blockage occurred at the cold waste weir due to tree root. flow went from approximately 170 GPM to 550 GPM. the blockage occurred from 11/10/11 at 1530 to 11/14/11 at 1540. flow returned to approximately 170 GPM. flow differential for 11/13/11 12/17 is 24 hours at 380 GPM for a total of 547200 gallons. flow total for 11/13/11 would be 114920 Gallons

**

COLD WASTE SAMPLING STATION TRA-764		
Flow to Cold Waste Sump (gpm)	Building Temperature (3)	CW Sample (6)
	>45°F	Initial
570	66	
565		LL

NON-CWP DATA REDACTED

PF/LSRAO REVIEW (NOTE 2) MIDS: EL DAYSHIFT: ______ ROTATING DAYS: ______

** Sheet corrected 12/17/12 to reflect Error made on original Sheet

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ATR PROGRAMS

ATR COMPLEX WASTE SYSTEMS DATA SHEET (1)

INTEGRATOR READINGS				
Take Integrator Readings 0700-1900 Daily	Cold Waste Total Flow (Gallons) (11)	Cold Waste Pumps Run Time (Hours)		
		No. 1	No. 2	No. 3
Todays Reading	59036176	324192	36146.3	76154
Previous Day	58944300	324192	361391	76108
Total	* 81876 0	0	7.2	4.6

NON-CWP DATA REDACTED

* at 1530 on 11/10/11 a flow Blockage occurred at the cold waste weir due a tree Root. flow went from approximately 170GPM to 550GPM. the Blockage occurred from 11/10/11 at 1530 to 11/14/11 at 1540. when flow returned to approximately 170GPM. flow differential for 11/13 is ~~15.5~~ 24.0 hours at 380 GPM for a total of ~~357,200~~ ~~353,400~~ gallons. flow total for 11/14 should Be 547,200 8/12/12 ~~461,560 gallons~~ ~~710~~ 271,560 8/12/17 **

NON-CWP DATA REDACTED

COLD WASTE SAMPLING STATION TRA-764		
Flow to Cold Waste Sump (gpm)	Building Temperature (3)	CW Sample (6)
	>45°F	Initial
567	66	
560		N/A

PF/LSRAO REVIEW (NOTE 2) MIDS: RL DAYSHIFT: U ROTATING DAYS: U

** Sheet corrected 12/17/12 to reflect Error made on original Sheet

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Quality Level 3

ATR PROGRAMS

ATR COMPLEX WASTE SYSTEMS DATA SHEET (1)

INTEGRATOR READINGS				
Take Integrator Readings 0700-1900 Daily	Cold Waste Total Flow (Gallons) (11)	Cold Waste Pumps Run Time (Hours)		
		No. 1	No. 2	No. 3
Todays Reading	59062377	32419.2	36152.8	7619.6
Previous Day	59026176	32419.2	36146.3	765.4
Total	36201 0	0	6.5	4.2

NON-CWP DATA REDACTED

* at 1530 on 11/10/11 a flow Blockage occured at the cold waste wier due too tree root. flow went from approximately 170 GPM to 550GPM. the Blockage occured from 11/10/11 at 1530 to 11/14/11 at 1540 when flow returned to approx. 170GPM flow differential for 11/14/11 is 15.66 hours at 380GPM for a total of 357,048 gallons. flow total for 11/14/11 would be 4962 gallons. this corrected flow total results in a lower than normal flow likely due to the assumptions used to estimate a corrected flow and the variability in the time the operators collect the flow data each day. the five day (11/10-11/14) average of adjusted flow rates is approx. 176 GPM which is ±10GPM of the instantaneous flow recorded Before (167gpm on 11/10) and after (170gpm on 11/14) the Root Blockage.

COLD WASTE SAMPLING STATION TRA-764		
Flow to Cold Waste Sump (gpm)	Building Temperature (3)	CW Sample (6)
	>45°F	Initial
170	64	
170		NA

NON-CWP DATA REDACTED

PF/LSRAO REVIEW (NOTE 2) MIDS: RC DAYSHIFT: RCR ROTATING DAYS: KM

** Sheet corrected on 12/17/12 to reflected Errors made on original Sheet