INL/EXT-12-24337

2011 Annual Industrial Wastewater Reuse Report for the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Pond

February 2012

The INL is a U.S. Department of Energy National Laboratory
operated by Battelle Energy Alliance

INL/EXT-12-24337

2011 Annual Industrial Wastewater Reuse Report for the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Pond

February 2012

Idaho National Laboratory
Idaho Falls, Idaho 83415

http://www.inl.gov

Prepared for the
U.S. Department of Energy
Office of Nuclear Energy
Under DOE Idaho Operations Office
Contract DE-AC07-05ID14517

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, 2010 through October 31, 2011. 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 and other issues

Discussion of the facility's environmental impacts

During the 2011 permit year, approximately 166 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 were below the Ground Water Quality Rule Secondary Constituent Standards in the down gradient monitoring wells.

CONTENTS

ABSTRACT iii

ACRONYMS vii

1. INTRODUCTION 1

2. FACILITY, SYSTEM DESCRIPTION, AND OPERATION 1

3. COLD WASTE POND EFFLUENT MONITORING 3
   - 3.1 Sampling Program and Analytical Methods 3
   - 3.2 Effluent Monitoring Results 3
   - 3.3 Flow Volumes and Hydraulic Loading Rates 7
     - 3.3.1 Flow Meter Calibration 7

4. GROUNDWATER MONITORING 8
   - 4.1 Sampling Program 8
   - 4.2 Analytical Methods 8
   - 4.3 Monitoring Wells 8
   - 4.4 Groundwater Monitoring Results 10
   - 4.5 Water Table Information 10

5. PERMIT YEAR SUMMARIES 15
   - 5.1 Status of Permit Required Compliance Activity 15
   - 5.2 Noncompliance Issues 15
   - 5.3 Other Issues 15
     - 5.3.1 Incorrect Report Information 15

6. ENVIRONMENTAL IMPACTS 15

7. REFERENCES 19

Appendix A Daily Discharge Volumes to the Advanced Test Reactor Complex Cold Waste Pond 21

FIGURES

Figure 1. Advanced Test Reactor Complex Cold Waste system flow schematic. 2

Figure 2. Locations of the Advanced Test Reactor Complex Cold Waste Pond Industrial Wastewater Reuse Permit monitoring wells. 9

Figure 3. Groundwater contour map based on the April 2011 water level measurements. 13

Figure 4. Groundwater contour map based on the October 2011 water level measurements. 14

TABLES

Table 1. Advanced Test Reactor Complex Cold Waste Pond effluent data (WW-016101). 5

Table 2. Cold Waste Pond flow summaries. 7

Table 3. Advanced Test Reactor Complex Cold Waste Pond aquifer monitoring well unfiltered and filtered (values are in parentheses) data for the 2011 reporting year. 11

Table 4. Comparison of 2011 results from unfiltered and filtered (values are in parentheses) samples collected from wells TRA-07 and TRA-08. 17

Table A-1. Daily discharge volumes to the ATR Complex CWP for the 2011 permit year....................... 23

ACRONYMS

Al	Aluminum
ATR	Advanced Test Reactor
BEA	Battelle Energy Alliance, LLC
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

2011 Annual Industrial Wastewater Reuse Report for the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Pond

1. INTRODUCTION

The Advanced Test Reactor (ATR) Complex Cold Waste Pond (CWP) is an industrial wastewater reuse treatment facility operated by Battelle Energy Alliance, LLC (BEA) 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).

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 2011 permit year (beginning November 1, 2010 through October 31, 2011).

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 mi. 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 ¾ 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 July 20, 2011, the flow was switched from the south cell to the north cell.

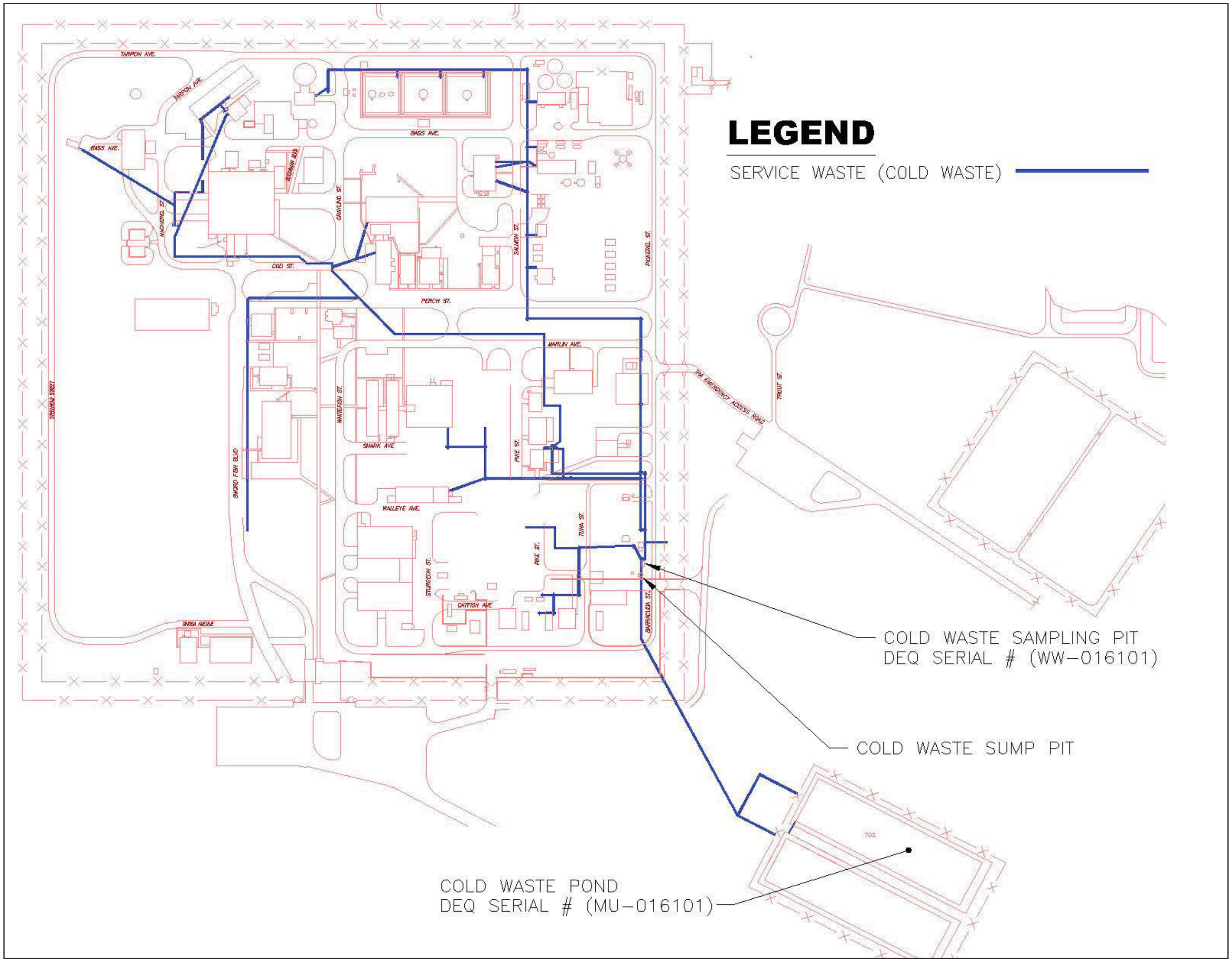

Figure 1. Advanced Test Reactor Complex Cold Waste system flow schematic.

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

Monitoring Services (MS) at the INL monitors 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 taken during a preselected week each month following a randomly generated sampling schedule to represent normal operating conditions. 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 from November 1, 2010, through October 31, 2011.

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 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 December at 3.366 mg/L (see Table 1) with a low of 1.051 mg/L in February. 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. 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. follows.

The TDS SCS is 500 mg/L. The concentration in the effluent to the CWP ranged from 241 mg/L in the February sample to 1,060 mg/L in the December sample (see Table 1). Concentrations of TDS in the effluent were above the SCS level in five 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 21.2 mg/L in the March sample to a maximum of 526 mg/L in the December 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	February	March	April	May	June	July[a]	August	September	October
Sample Date	11/09/10	12/07/10	01/04/11	02/08/11	03/22/11	04/19/11	05/24/11	06/09/11	07/26/11	08/17/11	09/08/11	10/06/11
Nitrite + nitrate as nitrogen (mg/L)	0.982	3.06	2.81	0.882	0.915	2.42	0.909	1.72	2.82 [2.82]	0.896	1.24	0.848
Total Kjeldahl nitrogen (mg/L)	0.416	0.306	0.467	0.169	0.239	0.451	0.156	0.315	0.354 [0.228]	0.187	0.25	0.227
Total nitrogen[b] (mg/L)	1.398	3.366	3.277	1.051	1.154	2.871	1.065	2.035	3.174 [3.048]	1.083	1.49	1.075
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)	330	1,060	968	241	243	847	272	642	956 [970]	282	411	296
Chloride (mg/L)	34.1	33.9	31	10.2	10.4	34.4	10.6	31.8	35.3 [35.5]	12.3	19	16
Electrical conductivity (µS/cm)	538	1,313	1,341	460	437	1,114	443	881	1,262	495	663	491
Arsenic (mg/L)	0.005 U	0.0057	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)	0.0499	0.145	0.145	0.0489	0.0482	0.150	0.0466	0.0882	0.132 [0.130]	0.0468	0.059	0.0467
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)	0.0042	0.0111	0.0101	0.0037	0.004	0.0101	0.0029	0.0051	0.0058 [0.0062]	0.0028	0.0044	0.0042
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)	0.0022	0.0043	0.0033	0.001 U	0.0015	0.0108	0.0018	0.0074	0.0053 [0.0053]	0.0013	0.0023	0.0032
Fluoride (mg/L)	0.131	0.491	0.456	0.179	0.191	0.401	0.183	0.314	0.421 [0.425]	0.207	0.246	0.195
Iron (mg/L)	0.109	0.169	0.165	0.025 U	0.0448	0.174	0.025 U	0.078	0.101 [0.101]	0.0555	0.0896	0.0943
Manganese (mg/L)	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0134	0.0025 U	0.0036	0.0028 [0.0027]	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)	0.0014	0.0043	0.0036	0.001	0.001	0.0031	0.0011	0.0022	0.0048 [0.0045]	0.0015	0.0019	0.0012

Sample Month	November	December	January	February	March	April	May	June	July[a]	August	September	October
Sample Date	11/09/10	12/07/10	01/04/11	02/08/11	03/22/11	04/19/11	05/24/11	06/09/11	07/26/11	08/17/11	09/08/11	10/06/11
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)	44.4	526	477	21.8	21.2	372	21.9	239	474 [470]	40.7	128	60.9

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 and nitrite + nitrate nitrogen.
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 2011 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 July 20, 2011, flow volume of 141,580 gallons (see Appendix A) is a combination of recorded flow and estimated flow due to a power outage to the flow meter and totalizer that lasted approximately 6 hours and 20 minutes (see Section 5.2 for additional information).

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 2010	445,918	162,700	780,000	13.38
December 2010	260,951	198,960	314,320	8.09
January 2011	536,468	201,230	761,840	16.63
February 2011	630,371	455,960	880,000	17.65
March 2011	697,686	538,320	954,430	21.63
April 2011	506,177	241,700	1,038,490	15.19
May 2011	482,937	240,410	872,010	14.97
June 2011	320,721	129,910	840,000	9.62
July 2011	270,799	132,500	840,000	8.39
August 2011	422,785	195,400	638,840	13.11
September 2011	630,259	359,510	846,670	18.91
October 2011	258,327	90,520	461,850	8.01
Yearly summary	453,620	90,520	1,038,490	165.57

a. gpd—gallons per day.

b. MG—million gallons.

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 453,620 gpd. Daily flow ranged from a low of 90,520 gpd and a high of 1,038,490 gpd for the permit year.

Total effluent flow volume was 165.57 MG for the 2011 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 June 6, 2011, by the

ATR Complex maintenance organization (work order #157142). The calibration was performed to +/- 2% of full scale.

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 2011 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 for SCS metals analyses were also collected.

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 SCS sample results will be used to demonstrate compliance with the IWRP.

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).

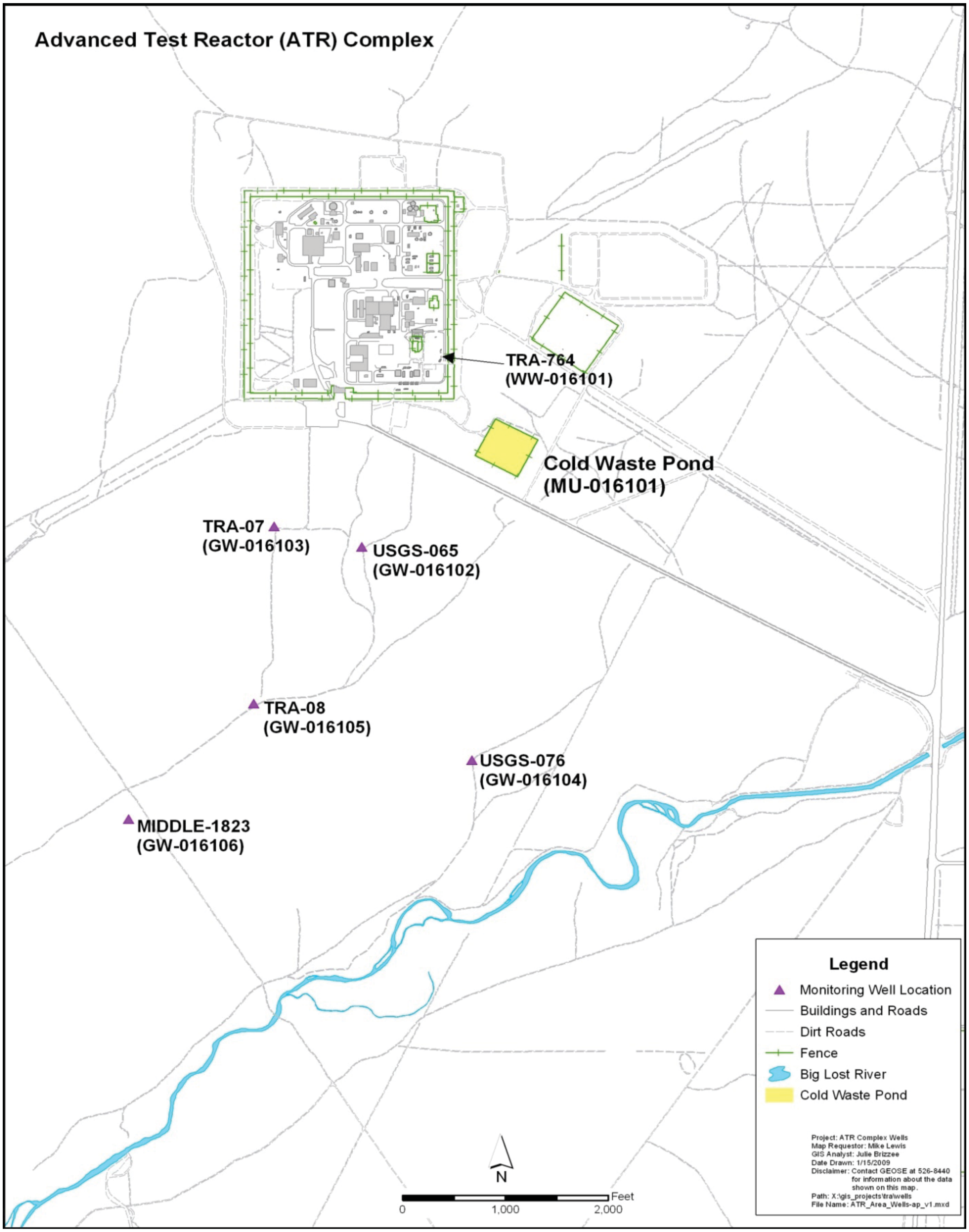

Figure 2. Locations of the Advanced Test Reactor Complex Cold Waste Pond Industrial Wastewater Reuse Permit monitoring wells.

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 2011, 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 2011 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. Samples were collected from all five wells in both April and October.

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 2011 reporting year for all wells associated with the ATR Complex CWP.

However, both aluminum (Al) and iron (Fe) were above their respective SCSs in the unfiltered samples collected from wells TRA-07 and TRA-08 during the April and October sampling events. 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 manganese in well TRA-07 was exceeded in the unfiltered October sample, but not in the April sample. This was similar to the 2010 April and October sample results for well TRA-07, where the unfiltered October sample result was above the SCS but the April sample result was below. The 2011 April and October unfiltered manganese results in TRA-08 were both below the SCS. The filtered sample results for manganese, used for determining permit compliance, in both wells were below the SCS.

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 2011 samples (see Table 3). The SCS for sulfate and TDS are 250 mg/L and 500 mg/L, respectively. Both the April and October 2011 sample results from these two wells were below the sulfate and TDS SCS limits. Sulfate and TDS concentrations in the two wells for April and October 2011 were similar to the April and October 2009 and 2010 sample results.

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 (values are in parentheses) data for the 2011 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	04/06/11	10/11/11	04/06/11	10/12/11	04/05/11	10/12/11	04/06/11	10/11/11	04/05/11	10/12/11	
Water Table Depth (ft below ground surface)	475.84	475.2	483.88	483.87	482.78	483.12	488.85	488.71	492.5	492.8	NA[b]
Water Table Elevation (above mean sea level in ft)[c]	4452.68	4453.32	4451.2	4451.21	4450.43	4450.09	4449.59	4449.73	4450.37	4450.07	NA
pH	8.1	8.13	8.18	7.97	8.05	7.94	8.03	8.1	8.08	8.02	6.5 to 8.5
Total Kjeldahl nitrogen (mg/L)	0.129	0.1 U[d]	0.141	0.253	0.147 [0.1 U][e]	0.117	0.114	0.235	0.142	0.191	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
Nitrate nitrogen (mg/L)	1.48	1.39	1.12	1.12	1.05 [1.05]	1.06	1.02	0.975	0.985	0.935	10
Total nitrogen[f] (mg/L)	1.634	1.465	1.286	1.398	1.222 [1.125]	1.202	1.159	1.235	1.152	1.151	NA
Total dissolved solids (mg/L)	439	423	444	432	274 [292]	266	289	284	272	263	500
Aluminum (mg/L)	0.0037 (0.0032)[g]	0.0082 (0.0037)	**0.527**[h] (0.0054)	**5.620** (0.0106)	0.0035 [0.0035] (0.0039) ([0.0033])	0.0044 (0.0046)	**1.910** (0.0178)	**4.270** (0.0183)	0.117 (0.0023)	0.102 (0.0027)	0.2
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
Arsenic (mg/L)	0.00061	0.0005 U	0.0006	0.0015	0.0017 [0.0013]	0.0014	0.0014	0.0013	0.0019	0.0014	0.05
Barium (mg/L)	0.0437	0.0438	0.0713	0.125	0.0693 [0.0692]	0.0676	0.0807	0.105	0.0614	0.0596	2
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
Chloride (mg/L)	19.4	18.7	20.1	21.5	13.7 [13.7]	14.8	11.7	12.3	11.6	12.1	250

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	04/06/11	10/11/11	04/06/11	10/12/11	04/05/11	10/12/11	04/06/11	10/11/11	04/05/11	10/12/11	
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	NA
Copper (mg/L)	0.0025 U	0.0025 U	0.0302	0.0240	0.0092 [0.0146]	0.0025 U	0.0205	0.0092	0.104	0.0025 U	1.3
Fluoride (mg/L)	0.242	0.217	0.236	0.210	0.16 [0.164]	0.179	0.219	0.200	0.162	0.173	4
Iron (mg/L)	0.050 U (0.050 U)	0.119 (0.0554)	**0.654** (0.0536)	**3.360** (0.050 U)	0.105 [0.134] (0.050 U) ([0.050 U])	0.050 U (0.050 U)	**1.110** (0.050 U)	**1.540** (0.050 U)	0.0946 (0.050 U)	0.050 U (0.050 U)	0.3
Manganese (mg/L)	0.0025 U (0.0025 U)	0.0025 U (0.0025 U)	0.0091 (0.006)	**0.0508** (0.0025 U)	0.0025 U [0.0025 U] (0.0025 U) ([0.0025 U])	0.0025 U (0.0025 U)	0.020 (0.0025 U)	0.0309 (0.0025 U)	0.0032 (0.0075)	0.0032 (0.0025 U)	0.05
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
Selenium (mg/L)	0.0016	0.0020	0.0011	0.0019	0.0012 [0.0012]	0.0014	0.00086	0.0013	0.0011	0.0014	0.05
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 (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
Sulfate (mg/L)	160	162	154	158	32.3 [32.7]	32.8	49.9	49.7	34.4	34.6	250

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. Values 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, half the detection limit for that parameter is used in the calculation.
g. Results shown in parentheses are from filtered samples used for comparison with the SCS.
h. Concentrations shown in bold are above the Ground Water Quality Rule SCS. Filtered sample results, shown in parentheses, are used for permit compliance determinations for these constituents and the results are below the SCS.

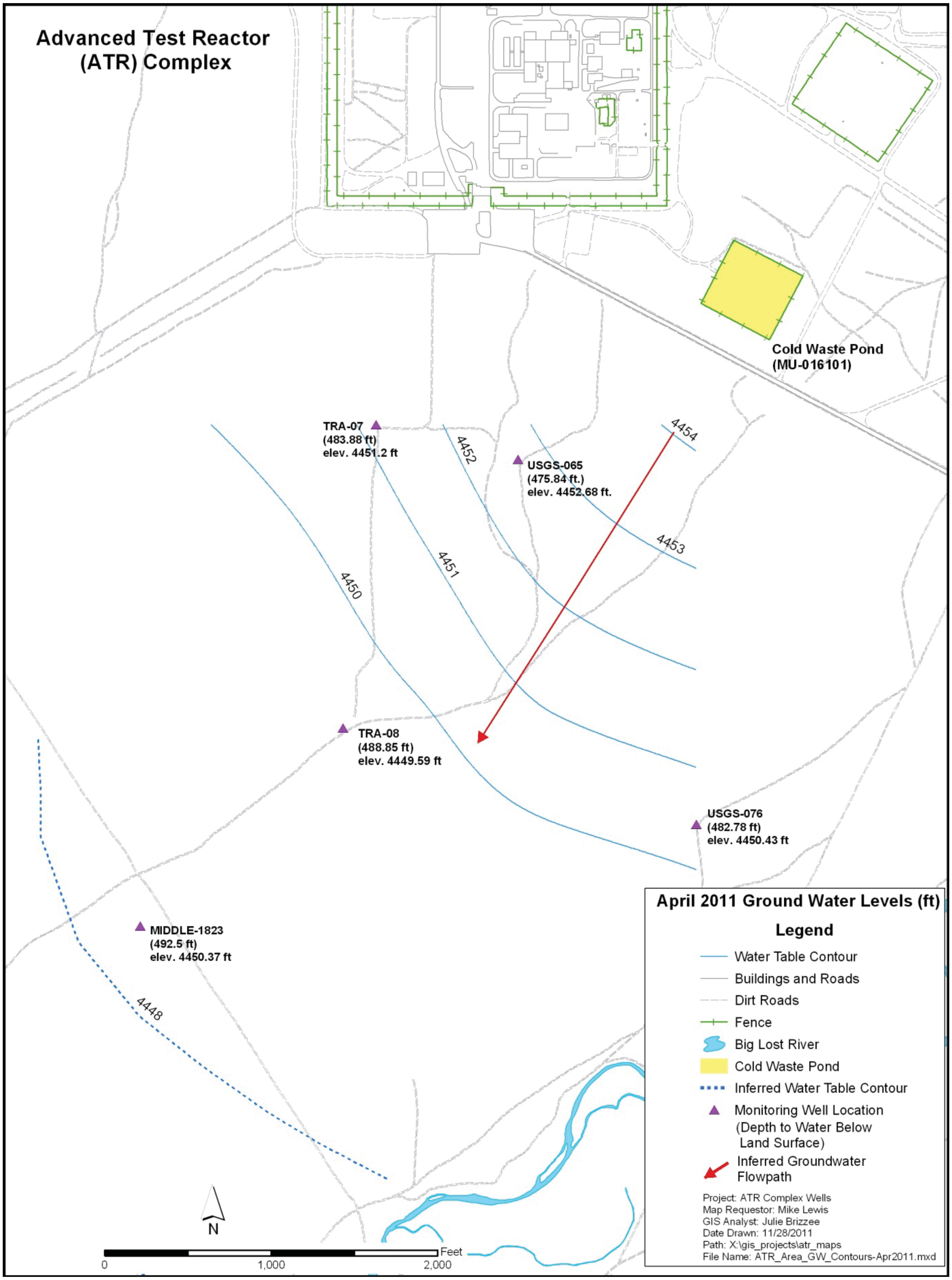

Figure 3. Groundwater contour map based on the April 2011 water level measurements.

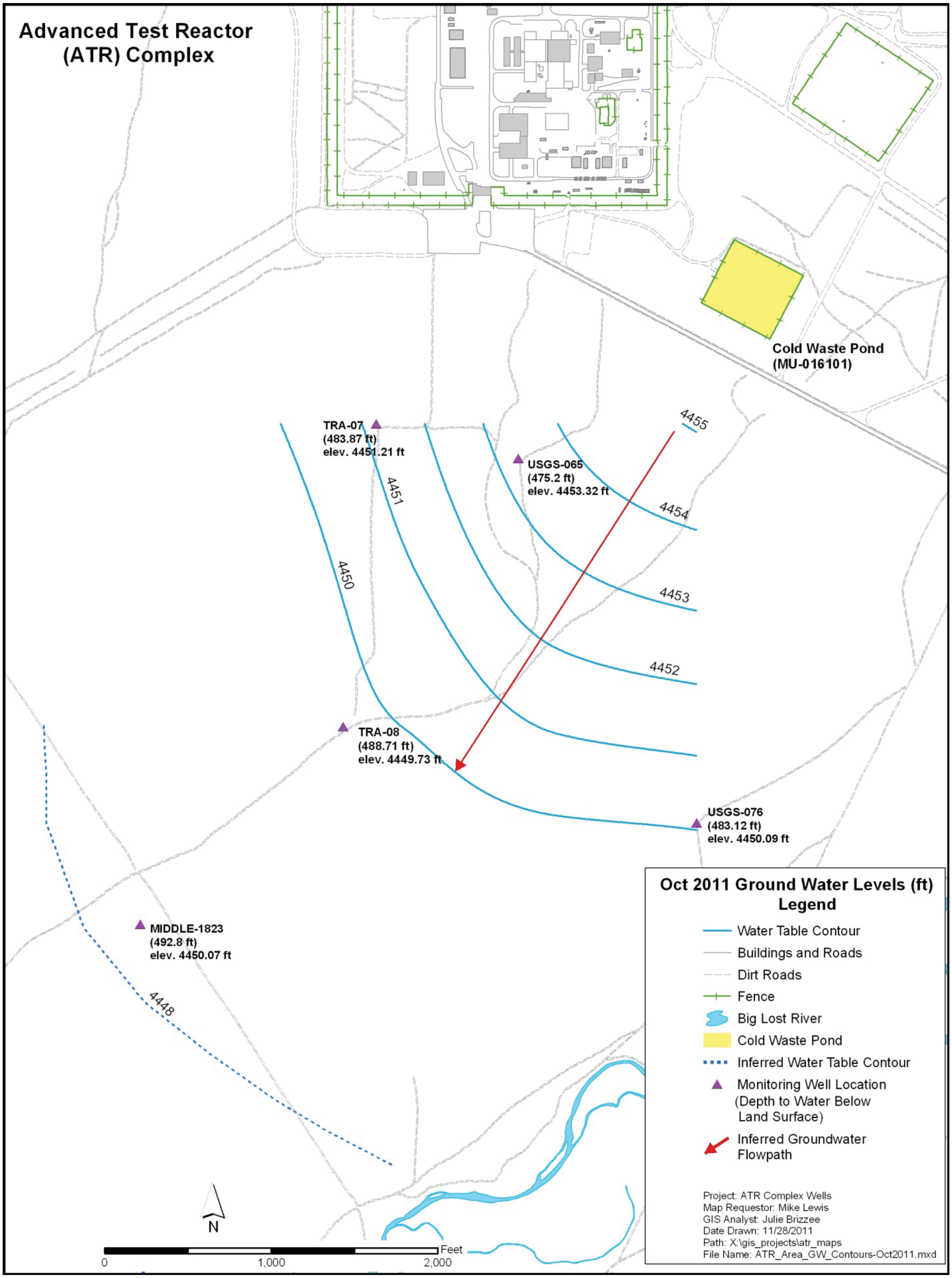

Figure 4. Groundwater contour map based on the October 2011 water level measurements.

5. PERMIT YEAR SUMMARIES

This section provides information and status associated with permit required compliance activities. Noncompliance issues are also addressed in this section. Section 5.3 identifies issues that were not considered noncompliances but were not typical operational or reporting events.

5.1 Status of Permit Required Compliance Activity

Section E of the current ATR Complex IWRP identified one compliance activity and specified the completion date. This compliance activity was reported as complete in the 2009 Annual Report.

5.2 Noncompliance Issues

Decommissioning and demolition activities were being performed that required replacement of affected electrical systems providing power to the ATR Complex CWP system. As a result, a power outage occurred that resulted in the flow totalizer being without power for a period of approximately 6 hours and 20 minutes. Due to the outage, the flow for July 20, 2011, is an estimated value. Flow rate before the outage was 85 gpm and 79 gpm after the outage. The flow rate of 85 gpm was used to calculate the volume during the outage and resulted in an estimated volume of 32,300 gallons (380 minutes x 85 gpm). Adding the estimated volume to the recorded volume gave a total daily volume of 141,580 gallons.

Because of potential noncompliance issues as a result of the decommissioning and demolition activities, a 30-day notice pursuant to the IWRP standard permit condition, Section I.7.b, was submitted (Stenzel 2011). No other noncompliance issues, other than estimating the flow volume were identified.

In accordance with the August 4, 2010, DEQ letter (Rackow 2010a), a copy of the daily log sheet is included at the end of Appendix A daily flow readings. The log sheet identifies the approach for estimating the flow volume.

5.3 Other Issues

This section discusses other issues for the ATR Complex Cold Waste system that occurred during the permit year. There was only one issue identified for the 2011 permit year.

5.3.1 Incorrect Report Information

A project to deepen aquifer monitoring well TRA-08 (GW-016105) was completed on April 21, 2010. Information concerning this project was reported in the 2010 Annual Report and included a diagram of the modified well. The well diagram was provided to BEA by another contractor. On May 10, 2011, BEA received the transmittal of the contractor's Water Use and Comprehensive Well Inventory Information, which included a revised well diagram for well TRA-08. BEA identified minor changes in the revised well diagram from the one previously provided in the 2010 Annual Report.

In accordance with Section I.7.e of the IWRP for reporting incorrect information found in a report, a letter identifying the corrected information and providing a copy of the revised well diagram was submitted to the DEQ on May 23, 2011 (Stenzel 2011a).

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, 2010, through October 31, 2011) was 165.57 MG. The average daily flow during the 2011 permit year was 453,620 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 1.051 mg/L to 3.366 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 1.634 mg/L and 1.415 mg/L in the April and October 2011 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 2011 nitrate sample results were slightly higher than the October 2011 results from well USGS-065. The April 2011 sample results from well USGS-065 had a nitrate concentration of 1.48 mg/L and a nitrite concentration of less than 0.05 mg/L (undetected). Both 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 2011 permit year effluent monthly samples ranged from a low of 21.2 mg/L to a high of 526 mg/L. The TDS concentrations ranged from a low of 241 mg/L to a high of 1,060 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 2011 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 162 mg/L and 158 mg/L, respectively. The maximum TDS concentration for well USGS-065 was 439 mg/L in the April 2011 sample. Well TRA-07 had a maximum TDS concentration of 444 mg/L in the April 2011 sample. The 2011 sulfate and TDS results were similar to the April and October 2010 sulfate and TDS concentrations in these wells. The maximum 2010 sulfate concentration in well USGS-065 was 160 mg/L and 155 mg/L in well TRA-07. The maximum 2010 TDS concentration in well USGS-065 was 437 mg/L and 443 mg/L in well TRA-07. When compared with the 2009 and 2010 sample results for wells USGS-065 and TRA-07, it appears the sulfate and TDS concentrations have stabilized, at least temporarily.

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 2011 sulfate and TDS concentration of 34.6 mg/L and 272 mg/L, respectively. Well USGS-065, located approximately 1,200 ft down gradient of the CWP had a maximum 2011 sulfate concentration of 162 mg/L and a TDS concentration of 439 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.

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.

The April and October 2011 unfiltered sample results for Al and Fe in wells TRA-07 and TRA-08 were above their respective SCSs, whereas, the filtered (used for permit compliance) sample results for these two metals were all below the SCS (see Table 4). The unfiltered October manganese result for well

TRA-07 was slightly above the SCS. All other April and October filtered and unfiltered manganese sample results for wells TRA-07 and TRA-08 were below the SCS.

Table 4. Comparison of 2011 results from unfiltered and filtered (values are in parentheses) samples collected from wells TRA-07 and TRA-08.

WELL NAME	TRA-07 (GW-016103)		TRA-08 (GW-016105)		SCS[a]
Sample Date	04/06/11	10/12/11	04/06/11	10/11/11	
Aluminum (mg/L)	**0.527**[b]	**5.620**	**1.910**	**4.270**	0.2
	(0.0054)[c]	(0.0106)	(0.0178)	(0.0183)	
Iron (mg/L)	**0.654**	**3.360**	**1.110**	**1.540**	0.3
	(0.0536)	(0.050 U[d])	(0.050 U)	(0.050 U)	
Manganese (mg/L)	0.0091	**0.0508**	0.020	0.0309	0.05
	(0.006)	(0.0025 U)	(0.0025 U)	(0.0025 U)	

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.

Concentrations of Al, Fe, and Mn in samples from the effluent to the CWP and from well USGS-065 indicate that discharges to the CWP are not expected to be the direct cause of the high Al, Fe, and Mn in wells TRA-07 and TRA-08. It is likely that the higher concentrations of these metals in wells TRA-07 and TRA-08 are due to suspended solids found within the well. The high levels of metals appear to be confined to wells TRA-07 and TRA-08 since the concentrations of these metals in the other two down gradient wells (USGS-065 and Middle-1823) were at low levels or below the laboratory instrument detection limits (see Table 3).

All three metals have an impact on color of the water. Both iron and manganese cause staining and also cause the water to have 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, Fe, and Mn in wells TRA-07 and 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

40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 141, "National Primary Drinking Water Regulations," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 143, "National Secondary Drinking Water Regulations," *Code of Federal Regulations*, Office of the Federal Register.

DEQ, 2007, *Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater*, Idaho Department of Environmental Quality, September 2007.

Eager, G., P.E., DEQ, to W. F. Hamel, DOE-ID, August 20, 2008, "Minor Modification "B", Facility Name Change from Reactor Technology Complex (RTC) to Advanced Test Reactor Complex (ATR Complex), Cold Waste Pond, Wastewater Reuse Permit No. LA-000161-01," CCN 214687.

Environmental Protection Agency, 1992, *Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals*, EPA 810/K-92-001.

IDAPA 58.01.11, "Ground Water Quality Rule."

Johnston, J., DEQ, to W. F. Hamel, DOE-ID, February 26, 2008, "Reactor Technology Complex (RTC) Cold Waste Pond, Wastewater Reuse Permit No. LA-000161-01 (Industrial Wastewater)," CCN 212842.

Rackow, T., P.E., DEQ, to J. A. Stenzel, INL, January 29, 2010, "LA-000161-01 ATR Cold Waste Pond Permit Modification Request", CCN 219974.

Rackow, T., P.E., DEQ, to T. L. Carlson, INL, August 4, 2010a, "Clarification of Flow Reporting Requirements, Wastewater Reuse Permits: LA-000161-01, INL ATR Complex Cold Waste Pond, Issued February 26, 2008, LA-000141-03, INL CFA Sewage Treatment Plant, Issued March 17, 2010, and LA-000160-01, INL MFC Industrial Waste Pond, Effective May 1, 2010," CCN 221858.

Rackow, T., P.E., DEQ, to J. A. Stenzel, INL, June 10, 2011a, "LA-000161-01 INL ATR Cold Waste Ponds, 2010 Annual Report Review", CCN 224459.

Rackow, T., P.E., DEQ, to J. A. Stenzel, INL, August 12, 2011b, "LA-000161-01 INL ATR, 2011 Wastewater Reuse Inspection", CCN 225075.

Stenzel, J. A., INL, to G. Eager, P.E., DEQ, October 8, 2009, "Request to Use Dissolved Concentrations of Secondary Constituents for Compliance Groundwater Monitoring," CCN 218748.

Stenzel, J. A., INL, to T. Rackow, P.E., DEQ, March 3, 2011, "Thirty-Day Notice for Industrial Wastewater Reuse Permit No. LA-000161-01, Minor Modification B-Advanced Test Reactor Complex Cold Waste Pond," CCN 223487.

Stenzel, J. A., INL, to G. Eager, P.E., DEQ and R. Huddleston, P.E., DEQ, May 23, 2011a, "Revised Well TRA-08 Construction Information for the 2010 Annual Industrial Wastewater Reuse Report for the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Pond," CCN 224211.

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 2011 permit year.

Date	Daily Discharge Volume (gallons)
11/01/2010	760,000
11/02/2010	534,700
11/03/2010	566,100
11/04/2010	633,670
11/05/2010	668,770
11/06/2010	566,140
11/07/2010	640,000
11/08/2010	516,700
11/09/2010	601,470
11/10/2010	602,380
11/11/2010	692,280
11/12/2010	608,970
11/13/2010	528,300
11/14/2010	780,000
11/15/2010	453,050
11/16/2010	635,000
11/17/2010	323,480
11/18/2010	188,920
11/19/2010	176,550
11/20/2010	280,450
11/21/2010	238,460
11/22/2010	316,890
11/23/2010	234,610
11/24/2010	278,700
11/25/2010	296,120
11/26/2010	334,500
11/27/2010	162,700
11/28/2010	221,700
11/29/2010	235,920
11/30/2010	301,000
12/01/2010	230,650
12/02/2010	261,620
12/03/2010	288,910

Date	Daily Discharge Volume (gallons)
12/04/2010	255,240
12/05/2010	218,300
12/06/2010	262,650
12/07/2010	302,000
12/08/2010	213,000
12/09/2010	291,770
12/10/2010	236,300
12/11/2010	309,740
12/12/2010	198,960
12/13/2010	261,920
12/14/2010	314,320
12/15/2010	244,320
12/16/2010	261,660
12/17/2010	259,530
12/18/2010	257,400
12/19/2010	312,000
12/20/2010	250,340
12/21/2010	238,190
12/22/2010	273,750
12/23/2010	266,460
12/24/2010	271,700
12/25/2010	250,540
12/26/2010	266,410
12/27/2010	274,180
12/28/2010	259,860
12/29/2010	240,410
12/30/2010	242,100
12/31/2010	275,240
01/01/2011	257,610
01/02/2011	304,900
01/03/2011	201,230
01/04/2011	293,000
01/05/2011	217,290

Date	Daily Discharge Volume (gallons)
01/06/2011	262,060
01/07/2011	253,550
01/08/2011	622,450
01/09/2011	581,770
01/10/2011	761,840
01/11/2011	579,070
01/12/2011	469,710
01/13/2011	628,240
01/14/2011	573,030
01/15/2011	665,540
01/16/2011	559,110
01/17/2011	633,930
01/18/2011	612,450
01/19/2011	584,510
01/20/2011	685,990
01/21/2011	611,990
01/22/2011	609,190
01/23/2011	525,810
01/24/2011	596,240
01/25/2011	713,000
01/26/2011	591,300
01/27/2011	578,520
01/28/2011	614,990
01/29/2011	661,020
01/30/2011	691,170
01/31/2011	690,000
02/01/2011	591,000
02/02/2011	530,520
02/03/2011	554,000
02/04/2011	596,730
02/05/2011	674,540
02/06/2011	544,850
02/07/2011	666,000
02/08/2011	485,500
02/09/2011	608,450
02/10/2011	582,160
02/11/2011	585,710
02/12/2011	710,130
02/13/2011	456,190

Date	Daily Discharge Volume (gallons)
02/14/2011	724,120
02/15/2011	518,210
02/16/2011	571,810
02/17/2011	746,200
02/18/2011	455,960
02/19/2011	629,410
02/20/2011	562,700
02/21/2011	586,010
02/22/2011	661,660
02/23/2011	670,000
02/24/2011	758,840
02/25/2011	818,600
02/26/2011	620,070
02/27/2011	861,020
02/28/2011	880,000
03/01/2011	739,700
03/02/2011	638,000
03/03/2011	697,910
03/04/2011	640,600
03/05/2011	888,010
03/06/2011	670,280
03/07/2011	760,000
03/08/2011	547,000
03/09/2011	631,000
03/10/2011	641,630
03/11/2011	672,960
03/12/2011	650,750
03/13/2011	840,000
03/14/2011	538,320
03/15/2011	695,830
03/16/2011	659,050
03/17/2011	678,700
03/18/2011	658,440
03/19/2011	686,500
03/20/2011	735,000
03/21/2011	637,920
03/22/2011	662,010
03/23/2011	651,570
03/24/2011	694,230

Date	Daily Discharge Volume (gallons)
03/25/2011	601,010
03/26/2011	743,580
03/27/2011	827,000
03/28/2011	544,710
03/29/2011	810,000
03/30/2011	832,140
03/31/2011	954,430
04/01/2011	1,038,490
04/02/2011	605,340
04/03/2011	674,070
04/04/2011	692,310
04/05/2011	850,700
04/06/2011	600,080
04/07/2011	623,500
04/08/2011	645,530
04/09/2011	756,000
04/10/2011	722,470
04/11/2011	820,000
04/12/2011	630,080
04/13/2011	685,950
04/14/2011	467,210
04/15/2011	295,600
04/16/2011	267,760
04/17/2011	360,000
04/18/2011	241,700
04/19/2011	352,710
04/20/2011	353,350
04/21/2011	422,180
04/22/2011	279,860
04/23/2011	410,140
04/24/2011	330,000
04/25/2011	286,340
04/26/2011	365,430
04/27/2011	339,150
04/28/2011	349,030
04/29/2011	347,830
04/30/2011	372,510
05/01/2011	340,500
05/02/2011	409,000

Date	Daily Discharge Volume (gallons)
05/03/2011	284,300
05/04/2011	353,800
05/05/2011	356,700
05/06/2011	348,000
05/07/2011	355,080
05/08/2011	358,220
05/09/2011	411,800
05/10/2011	283,030
05/11/2011	358,300
05/12/2011	367,450
05/13/2011	370,100
05/14/2011	323,690
05/15/2011	450,000
05/16/2011	268,520
05/17/2011	333,050
05/18/2011	355,320
05/19/2011	413,200
05/20/2011	240,410
05/21/2011	824,610
05/22/2011	872,010
05/23/2011	850,000
05/24/2011	617,830
05/25/2011	593,210
05/26/2011	748,310
05/27/2011	632,160
05/28/2011	796,650
05/29/2011	732,730
05/30/2011	740,000
05/31/2011	583,070
06/01/2011	784,660
06/02/2011	741,800
06/03/2011	747,790
06/04/2011	573,700
06/05/2011	840,000
06/06/2011	360,910
06/07/2011	129,910
06/08/2011	160,890
06/09/2011	224,030
06/10/2011	230,140

Date	Daily Discharge Volume (gallons)
06/11/2011	235,790
06/12/2011	290,000
06/13/2011	200,960
06/14/2011	239,190
06/15/2011	252,530
06/16/2011	265,250
06/17/2011	257,600
06/18/2011	218,800
06/19/2011	211,070
06/20/2011	270,000
06/21/2011	196,430
06/22/2011	244,100
06/23/2011	244,110
06/24/2011	283,000
06/25/2011	258,840
06/26/2011	250,000
06/27/2011	180,500
06/28/2011	243,230
06/29/2011	269,520
06/30/2011	216,890
07/01/2011	236,000
07/02/2011	241,810
07/03/2011	246,430
07/04/2011	254,240
07/05/2011	227,600
07/06/2011	237,150
07/07/2011	237,340
07/08/2011	243,000
07/09/2011	240,970
07/10/2011	250,930
07/11/2011	251,110
07/12/2011	271,460
07/13/2011	270,000
07/14/2011	216,760
07/15/2011	227,260
07/16/2011	339,060
07/17/2011	210,000
07/18/2011	259,080
07/19/2011	132,500

Date	Daily Discharge Volume (gallons)
07/20/2011	141,580[a]
07/21/2011	246,290
07/22/2011	206,800
07/23/2011	234,400
07/24/2011	233,910
07/25/2011	231,490
07/26/2011	244,220
07/27/2011	273,810
07/28/2011	253,860
07/29/2011	219,010
07/30/2011	676,700
07/31/2011	840,000
08/01/2011	429,890
08/02/2011	560,140
08/03/2011	536,500
08/04/2011	562,010
08/05/2011	571,300
08/06/2011	559,400
08/07/2011	482,870
08/08/2011	519,010
08/09/2011	609,370
08/10/2011	419,220
08/11/2011	638,840
08/12/2011	381,680
08/13/2011	547,100
08/14/2011	479,910
08/15/2011	550,130
08/16/2011	634,000
08/17/2011	436,040
08/18/2011	464,900
08/19/2011	443,750
08/20/2011	195,400
08/21/2011	223,370
08/22/2011	254,880
08/23/2011	255,130
08/24/2011	269,680
08/25/2011	301,240
08/26/2011	287,460
08/27/2011	267,270

Date	Daily Discharge Volume (gallons)
08/28/2011	282,470
08/29/2011	297,500
08/30/2011	340,000
08/31/2011	305,870
09/01/2011	727,880
09/02/2011	667,050
09/03/2011	612,160
09/04/2011	771,170
09/05/2011	643,130
09/06/2011	637,600
09/07/2011	708,680
09/08/2011	846,670
09/09/2011	515,430
09/10/2011	737,580
09/11/2011	581,810
09/12/2011	823,710
09/13/2011	587,830
09/14/2011	573,770
09/15/2011	710,430
09/16/2011	605,010
09/17/2011	841,310
09/18/2011	670,000
09/19/2011	501,390
09/20/2011	659,100
09/21/2011	678,170
09/22/2011	631,570
09/23/2011	561,440
09/24/2011	575,410
09/25/2011	555,510
09/26/2011	619,200
09/27/2011	550,620
09/28/2011	532,270
09/29/2011	359,510

a. Estimated flow volume, see Section 5.2.

Date	Daily Discharge Volume (gallons)
09/30/2011	422,360
10/01/2011	317,850
10/02/2011	294,840
10/03/2011	293,240
10/04/2011	263,230
10/05/2011	403,200
10/06/2011	381,960
10/07/2011	354,380
10/08/2011	329,400
10/09/2011	382,710
10/10/2011	324,020
10/11/2011	397,900
10/12/2011	307,500
10/13/2011	461,850
10/14/2011	290,990
10/15/2011	129,750
10/16/2011	90,520
10/17/2011	134,240
10/18/2011	118,940
10/19/2011	166,510
10/20/2011	199,410
10/21/2011	194,160
10/22/2011	178,620
10/23/2011	161,510
10/24/2011	186,020
10/25/2011	179,800
10/26/2011	216,620
10/27/2011	244,280
10/28/2011	237,000
10/29/2011	246,000
10/30/2011	237,670
10/31/2011	284,020

See Reverse Side For Instructions
Date: 7-20-11 / 7-21-11
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)	Cold Waste Pumps Run Time (Hours)		
		No. 1	No. 2	No. 3
Todays Reading	54127896 *	32416.6	34991.7	6610.8
Previous Day	54116968	32416.6	34987.8	6607.5
Total	10928 0	0	13.9	3.3

NON-CWP DATA REDACTED

* power secured to flow totalizer for 6 hours 20 minutes for D&D activities. flow 85 gal/min when secured 79 gal/min when flow restored. used 85 gal/min for a total of 32,300 gal of flow not recorded. flow total ~~43,228.~~ [initials] 141,580 11/17 [signature] 7/21/11

COLD WASTE SAMPLING STATION TRA-764		
Flow to Cold Waste Sump (gpm)	Building Temperature (3)	CW Sample (6)
	>45°F	Initial
88	✓	
129		N/A

NON-CWP DATA REDACTED

PF/LSRAO REVIEW (NOTE 2) MIDS: [initials] DAYSHIFT: [initials] ROTATING DAYS: [initials]