

# **2011 Annual Wastewater Reuse Report for the Idaho National Laboratory Site's Central Facilities Area Sewage Treatment Plant**

February 2012



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# **2011 Annual Wastewater Reuse Report for the Idaho National Laboratory Site's Central Facilities Area Sewage Treatment Plant**

February 2012

**Idaho National Laboratory  
Idaho Falls, Idaho 83415**

**<http://www.inl.gov>**

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## **ABSTRACT**

This report describes conditions, as required by the state of Idaho Wastewater Reuse Permit (#LA-000141-03), for the wastewater land application site at Idaho National Laboratory Site's Central Facilities Area Sewage Treatment Plant from November 1, 2010, through October 31, 2011. The report contains the following information:

- Site description
- Facility and system description
- Permit required monitoring data and loading rates
- Status of compliance conditions and activities
- Discussion of the facility's environmental impacts.

During the 2011 permit year, approximately 1.22 million gallons of treated wastewater was land-applied to the irrigation area of the Central Facilities Area Sewage Treatment Plant.



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## ACRONYMS

CFA	Central Facilities Area
CFR	Code of Federal Regulations
CES	Cascade Earth Sciences, Ltd.
COD	chemical oxygen demand
DEQ	Idaho Department of Environmental Quality
gpd	gallons per day
INL	Idaho National Laboratory
MS	Monitoring Services
STP	Sewage Treatment Plant
SwRI	Southwest Research Institute
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TN	total nitrogen
WRP	Wastewater Reuse Permit



# **2011 Annual Wastewater Reuse Report for the Idaho National Laboratory Site's Central Facilities Area Sewage Treatment Plant**

## **1. INTRODUCTION**

The Central Facilities Area (CFA) Sewage Treatment Plant (STP) is a wastewater land application facility operated by Battelle Energy Alliance, LLC, under Wastewater Reuse Permit (WRP) LA-000141-03 issued by the State of Idaho, Department of Environmental Quality (DEQ). The permit was re-issued on March 17, 2010 and expires on March 16, 2015 (Neher 2010). This report covers the reporting year of November 1, 2010, through October 31, 2011.

Following a description of the STP site, facility, and system, this report presents the status of monitoring data, special compliance conditions, noncompliances, and environmental impacts that occurred at the CFA STP during the 2011 reporting year.

## **2. SITE, FACILITY, AND SYSTEM DESCRIPTION**

The STP is located approximately five miles north of the Idaho National Laboratory (INL) Site's southern boundary and southeast of the Central Facilities Area (CFA), which is about 50 miles west of Idaho Falls in Butte County, Idaho (see Figure 1). The STP is approximately 2,200 ft downgradient of the nearest drinking water well and 4,000 ft north of Highway 26. The wastewater land application area is approximately 2,200 ft from the nearest inhabited building.

As shown in Figure 1, the STP consists of a:

- 1.7-acre partial-mix, aerated lagoon (Lagoon No. 1)
- 10.3-acre facultative lagoon (Lagoon No. 2)
- 0.5-acre polishing pond (Lagoon No. 3)
- 73.5 acre wastewater land application area consisting of desert steppe and crested wheatgrass vegetative communities
- Computerized center-pivot, sprinkler irrigation system.

A 350-gpm (gallon per minute) pump moves wastewater from the lagoons to the center-pivot sprinkler system, which waters the land application area at low pressures (about 30 lbs/in<sup>2</sup>) to minimize aerosols and spray drift.

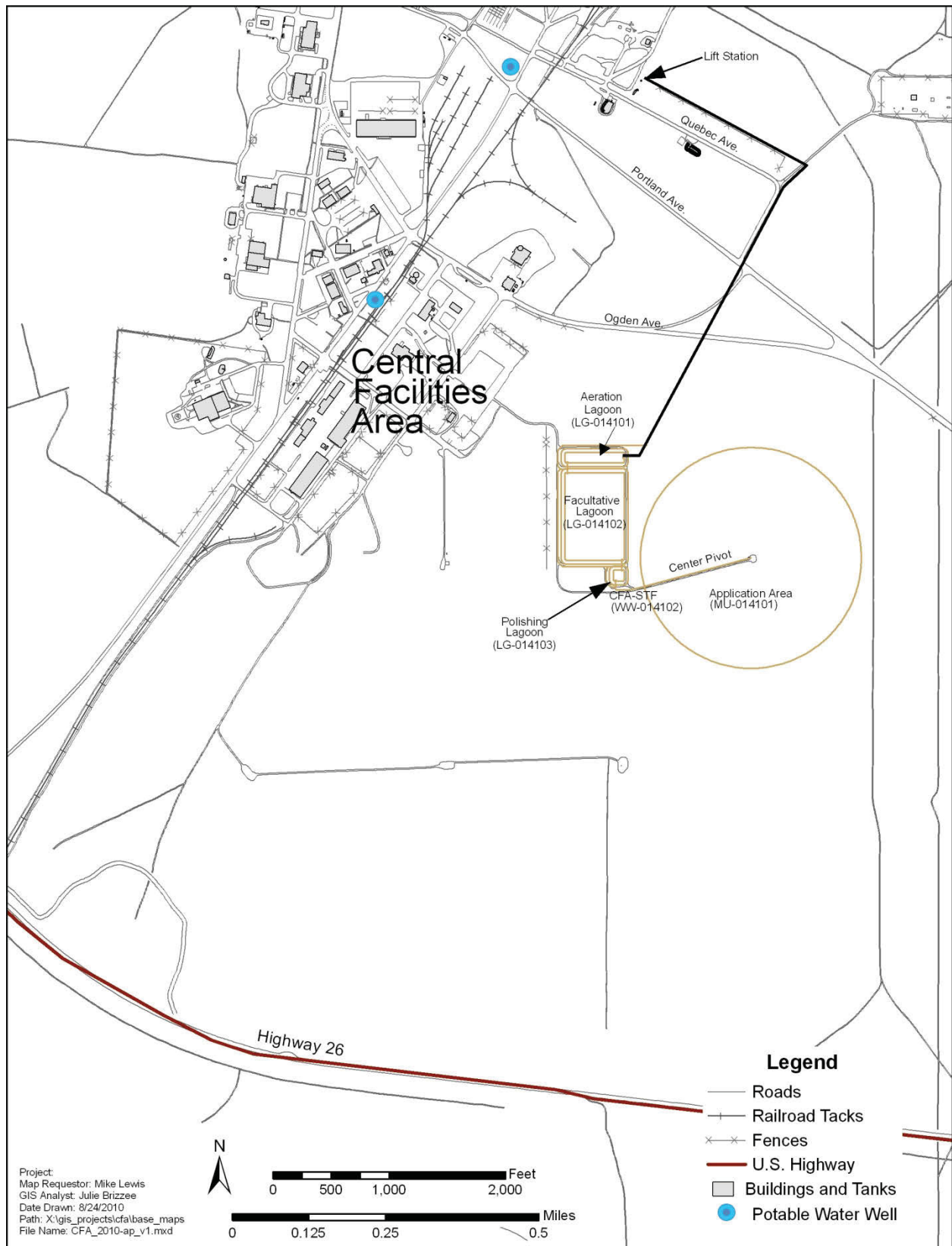


Figure 1. Area map showing the location of the STP at CFA.

As stipulated in the permit (Section F, Table 4), no grazing of domesticated animals or cultivation of crops for human consumption occurred on the application area during the 2011 permit year.

The STP serves all major CFA facilities. The wastewater is derived from: bus and vehicle maintenance areas; boiler blowdown; heating, ventilation, and air conditioning systems; employee showers and restrooms; laboratories; craft shops; a fire station; and a medical dispensary. Additional wastewater may be transported from other area comfort stations, septic tanks and portable toilets.

### **3. EFFLUENT MONITORING**

This section describes the sampling and analytical methods used in the effluent monitoring program. It provides the effluent monitoring data, the effluent flow data, and a summary of the truck-hauled wastewater that is discharged to the CFA STP. The section also includes the calculated hydraulic and nutrient loading rates as required by the permit.

#### **3.1 Sampling Program and Analytical Methods**

Monitoring Services (MS) at the INL monitors effluent discharges at the CFA STP. This program involves sampling, analysis, and data interpretation carried out under a quality assurance program. During the 2011 permit year, MS conducted monthly effluent monitoring as required in Section G of the permit for the CFA STP. Effluent samples were collected from the pump pit (sampling location WW-014102) prior to discharge to the pivot. All samples were collected according to established programmatic sampling procedures.

Effluent samples are taken during a preselected week each month following a randomly generated sampling schedule to represent normal operating conditions. All samples were analyzed using methods identified in 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants;" 40 CFR 141, "National Primary Drinking Water Regulations;" 40 CFR 143, "National Secondary Drinking Water Regulations;" or as approved by the DEQ. The pH and total coliform samples were collected as grab samples. The other WRP required samples were collected as flow proportional composite samples.

As required by Section G of the WRP, daily effluent flow readings were taken from the sprinkler pivot flow meter when irrigation occurred.

CH2M-WG Idaho, LLC (CWI), wastewater operators were subcontracted to perform the monthly effluent total coliform analyses. The CWI, State of Idaho-licensed wastewater operators performed the monthly total coliform analysis using *Standard Methods for Examination of Water and Wastewater* (2005). The total coliform sample was collected from the CFA STP pump pit (WW-014102) prior to discharge to the sprinkler pivot.

The pH analysis was performed by MS personnel on a grab sample collected at the effluent location.

All other effluent and soil samples were submitted to and analyzed by Southwest Research Institute's (SwRI) Analytical and Environmental Chemistry Department located in San Antonio, Texas.

#### **3.2 Effluent Monitoring Results**

The permit year covered in this report is November 1, 2010, through October 31, 2011.

Effluent samples are collected from the pump pit (prior to the pivot) during pivot operation. The pivot was only operated in August 2011. The effluent samples collected were flow proportional composite samples during pivot operation, except for pH and total coliform. These samples were collected as grab samples. All samples were collected and analyzed as required by the permit. Table 1 summarizes the effluent results.

Table 1. CFA STP effluent water quality data (to pivot, WW-014102).

Sample Month	Sample Date	TKN <sup>a</sup> (mg/L)	NNN <sup>b</sup> (mg/L)	TN <sup>c</sup> (mg/L)	COD <sup>d</sup> (mg/L)	TDS <sup>e</sup> (mg/L)	pH	Total Phosphorus (mg/L)	Total Coliform (100 mL)
August	08/09/11	1.99	0.25 U <sup>f</sup>	2.12	59.8	1,460	9.59	0.374	16

a. TKN—total Kjeldahl nitrogen.

b. NNN—nitrate+nitrite as nitrogen.

c. TN—total nitrogen is the sum of TKN and nitrate+nitrite as nitrogen. For results reported below the instrument detection limit, half the detection limit for that parameter is used in the calculation.

d. COD—chemical oxygen demand.

e. TDS—total dissolved solids.

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

For comparison of the 2011 effluent data, Table 2 shows the 2002 through 2011 effluent annual averages. The 2011 chemical oxygen demand (COD) concentration of 59.8 mg/L was higher than the high for 2008 at 53.45 mg/L. The total dissolved solids (TDS) concentration of 1,460 mg/L was higher than the previous high in 2007 of 1,203 mg/L.

Table 2. CFA STP 2002 through 2011 effluent annual averages.

Annual Averages	TKN (mg/L)	NNN (mg/L)	TN (mg/L)	COD (mg/L)	TDS (mg/L)	pH	Total Phosphorus (mg/L)	Total Coliform (100 mL)
2002	1.58	0.026	1.61	29.00	NS <sup>a</sup>	9.85	0.23	6
2003	3.92	0.032	3.95	37.90	NS	9.52	0.29	24
2004	0.63	0.006	0.64	27.10	NS	9.74	0.17	7
2005	2.03	0.025	2.06	39.24	992	8.78	0.60	23
2006	2.48	0.076	2.56	45.60	1,071	8.81	1.32	7
2007	2.19	0.239	2.43	38.7	1,203	9.16	0.188	3
2008	2.78	0.212	2.99	53.45	1,040	9.38	0.528	3
2009	2.25	0.183	2.43	46.6	1,160	9.33	0.293	1
2010	4.58	0.151	4.73	47.6	1,200	9.11	0.888	3
2011	1.99	0.25 U <sup>b</sup>	2.12 <sup>c</sup>	59.8	1,460	9.59	0.374	16

a. NS—Not sampled. Previous permit did not require this parameter to be sampled.

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

c. TN—total nitrogen is the sum of TKN and nitrate+nitrite as nitrogen. For results reported below the instrument detection limit, half the detection limit for that parameter is used in the calculation.

### 3.3 Flow Volumes and Hydraulic Loading Rates

Daily effluent flow readings were recorded at the pivot control panel when the pivot was operating. All flow readings were recorded in gallons per day (gpd). The pivot was only operated for 10 days during the month of August. As required, all wastewater was applied to the land application area (MU-014101). Table 3 summarizes monthly and annual flow data. Daily effluent flow data is provided in Appendix A.

The effluent flow meter was removed and shipped to the manufacturer (Great Plains Meter, INC) for reconditioning and recalibration in March 2011. After reconditioning, the meter was found to have an accuracy of 99.7% at 817 gpm.

Approximately 40,340 gallons of truck-hauled wastewater was discharged into the CFA STP during the 2011 permit year (see Section 3.3.1).

Table 3. CFA STP effluent to the pivot (WW-014102) flow summaries.

Sample Month	Average (gpd <sup>a</sup> )	Minimum (gpd)	Maximum (gpd)	Total to Land Application Site (MU-014101) (MG <sup>b</sup> )
April 2011	NF <sup>c</sup>	NF	NF	NF
May 2011	NF	NF	NF	NF
June 2011	NF	NF	NF	NF
July 2011	NF	NF	NF	NF
August 2011	133,733 <sup>d</sup>	14,000	165,400	1.22
September 2011	NF	NF	NF	NF
October 2011	NF	NF	NF	NF
Yearly summary	133,733	14,000	165,400	1.22

a. gpd—gallons per day.

b. MG—million gallons.

c. NF—no flow.

d. The minimum flow of 14,000 gpd was not used in the calculation of average flow. A flow of 14,000 gpd is not considered typical for daily application.

The permit (Section F, Table 4) specifies the following:

- Application season (growing season) is April 1 through October 31. Application to frozen or snow-covered ground is prohibited.
- Application of supplemental (fresh) irrigation water is prohibited.
- Wastewater shall not exceed 37 million gallons (MG) annually or 18.5 in./acre.
- Wastewater may be applied on a maximum of 73.5 acres.

Wastewater was not applied to frozen or snow-covered ground. No supplemental irrigation water was applied to the application area. When applied, discharge to the application area averaged 133,733 gpd (NOTE: the minimum daily value of 14,000 gpd was not used in the average calculation). The end gun was used during the 2011 application period and wastewater was applied evenly to the entire 73.5 acres.

The volume of wastewater that can be land applied annually is 37 MG or 18.5 in./acre/yr. The 2011 hydraulic loading rates to the application area are presented in Table 4. A total of 1.22 MG (0.61 acre-in./acre/year) were applied to the land application area.

Table 4. 2011 hydraulic loading rates.<sup>a</sup>

Month	Applied Wastewater		Total (MG <sup>b</sup> )
	(MG/acre)	(in./acre)	
August	0.016	0.61	1.22
Yearly total	0.016	0.61	1.22

a. Loading rates are calculated for wastewater application on 73.5 acres (hydraulic management unit MU-014101).

b. MG—million gallons.

Figure 2 shows the effluent flow volumes to the CFA STP pivot from permit year 2002 through the current permit year. Volumes decreased significantly from 2004 through 2007, remained relatively stable from 2007 through 2010, and dropped to 1.22 MG in 2011. Reduction in personnel and operations is expected to have resulted in a reduction in the wastewater flow.

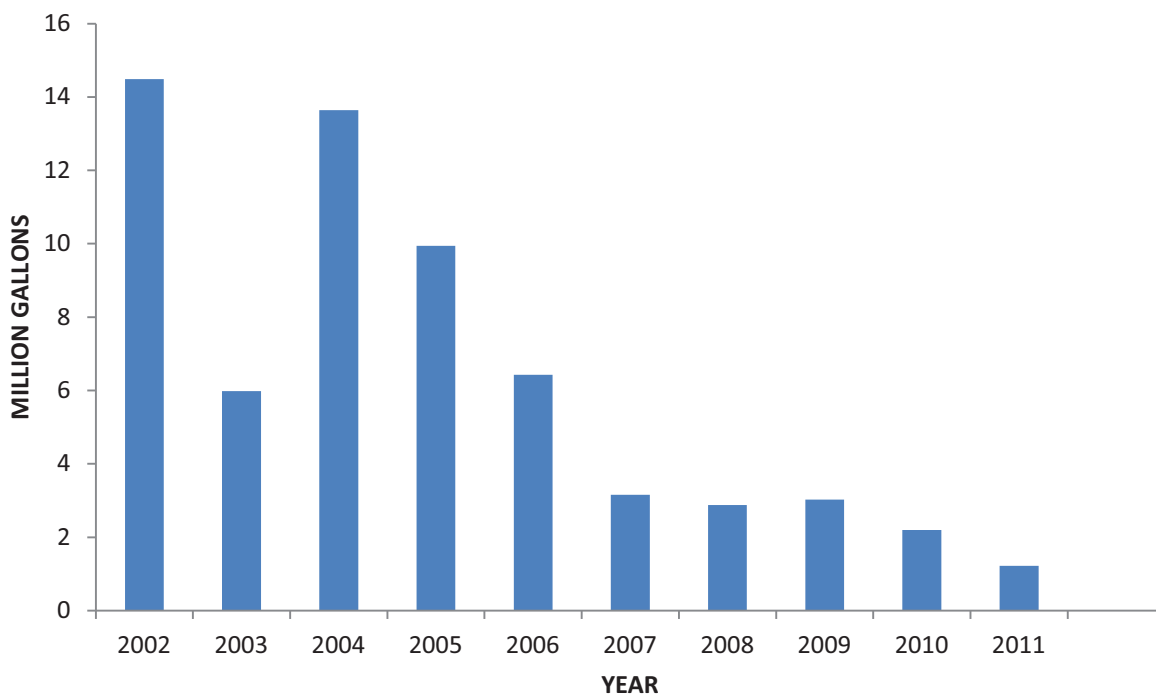


Figure 2. Annual effluent flow to the CFA STP pivot.

### 3.3.1 Truck-hauled Wastewater Discharges

Truck-hauled wastewater consists of wastewater pumped from portable toilets, septic tanks, and comfort stations. These wastewater systems are pumped by septic system pumping companies licensed in the State of Idaho. Prior to discharge, CFA STP personnel are contacted by the pumping company. A form is filled out documenting the date and the estimated volume of wastewater discharged. The wastewater is then discharged into a manhole upstream of the influent flow meter. For the 2011 permit year, approximately 40,340 gallons of truck-hauled wastewater was discharged to the CFA STP.

## 3.4 Nutrient Loading Rates

The permit requires loading rate calculations for TDS, total nitrogen, COD, and total phosphorus. However, the permit does not specify any limits for loading rates. The 2011 monthly and annual effluent nutrient-loading rates to the application area are presented in Table 5. Wastewater was applied to the entire 73.5 acres of the application area during 2011.

Table 5. 2011 nutrient-loading rates.<sup>a</sup>

Month	TDS (lbs/acre)	Total Nitrogen <sup>b</sup> (lbs/acre)	COD (lbs/acre)	Total Phosphorus (lbs/acre)
August	194.94	0.28	7.98	0.05
Yearly total	194.94	0.28	7.98	0.05

a. Loading rates calculated for wastewater application on 73.5 acres (hydraulic management unit MU-014101).

b. Total nitrogen is determined from the sum of the TKN and NNN results.

Sampling and analysis of TDS in the wastewater became a requirement with the issuance of a new permit in 2005 (Johnston 2005). The total annual TDS loading rate for 2010 was 300.42 lbs/acre compared to the 2011 rate of 194.94 lbs/acre.



Total nitrogen loading rate for 2011 from the wastewater was only 0.28 lbs/acre/year. Figure 3 shows the total annual loading rates from 2002 through 2011. As a general rule, nitrogen loading should not exceed the amount necessary for crop utilization plus 50%. However, wastewater is applied to desert steppe and crested wheat grass communities without nitrogen removal via crop harvest. To estimate nitrogen buildup in the soil under this condition, a nitrogen balance was prepared by Cascade Earth Science, Ltd.(CES), which estimated it would take 20 to 30 years to reach normal nitrogen agricultural levels in the soil (based on a loading rate of 32 lbs/acre/year) (CES 1993). The extremely low nitrogen-loading rates are expected to have an insignificant effect on nitrogen accumulation in the soil.

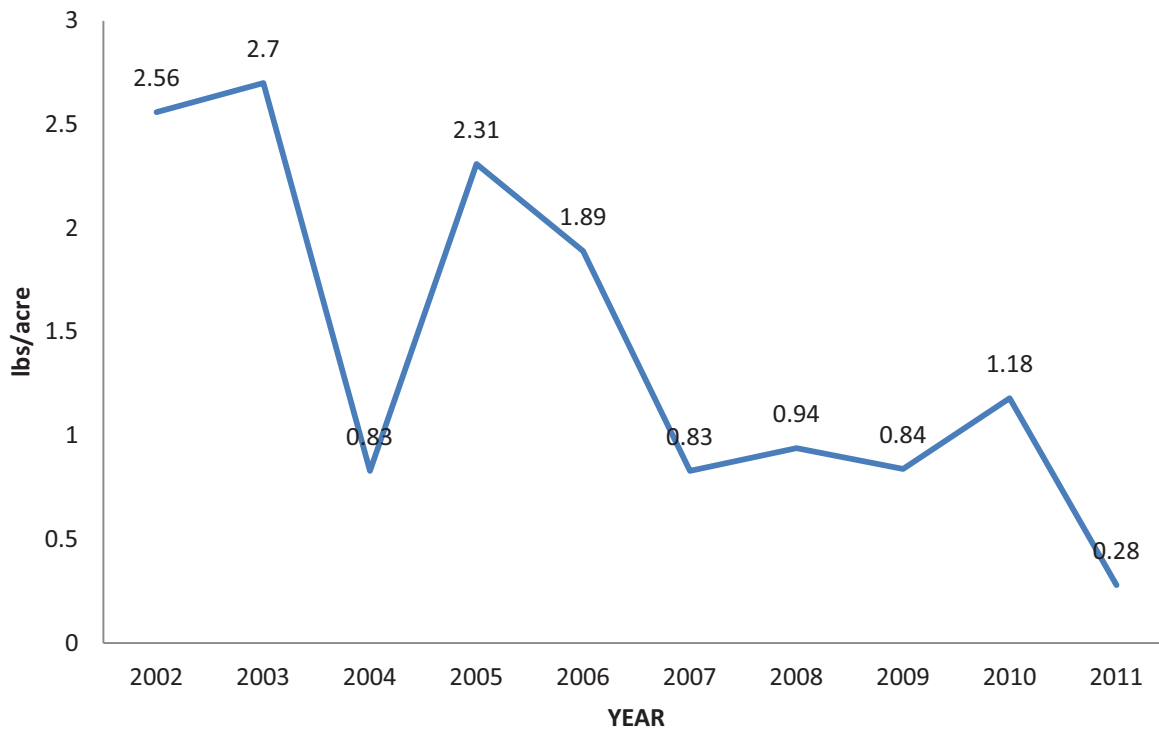


Figure 3. Total nitrogen annual loading rates for permit years 2002 through 2011.

Total COD loading of 7.98 lbs/acre/year for 2011 was lower than the COD loading rate for the 2010 permit year of 11.92 lbs/acre/year. The 2011 COD loading rate was also significantly lower than the rate specified in the DEQ guidance (DEQ 2007) of 50.0 lbs/acre/day for the growing season.

The 2011 annual total phosphorus loading rate of 0.05 lbs/acre/year was well below the projected maximum loading rate of 4.5 lbs/acre/year (CES 1993). Figure 4 shows the total phosphorus loading rates for permit years 2002 through 2011. The small amount of phosphorus applied is expected to be removed by sorption reactions in the soil and used by vegetation, rather than lost to ground water.

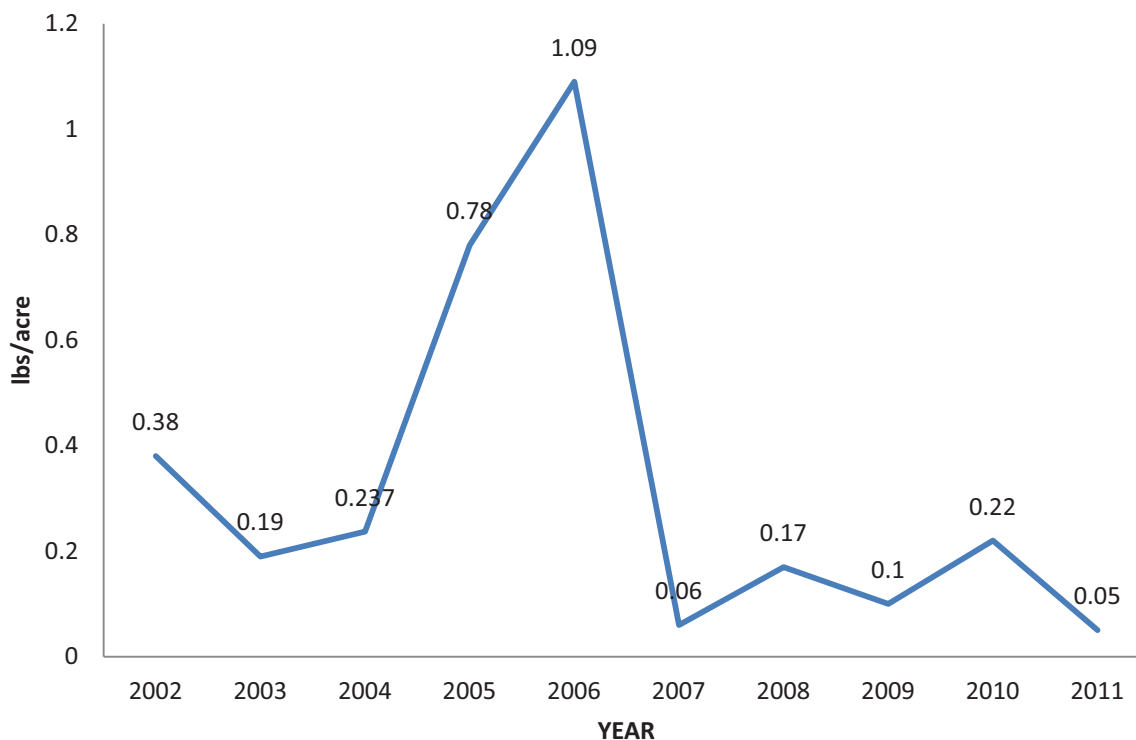


Figure 4. Total phosphorous annual loading rates for permit years 2002 through 2011.

## 4. SOIL MONITORING

The CFA STP permit requires that the soil within the land application area be sampled in October of 2010, and then three years later in October of 2013. No soil samples were collected in the 2011 permit year; therefore, there is no data to report.

## 5. PERMIT YEAR ACTIVITIES AND ISSUES

This section provides information and status associated with applicable activities and issues during the permit year.

### 5.1 Status of Permit Required Compliance Activities

Section H, Paragraph 5, of the permit requires that DEQ be notified within 30 days of completing any work described in Section E, and that the annual report shall provide the status of compliance activities still in progress at the end of the permit year.

**Compliance Activity CA-141-01(within 12 months of permit issuance):** A final Plan of Operation (O&M Manual) for the wastewater reuse facility, incorporating the requirements of this permit shall be submitted to the Department for review and approval. The Plan shall include a description of approved sample collection methods, appropriate analytical methods, and companion QA/QC protocol. The manual may reference other written procedures required for the operation and maintenance of the wastewater reuse facility.

The permit was issued on March 17, 2010, and therefore, the Plan of Operation was required to be submitted to the DEQ by March 17, 2011, for review and approval. The Plan of Operation was submitted

to the DEQ on February 28, 2011 (Stenzel 2011), and approved on June 23, 2011 (Rackow 2011). This compliance activity is completed.

**Compliance Activity CA-141-02 (May 31, 2014):** Submit a Seepage Testing Procedure to DEQ for review and approval for the three wastewater treatment lagoons. The Procedure shall describe the testing procedures, equipment, measurement methods, and calculation methodology conclusions for DEQ review and approval.

This procedure will be completed by May 31, 2014.

**Compliance Activity CA-141-03 (August 31, 2014):** Upon DEQ approval of the Seepage Testing Procedure (CA-141-02, above), the permittee shall complete seepage testing of CFA STP lagoons 1 through 3 and submit a Seepage Test Results Report to DEQ no later than August 31, 2014, for review and approval.

The seepage test will be completed by August 31, 2014.

**NOTE:** The Compliance Activity Description in Section E, Table 3, of the permit, states that this test is to be completed “no later than August 31, 2015,” which contradicts the date of August 31, 2014, given in the Compliance Activity Number Completion Date column in the same section and table. In order to allow the DEQ time to review the seepage test results prior to issuing a new permit, the correct date is clarified as August 31, 2014.

## **5.2 Noncompliance Issues**

There were no noncompliance issues identified during the 2011 permit year.

## **5.3 Experimental Weed Control**

During permit year 2007, prolific aquatic vegetative growth in Lagoons No. 2 and 3 became a potential operational concern. Concerns included the potential for short circuiting, insect breeding, and plugging of the pivot irrigation system pump and spray nozzles. Several vegetative control methods were considered. After discussion with the DEQ (Stanley 2008), it was decided that the INL would purchase grass carp (*Ctenopharyngodon idella*) and stock them in the two lagoons.

Grass carp can be an economical and effective method for controlling aquatic vegetation. On a daily basis, small grass carp (<16 inches in length) can consume up to two times their body weight under optimal conditions. This rate decreases to 80% of their body weight as the fish grow. Grass carp may live up to 10 or more years under the right conditions.

Approximately 250 triploid (sterile) 6-in. grass carp were released into the CFA STP lagoons during the summer of 2008. Approximately 240 more were released into Lagoon No. 2, and 10 were released into Lagoon No. 3.

The grass carp suffered significant mortality during the first month following stocking evidenced by dead grass carp floating on the lagoon surfaces. The extent of mortality and survival was unknown. The 2008 seasonal aquatic plant growth in the facultative lagoon was similar to prior years, but plant growth in the polishing lagoon was significantly below that observed during prior years.

In 2009, plant growth in the lagoons was less than what had been observed in 2008. Whether this can be attributed to the grass carp is unknown. However, a few more dead carp were observed in 2009 indicating that at least some had survived over the winter.

On May 18, 2010, an additional 190 grass carp were released into Lagoon No. 2, and 10 more were released into Lagoon No. 3. The carp were approximately 6 inches in length. It appeared that survival of this population was good over the spring, summer, and early fall of 2010.

Aquatic weeds were not an operational issue during the 2011 permit year. No carp were planted in 2011.

#### **5.4 CFA-1718 Lift Station Pump Replacement**

One of the two dedicated CFA-1718 lift station pumps failed and was taken out of service. One pump is capable of handling the wastewater flow in the lift station. As of October 27, 2011, the replacement pump has been received. However, a part on the replacement pump was found to be defective. A new part has since been ordered.

In the interim, there is a diesel-powered standby pump available if the second dedicated lift pump were to fail.

### **6. ENVIRONMENTAL IMPACTS**

When compared to the historical sample results from the CFA STP effluent for the period of 2002 through 2010 (see Table 2), the 2011 COD result of 59.8 mg/L was higher than the previously recorded historical annual average maximum of 53.45 mg/L for permit year 2008. The 2011 effluent total phosphorous concentration of 0.374 mg/L was within the 2002 through 2010 annual average historical minimum of 0.17 mg/L and annual average historical maximum of 1.32 mg/L.

Monitoring of TDS in the effluent began in 2005. The September 2011 TDS concentration of 1,460 mg/L was above the previous high in 2007 of 1,203 mg/L.

Wastewater was applied to the land application area a total of 14 days during the month of August. Only 1.22 MG (0.61 acre-in./acre/year) of wastewater were applied to the land application area. This is well below the permit limit of 37 MG (18.5 acre-in./acre/year).

The permit requires loading rate calculations for total nitrogen, COD, total phosphorus, and TDS. The total annual 2011 loading rates for these constituents were as follows:

- Total nitrogen was 0.28 lbs/acre/year.
- COD was 7.98 lbs/acre/year.
- Total phosphorus was 0.05 lbs/acre/year, well below the projected maximum loading rate of 4.5 lbs/acre/year (CES 1993).
- Sampling and analysis of TDS in the effluent was a new requirement in the 2005 permit. TDS loading for 2011 was 194.94 lbs/acre/year compared to 300.42 lbs/acre/year in 2010.

The low-strength wastewater influent, followed by treatment in the CFA STP lagoons, produced an effluent with very low loading rates. In fact, the nitrogen loading was far less than that needed for optimal plant growth.

No waste solids were removed from the lagoons during the permit year. Therefore, there were no disposal concerns.

With the low hydraulic and nutrient loading rates to the application area and the depth to groundwater (approximately 600 feet below land surface), there are no negative impacts expected to the groundwater resource.

## 7. REFERENCES

- 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants," *Code of Federal Regulations*, Office of the Federal Register.
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- Neher, E., IDEQ, to R. V. Furstenau, DOE-ID and D. E. Coburn, BEA, March 17, 2010, "LA-000141-03 INL CFA Sewage Treatment Facility, Final Wastewater Reuse Permit," CCN 220416.
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- Standard Methods for the Examination of Water and Wastewater*, 21<sup>st</sup> Edition, American Public Health Association, American Water Works Association, and Water Environment Federation, 2005.
- Stanley, N., email to distribution, April 8, 2008, "Memo of Conversation with Tom Rackow (DEQ) on Grass Carp," CCN 213255.
- Stenzel, J. A., INL, to T. Rackow, P.E., DEQ, "Submittal of the Operation and Maintenance Manual for the Central Facilities Area Sewage Treatment Plant," CCN 223445.



## **Appendix A**

### **Central Facilities Area Sewage Treatment Plant Daily Effluent Flow Readings**





## Appendix A

### Central Facilities Area Sewage Treatment Plant Daily Effluent Flow Readings

Table A-1. CFA STP daily effluent flows for the 2011 permit year.

<b>Date</b>	<b>CFA Effluent (gallons)</b>	<b>Date</b>	<b>CFA Effluent (gallons)</b>	<b>Date</b>	<b>CFA Effluent (gallons)</b>
04/01/2011	No flow	05/04/2011	No flow	06/06/2011	No flow
04/02/2011	No flow	05/05/2011	No flow	06/07/2011	No flow
04/03/2011	No flow	05/06/2011	No flow	06/08/2011	No flow
04/04/2011	No flow	05/07/2011	No flow	06/09/2011	No flow
04/05/2011	No flow	05/08/2011	No flow	06/10/2011	No flow
04/06/2011	No flow	05/09/2011	No flow	06/11/2011	No flow
04/07/2011	No flow	05/10/2011	No flow	06/12/2011	No flow
04/08/2011	No flow	05/11/2011	No flow	06/13/2011	No flow
04/09/2011	No flow	05/12/2011	No flow	06/14/2011	No flow
04/10/2011	No flow	05/13/2011	No flow	06/15/2011	No flow
04/11/2011	No flow	05/14/2011	No flow	06/16/2011	No flow
04/12/2011	No flow	05/15/2011	No flow	06/17/2011	No flow
04/13/2011	No flow	05/16/2011	No flow	06/18/2011	No flow
04/14/2011	No flow	05/17/2011	No flow	06/19/2011	No flow
04/15/2011	No flow	05/18/2011	No flow	06/20/2011	No flow
04/16/2011	No flow	05/19/2011	No flow	06/21/2011	No flow
04/17/2011	No flow	05/20/2011	No flow	06/22/2011	No flow
04/18/2011	No flow	05/21/2011	No flow	06/23/2011	No flow
04/19/2011	No flow	05/22/2011	No flow	06/24/2011	No flow
04/20/2011	No flow	05/23/2011	No flow	06/25/2011	No flow
04/21/2011	No flow	05/24/2011	No flow	06/26/2011	No flow
04/22/2011	No flow	05/25/2011	No flow	06/27/2011	No flow
04/23/2011	No flow	05/26/2011	No flow	06/28/2011	No flow
04/24/2011	No flow	05/27/2011	No flow	06/29/2011	No flow
04/25/2011	No flow	05/28/2011	No flow	06/30/2011	No flow
04/26/2011	No flow	05/29/2011	No flow	07/01/2011	No flow
04/27/2011	No flow	05/30/2011	No flow	07/02/2011	No flow
04/28/2011	No flow	05/31/2011	No flow	07/03/2011	No flow
04/29/2011	No flow	06/01/2011	No flow	07/04/2011	No flow
04/30/2011	No flow	06/02/2011	No flow	07/05/2011	No flow
05/01/2011	No flow	06/03/2011	No flow	07/06/2011	No flow
05/02/2011	No flow	06/04/2011	No flow	07/07/2011	No flow
05/03/2011	No flow	06/05/2011	No flow	07/08/2011	No flow

<b>Date</b>	<b>CFA Effluent (gallons)</b>	<b>Date</b>	<b>CFA Effluent (gallons)</b>	<b>Date</b>	<b>CFA Effluent (gallons)</b>
07/09/2011	No flow	08/17/2011	No flow	09/25/2011	No flow
07/10/2011	No flow	08/18/2011	112,350	09/26/2011	No flow
07/11/2011	No flow	08/19/2011	No Flow	09/27/2011	No flow
07/12/2011	No flow	08/20/2011	No Flow	09/28/2011	No flow
07/13/2011	No flow	08/21/2011	No flow	09/29/2011	No flow
07/14/2011	No flow	08/22/2011	127,800	09/30/2011	No flow
07/15/2011	No flow	08/23/2011	146,600	10/01/2011	No flow
07/16/2011	No flow	08/24/2011	127,500	10/02/2011	No flow
07/17/2011	No flow	08/25/2011	109,200	10/03/2011	No flow
07/18/2011	No flow	08/26/2011	No flow	10/04/2011	No flow
07/19/2011	No flow	08/27/2011	No flow	10/05/2011	No flow
07/20/2011	No flow	08/28/2011	No flow	10/06/2011	No flow
07/21/2011	No flow	08/29/2011	147,400	10/07/2011	No flow
07/22/2011	No flow	08/30/2011	165,400	10/08/2011	No flow
07/23/2011	No flow	08/31/2011	142,600	10/09/2011	No flow
07/24/2011	No flow	09/01/2011	No flow	10/10/2011	No flow
07/25/2011	No flow	09/02/2011	No flow	10/11/2011	No flow
07/26/2011	No flow	09/03/2011	No Flow	10/12/2011	No flow
07/27/2011	No flow	09/04/2011	No Flow	10/13/2011	No flow
07/28/2011	No flow	09/05/2011	No Flow	10/14/2011	No flow
07/29/2011	No flow	09/06/2011	No flow	10/15/2011	No flow
07/30/2011	No flow	09/07/2011	No flow	10/16/2011	No flow
07/31/2011	No flow	09/08/2011	No flow	10/17/2011	No flow
08/01/2011	No flow	09/09/2011	No flow	10/18/2011	No flow
08/02/2011	No flow	09/10/2011	No flow	10/19/2011	No flow
08/03/2011	No flow	09/11/2011	No flow	10/20/2011	No flow
08/04/2011	No flow	09/12/2011	No flow	10/21/2011	No flow
08/05/2011	No flow	09/13/2011	No flow	10/22/2011	No flow
08/06/2011	No flow	09/14/2011	No flow	10/23/2011	No flow
08/07/2011	No flow	09/15/2011	No flow	10/24/2011	No flow
08/08/2011	14,000	09/16/2011	No flow	10/25/2011	No flow
08/09/2011	124,750	09/17/2011	No flow	10/26/2011	No flow
08/10/2011	No flow	09/18/2011	No flow	10/27/2011	No flow
08/11/2011	No flow	09/19/2011	No flow	10/28/2011	No flow
08/12/2011	No flow	09/20/2011	No flow	10/29/2011	No flow
08/13/2011	No flow	09/21/2011	No flow	10/30/2011	No flow
08/14/2011	No flow	09/22/2011	No flow	10/31/2011	No flow
08/15/2011	No flow	09/23/2011	No flow		
08/16/2011	No flow	09/24/2011	No flow		