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2002 Wastewater Land Application Site Performance Reports for the Idaho National Engineering and Environmental Laboratory

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Idaho National Engineering and Environmental Laboratory
Bechtel BWXT Idaho, LLC

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Central Facilities Area Sewage Treatment Plant
Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds
Idaho Nuclear Technology and Engineering Center New Percolation Ponds
Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant
Test Area North/Technical Support Facility Sewage Treatment Plant

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ABSTRACT

The *2002 Wastewater Land Application Site Performance Reports for the Idaho National Engineering and Environmental Laboratory* describe site conditions for the facilities with State of Idaho Wastewater Land Application Permits. Permit-required monitoring data are summarized, and permit exceedences or environmental impacts relating to the operation of the facilities during the 2002 permit year are discussed.

SUMMARY

The *2002 Wastewater Land Application Site Performance Reports for the Idaho National Engineering and Environmental Laboratory* (INEEL) describe site conditions for the following facilities as required by the applicable State of Idaho Wastewater Land Application Permits (WLAPs):

- Central Facilities Area (CFA) Sewage Treatment Plant (STP), Permit Number LA-000141-01
- Idaho Nuclear Technology and Engineering Center (INTEC) (formerly the Idaho Chemical Processing Plant or ICPP) Percolation Ponds, Permit Number LA-000130-02 (referred to as the existing Percolation Ponds)
- INTEC New Percolation Ponds, Permit Number LA-000130-03
- INTEC STP, Permit Number LA-000115-02
- Test Area North/Technical Support Facility (TAN/TSF) STP, Permit Number LA-000153-01.

These reports contain the following information:

- Site description
- Facility and system description
- Status of special compliance conditions
- Permit-required monitoring data
- Discussions of environmental impacts by the facilities.

The CFA report covers from December 1, 2001, through November 30, 2002, while the INTEC and TAN reports cover from November 1, 2001, through October 31, 2002. These reporting periods are based on the individual facility permits.

The original WLAP issued for the CFA STP expired August 7, 1999. A renewal application was submitted February 9, 1999. A letter authorizing the continued operation of the CFA STP under the original WLAP was issued by the Idaho Department of Environmental Quality (DEQ) on September 18, 2000.

The original WLAPs issued for the INTEC STP and the existing INTEC Percolation Ponds expired September 17, 2000. Renewal applications for these two WLAPs were submitted during March 2000. Authorization to continue to operate the existing INTEC Percolation Ponds and INTEC STP was received in June 2000 and January 2001, respectively. The initial WLAP for the INTEC New Percolation Ponds was issued on September 10, 2001, and amended on March 28, 2002. On August 26, 2002, with construction of the INTEC New Percolation Ponds complete, wastewater previously discharged to the existing

INTEC Percolation Ponds was routed to the INTEC New Percolation Ponds, and the existing INTEC Percolation Ponds were taken out of service.

The original WLAP issued for the TAN/TSF STP expired on May 8, 2001. The renewal application for this facility was submitted on November 2, 2000. Authorization to continue to operate the TAN/TSF STP was received from DEQ on July 12, 2001.

Authorization by DEQ to continue to operate the CFA, INTEC, and TAN/TSF STPs is in effect until new WLAPs are issued for each of these facilities. A request to cancel the WLAP issued for the existing INTEC Percolation Ponds was made to DEQ in October 2002, with acknowledgement from DEQ that the existing Percolation Ponds permit was considered ineffective as of November 4, 2002.

During the 2002 permit year, approximately 14.5 million gallons of treated wastewater was land applied in the irrigation area at CFA. Soil and weather conditions combined with the relatively low volume of wastewater applied during the 2002 permit year resulted in no leaching loss for the year, compared to the permit limit of 3 in. per year. As a result, land application of wastewater appeared to have negligible impact on soils and groundwater. While sodium adsorption ratios (SARs) were slightly elevated relative to preapplication SARs, they remain well below those in soils classified with sodium problems.

Evaluations conducted to date regarding the high nitrate + nitrite concentrations detected in groundwater near the new CFA STP determined that the new STP was not the likely source. Since the source is not believed to be the STP, Waste Area Group (WAG) 4 (under the INEEL Federal Facilities Agreement/ Consent Order) will continue to monitor the groundwater nitrate + nitrite concentrations. In addition, a recent WAG 4 5-year review of the Record of Decision remedies selected for the CFA landfills concluded that the source of the nitrate + nitrite would be reevaluated. This reevaluation would include preparing corrected groundwater contour maps and reviewing recently available source information.

Annual flow volume to the existing INTEC Percolation Ponds and contaminant concentrations in the groundwater remained within permit limits during the 2002 permit year, with the exception of iron concentrations detected in one aquifer well. The average iron concentration in the effluent for the permit year was significantly lower than that detected in the well. Therefore, it is expected that corrosion of the carbon steel casing and the galvanized riser pipes and not the discharge of effluent to the existing INTEC Percolation Ponds may have contributed to the elevated iron concentrations in the well.

As in previous years for the existing INTEC Percolation Ponds, concentrations of total dissolved solids (TDS), chloride, and sodium were elevated in the compliance wells (USGS-112 or USGS-113) compared to the background well (USGS-121). These elevated concentrations are the result of water softening and treatment operations. Decreasing trends were shown for chloride in both compliance wells and for chloride, TDS, and sodium in the effluent. Based on data through the 2002 permit year, the trends in the compliance wells for chloride followed the trends in the existing Percolation Ponds effluent. Now that wastewater is no longer being discharged to the existing Percolation Ponds, it is expected that the chloride, TDS, and sodium concentrations in USGS-112 and USGS-113 will decrease with time.

The INTEC New Percolation Ponds became operational on August 26, 2002, when wastewater from CPP-797 was diverted from the existing INTEC Percolation Ponds. During the abbreviated permit year, daily and annual flow volume to the New Percolation Ponds remained within permit limits.

The concentrations of aluminum, iron, and manganese in aquifer well ICPP-MON-A-166 were above the applicable permit limits. The concentrations of these parameters in the background well (ICPP-MON-A-167) exceeded the applicable groundwater quality standards. However, these elevated concentrations are not thought to be related to operational activities at the INTEC New Percolation Ponds. Concentrations of these parameters in well ICPP-MON-A-166 during October 2002 are similar to the preoperational concentrations, while concentrations of these parameters in well ICPP-MON-A-167 were lower than the preoperational concentrations. One possible explanation may be that both wells were insufficiently developed during construction activities. Another possible explanation is that the annular seals were placed incorrectly, thus allowing bentonite slurry to affect the water quality. Prior to the next sampling event, additional purging will be performed on both wells to try to remove any residual slurry that may be in the wells as a result of the well construction activities.

INTEC STP effluent flow volumes, effluent total suspended solids (TSS), and groundwater concentrations were all within permit limits. Total nitrogen concentrations in the effluent exceeded the permit limit (20 mg/L) 3 months during the 2002 permit year. Maintenance and operational corrective actions continued during the permit year. An aeration study, covering April 11, 2001, through April 26, 2002, concluded that the use of aeration to remove ammonia nitrogen from the wastewater would not guarantee the total nitrogen concentration in the effluent would remain below the permit limit of 20 mg/L. As a result, various options have been evaluated to meet the total nitrogen limit. The preferred alternative will be submitted to DEQ in 2003 for review and approval prior to implementation.

During the 2002 permit year, the problems with the influent and effluent flow meters persisted. Several discrepancies were identified during the permit year, which resulted in inaccurate readings. Measures are being implemented to reduce the ice buildup during the colder months and to install hour meters, which can be used as backup measurements to the permanent flow meters.

Concentrations of permit-required parameters in groundwater samples collected from the aquifer compliance well (USGS-052) near the INTEC STP were all within permit limits during 2002. Total coliform was detected in the perched water well (ICPP-MON-PW-024) in October 2002 and in the background well (USGS-121) in April 2002. It is uncertain whether the coliform in the INTEC STP effluent caused the contamination in the perched water well.

However, it is unlikely that the INTEC STP was the source of coliform in the upgradient background well.

The TAN/TSF effluent flow volumes and concentrations were within permit limits. The iron concentration in the April 2002 sample for TANT-MON-A-001 (background well) was above the groundwater quality standard. Iron concentrations exceeded the permit limit in TAN-13A in April and in TAN-10A in the April and October 2002 samples. In addition, all samples collected from well TAN-10A in 2002 exceeded the permit limit for TDS. Elevated iron concentrations historically have been detected in the TAN WLAP monitoring wells. The riser pipes attached to the dedicated submersible pumps were replaced with stainless steel riser pipes in all four TAN WLAP monitoring wells during August 2001. Iron concentrations decreased in TAN-13A, TANT-MON-A-001, and TANT-MON-A-002 since the riser pipes were replaced, and continued to decrease between the April and October 2002 sampling events. Of the four TAN WLAP wells, TAN-10A is cased with carbon steel well casing that is corroded most of the way to the water table. The iron concentrations in TAN-10A increased after the riser pipes were replaced, and the October 2002 iron concentrations for TAN-10A were the highest reported for the four wells. The condition of the well casing, coupled with the residual effects from replacing the galvanized riser pipe, may have resulted in the increased iron concentrations in TAN-10A. The condition of the well casing and the residual effects from replacing the riser pipe may also be contributing to the increase of the TDS in well TAN-10A.

Total coliform was present in the TANT-MON-A-001 (background well) and TANT-MON-A-002 (compliance well) in the October samples. However, it is unlikely that the coliform detected in these two wells was the result of the Disposal Pond effluent. Overall, environmental impacts from TAN/TSF STP operations are considered negligible.

Four monitoring wells associated with the TAN/TSF facility have been approved for a “no-longer-contained-in” determination from DEQ. These wells include two monitoring wells associated with the Wastewater Land Application Permit (TAN-10A and TAN-13A) and wells TAN-27 and TSFAG-05. During the 2002 permit year, no purge water was discharged to the TAN/TSF Disposal Pond as a result of sampling these wells.

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FIGURES

TABLES

ACRONYMS

BBWI	Bechtel BWXT Idaho, LLC
BLR	Big Lost River
BOD	biochemical oxygen demand
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CES	Cascade Earth Sciences, Ltd.
CFA	Central Facilities Area
CFR	Code of Federal Regulations
COD	chemical oxygen demand
d	day
DEQ	Department of Environmental Quality
DOE-ID	Department of Energy Idaho Operations Office
EBR-I	Experimental Breeder Reactor I
EC	electrical conductivity
EPA	Environmental Protection Agency
ESRP	eastern Snake River Plain
ESRPA	eastern Snake River Plain aquifer
FFA/CO	Federal Facilities Agreement/Consent Order
ft	foot
gal/d/ft	gallons/day/foot
gpd	gallons per day
ICPP	Idaho Chemical Processing Plant
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
MG	million gallons
mg/L	milligram per liter
mi	mile
N	nitrogen
NLCI	no-longer-contained-in
NNN	nitrate + nitrite as nitrogen
NO_2-N	nitrite as nitrogen
NO_3-N	nitrate as nitrogen
NH_3-N	ammonia as nitrogen
NH_4-N	ammonium
O&M	Operations and Maintenance
OU	Operable Unit
PCS	primary constituent standard

RCRA	Resource Conservation and Recovery Act
RE	removal efficiency
RI	rapid infiltration
ROD	Record of Decision
SAR	sodium adsorption ratio
SCS	secondary constituent standard
STP	Sewage Treatment Plant
TAN	Test Area North
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TSF	Technical Support Facility
TSS	total suspended solids
USGS	United States Geological Survey
WAG	Waste Area Group
WLAP	Wastewater Land Application Permit
WGS	Waste Generator Services

2002 Wastewater Land Application Site Performance Reports for the Idaho National Engineering and Environmental Laboratory

1. INTRODUCTION

The *2002 Wastewater Land Application Site Performance Reports for the Idaho National Engineering and Environmental Laboratory* (INEEL) describe site conditions for the facilities listed in Table 1-1 as required by the State of Idaho Wastewater Land Application Permits (WLAPs).

Table 1-1. Idaho National Engineering and Environmental Laboratory facilities and permit numbers.

Facility	Permit Number
Central Facilities Area (CFA) Sewage Treatment Plant (STP)	LA-000141-01
Idaho Nuclear Technology and Engineering Center (INTEC) (formerly the Idaho Chemical Processing Plant or ICPP) Percolation Ponds (referred to as the existing Percolation Ponds)	LA-000130-02
INTEC New Percolation Ponds	LA-000130-03
INTEC STP	LA-000115-02
Test Area North/Technical Support Facility (TAN/TSF) STP	LA-000153-01

These reports contain the following information:

- Site description
- Facility and system description
- Status of special compliance conditions
- Permit-required monitoring data
- Discussions of environmental impacts by the facilities.

The Central Facilities Area (CFA) report covers from December 1, 2001, through November 30, 2002, while the Idaho Nuclear Technology and Engineering Center (INTEC) and Test Area North/Technical Support Facility (TAN/TSF) reports cover from November 1, 2001, through October 31, 2002. These reporting periods are based on the individual facility permits.

The original WLAP issued for the CFA Sewage Treatment Plant (STP) expired August 7, 1999 (Green 1994). A renewal application was submitted February 9, 1999 (Bennett 1999). A letter authorizing the continued operation of the CFA STP under the original WLAP was issued September 18, 2000 (Johnston 2000a).

The original WLAPs issued for the INTEC STP (Green 1995a) and the existing INTEC Percolation Ponds (Green 1995b) expired September 17, 2000. Renewal applications for these two WLAPs were submitted during March 2000 (Graham 2000a; Graham 2000b) Authorization to continue operation was received in June 2000 for the existing INTEC Percolation Ponds (Johnston 2000b) and in January 2001 for the INTEC STP (Johnston 2001). The initial WLAP for the INTEC New Percolation Ponds was issued by DEQ on September 10, 2001 (Eager 2001), and was amended on March 28, 2002 (Eager 2002). The amended permit is effective as of March 28, 2002, and expires on April 1, 2007. On August 26, 2002, wastewater discharge to the existing Percolation Ponds ceased. A letter (Guymon 2002a) requesting cancellation of the WLAP (LA-000130-02) was submitted to DEQ on October 23, 2002. DEQ acknowledged that the existing Percolation Ponds permit was considered ineffective as of November 4, 2002 (Rackow 2002a). Because the existing Percolation Ponds were in operation during the 2002 reporting year, a WLAP Performance Report is required and is being provided for 2002. However, because the permit became ineffective and wastewater is no longer discharged to the existing Percolation Ponds, no future WLAP Performance Reports will be required for LA-000130-02.

The original WLAP issued for the TAN/TSF STP expired on May 8, 2001 (Green 1996). A renewal application was submitted on November 2, 2000 (Guymon 2000a). Authorization to continue operating the TAN/TSF STP was received in July 2001 (Teuscher 2001).

Operations at all facilities are conducted by Bechtel BWXT Idaho, LLC (BBWI) for the Department of Energy Idaho Operations Office (DOE-ID).

1.1 Idaho National Engineering and Environmental Laboratory Site Description

The INEEL is approximately 890 mi^2 and is located on the eastern Snake River Plain (ESRP) in southeastern Idaho (Figure 1-1). It was established as a nuclear energy research and development testing station in the late 1940s and was designated a National Environmental Research Park in 1975. All land within the INEEL is protected as an outdoor laboratory where the effects of energy development and industrial activities on the environment and the complex ecological relationships of this cool desert ecosystem can be studied. The INEEL serves as a research area for scientists from several universities and state and federal agencies.

Subsurface geology at the INEEL consists of successive layers of basalt and sedimentary strata, overlaid at the surface by wind- and water-deposited sediments. The primary groundwater source of the region is the eastern Snake River Plain aquifer (ESRPA). Most of the INEEL is located in the Mud Lake-Lost River Basin (Pioneer Basin), which is an informally named, closed drainage basin. Surface water within the Pioneer Basin includes that from the Big Lost River, the Little Lost River, and Birch Creek, all of which drain mountain watersheds located to the north and northwest of the INEEL. All three water bodies may flow onto the INEEL during high flow years, but are otherwise intermittent. In addition, local rainfall and snowmelt contribute to surface water mainly during the spring. The portion of surface water that is not lost to evapotranspiration infiltrates into the subsurface. Both aquifer and surface waters are used for irrigating crops and other applications outside the INEEL.

The ESRPA is approximately 199 mi long and 20 to 60 mi wide and encompasses an area of about 9,650 mi^2. The depth to the ESPRA varies from 200 ft in the northern part of the INEEL to over 900 ft in the southern part. The ESRPA is the ESRP's source of groundwater. It is also the source of process water and drinking water both on and off the INEEL. The aquifer is recharged from infiltration of precipitation and irrigation seepage, runoff from the surrounding highlands, and groundwater underflows from the surrounding watersheds (DOE-ID 2002a). Groundwater in the ESRPA flows generally to the

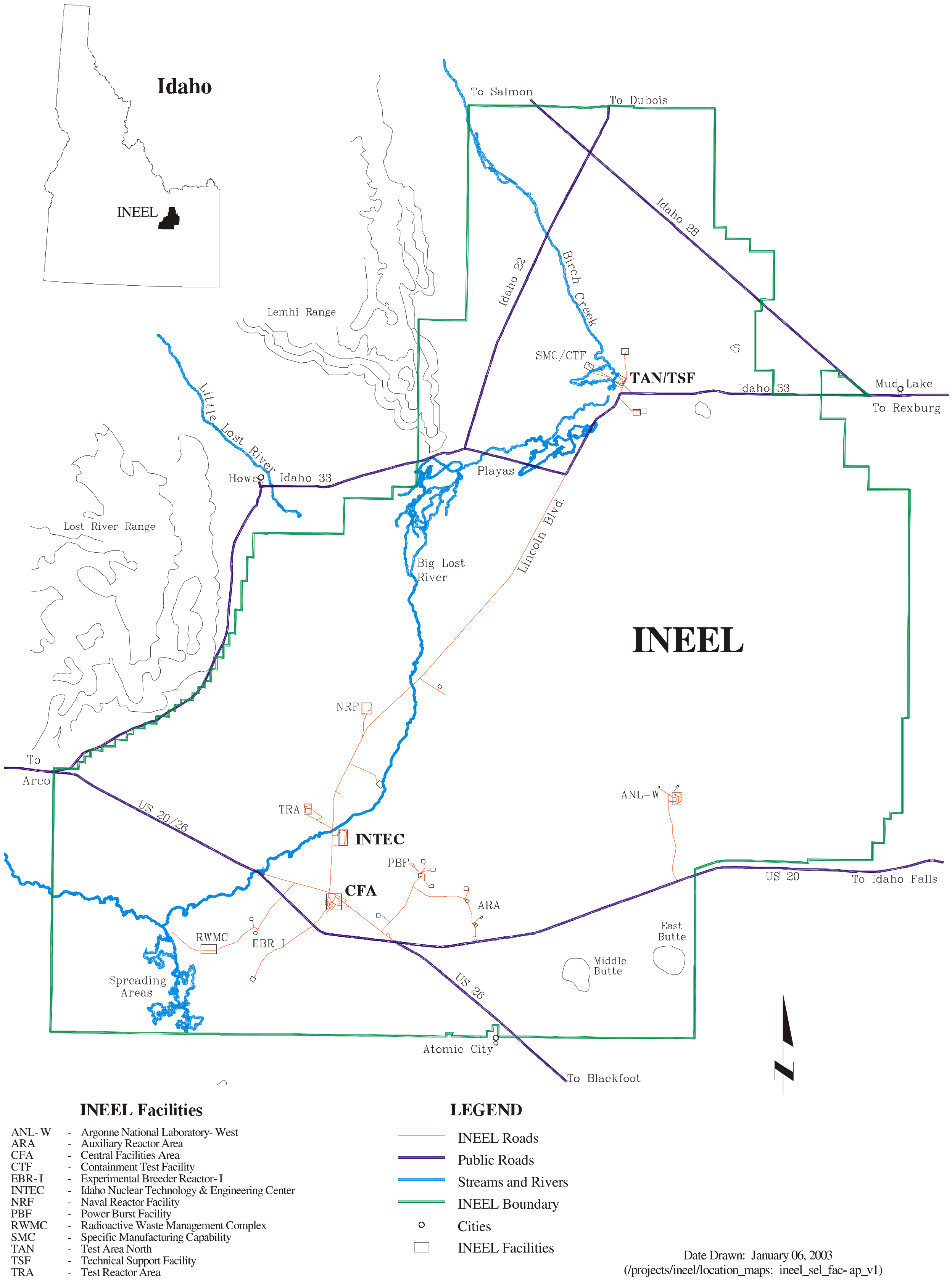

Figure 1-1. Idaho National Engineering and Environmental Laboratory.

southwest, although locally the direction of flow is influenced by recharge from rivers, surface water, spreading areas, and heterogeneities in the aquifer. Tracer studies at the INEEL indicate that natural flow rates range from 5 to 20 ft/d. Aquifer transmissivities range from 3×10^4 to 1.8×10^7 gal/d/ft; storage coefficients range from 0.01 to 0.06 (Robertson, Shoen, and Barrachlough 1974).

Meteorological and climatological data that apply to the INEEL region are collected and compiled from several meteorological stations operated by the National Oceanic and Atmospheric Administration field office in Idaho Falls, Idaho. Thirteen stations are located on the INEEL. Annual rainfall at the INEEL is light, and the region is classified as arid to semiarid (Clawson, Start, and Ricks 1989). The long-term average (from March 1950 through 2001) annual precipitation at the INEEL is 8.6 in. (at the CFA station). Monthly precipitation is usually highest in April, May, and June and lowest in July and October. The average daytime maximum temperature is 87°F (July), while the average daytime minimum temperature is 5°F (January) (Hukari 2002). The INEEL is in the belt of prevailing westerly winds, which are channeled within the plain to produce a west-southwesterly or southwesterly wind at most locations on the INEEL.

1.2 Liquid Effluent Monitoring Program

The INEEL Liquid Effluent Monitoring Program monitors effluent discharges at facilities operated by Bechtel BWXT Idaho, LLC (BBWI) at the INEEL. This program involves sampling, analysis, and data interpretation carried out under a quality assurance program. The INEEL Liquid Effluent Monitoring Program conducted effluent and influent monitoring as required by the Wastewater Land Application Permits (WLAPs) for the CFA STP, the INTEC STP, and the TAN/TSF STP during the 2002 permit year. INTEC Operations monitored effluent to the existing and new INTEC Percolation Ponds.

Daily flow and monthly coliform readings were taken by CFA Wastewater Operations for the CFA STP, the INTEC STP, and the TAN/TSF STP during the 2002 permit year. Daily flow readings for the existing and new INTEC Percolation Ponds were taken by INTEC Operations.

Effluent samples were collected each month according to INEEL sampling procedures and a randomly generated sampling schedule. Effluent samples were analyzed using methods described in 40 Code of Federal Regulations (CFR) 136, (40 CFR 136), with the following exceptions. For the existing and new INTEC Percolation Ponds effluent samples, anions were analyzed using Environmental Protection Agency (EPA) Method 300.0 (EPA 1984) approved for drinking water. For the existing and new INTEC Percolation Pond effluent samples, total phosphorus was analyzed using EPA Method 200.7 (MacConnel 2002a). CFA Wastewater Operations follow the standard membrane filtration method (American Public Health Association 1992) to obtain the monthly coliform results and INEEL technical procedures to take the daily flow readings.

1.3 Drinking Water Program

For the INTEC New Percolation Ponds, Section G of the permit requires reporting the results of water quality testing performed at the Weapons Range B21-608 Building, which is monitored in accordance with the DEQ Drinking Water Program. These samples are collected by the INEEL Drinking Water Program and analyzed using approved drinking water methods.

1.4 Groundwater Monitoring Program

Groundwater was monitored in support of the WLAPs for the existing and new INTEC Percolation Ponds, the INTEC STP, and the TAN/TSF STP following the sampling and analysis plan and INEEL procedures. All samples were collected in spring (April) and fall (September or October) at INTEC and TAN facilities. All samples were analyzed using EPA-approved methods.

1.5 Soil Sample Collection

The CFA STP WLAP requires the soil within the land application area to be sampled annually during each permit period. Five soil subsamples are collected from the land application area at two depths and then are composited in accordance with INEEL procedures and as specified in the permit. The samples are analyzed using *Methods of Soil Analysis* (Page 1982).

2. CENTRAL FACILITIES AREA SEWAGE TREATMENT PLANT DATA SUMMARY AND ASSESSMENT

2.1 Site Description

The Central Facilities Area (CFA) is about 50 mi west of Idaho Falls, Idaho, in Butte County Idaho, approximately 5 mi from the INEEL southern boundary. The CFA provides functional space for crafts, offices, services, and laboratories for approximately 900 employees. CFA includes approximately 72 buildings and 62 other structures.

The CFA STP serves all major facilities at CFA. The STP is southeast of CFA, approximately 2,200 ft downgradient of the nearest drinking water well (Figure 2-1). A public road passes approximately 0.75 mi south of the STP, and the nearest inhabited building is approximately 2,000 ft from the wastewater land application area.

2.2 System Description and Operation

The CFA STP was built in 1994 and put into service on February 6, 1995. Approximately 103,000 gallons per day (gpd) of water were processed from sanitary sewage drains throughout CFA during the 2002 permit year. Wastewater is derived from restrooms, showers, and the cafeteria, a significant portion of which is comprised of noncontact cooling water from air conditioners and heating systems. This large volume of cooling water dilutes the wastewater effluent. Other contributing discharge sources include those from bus and vehicle maintenance areas, analytical laboratories, and a medical dispensary.

The STP consists of:

- 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)
- Sprinkler pivot irrigation system, which applies wastewater on up to 73.5 acres of native desert rangeland.

Lagoon sizes presented for Lagoon No. 1 and No. 2 are the same as those reported in the 2001 annual report. The sizes reported here are based on the 8-foot design depth. Under existing flow conditions, the winter storage capacity of the lagoons or ponds has been at least 8 months. Aeration can be used to mix, aerate, and agitate the wastewater within the cell of Lagoon No. 1.

A 400-gallon-per-minute pump applies wastewater from the lagoons to the land through a computerized center pivot system. The center pivot operates at low pressures (30 $lbs/in.^2$) to minimize aerosols and spray drift. The permit limits wastewater application to 25 acre-in./acre/year from March 15 through November 15 and limits leaching losses to 3 in./year.

In 2002, wastewater application began June 18 and continued through September 26. The end gun on the pivot was used during 2002, resulting in an application area of approximately 73.5 acres. Aerial photographs of the STP area are presented in Appendix A as a visual record of changes in vegetation due

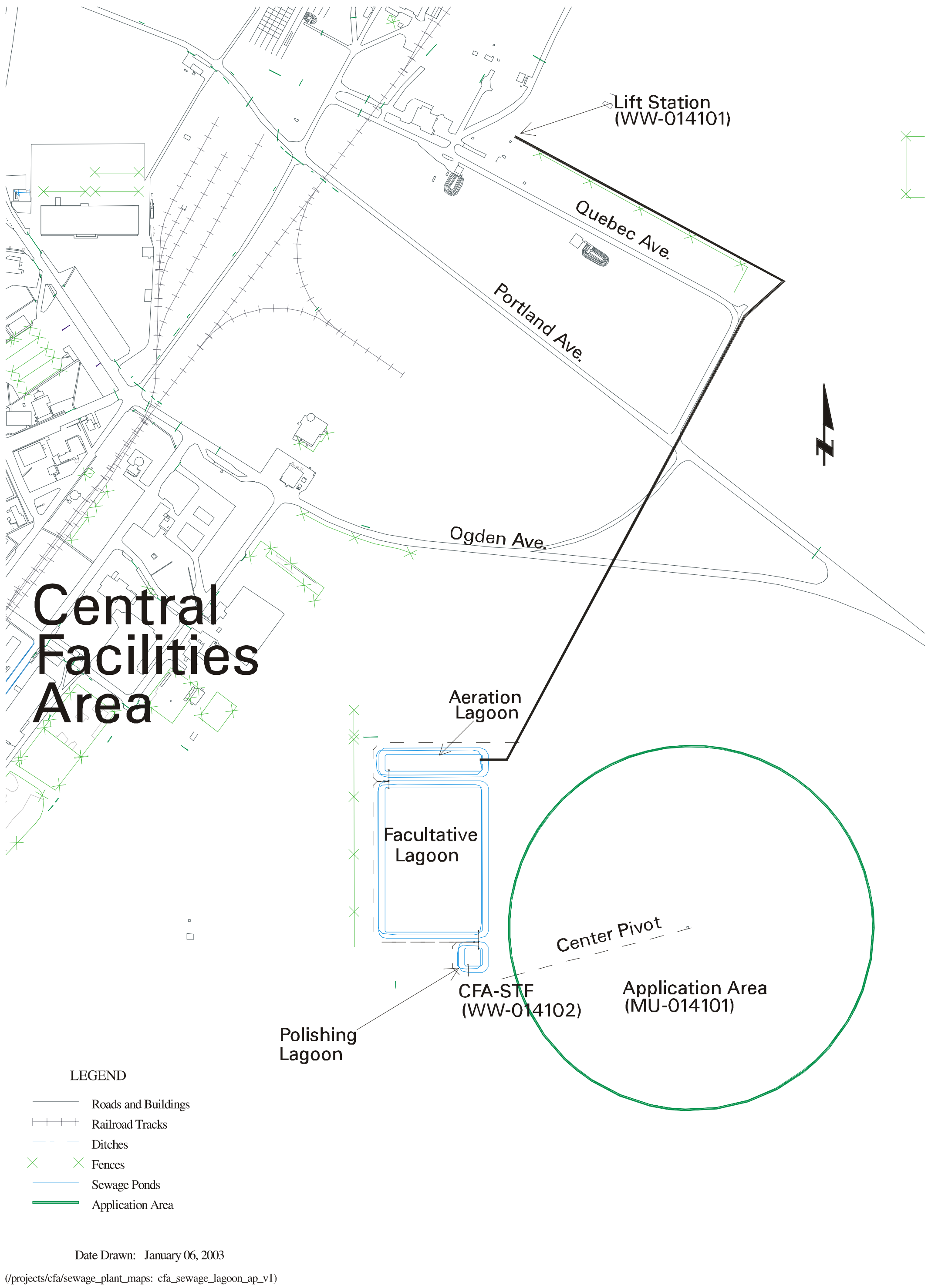

Figure 2-1. Central Facilities Area Sewage Treatment Plant.

to the operation of the pivot. A photograph is included for each year since the permit was issued, except for the 2001 permit year. Photographs were scheduled to be taken in late fall 2001. However, due to the increased security and closed airspace over the INEEL after September 11, 2001, aerial photographs could not be taken prior to the end of the 2001 permit year.

The original WLAP issued for the CFA STP expired August 7, 1999 (Green 1994). A renewal application was submitted February 9, 1999 (Bennett 1999). A letter authorizing the continued operation of the CFA STP under the original WLAP was issued September 18, 2000 (Johnston 2000a). In compliance with Section 1 of the WLAP, which states that "wastewater shall be managed substantially in accordance with the plan of operation," the CFA STP Operations and Maintenance (O&M) Manual was modified to reflect current operating methodologies. The manual was submitted to DEQ on November 29, 2001 (Rugg 2001). DEQ provided comments (Rackow 2002b) on the modified O&M Manual, and the INEEL submitted a response to DEQ on April 9, 2002 (Rugg 2002).

2.3 Status of Special Compliance Conditions

No special compliance conditions were in effect in 2002.

2.4 Influent and Effluent Monitoring Results

The permit year is from November 16, 2001, through November 15, 2002. However, to provide a more complete data set and for water balance calculations, data are reported from December 1, 2001, through November 30, 2002.

Influent samples were collected monthly from the lift station at CFA (prior to Lagoon No. 1) during the permit year. Effluent samples were collected from the pump pit (prior to the pivot) starting in June and continued through the months of pivot operation. All samples collected were 24-hour composite samples, except the pH and coliform samples, which were collected as grab samples by CFA Wastewater Operations personnel. Tables 2-1 and 2-2 summarize the influent and effluent results.

Yearly average concentrations for all parameters measured in the influent to the lagoons were at or below concentrations typically classified as "weak" municipal wastewater (biochemical oxygen demand [BOD] < 110, chemical oxygen demand [COD] < 250, total suspended solids [TSS] < 100, and total nitrogen [N] < 20 mg/L) (Metcalf and Eddy 1979). The average total Kjeldahl nitrogen (TKN) and BOD concentrations in the influent were less than those for the 2001 permit year, while the yearly average concentrations for the remainder of the permit parameters were greater than those for the 2001 permit year. The April 2002 pH reading (8.92) and one of the September 2002 duplicate COD concentrations (933 mg/L) represented historical highs, while the March 2002 TSS concentration represented the historical low (below detection at 4 mg/L). All other permit parameters were within historical ranges.

The yearly average concentrations for BOD, COD, fecal coliform, and total coliform measured in the effluent discharged to the pivot were lower than those of the previous year. All parameters were within the historical ranges, except for one September 2002 duplicate TSS concentration (33.7 mg/L), which represented the historical high. The July and August 2002 nitrate + nitrite as nitrogen concentrations were at the historical lows (below detection at 0.01 mg/L). The 2002 monthly pH readings were some of the highest reported to date; however, all were below the historical maximum of 9.97.

Removal efficiencies (REs) were calculated to estimate treatment in the lagoons (Table 2-3). Average REs were higher than the previous year, and all achieved their projected efficiency (i.e., total

Table 2-1. Central Facilities Area Sewage Treatment Plant influent water quality data from lift station (WW-014101).

Sample Month	Sample Date	TKN (mg/L)	NNN[a] (mg/L)	BOD (mg/L)	COD (mg/L)	TSS (mg/L)	pH
December	12/20/2001	21.3	1.87	78.7	142	58.2	7.74
January	1/15/2002	17.5	0.257	59.0	159	60.5	8.51
February	2/14/2002	21.2	0.537	46.5	109	36.6	6.87
March	3/27/2002	14.3	0.518	38.0	75.6	4.0 U[b]	8.16
April	4/17/2002	16.5	0.571	54.4	99.5	54.9	8.92
May	5/21/2002	11.3	1.02	19.3	153	33.2	8.87
June	6/26/2002	7.6	1.00	13.0	74.1	31.1	7.74
July	7/30/2002	10.5	1.13	44.2	370	52.8	8.31
August	8/27/2002	16.9	1.01	33.9	114	30.9	7.95
September	9/17/2002	19.6[c]	0.510[c]	65.5[c]	553[c]	178[c]	8.17
October	10/1/2002	12.5	0.159	59.2	175	49.9	7.87
November	11/5/2002	12.7	0.656	28.1	59.5	12.4	8.88
Yearly Average[d]		15.2	0.770	45.0	174	50.0	8.17

a. NNN—Nitrate + nitrite as nitrogen.

b. U flag indicates that the result was reported as below the detection limit.

c. The result shown is the average of the duplicate samples taken for the month.

d. Yearly average is determined from the average of the monthly values. Half the reported detection limit was used in the yearly average calculation for those results reported as below the detection limit.

Table 2-2. Central Facilities Area Sewage Treatment Plant effluent water quality data prior to pivot (WW-014102).

Sample Month	Sample Date	TKN (mg/L)	NNN[a] (mg/L)	BOD (mg/L)	COD (mg/L)	TSS (mg/L)	pH	Total Phosphorus (mg/L)	Fecal Coliform[b] (col/100 mL)	Total Coliform[b] (col/100 mL)
June	6/26/2002	1.37	0.026	2.00 U[c]	25.8	4.0 U	9.94	0.188	4	16
July	7/30/2002	1.15	0.01 U	2.00 U	26.4	4.3	9.86	0.253	1	1
August	8/27/2002	1.53	0.01 U	2.12	32.1	4.0 U	9.75	0.210	4	1
September	9/17/2002	2.27[d]	0.069[d]	2.00 U[d]	31.6[d]	30.6[d]	9.83	0.259[d]	1	6
Yearly Average[e]		1.58	0.026	1.28	29.0	9.7	9.85	0.228	3	6

a. NNN—Nitrate + nitrite as nitrogen.

b. Coliform samples were collected independent of the composite samples on 6/27/2002, 7/31/2002, 8/29/2002, and 9/19/2002.

c. U flag indicates that the result was reported as below the detection limit.

d. The result shown represents the average of duplicate samples taken for the month. A U flag indicates that all results for that month were reported as below the detection limit.

e. Yearly average is determined from the average of the monthly values. Half the reported detection limit was used in the yearly average calculation for those results reported as below the detection limit.

Table 2-3. 2002 removal efficiency[a] percentages for Central Facilities Area Sewage Treatment Plant permit monitoring parameters.

Sample Month	Total Nitrogen[b] (%)	BOD (%)	COD (%)	TSS (%)
June 2002	84	92[c]	65	94[d]
July 2002	90[e]	98[c]	93	92
August 2002	91[e]	94	72	94[d]
September 2002	88	98[c]	94[f]	81
Yearly Average RE	88	96	81	90

a. Removal efficiency (RE) = [(average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration] × 100.

b. Total nitrogen is calculated as the sum of the TKN and NNN results.

c. For BOD, half the detection limit was used in the RE calculation for the effluent concentration since the effluent results were reported as below the detection limit.

d. For TSS, half the detection limit was used in the RE calculation for the effluent concentration since the effluent results were reported as below the detection limit.

e. For total nitrogen, half the detection limit was used for the NNN component of the effluent concentration since the NNN results were reported as below the detection limit.

f. The RE shown is the average RE based on the average influent and effluent concentrations of the duplicate samples taken.

nitrogen, BOD, and TSS of 80% and COD of 70%). During the 2002 permit year, the average REs indicate that treatment in the lagoons was sufficient to produce a good quality effluent for land application.

2.4.1 Flow Volumes and Loading Rates

Daily influent flow readings were recorded at the flow meter prior to the first lagoon during the permit year. 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). Table 2-4 summarizes monthly and annual flow data, and Appendix A presents daily flow readings and copies of the required electronic WLAP data files (DEQ 2002).

Daily influent flows averaged less than 104,000 gpd, which was much less than the design flow of 250,000 gpd. Average daily flows continued to be greatest during the summer. Total influent flow volume was approximately 38 million gallons (MG) for the permit year. Discharge to the pivot averaged less than 173,000 gpd when it operated. The end gun was used during the entire 2002 application period (June 18, 2002, through September 26, 2002). Application rates ranged from 0.07 to 0.1 acre-in./day.

Table 2-5 presents hydraulic and nutrient loading rates. The total volume of applied wastewater for 2002 was approximately 14.49 MG, which is significantly less than the design hydraulic loading of 40.5 MG. Hydraulic loading peaked in August. Nitrogen loading rates were significantly lower (2.6 lb/acre/yr) than the projected maximum loading rate of 32 lb/acre/year. As a general rule, nitrogen loading should not exceed the amount necessary for crop utilization plus 50%. However, wastewater is applied to native rangeland without nitrogen removal via crop harvest. To estimate nitrogen buildup in the soil under this condition, a nitrogen balance was prepared by Cascade Earth Sciences, Ltd. (CES), which estimated it would take 20 to 30 years to reach normal nitrogen agricultural levels in the soil (based on

Table 2-4. Central Facilities Area Sewage Treatment Plant flow summaries.

Sample Month	Influent to Pond (WW-014101) Average (gpd[a])	Minimum (gpd)	Maximum (gpd)	Total (MG)[b]	Effluent to Pivot (WW-014102) Average (gpd)	Minimum (gpd)	Maximum (gpd)	Total to Field 1 (MU-014101) (MG)[b]
December 2001	65,355	39,394	100,914	2.03	NF[c]	NF	NF	NF
January 2002	77,475	49,261	102,089	2.40	NF	NF	NF	NF
February 2002	75,790	49,337	107,471	2.12	NF	NF	NF	NF
March 2002	82,748	58,801	124,691	2.57	NF	NF	NF	NF
April 2002	95,779	71,934	136,918	2.87	NF	NF	NF	NF
May 2002	108,805	79,285	146,057	3.37	NF	NF	NF	NF
June 2002	140,993	89,639	186,348	4.23	179,510	156,025	200,900	1.80
July 2002	135,477	60,459	194,956	4.20	176,219	149,600	197,300	4.58
August 2002	148,045	109,194	200,389	4.59	175,241	152,800	197,650	5.08
September 2002	121,384	84,181	168,035	3.64	159,353	155,100	160,800	3.03
October 2002	100,591	27,518	127,319	3.12	NF	NF	NF	NF
November 2002	86,551	65,678	108,988	2.60	NF	NF	NF	NF
Yearly Summary	103,388	27,518	200,389	37.74	172,458	149,600	200,900	14.49

a. gpd—Gallons per day.

b. Monthly and annual totals are shown in millions gallons (MG).

c. NF—No flow.

Table 2-5. 2002 hydraulic and nutrient loading rates.[a]

Sample Month	Applied Wastewater Total (MG)[b]	Applied Wastewater Per Acre (MG)	Total Nitrogen[c] (lb/acre)	COD (lb/acre)	Total Phosphorus (lb/acre)
June	1.8	0.024	0.279	5.16	0.038
July	4.58	0.062	0.596	13.63	0.131
August	5.08	0.069	0.882	18.44	0.121
September[d]	3.03	0.041	0.799	10.79	0.088
Yearly Total	14.49	0.196	2.556	48.02	0.378

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

b. MG—Million gallons.

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

d. All September nutrient loading rates are based on average monthly nutrient concentrations.

a loading rate of 32 lb/acre/year) (CES 1993). The extremely low 2002 nitrogen loading rate of 2.6 lb/acre/year had a negligible effect on nitrogen accumulation.

The 2002 annual total COD loading rate at CFA STP (48 lb/acre/year) was less than the previous year and was substantially less than the state guidelines of 50 lb/acre/day (which is equivalent to 18,250 lb/acre/year).

The annual total phosphorus loading rate (0.378 lb/acre/year) was well below the projected maximum loading rate of 4.5 lb/acre/year. The small amount of phosphorus applied was probably removed by sorption reactions in the soil and utilized by vegetation, rather than lost to groundwater.

2.4.2 Soil Water Balance

A monthly water balance software package was prepared by Cascade Earth Sciences, Ltd. to determine leaching losses (Maloney 1993; Bruner 1994). This water balance software calculates leaching losses based on:

- Soil available water capacity
- Precipitation
- Wastewater application
- Evapotranspiration.

This calculation:

- Assumes full soil profile water storage on April 1
- Applies an adjustment factor of 84% to the measured precipitation values to account for interception by vegetation onsite
- Applies an irrigation efficiency factor to the measured wastewater flows to account for evaporation resulting from spraying. (Irrigation efficiencies of 70% were used for the center pivot for June, July, and August, and 80% for September.)

Potential and actual evapotranspiration values are estimated based on average monthly temperatures and the volume of water stored in the soil, respectively. The National Oceanic and Atmospheric Administration measures monthly precipitation and temperature at the CFA Weather Station.

A projected water balance was submitted with the original WLAP application to the DEQ. Table 2-6 shows the water balance for the 2002 permit year. A total of 7.25 acre-in./acre of wastewater was applied over approximately 73.5 acres during the 2002 permit year, which was 0.25 in. less than that applied in 2001. This total, when adjusted for irrigation efficiency and added to the total adjusted precipitation for the permit year, yields 9.60 acre-in./acre, which is well below the permit limit of 25 acre-in./acre/year. The relatively low volume of wastewater, coupled with below average annual precipitation (by 3.4 in.) and above average monthly temperatures during the application period for June (by 1.9°F) and July (by 4.6°F), resulted in no leaching loss.

Table 2-6. Central Facilities Area Sewage Treatment Plant monthly water balance for 14.49 MG wastewater applied to the irrigation area.[a]

Month	Water Applied (in.)				Total (in.)	Evapotranspiration[b] (in.)		Stored in Soil (in.)	Leaching Loss[e] (in.)
	PPT[c]	ADJ PPT[c]	Waste[d]	ADJ Waste[d]		PET	ACT		
December 2001	0.92	0.77	0	0	0.77	0.10	0.10	0.68	0
January 2002	0.23	0.19	0	0	0.19	0.12	0.12	0.76	0
February 2002	0.10	0.08	0	0	0.08	0.09	0.09	0.75	0
March 2002	0.98	0.82	0	0	0.82	0.40	0.40	1.18	0
April 2002	0.51	0.43	0	0	0.43	1.35	1.27	8.22	0
May 2002	0.49	0.41	0	0	0.41	2.48	2.14	6.49	0
June 2002	0.75	0.63	0.89	0.62	1.25	4.09	3.31	4.43	0
July 2002	0.14	0.12	2.29	1.60	1.72	6.03	4.16	1.99	0
August 2002	0.13	0.11	2.55	1.79	1.89	4.31	3.62	0.26	0
September 2002	0.52	0.44	1.52	1.22	1.65	2.47	2.34	0	0
October 2002	0.02	0.02	0	0	0.02	0.77	0.73	0	0
November 2002	0.41	0.34	0	0	0.34	0.32	0.32	0.03	0
Total:	5.20	4.37	7.25	5.23	9.60	22.51	18.60	0	0
				Soil Available Water Capacity[f]:				8.22	

a. Water balance was calculated using the method in *Irrigation Water Requirements* (Department of Agriculture 1979).

b. PET—potential evapotranspiration; ACT—actual evapotranspiration.

c. PPT— precipitation. ADJ PPT—adjusted precipitation. An efficiency factor was applied to the raw monthly data to account for interception by native vegetation (Linsley, Kohler, and Paulhus 1982).

d. Waste—applied wastewater. ADJ Waste—applied wastewater adjusted for irrigation losses. A monthly efficiency factor was applied to correct for irrigation losses due to evaporation (Department of Agriculture 1986).

e. Leaching losses of water moving below the rooting zone (assumed to be a depth of 52 in.).

f. Soil available water capacity was determined from field measurements and textural analyses to be 8.22 in.

2.5 Evaluation of Groundwater Data

Groundwater monitoring is not required by the current permit based on the following:

- Quantity and quality of water discharged
- Local geology and hydrology
- Distance to nearest downgradient drinking water well (Experimental Breeder Reactor [EBR]-I production well approximately 3.5 mi southwest).

However, as discussed in previous WLAP reports, groundwater sampling results of several wells downgradient of the STP identified nitrate + nitrite near or above the applicable state groundwater quality concentration limits of 10 mg/L. These limits are the primary constituent standards (PCSs) specified in IDAPA 58.01.11, "Ground Water Quality Rule."

Three wells, which were constructed as part of the CFA regional groundwater monitoring network in 1995 (CFA-MON-A-001, -002, and -003), are located generally downgradient of the new CFA STP (Figure 2-2). Since 1995, nitrate + nitrite concentrations in well CFA-MON-A-001 were well below the primary constituent standard of 10 mg/L (Figure 2-3). Over the same period, the nitrate + nitrite concentrations in wells CFA-MON-A-002 and -003 (Figures 2-4 and 2-5, respectively) were above or near the primary constituent standard.

Previous evaluations have indicated that the new CFA STP is not a likely source of nitrate + nitrite based on effluent concentrations and the vadose zone and groundwater travel time between the new CFA STP and the wells (INEEL 2000a). Total nitrogen concentrations in the CFA STP effluent are consistently too low to provide a steady source of nitrate + nitrite from lagoon seepage at the concentrations detected in the wells. In addition, based on water balance calculations showing minimal leaching losses from land application, it is unlikely that the effluent is migrating from the land application area to the aquifer.

Several evaluations have been conducted to determine the potential source of the nitrate + nitrite. The most recent evaluation (INEEL 2000b) was completed by Waste Area Group (WAG) 4, which is responsible for implementing characterization and cleanup activities at CFA under the INEEL's Federal Facilities Agreement and Consent Order (FFA/CO) as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Program. In November 2002, WAG 4 completed the initial 5-year review of the Record of Decision (ROD) remedies selected for the CFA landfills and the general groundwater impacts in the CFA area (DOE-ID 2002b). The result of this review concluded that the source of the nitrate + nitrite in wells CFA-MON-A-002 and CFA-MON-A-003 is uncertain. In addition, the review concluded that the source of the nitrate + nitrite would be reevaluated. This reevaluation would include a preparation of corrected groundwater contour maps and a review of recently available source information.

The groundwater nitrate + nitrite concentrations will continue to be monitored by the INEEL FFA/CO Program since the source is not believed to be the new CFA STP.

2.6 Soil Monitoring

Cascade Earth Sciences, Ltd. characterized soils at the CFA STP prior to construction. Soils in the upper 6 in. are predominantly silty clay loam and from 6 to 52 in. are predominantly silt loam. Soils at CFA were determined to be suitable for slow-rate wastewater application (EG&G 1993).

Soils have since been sampled from the land application area (locations 1 through 5 shown in Figure 2-6) following each application season. Subsamples were taken from 0–12 in. and 12–24 in. at each location and composited, yielding two composite samples, one from each depth. These results are presented in Table 2-7. In addition, preapplication data collected by Cascade Earth Sciences, Ltd. are presented for comparison purposes.

pH levels decreased slightly during the application period (Table 2-7), and the pH level at both the 0−12 in. and the 12−24 in. intervals during 2002 represent the application period minimum. Percent organic matter varied around preapplication concentrations; however, it is expected to take several years for decomposed vegetation to be incorporated into the soil profile.

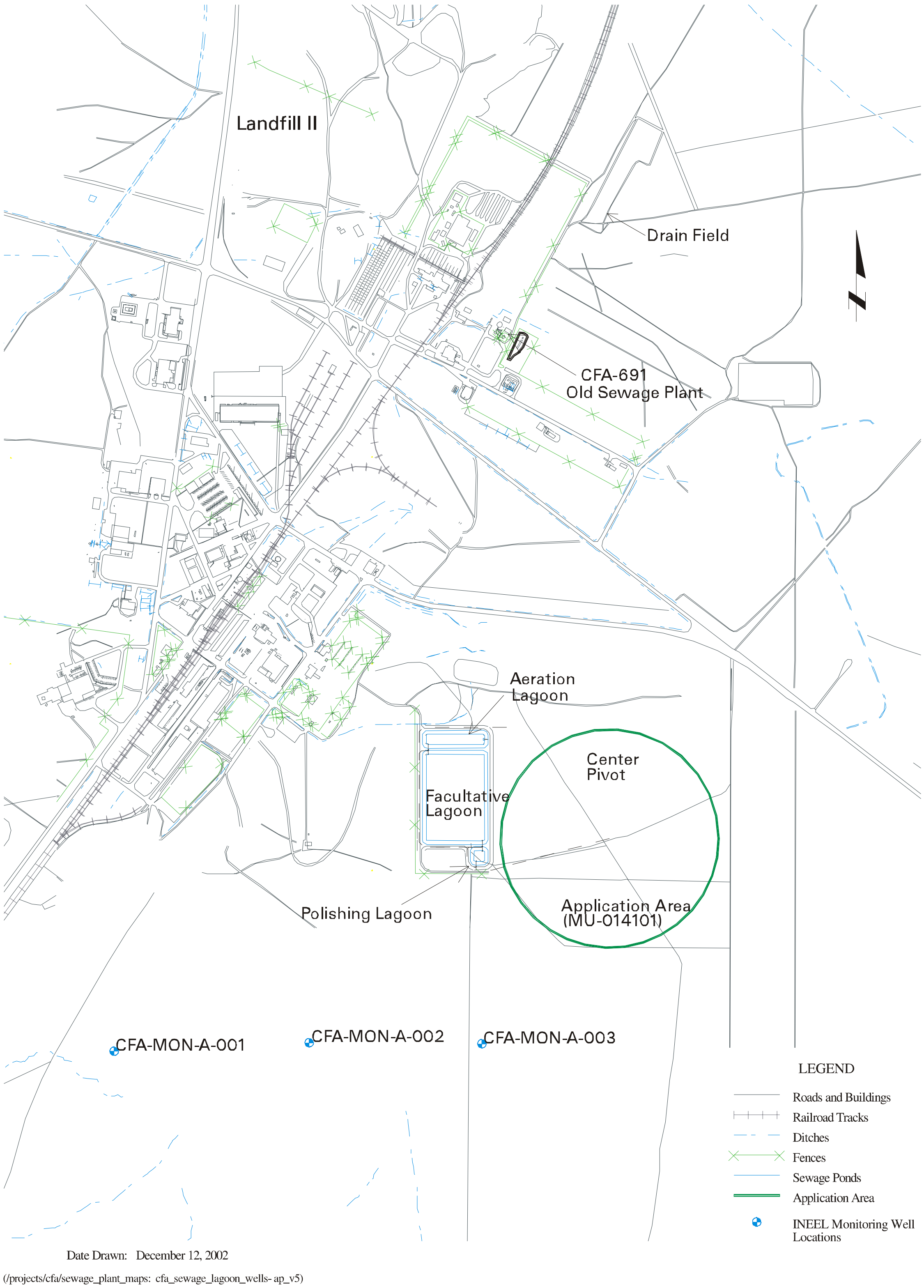

Figure 2-2. Locations of monitoring wells in the vicinity of the Central Facilities Area Sewage Treatment Plant.

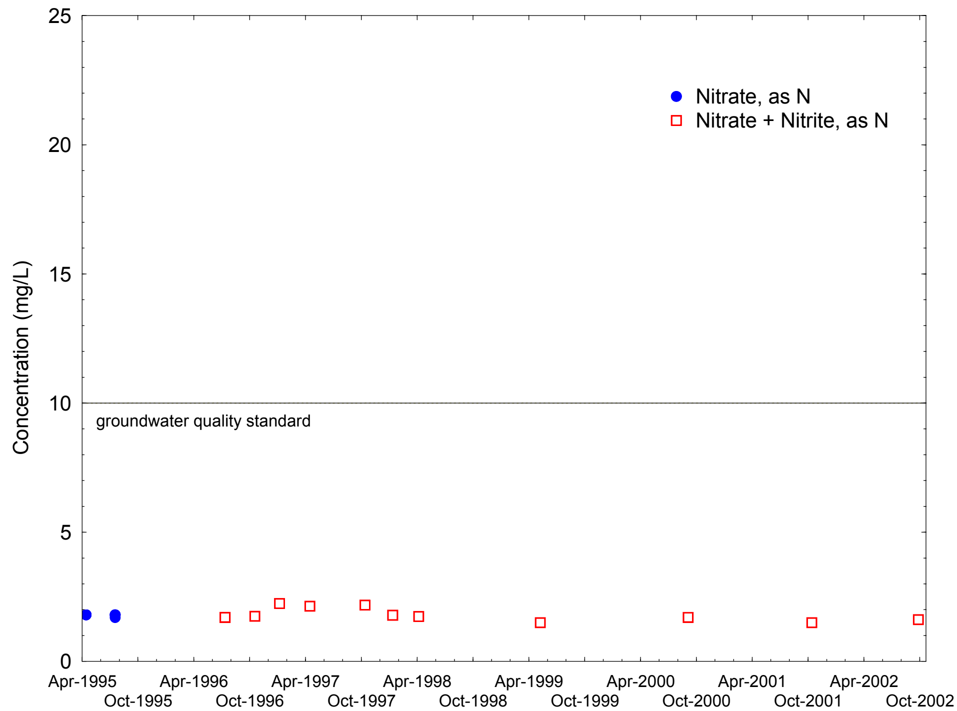

Figure 2-3. Nitrate and nitrite (as N) at CFA-MON-A-001.

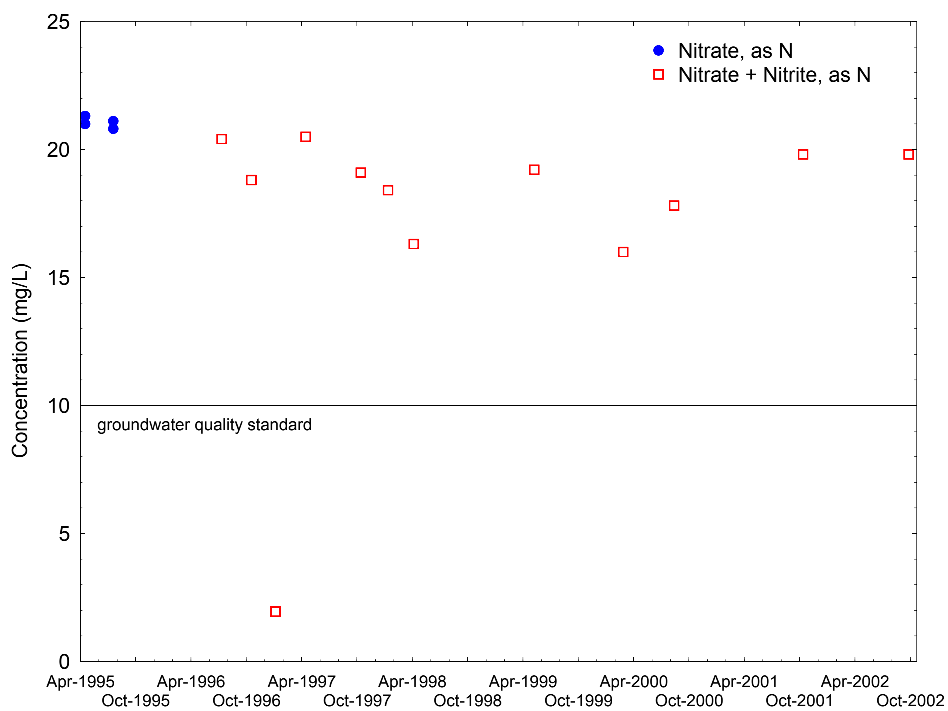

Figure 2-4. Nitrate and nitrite (as N) at CFA-MON-A-002.

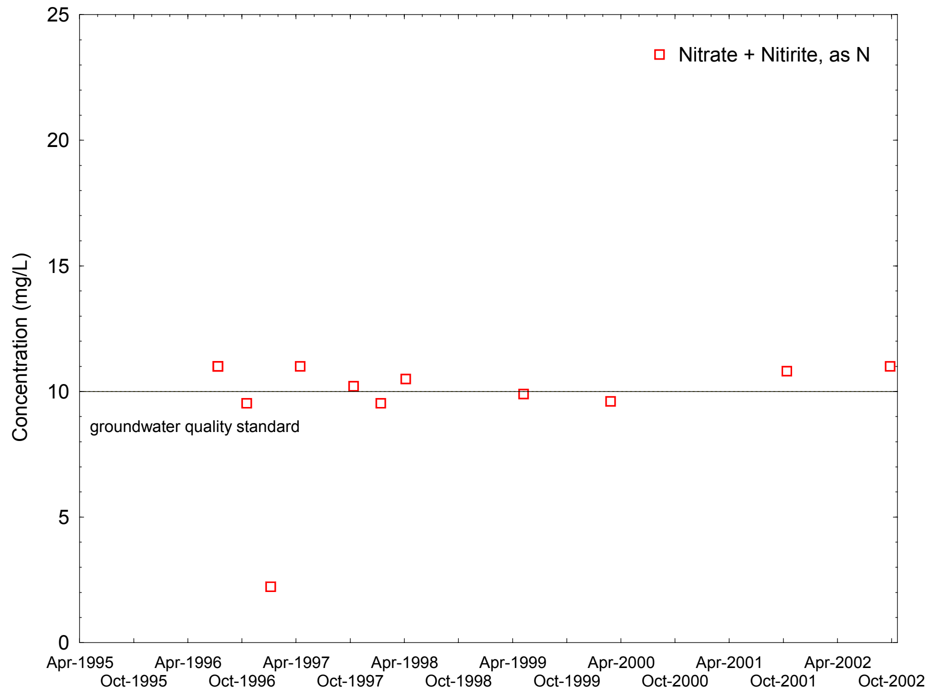

Figure 2-5. Nitrate + nitrite (as N) at CFA-MON-A-003.

The soil salinity levels were within acceptable ranges based on electrical conductivity (EC) results. Soil salinity levels between 0–2 mmhos/cm are generally accepted to have negligible effects on plant growth. During 2002, the electrical conductivity in the 0–12 in. interval remained near the 2001 concentrations, and the 12–24 in. interval was approximately half the 2001 concentration. Both intervals remained within the 0–2 mmhos/cm range.

Soils with sodium adsorption ratios (SARs) below 15 and EC levels below 2 mmhos/cm are generally classified as not having sodium or salinity problems (Bohn, McNeal, and O'Connor 1985). During 2002, SARs were slightly elevated at both depths relative to preapplication SARs. However, they remain well below 15. The SAR is an indicator of the exchangeable sodium levels in the soil. Soils with high exchangeable sodium levels tend to crust badly or disperse, which greatly decreases soil hydraulic conductivity.

Nitrogen data suggest negligible nitrogen accumulation from wastewater application. Ammonium (NH_4-N) and nitrate as nitrogen (NO_3-N) concentrations continue to be well below preapplication concentrations. The low soil-available nitrogen (NH_4-N and NO_3-N) concentrations suggest that the native sagebrush and grass vegetation utilize all of the plant-available nitrogen and that the total nitrogen application is low. Increased nutrients and water from wastewater application may be stimulating plant growth, which in turn rapidly utilizes plant-available nitrogen. The ammonium and nitrate as nitrogen concentrations are comparable to those of nonfertilized, background agricultural soils.

The permit requires total phosphorus analysis of soils; however, since the total phosphorous content includes the digestion of phosphate minerals, the results of total phosphorous analyses are not indicative of plant-available phosphorous or water-soluble phosphorous that could leach to groundwater. Phosphorous soluble in sodium bicarbonate is the common method for determining plant-available and

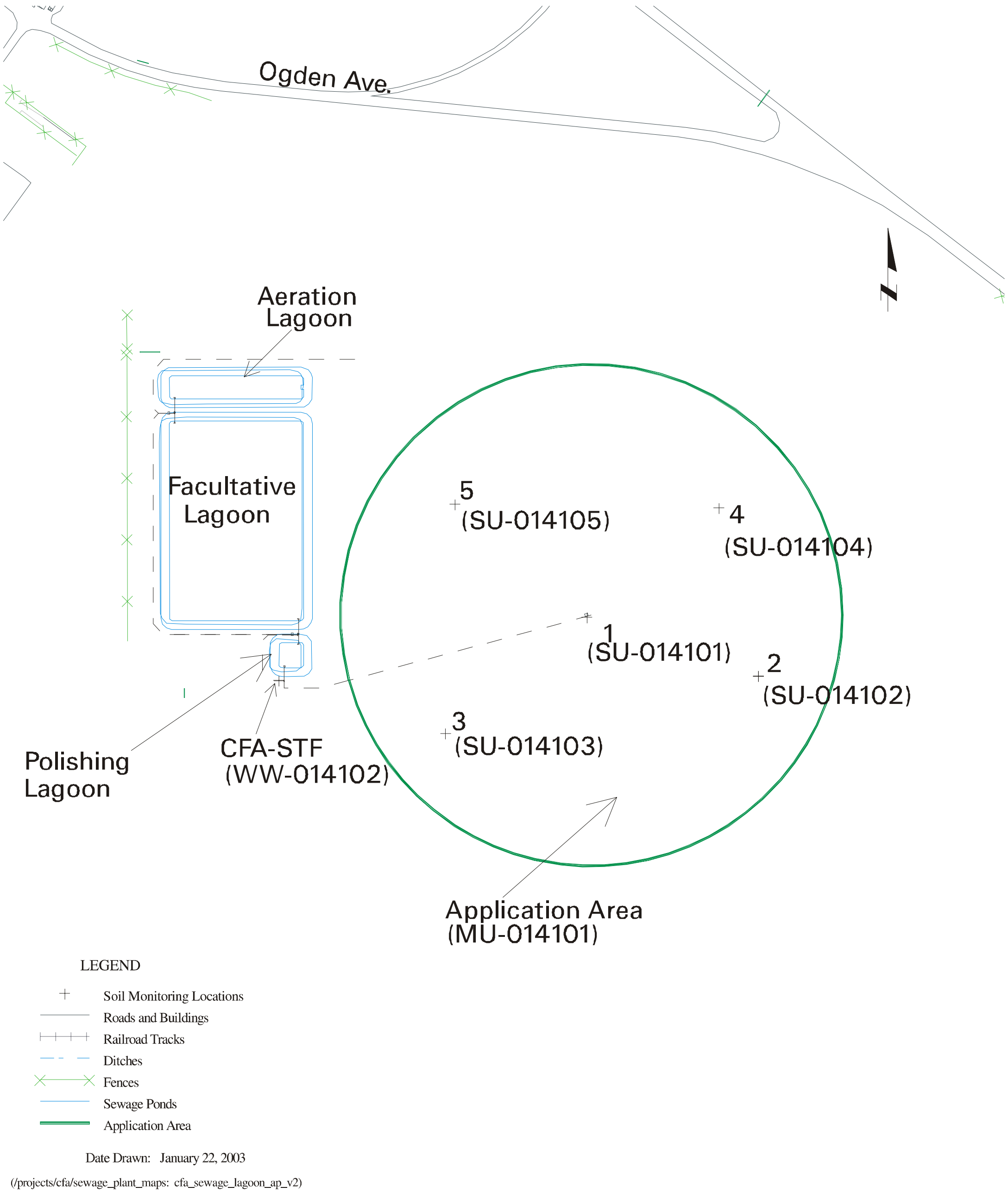

Figure 2-6. Central Facilities Area Wastewater Land Application Permit soil monitoring locations.

Table 2-7. Central Facilities Area Sewage Treatment Plant application area soil monitoring results.

Parameter	Preapplication Period[a] Depth (in.)	1993	Application Period Depth (in.)	1995 through 2001 Minimum	Maximum	Average	2002
pH	0–6	7.6	0–12	8.0[b]	8.4[b]	8.2[b]	7.6
	6–16	8.0	12–24	7.9[b]	8.6[b]	8.3[b]	7.6
	16–30	8.1					
Electrical conductivity (mmhos/cm)	0–6	0.6	0–12	0.36	1.20	0.74	1.01
	6–16	0.7	12–24	0.20	1.64	0.69	0.80
	16–30	0.6					
Organic matter (%)	0–6	2.2	0–12	0.63[b]	3.09[b]	1.85[b]	0.44
	6–16	1.6	12–24	0.56[b]	2.29[b]	1.16[b]	0.84
	16–30	1.4					
Nitrate as nitrogen (ppm)	0–6	16	0–12	1.81[c]	6.00	3.45[d]	0.676
	6–16	6	12–24	0.43[c]	5.20	1.80[d]	4.17
	16–30	3					
Ammonium nitrogen (ppm)	0–6	7.9	0–12	1 U[e]	6.10	3.50[d]	0.81 U
	6–16	7.6	12–24	1 U	6.00	3.09[d]	0.84 U
	16–30	7.4					
Phosphorous (ppm)[f]	0–6	29	0–12	4.9	12.0	8.5[d]	3.69
	6–16	18	12–24	2 U	10.2	4.2[d]	1.39
	16–30	12					
Sodium adsorption ratio	0–6	1.0	0–12	0.35	6.72	2.64	3.23
	6–16	1.4	12–24	0.31	4.03	1.55	1.82
	16–30	2.6					

a. Preapplication sample results were based on a composite of three representative samples taken at each depth. Preapplication soil depths and locations differ from permit samples.

b. The summary statistics shown do not reflect a result from 1995. While samples were collected in 1995, the analytical laboratory failed to analyze them.

c. The minimum shown is the minimum of the detected results. For the 0-12 in. depth, a result of less than 25 ppm was reported in 1997. For the 12-24 in. depth, a result of less than 1 was reported in 1999, a result of less than 2.25 ppm was reported in both 2000 and 2001, and a result of less than 2.5 was reported in 1997.

d. Where applicable, half the reported detection limit was used to calculate the average.

e. U flag indicates that the reported result is below the detection limit.

f. Available phosphorus was analyzed rather than the total phosphorus analysis specified in the permit. DEQ 2002 identifies plant available phosphorous as an appropriate soil monitoring constituent and total phosphorus as an inappropriate soil monitoring constituent. The total phosphorus reported for 1995 is not included in the summary statistics presented.

soil-solution phosphorous, which can then be correlated to fertilizer needs or environmental concerns. Therefore, this analysis was requested since the 1996 soil monitoring. In 2002, available phosphorous concentrations remained below preapplication concentrations and at concentrations less than that considered adequate for range and pasture crop growth (EPA 1981).

2.7 Summary of Environmental Impacts

Operations of the CFA STP continued to have little environmental impact during the 2002 permit year. The relatively weak wastewater influent, followed by treatment in the CFA STP lagoons, produced a good quality effluent for application for the 2002 permit year. When combined with an annual hydraulic loading rate that was lower than that of the design criteria, the nutrient loading rates were below projected levels. Soil and weather conditions, combined with the relatively low volume of wastewater applied during the permit year, resulted in no leaching loss for the year, compared to the permit limit of 3 in. per year. As a result, land application of wastewater appeared to have negligible impact on soils and groundwater. While sodium adsorption ratios (SARs) were slightly elevated at both depths relative to preapplication SARs, they remain well below those in soils classified with sodium problems.

Evaluations conducted to date into the high nitrate + nitrite concentrations detected in the groundwater near the new STP have determined that the new STP was not the likely source. Since the source is not believed to be the STP, WAG 4 (under the INEEL FFA/CO) will continue to monitor the groundwater nitrate + nitrite concentrations. In addition, a recent WAG 4 5-year review of the ROD remedies selected for the CFA landfills concluded that the source of the nitrate + nitrite will be reevaluated. This reevaluation will include a preparation of corrected groundwater contour maps and a review of recently available source information.

3. EXISTING IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING CENTER PERCOLATION PONDS DATA SUMMARY AND ASSESSMENT

3.1 Site Description

The Idaho Nuclear Technology and Engineering Center (INTEC) is an approximately 265-acre, multipurpose plant located on the INEEL (Figure 3-1). It was constructed in 1951 and presently includes approximately 280 buildings and structures. Within INTEC are all of the facilities necessary to receive and store spent nuclear fuel, process the fuel to recover uranium-235, and handle waste generated by those functions. However, due to a change in mission in 1992, uranium-235 is no longer recovered at INTEC. Currently, INTEC receives and stores spent nuclear fuel, prepares the spent nuclear fuel for shipment to an off-Site repository, and manages the waste fission products resulting from the spent fuel recovery process. In addition, research and development work is conducted to develop and improve fuel management and waste processing technologies. Environmental restoration and remediation activities are also conducted as part of the INEEL's commitment to clean up the legacy of nuclear waste.

INTEC generates 1 to 2 MG/day on average of process wastewater (commonly called service waste) during normal operations. Prior to August 26, 2002, this wastewater was discharged to Percolation Ponds No. 1 or No. 2 (Figure 3-2), referred to as the existing Percolation Ponds, via the service waste system. In the event of unusual circumstances, the existing Percolation Ponds (No. 1 and No. 2) could accommodate up to 5 MG/day. On August 26, 2002, discharge of this wastewater ceased to the existing Percolation Ponds and was transferred to the New Percolation Ponds. Refer to Section 4 for a discussion of the New Percolation Ponds.

The INTEC Percolation Ponds (either existing or new) receive only the discharge of nonhazardous wastewater. Hazardous wastewater from INTEC processes and laboratories is disposed of in accordance with applicable Resource Conservation and Recovery Act regulations. Sanitary wastes from restrooms and the INTEC cafeteria are either discharged to the Sewage Treatment Plant (STP) or directed to on-Site septic tank systems.

3.2 System Description and Operation

The service waste system serves all major facilities at INTEC. This process-related wastewater from INTEC operations consists of:

- Steam condensates
- Noncontact cooling water
- Reverse osmosis, and water softener and demineralizer regenerate
- Boiler blowdown wastewater
- Other nonhazardous liquids.

Prior to August 26, 2002, all service waste entered CPP-797, the final sampling and monitoring station, prior to discharge to the existing Percolation Ponds. In CPP-797, the combined effluent is measured for flow rate and samples are collected for analyses. Two sets of two pumps transfer the wastewater from CPP-797 to the existing Percolation Ponds.

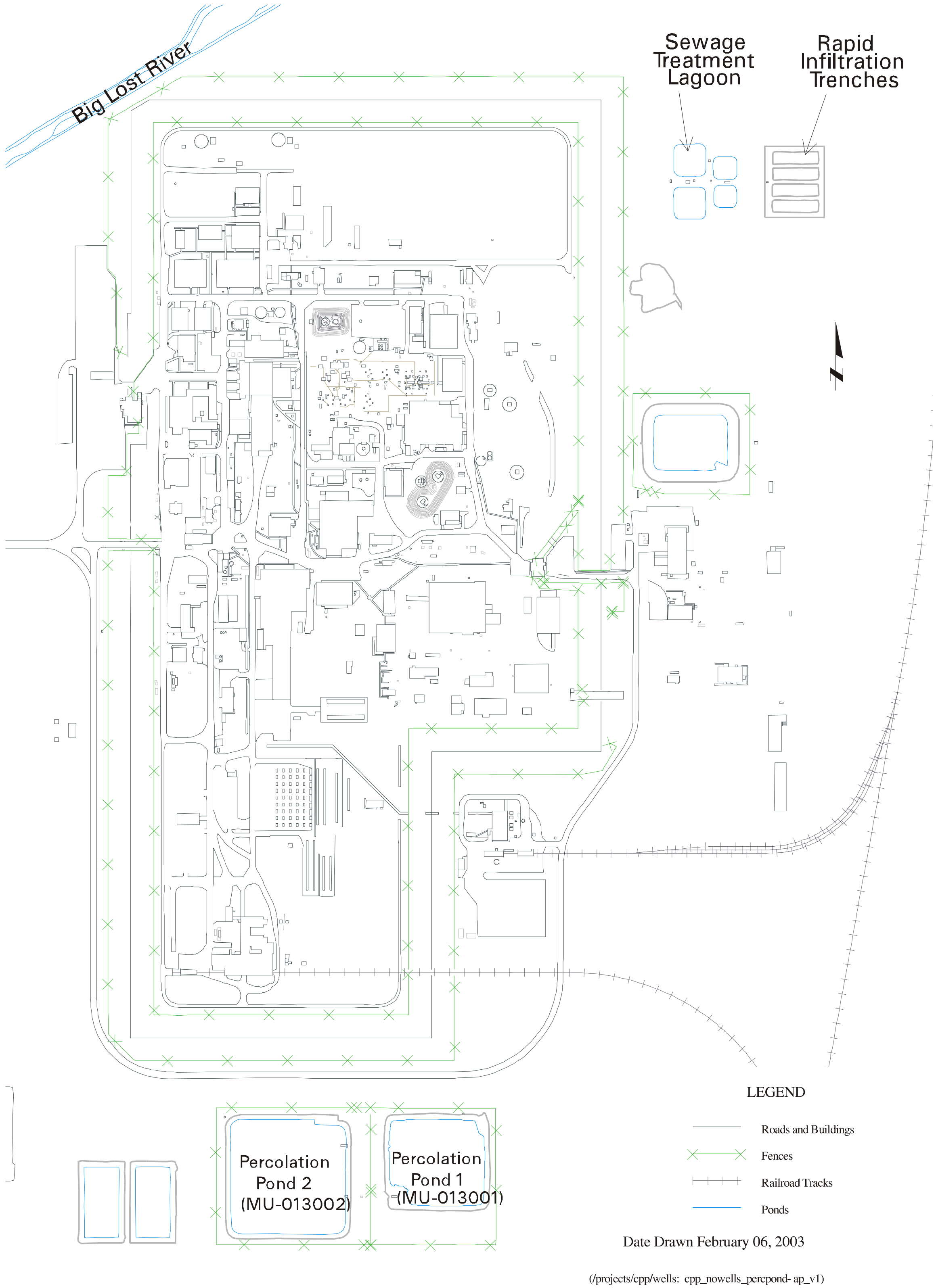

Figure 3-1. Idaho Nuclear Technology and Engineering Center facility map showing the existing Percolation Ponds.

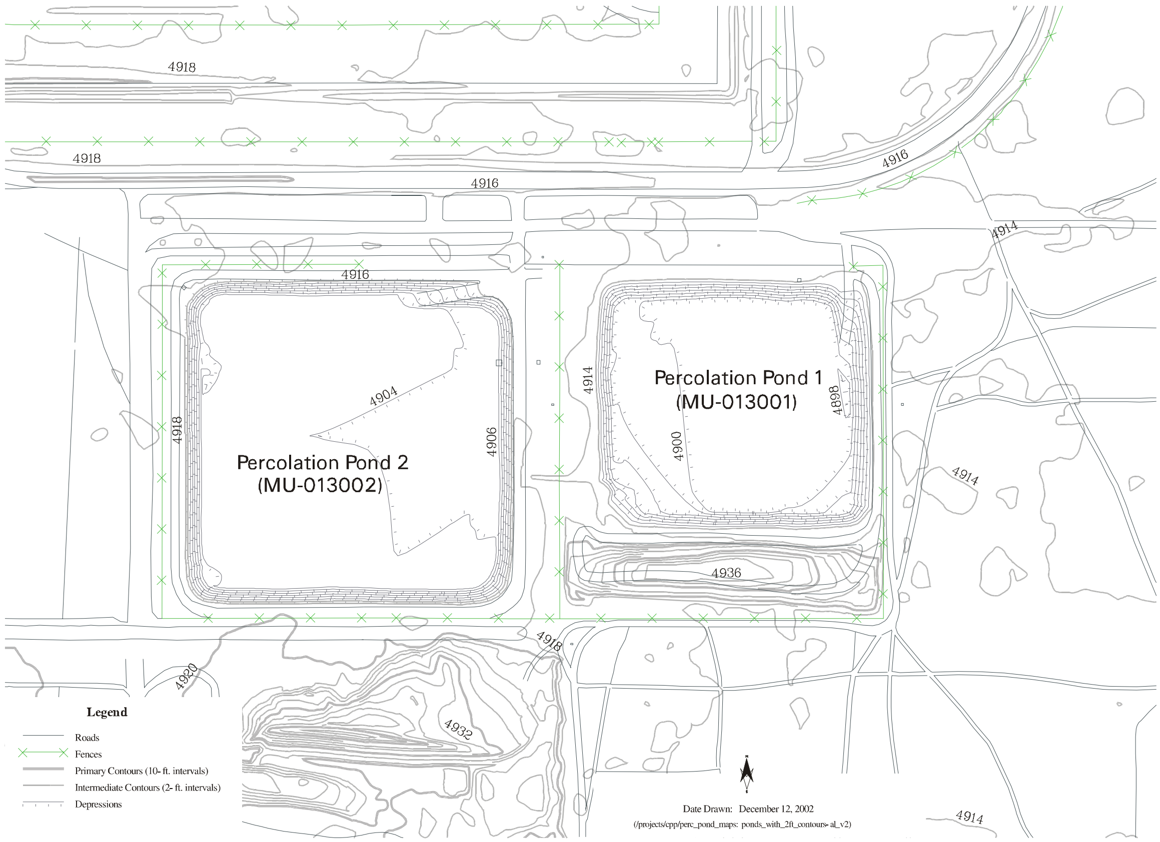

Figure 3-2. Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds.

Percolation Pond No. 1 is southeast of CPP-603. It is approximately 480 × 410 ft at the top and 16 ft deep. The gravelly alluvium in which the pond was excavated is approximately 20 to 35 ft thick and overlies basalt. Prior to operation, soil was backfilled into the pond to its present depth of 16 ft. The pond is designed to accommodate continuous discharge of approximately 2 MG/day.

Percolation Pond No. 2 is immediately west of Percolation Pond No. 1. It is approximately 500 × 500 ft and 12 to 14 ft deep. Percolation Pond No. 2 was built by removing approximately 12 ft of surficial sediments. The thickness of the remaining surficial sediments is estimated to range from 20 to 40 ft. The pond is designed to accommodate continuous discharge of approximately 3 MG/day based on the observed percolation rates.

Wastewater is normally sent to only one pond at a time. In the event the flow capacity of one pond is exceeded, the total capacity of both ponds (5 MG/day) is available. The ponds are enclosed by an 8-ft-high chain-link fence to restrict access.

The WLAP for the existing Percolation Ponds expired on September 17, 2000. On June 5, 2000, DEQ granted an extension for continued coverage under the existing WLAP until December 2003 (Johnston 2000b). On August 26, 2002, wastewater discharge to the existing Percolation Ponds ceased. A letter (Guymon 2002a) requesting cancellation of the WLAP (LA-000130-02) was submitted to DEQ on October 23, 2002. DEQ acknowledged that the existing Percolation Ponds permit was considered ineffective as of November 4, 2002 (Rackow 2002a). Because the existing Percolation Ponds were in operation during the 2002 reporting year, a WLAP Performance Report is required and is being provided for 2002. However, because the permit became ineffective and wastewater is no longer discharged to the existing Percolation Ponds, no future WLAP Performance Reports will be required for LA-000130-02.

3.3 Status of Special Compliance Conditions

No special compliance conditions are associated with this permit.

3.4 Effluent Monitoring Results

A 24-hour flow-proportional composite sample is collected monthly from the sample point located in CPP-797 and analyzed for parameters listed in Schedule B of the permit. Table 3-1 presents effluent water quality data for the 2002 permit year (November 2001 through October 2002).

The quality of wastewater discharged to the existing Percolation Ponds in 2002 is consistent with previous years. The permit does not specify concentration limits for effluent to the ponds; however, concentrations were compared to the applicable primary or secondary constituent standards (IDAPA 58.01.11). Yearly average effluent concentrations met these standards for all constituents except total dissolved solids (TDS). The secondary constituent standard for TDS is 500 mg/L. During the 2002 permit year, the secondary constituent standard was exceeded five times (November 2001, and February, March, April, and July 2002), and the yearly average concentration for TDS (519 mg/L) increased over the previous permit year. However, all individual monthly concentrations fell within historical ranges. Additionally, while the yearly chloride average concentration did not exceed the secondary constituent standard of 250 mg/L, both the February and July 2002 monthly concentrations were greater than 250 mg/L. February 2002 concentrations for chloride, TDS, and sodium represented permit year highs.

Chloride, TDS, and sodium concentrations in the effluent are primarily from the water softening and water treatment operations in CPP-606. In 1998, a reverse osmosis unit was installed, and a demineralizer system was put into operation; both have reduced the amount of salt additions required for treated water. Effluent chloride, TDS, and sodium concentrations showed decreasing trends when considering all data since 1995 (Figure 3-3). In April 2001, the brine feed to the water softener system was modified, removing the reclaimed brine cycle. The modification was made to further reduce the salt usage. However, salt usage increased in the months following the modification. Alternative water softening systems were reviewed during the 2002 permit year, and a recommendation was submitted to DOE-ID for installation of a new system that is expected to reduce overall salt usage.

Table 3-1 presents pH results from both grab and composite samples. The permit requires that the pH result come from a composite sample. In addition, DEQ verbally requested that pH be analyzed from a grab sample (Walker 1996). Both results are provided in Table 3-1 to meet these requirements. The results varied slightly between the grab and composite samples over time. However, when a paired t-test was performed on the pH results from both the grab and composite samples from January 1997 through the 2002 permit year, no statistical difference was found between the two groups (grab vs. composite).

3.4.1 Flow Volumes

The flow volumes to the existing Percolation Ponds were recorded daily from the flow meter in CPP-797. Table 3-2 presents monthly and total flow volumes, and Appendix B presents daily flow readings and copies of the required electronic WLAP data files (DEQ 2002). On August 26, 2002, the existing Percolation Ponds were taken out of service and the discharge of wastewater was diverted from the existing Percolation Ponds to the INTEC New Percolation Ponds (WLAP LA-000130-03). Prior to that date, weekly inspection logs indicate that all of the flow for the 2002 permit year (approximately

Table 3-1. Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds effluent data (WW-013001).

Sample Month Sample Date	November 11/6/2001	December 12/5/2001	January 1/29/2002	February 2/19/2002	March 3/5/2002	April 4/2/2002	May 5/28/2002	June 6/11/2002	July 7/9/2002	August 8/13/2002	September NR[a]	October NR	Yearly Average[b]
TKN (mg/L)	0.15 U[c]	0.14 U	0.15 U	0.15 U	0.15 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21	—	—	0.10
Chloride (mg/L)	228	131	96	360	210	223	110	99	273	87	—	—	182
TDS (mg/L)	595	407	399	835	579	578	392	379	648	375	—	—	519
Sodium (mg/L)	129	84	59	192	144	156	87	91	159	68	—	—	117
NO_2-N (mg/L)	0.003 U	0.014 U	0.003 U	0.003 U	0.005 U	0.005 U	0.004 U	0.004 U	0.004 U	0.005 U	—	—	0.002 U
NO_3-N (mg/L)	0.93	1.10	0.90	0.81	0.89	0.92	0.93	0.87	0.87	0.75	—	—	0.90
Arsenic (mg/L)	0.0026 U	0.0046 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.0047 U	0.0047 U	0.0047 U	0.0047 U	—	—	0.0020 U
Cadmium (mg/L)	0.0003 U	0.0008 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	—	—	0.0002 U
Chromium (mg/L)	0.0055	0.0064	0.0056	0.0056	0.0050	0.0061	0.0055	0.0058	0.0057	0.0063 U	—	—	0.0054
Mercury (mg/L)	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	—	—	0.0001 U
Selenium (mg/L)	0.0031 U	0.0046 U	0.0036 U	0.0036 U	0.0036 U	0.0036 U	0.0037 U	0.0037 U	0.0037 U	0.0040 U	—	—	0.0019 U
Silver (mg/L)	0.0012 U	0.0019 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0014 U	0.0014 U	0.0014 U	0.0018 U	—	—	0.0009 U
Fluoride (mg/L)	0.20	0.23	0.21	0.21	0.21	0.22	0.23	0.27	0.21	0.20	—	—	0.22
Iron (mg/L)	0.0273	0.0304 U	0.0228 U	0.0189 U	0.0322 U	0.0240	0.0166 U	0.0166	0.0150 U	0.0229	—	—	0.0159
pH (composite)[d]	8.30	8.10	7.90 R[e]	8.13	8.12	8.15	8.30	7.93	7.90	8.00	—	—	8.10
pH (grab)[f]	8.40	8.10	7.60	7.84	8.02	8.48	8.20	8.36	7.60	7.49	—	—	8.01
Manganese (mg/L)	0.0008	0.0012	0.0008 U	0.0007	0.0008	0.0010	0.0005 U	0.0006	0.0009	0.0012	—	—	0.0008
Copper (mg/L)	0.0050	0.0057	0.0035	0.0030	0.0034	0.0053	0.0013	0.0014	0.0019	0.0021	—	—	0.0033
Aluminum (mg/L)	0.0079	0.0183 U	0.0096	0.0084	0.0063 U	0.0073	0.0079 U	0.0079 U	0.0084	0.0110 U	—	—	0.0067

a. NR—Not required. On August 26, 2002, discharge of wastewater was diverted from the existing Percolation Ponds to the INTEC New Percolation Ponds. As a result, no effluent sample was required for the existing Percolation Ponds.

b. Yearly average is determined from the average of the monthly values. Half the detection limit was used in the yearly average calculations for those results reported as below the detection limit.

c. U flag indicates that the result was reported as below the detection limit by the analytical laboratory or that the result was impacted by laboratory quality control issues and flagged during validation.

d. pH result is from a 24-hour composite sample.

e. R flag indicates that the result was rejected during validation; the analytical laboratory failed to analyze the sample within the allotted hold time (Guymon 2002b). The reported result is not used in determining the yearly average.

f. pH result is from a grab sample.

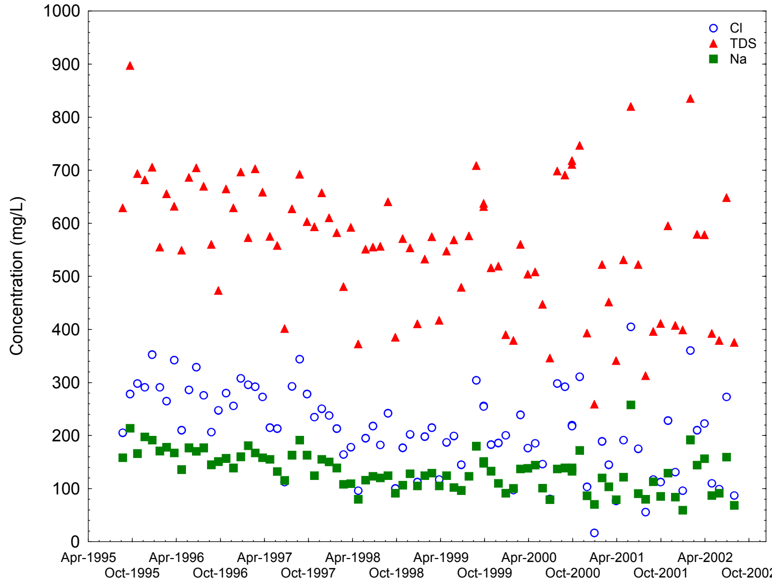

Figure 3-3. Existing Percolation Ponds chloride, total dissolved solids, and sodium effluent data.

Table 3-2. Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds flow summaries.

	Effluent (WW-013001) (gpd[a])			Total (MG[b])		
Time Period	Average	Minimum	Maximum	Pond 1 (MU-013001)	Pond 2 (MU-013002)	Ponds 1 & 2
November 2001	1,410,160	1,186,900	1,816,600	42.30	NF[c]	42.30
December 2001	1,574,729	1,175,200	2,308,600	48.82	NF	48.82
January 2002	1,595,536	1,334,400	1,863,000	49.46	NF	49.46
February 2002	1,358,889	1,155,400	1,608,800	38.05	NF	38.05
March 2002	1,337,248	1,207,300	1,483,500	41.45	NF	41.45
April 2002	1,146,390	976,700	1,414,400	34.39	NF	34.39
May 2002	1,009,016	919,400	1,305,300	31.28	NF	31.28
June 2002	1,184,759	700,544	1,717,800	35.54	NF	35.54
July 2002	1,422,882	809,395	1,589,000	44.11	NF	44.11
August 2002[d]	1,177,045	686,600	1,850,000	36.49	NF	36.49
September 2002	NF	NF	NF	NF	NF	NF
October 2002	NF	NF	NF	NF	NF	NF
Yearly Summary	1,101,091	686,600	2,308,600	401.90	NF	401.90

a. gpd—Gallons per day.

b. Monthly and annual totals are shown in million gallons (MG).

c. No flow reported during this period.

d. On August 26, 2002, discharge of wastewater was diverted from the existing Percolation Ponds to the INTEC New Percolation Ponds (WLAP LA-000130-03), making the existing Percolation Ponds inoperable.

402 MG) was discharged into Percolation Pond No. 1. Total flow during the 2002 permit year was well below the permit limit of 912 MG/year. During June and July, approximately 3.2 MG of wastewater was diverted to the INTEC New Percolation Ponds to perform system operability testing prior to the new ponds being placed in service (MacConnel 2002b). Since the flow was diverted from the existing Percolation Ponds, this flow was not included in the total flow reported for the existing Percolation Ponds.

3.5 Groundwater Monitoring Results

To measure potential existing Percolation Pond impacts to groundwater, the permit required that groundwater samples be collected from four monitoring wells (see Figure 3-4):

- One background aquifer well (USGS-121) upgradient of INTEC
- One aquifer well (USGS-048) immediately upgradient of the existing Percolation Ponds
- Two aquifer wells (USGS-112 and -113) downgradient of the existing Percolation Ponds, which serve as points of compliance.

Sampling must be conducted semiannually during April and October and must include a number of specified parameters for analysis. Contaminant concentrations (except for radiological parameters) in USGS-112 and -113 are limited by the permit to the primary constituent standards (PCSs) and secondary constituent standards (SCSs) specified in IDAPA 58.01.11, "Ground Water Quality Rule." Variances from these standards have been established for TDS and chloride, which have specified permit limits set at 800 mg/L and 350 mg/L, respectively. All permit-required samples are collected as unfiltered samples.

During the 2002 permit year, groundwater was sampled in April, September, and October. Approval was obtained from DEQ (Teuscher 2002) to sample the groundwater wells associated with the existing Percolation Ponds permit in September 2002 instead of October. Samples were collected from wells USGS-112 and USGS-113 in April and September and from wells USGS-048 and USGS-121 in April and October of 2002. Table 3-3 shows water levels (recorded prior to purging and sampling) and analytical results for all parameters specified by the permit. Analytical results were very similar to those of previous years with the following exceptions:

- Increased iron concentrations in compliance well USGS-112.
- Higher-than-expected TKN concentration in well USGS-048 in the October sample.

The iron concentration in well USGS-112 exceeded the SCS of 0.3 mg/L in both the April and September samples (Guymon 2002c, Guymon 2003). The April and September iron concentrations of 1.4 mg/L and 1.7 mg/L, respectively were significantly higher than those from previous sampling events (e.g., 0.121 mg/L for April 2001 and 0.0931 mg/L for October 2001). The purge water from the well was clear during the April sampling event. However, during the September sampling event, it was noted that the purge water had a slight rust color for the first minute of the purge. After the first minute, the water became clear.

Subsequent to the September 2002 sampling event, the pump and galvanized riser pipe for USGS-112 were removed to allow for borehole deviation logging. Significant corrosion of the galvanized riser pipe was noted. Due to the corrosion, a 20-foot section of the old riser pipe was replaced with new galvanized pipe. It is expected that corrosion of the carbon steel casing and the galvanized riser pipe and not the discharge of effluent to the existing Percolation Ponds may be contributing to the elevated iron concentrations. Historical iron concentrations in the effluent have been well below the iron concentrations

Figure 3-4. Locations of Idaho Nuclear Technology and Engineering Center WLAP monitoring wells associated with the existing Percolation Ponds.

Table 3-3. Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds groundwater data for April and September/October 2002.

	USGS-048 (GW-013004)		USGS-112 (GW-013001)		USGS-113 (GW-013002)		USGS-121 (GW-013003)		PCS/SCS[a]
Depth to Water Table (ft)	461.32	463.61	473.57	480.56	470.14	481.25	457.64	456.51	
Sample Date	4/9/02	10/16/02	4/9/02	9/25/02	4/16/02	9/25/02	4/17/02	10/16/02	
(units[b])	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
TKN	1.0 U[c]	3.9	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA[d]
Chloride	28.2	43.7	108	106	175	169	12.0	12.0	250 (350)[e]
TDS	268	276	406	463	542	672	206	222	500 (800)[e]
Sodium	15.7 R[f]	22.4	55.3 R[f]	51.7	85.3 R[f]	79.0	9.0 R[f]	8.59	NA
NO_3-N	2.77[g]	3.43	3.51[g]	3.14	2.5[g]	2.02	0.79R[g,h]	0.79	10
NO_2-N	0.10 U	0.10 U	0.10 U	0.10 U	0.1 U	0.10 U	0.10 U	0.10 U	1
NO_3-N +NO_2-N	2.51	3.4	3.15	3.08	2.07	2.18	0.77	0.77	10
Arsenic	0.0027 U	0.0022 U	0.0027 U	0.0022 U	0.0027 U	0.0022 U	0.0027 U	0.0032	0.05
Cadmium	0.0008 U	0.0006 U	0.0008 U	0.0006 U	0.0008 U	0.0006 U	0.0008 U	0.0006 U	0.005
Chromium	0.0065	0.0076	0.0070	0.0065	0.0062	0.0052	0.0047	0.005	0.1
Mercury	0.00012	0.00013	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.002
Selenium	0.0033 U	0.0026 U	0.0033 U	0.0026 U	0.0033 U	0.0026 U	0.0033 U	0.0026 U	0.05
Silver	0.0012 U	0.0018 U	0.0012 U	0.0018 U	0.0012 U	0.0018 U	0.0012 U	0.0018 U	0.1
Fluoride	0.20	0.3	0.20	0.20	0.20	0.20	0.20	0.3	4
Iron	0.0741	0.027 U	1.4	1.79	0.0558	0.027 U	0.0387 U	0.027 U	0.3
Manganese	0.0005 U	0.0004 U	0.0154	0.0225	0.0005 U	0.0004 U	0.0005 U	0.0004 U	0.05
Copper	0.0036 U	0.0078	0.012 U	0.0162	0.0036 U	0.0032 U	0.0036 U	0.0032 U	1.3
Aluminum	0.0461 U	0.0212 U	0.0461 U	0.0221	0.0461 U	0.0212 U	0.0461 U	0.0212 U	0.2

Table 3-3. (continued)

	USGS-048 (GW-013004)		USGS-112 (GW-013001)		USGS-113 (GW-013002)		USGS-121 (GW-013003)		PCS/SCS[a]
Depth to Water Table (ft)	461.32	463.61	473.57	480.56	470.14	481.25	457.64	456.51	
Sample Date	4/9/02	10/16/02	4/9/02	9/25/02	4/16/02	9/25/02	4/17/02	10/16/02	
(units[b])	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
pH	7.85	7.88	7.92	NR[i]	7.81	7.64	8.02	8.06	6.5–8.5

a. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in IDAPA 58.01.11.200.01.a and b.

b. The units for all parameters listed are as shown, except for pH which is unitless.

c. U flag indicates that the result was reported as below the detection limit.

d. NA—Not applicable.

e. The permit specifies exceptions for chloride and TDS limits of 350 mg/L and 800 mg/L, respectively.

f. R flag indicates that the result was rejected during validation. The result was not used in the annual average calculations. The April sodium results were rejected due to matrix spike and matrix spike duplicate issues.

g. The analytical laboratory failed to perform the NO_3-N analyses as requested. Therefore, the NO_3-N results shown are estimated based on the NO_3-N + NO_2-N results and the NO_2-N results. Because all NO_2-N results were undetected (as expected since the samples were preserved with sulfuric acid), it can be assumed that the NO_3-N + NO_2-N concentrations also represent the NO_3-N concentrations. (Guymon 2002c)

h. R flag indicates that the result was rejected during validation. The result was not used in the annual average calculations. The April NO_3-N result was rejected due to the holding time being greatly exceeded.

i. NR—No pH reading was available from this well due to failure of Hydrolab meter (Guymon 2003).

detected in USGS-112 during the 2002 permit year. For example, the average iron concentrations in the effluent for Permit Years 2001 and 2002 were 0.0309 mg/L and 0.0159 mg/L, respectively.

The October 2002 concentration for TKN in well USGS-048 was 3.9 mg/L and significantly higher than expected when compared to previous sampling events. The April 2002 TKN concentration was undetected at 1 mg/L. From 1997 through 2001, the highest detected TKN concentration in well USGS-048 was 0.337 mg/L. During 2002, only one effluent sample had detectable levels (0.21 mg/L) of TKN (see Table 3-1). Due to the low effluent TKN concentration and the fact that well USGS-048 is upgradient of the existing Percolation Ponds, it is highly unlikely that the effluent would be the cause of the elevated TKN in the well. The TKN result is not representative of historical TKN concentrations in USGS-048 or in the effluent and may have been an anomaly. However, the laboratory performing the October TKN analysis reviewed the raw data, recalculated the result, and did not identify any analytical anomalies.

Chloride, TDS, and sodium concentrations continue to be elevated in USGS-112 and USGS-113 compared to USGS-048. These elevated concentrations resulted from the continued operation of the water softening and treatment processes, which introduce chloride, TDS, and sodium into the service waste system.

Chloride showed a decreasing trend in both USGS-112 and USGS-113 when considering all permit data through October 2002. No trends were evident for sodium or TDS in either well. All three parameters have exhibited a decreasing trend since 1995 in the existing Percolation Ponds effluent (refer to Figures 3-5, 3-6, and 3-7, respectively). Both TDS and chloride concentrations have been expected to follow the trends exhibited by the effluent, but with lower concentrations due to mixing in the aquifer, and a time lag and dampening effect from the 450-ft thick vadose zone. However, only chloride concentrations in USGS-112 and USGS-113 continue to follow the decreasing effluent trends.

As of August 26, 2002, discharge of wastewater to the existing Percolation Ponds was discontinued. The wastewater is now being discharged to the INTEC New Percolation Ponds. Since wastewater is no longer being discharged to the existing Percolation Ponds, it is expected that the chloride, TDS, and sodium concentrations in USGS-112 and USGS-113 will decrease with time.

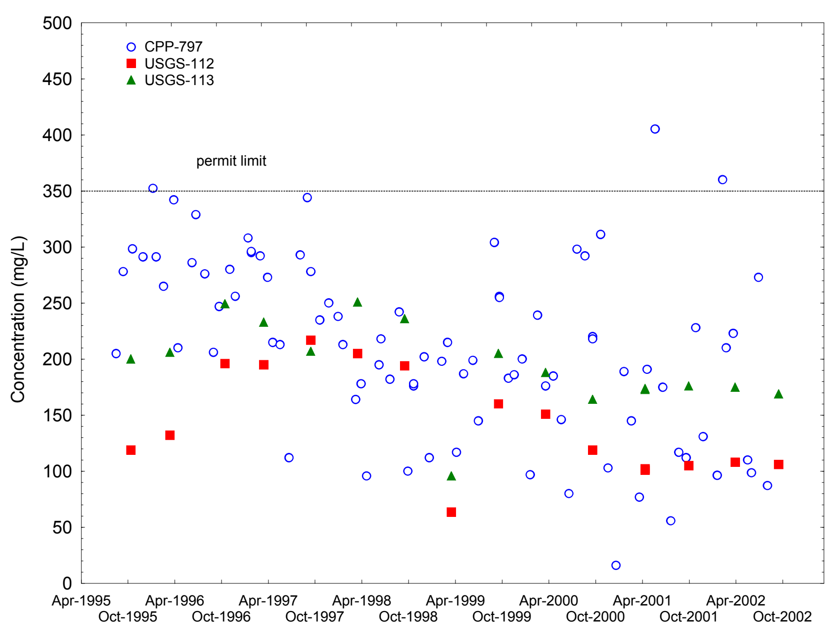

Figure 3-5. Chloride concentration from existing Idaho Nuclear Technology and Engineering Center Percolation Ponds wells and effluent (CPP-797).

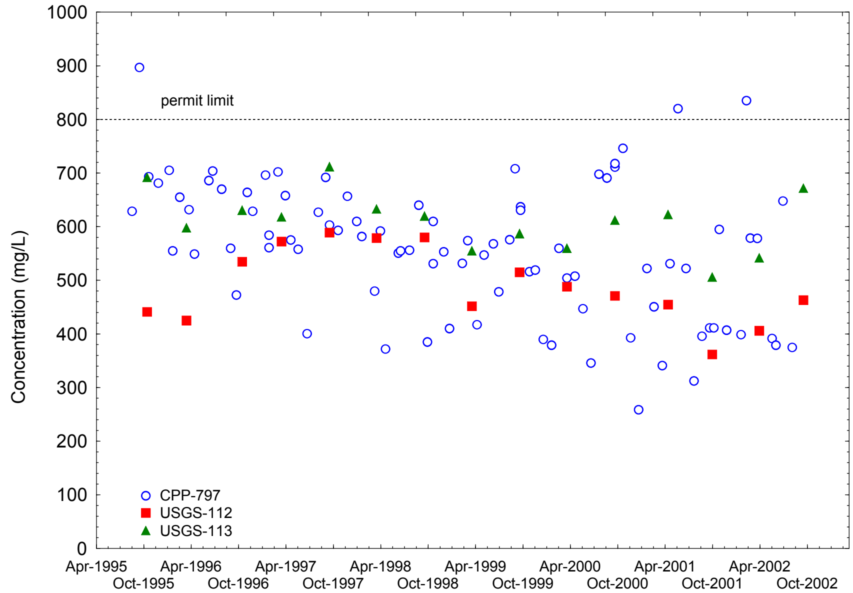

Figure 3-6. Total dissolved solids concentration from existing Idaho Nuclear Technology and Engineering Center Percolation Ponds wells and effluent (CPP-797).

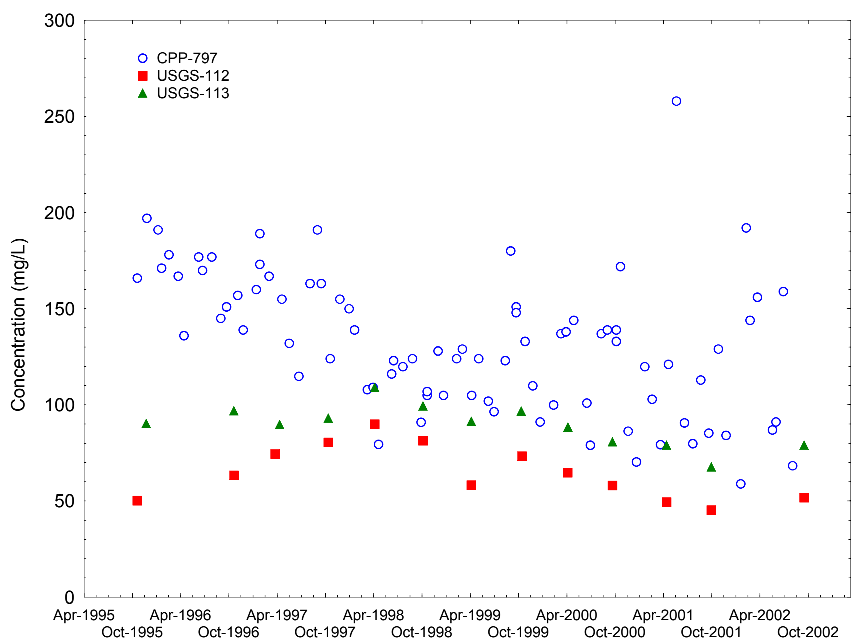

Figure 3-7. Sodium concentration from existing Idaho Nuclear Technology and Engineering Center Percolation Ponds wells and effluent (CPP-797).

3.6 Summary of Environmental Impacts

Annual flow volume to the existing INTEC Percolation Ponds and contaminant concentrations in the groundwater remained within limits established by the permit during the 2002 permit year, with the exception of iron concentrations detected in one aquifer well. It is expected that corrosion of the carbon steel casing and the galvanized riser pipes and not the discharge of effluent to the existing Percolation Ponds may be contributing to the elevated iron concentrations in the well because the average iron concentration in the effluent has been significantly lower than that detected in the well.

As in previous years, concentrations of TDS, chloride, and sodium were elevated in the compliance wells (USGS-112 or USGS-113) compared to the background well (USGS-121). These elevated concentrations are the result of water softening and treatment operations. Chloride in both compliance wells showed decreasing trends, and chloride, TDS, and sodium in the effluent showed decreasing trends. Based on data through the 2002 permit year, the trends in the compliance wells for chloride are following the trends in the existing Percolation Ponds effluent. As of August 26, 2002, discharge of wastewater to the existing Percolation Ponds was discontinued. The wastewater is now being discharged to the INTEC New Percolation Ponds. Since wastewater is no longer being discharged to the existing Percolation Ponds, it is expected that the chloride, TDS, and sodium concentrations in USGS-112 and USGS-113 will decrease with time.

4. IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING CENTER NEW PERCOLATION PONDS DATA SUMMARY AND ASSESSMENT

4.1 Site Description

As discussed in Section 3.1, the Idaho Nuclear Technology and Engineering Center (INTEC) is an approximately 265-acre, multipurpose plant located on the INEEL (Figure 3-1). The INTEC generates 1 to 2 MG/day on average of process wastewater (commonly called service waste) during normal operations. On August 26, 2002, discharge of this wastewater ceased to the existing Percolation Ponds (refer to Section 3) and was transferred to the New Percolation Ponds.

4.2 System Description and Operation

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Record of Decision for Operable Unit 3-13 (DOE-ID 1999) recommended ceasing use of the existing Percolation Ponds as the preferred alternative to decrease the perched water volume in the subsurface around INTEC. In response to this action, an alternative discharge location was identified approximately 2 miles southwest of INTEC (Figures 4-1 and 4-2).

The DEQ approved construction of the New Percolation Ponds on May 18, 2000 (Hall 2000). Construction of the New Percolation Ponds began in August of 2000 (Guymon 2000b). The DEQ issued a WLAP (LA-000130-03) for the New Percolation Ponds on September 10, 2001 (Eager 2001) and an amended permit on March 28, 2002 (Eager 2002). On August 26, 2002, construction was complete and the wastewater previously discharged to the existing Percolation Ponds was discharged to the New Percolation Ponds.

As discussed in Section 3.2, the service waste system serves all major facilities at INTEC. This process-related wastewater from INTEC operations consists of:

- Steam condensates
- Noncontact cooling water
- Reverse osmosis, and water softener and demineralizer regenerate
- Boiler blowdown wastewater
- Other nonhazardous liquids.

As of August 26, 2002, all service waste entering CPP-797 was discharged to the New Percolation Ponds. In CPP-797, the combined effluent is measured for flow rate, and samples are collected for analyses.

Two sets of electric pumps transfer wastewater from CPP-797 to the New Percolation Ponds. Stainless steel header piping was replaced with high-density polyethylene piping to minimize the effects of microbial corrosion. Two 16-inch lines (primary and redundant) are available to transport the wastewater from CPP-797 to the ponds. Typically, the primary line is used. The redundant line is used as a backup in case the primary line is taken out of service. Additionally, a diesel-driven pumping system is used as the backup for the electric motor systems.

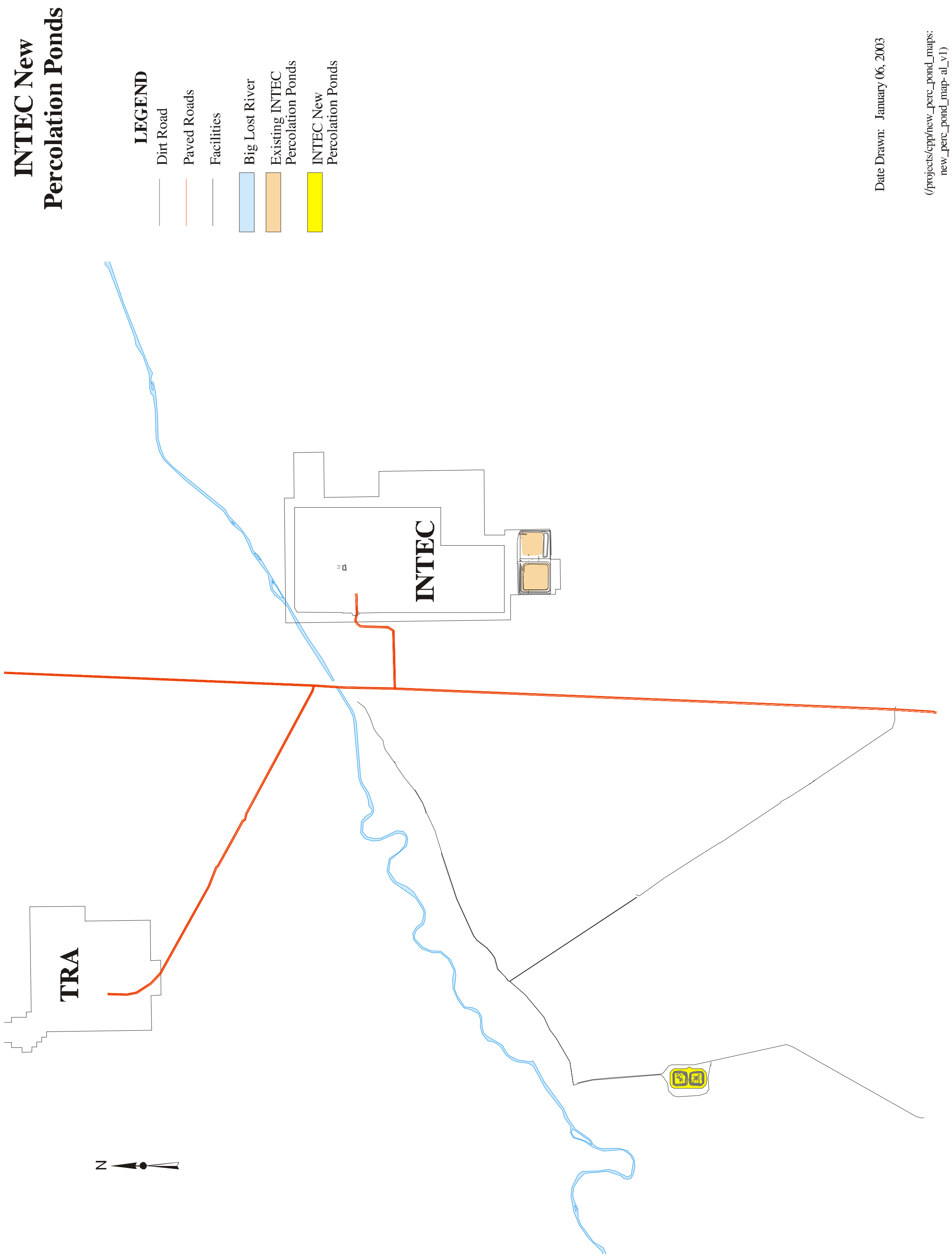

Figure 4-1. Location of Idaho Nuclear Technology and Engineering Center New Percolation Ponds.

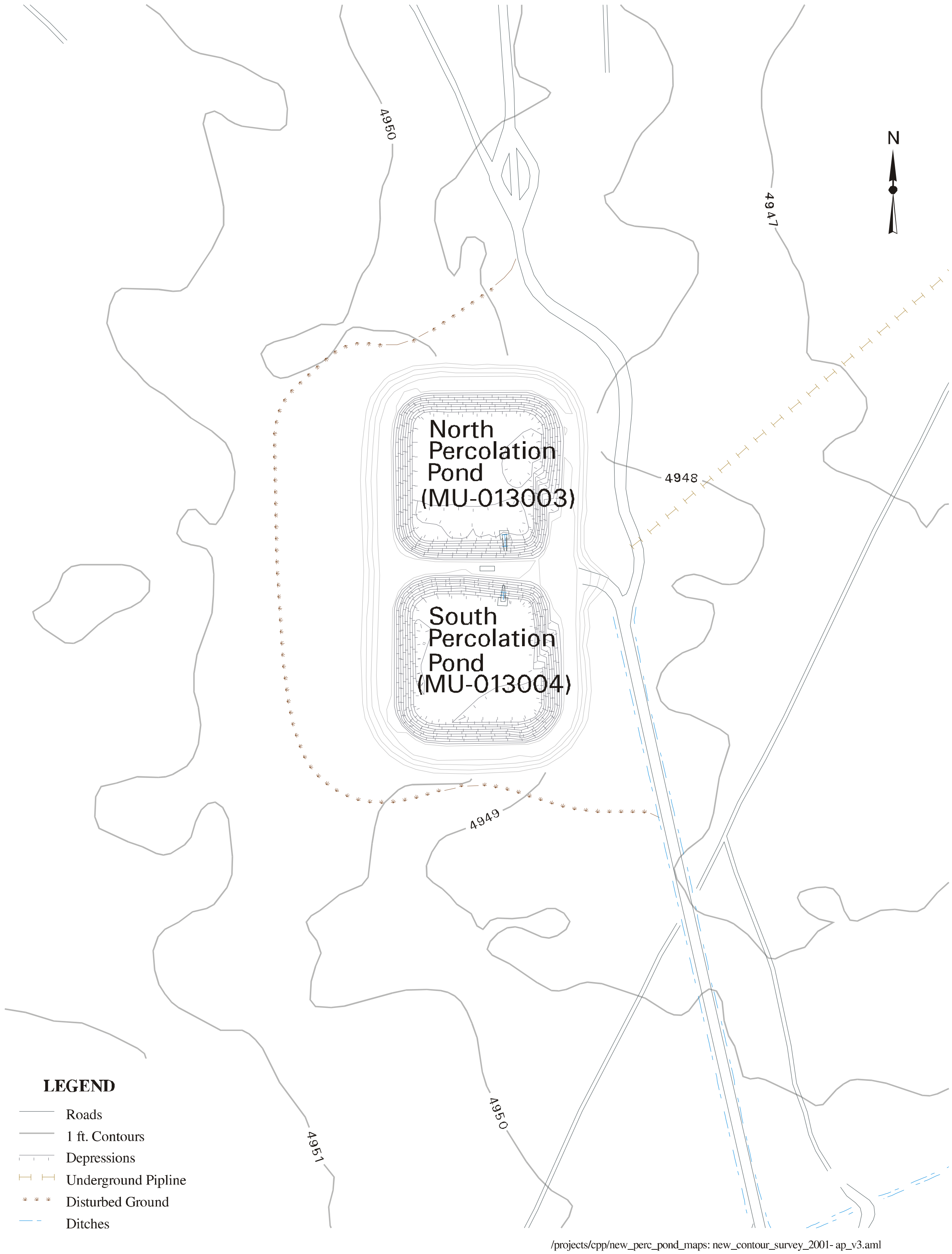

Figure 4-2. Detail of Idaho Nuclear Technology and Engineering Center New Percolation Ponds.

The INTEC New Percolation Ponds are designed to function similarly to the existing Percolation Ponds south of INTEC. The new pond complex is a rapid infiltration system and is comprised of two ponds excavated into the surficial alluvium and surrounded by bermed alluvial material. Each pond is approximately 305 × 305 ft at the top of the berm and is about 10 feet deep. Each pond is designed to accommodate a continuous wastewater discharge rate of approximately 3 million gallons/day.

During normal operation, wastewater is discharged to only one pond at a time. Periodically, the pond receiving the wastewater will be alternated to minimize algae growth and maintain good percolation rates. Ponds are routinely inspected, and the depth is recorded via permanently mounted staff gauges.

4.3 Status of Special Compliance Conditions

The amended WLAP for the New Percolation Ponds (issued March 28, 2002) identifies four special compliance conditions in Section F of the permit. Compliance activity CA-130-01 requires characterization of groundwater quality in the perched water formation prior to startup of the ponds using three perched water monitoring wells specified in the permit. Groundwater characterization is to include the parameters listed in Section E of the permit for groundwater monitoring requirements. Perched water formations are dependent on flow in the Big Lost River (BLR). If there is no BLR flow or no perched water formations occur prior to startup, the water quality characterization is not required. There was no flow in the BLR between September 10, 2001, the date the initial permit was issued, and August 26, 2002, when the New Percolation Ponds became operational. Perched wells ICPP-MON-V-191, ICPP-MON-V-200, and ICPP-MON-V-212 were monitored during the 2002 permit year to show compliance with this activity. No water was detected in any of these three perched wells during this monitoring, which was performed on March 18, 2002, April 22, 2002, May 28, 2002, June 17, 2002, June 27, 2002, July 31, 2002, and August 28, 2002. DEQ was notified that the perched water formations at the New Percolation Ponds were not characterized prior to operational startup because water was not present in any of the perched wells and there had been no flow to the BLR (Guymon 2002d).

Compliance activity CA-130-02 requires submittal of a final Operation and Maintenance Manual to the DEQ for review and approval 15 months after startup of the New Percolation Ponds. The manual must incorporate the requirements of the permit and any operational modifications made during the first year of operation, and it must reference written procedures required for operating the system. The New Percolation Ponds became operational on August 26, 2002, and the final Operation and Maintenance Manual will be provided to DEQ on or before November 26, 2003.

Compliance activity CA-130-03 requires submittal of a report describing the fate of nutrients (nitrogen and phosphorous) and their potential groundwater impact at the New Percolation Ponds site to the DEQ for review within 12 months after permit issuance. The amended permit for the New Percolation Ponds was issued March 28, 2002, making this report due to DEQ on or before March 28, 2003.

Compliance activity CA-130-04 requires submittal of the borehole logs and completion diagrams for perched monitoring well ICPP-SCI-V-212 to the DEQ within 3 months of well completion. The borehole logs and completion diagrams were submitted to DEQ on September 18, 2001 (Guymon 2001a). However, it was subsequently discovered that well ICPP-SCI-V-212 was not completed as proposed when the INEEL submitted comments to DEQ on May 14, 2001, on the draft WLAP for the New Percolation Ponds (Guymon 2001b). DEQ was informed of this discrepancy on January 28, 2002 (MacConnel 2002c), and final borehole logs and completion diagrams for well ICPP-MON-V-212 were submitted to DEQ on June 11, 2002 (Guymon 2002e).

4.4 Effluent Monitoring Results

The WLAP (LA-000130-03) issued by the DEQ for the New Percolation Ponds specifies a permit year from November 1 through October 31. For the 2002 permit year, the New Percolation Ponds were operational from August 26, 2002, through October 31, 2002. Compliance samples are collected monthly from CPP-797, based on a random sampling schedule and analyzed for parameters listed in the permit. The randomly scheduled sample from CPP-797 was taken on August 13, 2002, and is reported in Table 3-1 for the existing Percolation Ponds, since the New Percolation Ponds did not become operational until after the randomly scheduled date. Table 4-1 presents effluent water quality data applicable to the New Percolation Ponds for the 2002 permit year. A 24-hour flow-proportional composite sample was collected from the sample point in CPP-797 for all parameters except pH, which was taken as a grab sample as required by the permit.

The quality of wastewater discharged to the New Percolation Ponds in 2002 is consistent with that discharged to the existing Percolation Ponds in previous years. The permit for the New Percolation Ponds does not specify concentration limits for effluent to the ponds; however, concentrations were compared to the applicable primary or secondary constituent standards (IDAPA 58.01.11). For the abbreviated 2002 permit year, yearly average effluent concentrations met these standards for all constituents.

4.4.1 Flow Volumes

The flow volumes to the New Percolation Ponds were recorded daily from the flow meter in CPP-797. Table 4-2 presents monthly and total flow volumes for the abbreviated permit year starting August 26, 2002, and Appendix C presents daily flow readings and copies of the required electronic WLAP data files (DEQ 2002). During the 2002 permit year, daily flow was below 3 MG/day and total flow was well below the permit limit of 1,095 MG/year. During June and July 2002, prior to operational startup, approximately 3.2 MG of wastewater was discharged to the New Percolation Ponds to support system operability testing (MacConnel 2002b). This flow is not included in the flows reported for the permit year in Table 4-2 or in Appendix C because the discharge was prior to operational start-up.

4.5 Evaluation of Water Quality Testing for the Weapons Range

Section G of the WLAP requires reporting of water quality testing results for the Weapons Range drinking water well as required by the DEQ Drinking Water Program. The sampling location for the Weapons Range drinking water well was clarified by DEQ to be the point of compliance at Building B21-608 (Allred 2001). The water quality of the Weapons Range B21-608 Building is monitored by the INEEL Drinking Water Program in accordance with the DEQ Drinking Water Program. The Weapons Range is considered a transient, noncommunity water system. As such, monitoring is required yearly for nitrates and quarterly for bacteria. The Weapons Range water system is a chlorinated system.

The annual nitrate sample of the Weapons Range distribution system was collected on July 30, 2002, prior to the new ponds becoming operational. The concentration of nitrate was 1.0 mg/L, well below the primary constituent standard of 10 mg/L.

Quarterly sampling of bacteria is required of the Weapons Range water system. As a best management practice, the INEEL Drinking Water Program samples more frequently than quarterly. During the 2002 permit year, the New Percolation Ponds were operational from August 26, 2002, through October 31, 2002. However, the Weapons Range water system was sampled for bacteria throughout the permit year on November 7, 2001, January 9, 2002, February 6, 2002, March 6, 2002, April 2, 2002, May 7, 2002, June 5, 2002, July 10, 2002, August 7, 2002, September 11, 2002, and October 2, 2002. No bacteria were detected in the Weapons Range water system during the 2002 permit year.

Table 4-1. Idaho Nuclear Technology and Engineering Center New Percolation Ponds effluent data (WW-013001).

Sample Month	September	October	
Sample Date	9/10/2002	10/8/2002	Yearly Average[a]
pH (grab)	7.66	7.70	7.68
TKN (mg/L)	0.21 U[b]	0.24 U	0.24 U
NO_3-N (mg/L)	0.890[c]	0.960[d]	0.925
NO_2-N (mg/L)	0.014 U[c]	0.006 U[d]	0.014 U
Total phosphorus (mg/L)	0.0258	0.0246	0.0252
TDS (mg/L)	313.4	315.0	314.2
Chloride (mg/L)	28.5[c]	70.9[d]	49.7
Fluoride (mg/L)	0.23[c]	0.18[d]	0.21
Aluminum (mg/L)	0.0080	0.0110 U	0.0068
Arsenic (mg/L)	0.0043 U	0.0047 U	0.0047 U
Cadmium (mg/L)	0.0006 U	0.0006 U	0.0006 U
Chromium (mg/L)	0.0056	0.0070	0.0063
Copper (mg/L)	0.0038 U	0.0016 U	0.0038 U
Iron (mg/L)	0.0087 U	0.0325	0.0184
Manganese (mg/L)	0.0005	0.0007	0.0006
Mercury (mg/L)	0.00083 U	0.00083 U	0.00083 U
Selenium (mg/L)	0.0030 U	0.0040 U	0.0040 U
Silver (mg/L)	0.0020 U	0.0018 U	0.0020 U
Sodium (mg/L)	47.4	31.7	39.6

a. Yearly average is determined from the average of the monthly values. One-half the detection limit was used in the yearly average calculations for those results reported as below the detection limit, except where noted below. The yearly average shown for those parameters with all results for the year are reported as below the detection limit is the highest detection limit reported for the month, rather than an average calculated using half the detection limits.

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

c. Sample was collected on 9/18/2002.

d. Sample was collected on 10/14/2002.

Table 4-2. Idaho Nuclear Technology and Engineering Center New Percolation Ponds flow summaries.

Sample Month	Effluent (WW-013001) (gpd[a]) Average	Minimum	Maximum	Total (MG[b]) North Pond (MU-013003)	South Pond (MU-013004)	North & South Ponds
August 2002[c]	1,179,100	581,200	1,424,700	0.035	7.039	7.075
September 2002	1,583,057	1,114,700	1,822,000	14.735	32.757	47.492
October 2002	1,435,913	1,231,500	2,303,100	7.340	37.173	44.513
Yearly Summary	1,478,800	581,200	2,303,100	22.111	76.969	99.080

a. gpd—Gallons per day.

b. Monthly and annual totals are shown in million gallons (MG).

c. On August 26, 2002, discharge of wastewater was diverted from the existing Percolation Ponds to the INTEC New Percolation Ponds (WLAP LA-000130-03).

4.6 Evaluation of Groundwater Data

To measure potential impacts to groundwater from the New Percolation Ponds, the permit requires that groundwater samples be collected from six monitoring wells (see Figure 4-3):

- One background aquifer well (ICPP-MON-A-167) upgradient of the New Percolation Ponds
- One background perched water well (ICPP-MON-V-191) north of the New Percolation Ponds and just south of the Big Lost River
- Two aquifer wells (ICPP-MON-A-165 and -166) downgradient of the New Percolation Ponds
- Two perched water wells (ICPP-MON-V-200 and ICPP-MON-V-212) adjacent to the New Percolation Ponds. Well ICPP-MON-V-200 is north of the New Percolation Ponds and well ICPP-MON-V-212 is between the two ponds.

The permit requires that samples be collected semiannually during April and October after the New Percolation Ponds become operational. The New Percolation Ponds were placed into service on August 26, 2002. Therefore, samples were only collected in October of the 2002 permit year. The permit provides a specified list of parameters to be analyzed for in the groundwater samples. Aquifer wells ICPP-MON-A-165 and ICPP-MON-A-166 and perched water wells ICPP-MON-V-200 and ICPP-MON-V-212 are the permit compliance points. Aquifer well ICPP-MON-A-167 and perched water well ICPP-MON-V-191 are listed in the permit as upgradient, noncompliance points. Contaminant concentrations in the compliance wells are limited by the primary constituent standards (PCSs) and secondary constituent standards (SCSs) in IDAPA 58.01.11. All permit-required samples are collected as unfiltered samples.

Table 4-3 shows water levels (recorded prior to purging and sampling) and analytical results for all parameters specified by the permit. Samples were collected from wells ICPP-MON-A-165, ICPP-MON-A-166, ICPP-MON-A-167, and ICPP-MON-V-200. Perched water wells ICPP-MON-V-191

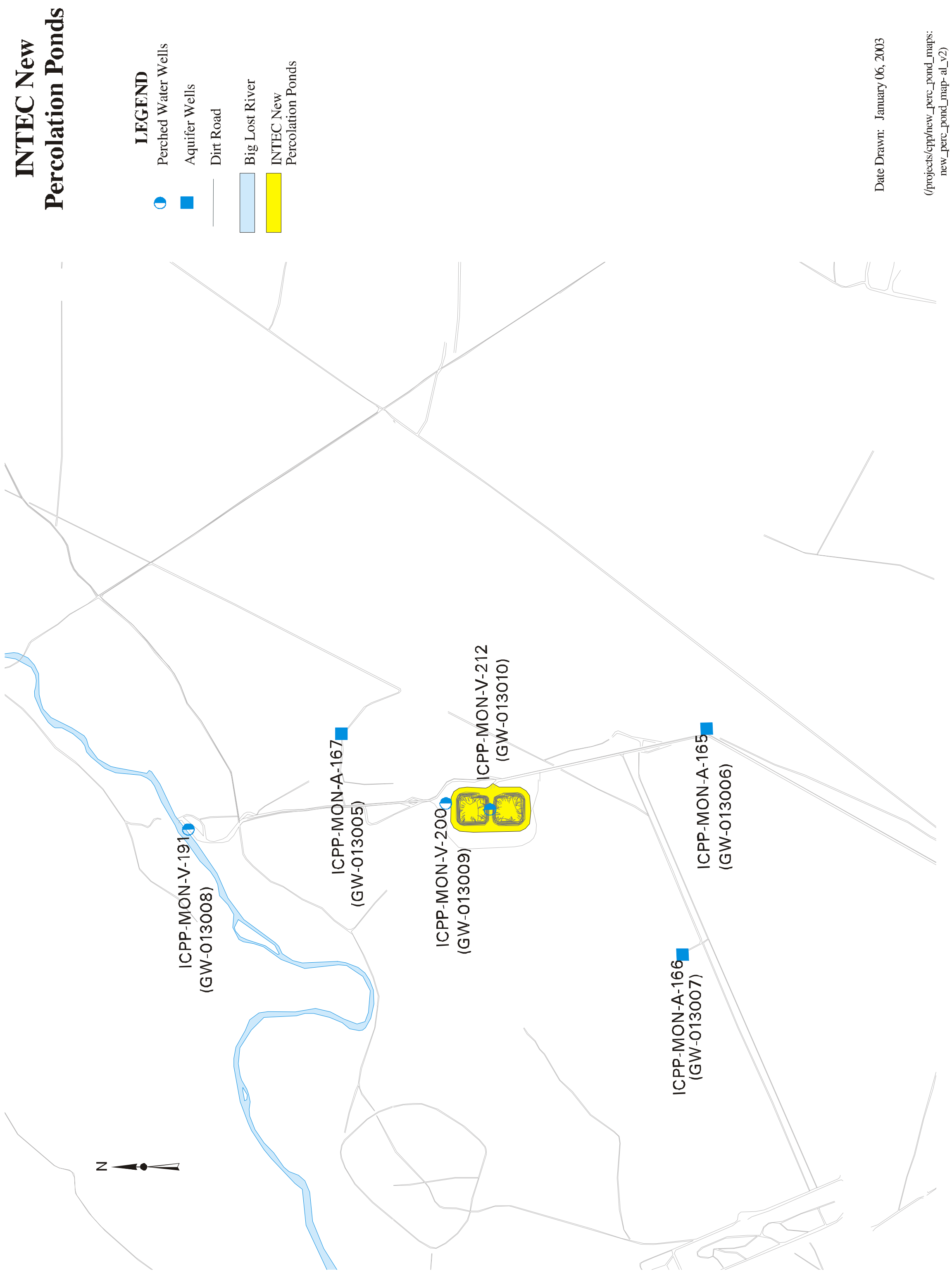

Figure 4-3. Location of Idaho Nuclear Technology and Engineering Center New Percolation Ponds WLAP monitoring wells.

Table 4-3. Idaho Nuclear Technology and Engineering Center New Percolation Ponds groundwater quality data for October 2002.

	ICPP-MON-A-167 (GW-013005)	ICPP-MON-A-165 (GW-013006)	ICPP-MON-A-166 (GW-013007)	ICPP-MON-V-191 (GW-013008)	ICPP-MON-V-200 (GW-013009)	ICPP-MON-V-212 (GW-013010)	PCS/SCS[a]
Depth to Water Table (ft)	494.65	501.5	503.97	Dry[b]	111.04	244.3	
Sample Date (units[c])	10/15/02 (mg/L)	10/14/02 (mg/L)	10/15/02 (mg/L)	Not Sampled[b]	10/14/02 (mg/L)	Insufficient Volume[d]	(mg/L)
pH	7.90	7.74	7.70	—[e]	7.78	—[e]	6.5–8.5
TKN	2.2	1.0 U[f]	2.2	—	1.0 U	—	NA[g]
NO_3-N	0.24[h]	0.83[h]	0.17[h]	—	1.1[h]	—	10
NO_2-N	0.10 U	0.10 U	0.10 U	—	0.10 U	—	1
Total phosphorus	0.45	0.10 U	0.10 U	—	0.10 U	—	NA
TDS	219	234	187	—	323	—	500
Chloride	8.4	8.9	8.1	—	33.6	—	250
Fluoride	0.20	0.3	0.3	—	0.3	—	4
Aluminum	6.0	0.0212 U	0.366	—	0.137	—	0.2
Arsenic	0.0025	0.0022 U	0.0027	—	0.0036	—	0.05
Cadmium	0.0006 U	0.0006 U	0.0006 U	—	0.0006 U	—	0.005
Chromium	0.0158	0.0139	0.0071	—	0.0077	—	0.1
Copper	0.021	0.0032 U	0.0032 U	—	0.0032 U	—	1.3
Iron	6.18	0.027 U	0.409	—	0.213	—	0.3
Manganese	0.112	0.00056	0.0947	—	0.0047	—	0.05
Mercury	0.0001 U	0.0001 U	0.0001 U	—	0.0001 U	—	0.002
Selenium	0.0026 U	0.0026 U	0.0026 U	—	0.0026 U	—	0.05
Silver	0.0018 U	0.0018 U	0.0018 U	—	0.0018 U	—	0.1

Table 4-3 (continued).

	ICPP-MON-A-167 (GW-013005)	ICPP-MON-A-165 (GW-013006)	ICPP-MON-A-166 (GW-013007)	ICPP-MON-V-191 (GW-013008)	ICPP-MON-V-200 (GW-013009)	ICPP-MON-V-212 (GW-013010)	PCS/SCS[a]
Depth to Water Table (ft)	494.65	501.5	503.97	Dry[b]	111.04	244.3	
Sample Date (units[c])	10/15/02 (mg/L)	10/14/02 (mg/L)	10/15/02 (mg/L)	Not Sampled[b]	10/14/02 (mg/L)	Insufficient Volume[d]	(mg/L)
Sodium	14.1	9.87	12.6	—	65.9	—	NA

a. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in IDAPA 58.01.11.200.01.a and b.

b. ICPP-MON-V-191 is a perched well and was dry in October 2002 when permit-required sampling was performed. Therefore, the well could not be sampled.

c. The units for all parameters listed are as shown, except for pH, which is unitless.

d. ICPP-MON-V-212 is a perched well, and in October 2002 when permit-required sampling was performed, there was insufficient water volume to obtain the needed samples.

e. Since the well could not be sampled, no analyte-specific results are available.

f. U flag indicates that the result was reported as below the detection limit.

g. NA—Not applicable.

h. The NO_3-N analyses were not requested due to an error in preparing the sampling and analysis plan table prior to sampling. Therefore, the NO_3-N results shown are estimated based on the NO_3-N + NO_2-N results and the NO_2-N results. Because all NO_2-N results were undetected (as expected because the samples were preserved with sulfuric acid), it can be assumed that the NO_3-N + NO_2-N concentrations also represent the NO_3-N concentrations. (Guymon 2003) and ICPP-MON-V-212 were not sampled. Well ICPP-MON-V-191 was dry, and ICPP-MON-V-212 had insufficient volume to collect a sample.

As stated in Section 4.3, perched water well ICPP-MON-V-200 was dry prior to wastewater being discharged into the new ponds. After approximately 1½ months of wastewater disposal to the ponds, a sufficient volume of water had accumulated in the well to collect samples in October 2002. The data from this sampling event indicate that no PCS or SCS levels were exceeded. However, the levels of TDS, chloride, and sodium in this well (Table 4-3) are possibly beginning to show the influence of the wastewater disposal (Table 4-1).

The concentrations for aluminum, iron, and manganese in aquifer wells ICPP-MON-A-166 and ICPP-MON-A-167 were above the SCS levels. As stated previously, well ICPP-MON-A-166 is a compliance well and is regulated by the permit not to exceed the PCS and SCS levels. Well ICPP-MON-A-167 is the background aquifer monitoring well and is not regulated to these levels by the permit.

Concentrations of aluminum, iron, and manganese in well ICPP-MON-A-166 from the October sample (Table 4-3) are similar to the preoperational baseline concentrations (INEEL 2002a) for this well (Table 4-4). The aluminum, iron, and manganese concentrations in the October sample from well ICPP-MON-A-167 were lower than those in the preoperational baseline samples. The concentrations of these contaminants in well ICPP-MON-A-167 appear to be decreasing over time.

No other PCS or SCS levels were exceeded in any of the permit wells. However, TKN levels in ICPP-MON-A-166 and ICPP-MON-A-167 were higher than expected and significantly higher than in the preoperational baseline samples (Table 4-4). There is no PCS or SCS limit for TKN.

It is unlikely that the elevated levels of TKN, aluminum, iron, and manganese in the aquifer wells could be the result of the disposal of wastewater to the new ponds for the following reasons:

- Well ICPP-MON-A-167 was selected as the upgradient (background) monitoring well and should not be affected by discharges to the new ponds

- The concentrations of TKN, aluminum, iron, and manganese in the effluent since August 26, 2002, are considerably lower than the concentrations in the aquifer wells in October 2002

- The wastewater discharged to the New Percolation Ponds is the same wastewater that had been discharged to the existing Percolation Ponds since 1995, and the concentrations of TKN, aluminum, iron, and manganese in the aquifer wells associated with the existing Percolation Ponds have not exceeded the SCS levels in the past

- With the exception of TKN, the aluminum, iron, and manganese had been detected in the preoperational samples at approximately equal or higher concentrations.

One possible explanation for the elevated levels of aluminum, iron, and manganese may be that both wells were insufficiently developed during construction activities. Another possible explanation is that the annular seals were placed incorrectly, thus allowing bentonite slurry to affect the water quality. The sampling logbook entry for October 2002 described the purge water from ICPP-MON-A-167 as murky for the entire purge and the color of bentonite. Prior to the next sampling event, additional purging will be performed on wells ICPP-MON-A-166 and ICPP-MON-A-167 to try to remove any residual contaminants that may be in the wells as a result of the well construction activities.

Table 4-4. Preoperational concentrations of TKN, aluminum, iron, and manganese in wells ICPP-MON-A-167 and ICPP-MON-A-166.

	ICPP-MON-A-167					ICPP-MON-A-166		
	November 2000	January 2001	February 2001	March 2001	May 2001[a]	March 2001	May 2001	SCS
TKN (mg/L)	0.1 U[b]	0.141	0.143	0.705	0.315	0.1 U	0.240	NA[c]
Aluminum (mg/L)	32.8	27.2	17.7	23.7	14.9	0.401	0.27	0.2
Iron (mg/L)	19.2	16.6	10.2	14.2	10.4	0.383	0.285	0.3
Manganese (mg/L)	0.355	0.3	0.218	0.205	0.165	0.265	0.168	0.05

a. Concentrations shown are the average of the sample and duplicate sample collected in May.

b. U flag indicates that the result was reported as below the detection limit.

c. NA—Not applicable. There is no SCS.

The reason for the higher-than-expected TKN concentrations in the October 2002 samples from wells ICPP-MON-A-166 and ICPP-MON-A-167 is unknown. However, TKN concentrations, as well as the other permit-required parameter concentrations in the six WLAP monitoring wells, will continue to be evaluated as more data become available.

4.7 Summary of Environmental Impacts

The New Percolation Ponds became operational on August 26, 2002, when wastewater from CPP-797 was diverted from the existing Percolation Ponds. During the abbreviated permit year, daily and annual flow volumes to the New Percolation Ponds remained within limits established by the permit.

The concentrations for aluminum, iron, and manganese in aquifer well ICPP-MON-A-166 were above the applicable permit limits. The concentrations of these parameters in the background well (ICPP-MON-A-167) exceeded the applicable SCS levels. However, these elevated concentrations are not thought to be related to operational activities at the New Percolation Ponds. Concentrations of these parameters in well ICPP-MON-A-166 during October 2002 are similar to the preoperational concentrations, while concentrations of these parameters in well ICPP-MON-A-167 were lower than those in the preoperational samples. One possible explanation may be that both wells were insufficiently developed during construction activities. Another possible explanation is that the annular seals were placed incorrectly, thus allowing bentonite slurry to affect the water quality. Prior to the next sampling event, additional purging will be performed on both wells to try to remove any residual slurry that may be in the wells as a result of the well construction activities.

5. IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING CENTER SEWAGE TREATMENT PLANT DATA SUMMARY AND ASSESSMENT

5.1 System Description and Operation

The Sewage Treatment Plant (STP) is east of INTEC, outside the INTEC fence. The STP treats and disposes of sanitary and other related wastes at INTEC. Approximately 43 permanent buildings within INTEC are connected to the STP. The sewage system consists of six lift stations, each with two pumps (except CPP-1713, which has only one). Four of the lift stations (CPP-768, CPP-1713, CPP-1772, and CPP-724) pump the waste into one of the two main lift stations (CPP-728). This main lift station and the eastside main lift station (CPP-733) both contain a sewage grinder that the wastewater passes through before being pumped to the STP. The INTEC STP (Figure 5-1) consists of:

- Two aerated lagoons (Cell Nos. 1 and 2)
- Two quiescent, facultative stabilization lagoons (Cell Nos. 3 and 4)
- Four rapid infiltration (RI) trenches
- Six control stations (weir boxes) (CPP-769, CPP-770, CPP-771, CPP-772, CPP-773, and CPP-774).

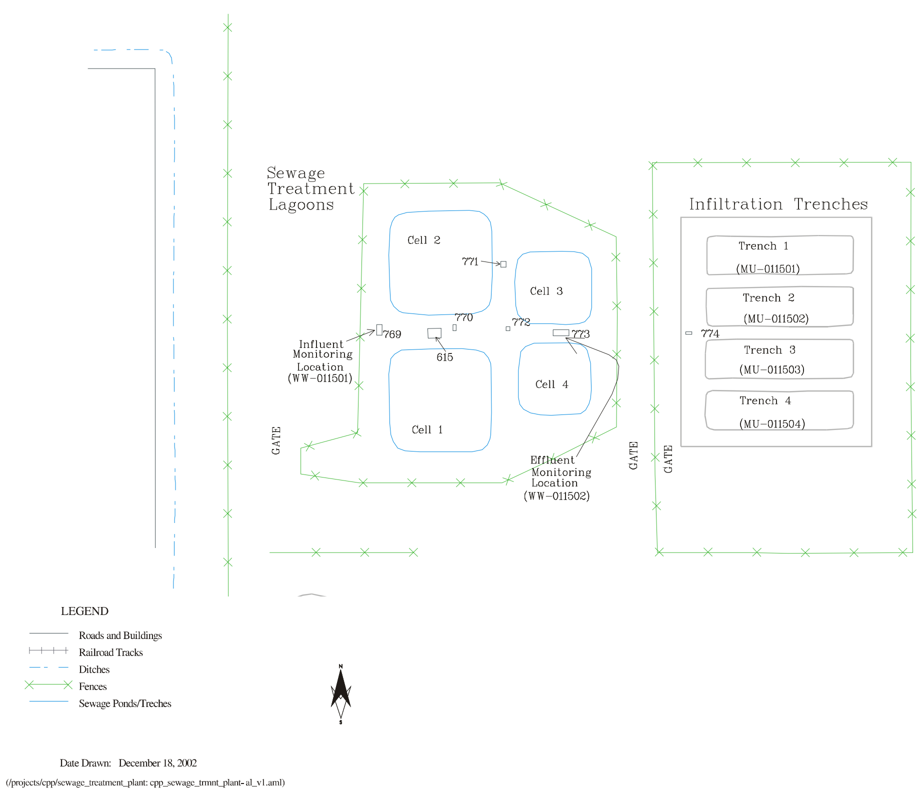

Figure 5-1. Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant and rapid infiltration trenches.

The six control stations direct the wastewater flow to the proper sequence of lagoons and infiltration trenches. Automatic flow-proportional composite samplers are located at control stations CPP-769 (influent) and CPP-773 (wastewater from the STP to the RI trenches). The composite samplers are connected to flow meters, thus allowing flow-proportional samples to be taken.

The influent wastewater is normally routed to aerated lagoon Cell No. 1. The wastewater then passes from Cell No. 1 through control station CPP-770 to aerated lagoon Cell No. 2. From Cell No. 2, all flow is divided in control station CPP-771, where half goes to quiescent facultative lagoon Cell No. 3 and the other half to quiescent facultative lagoon Cell No. 4. However, with the installation of two surface aerators in lagoon Cell No. 3 on April 26, 2001, this cell is no longer functioning as a quiescent facultative lagoon. The INTEC STP depends on natural biological and physical processes (digestion, oxidation, photosynthesis, respiration, aeration, and evaporation) to treat the wastewater.

The STP was originally designed to treat a flow of 80,000 gallons per day (gpd). However, an influent flow of 30,000 to 40,000 gpd more closely approximates the actual average influent flow (based on the yearly average flow for reporting years 1999 through 2002). Lagoon Cell Nos. 1 and 2 each have a retention time of 11 days at the designed flow of 80,000 gpd and 22 days at 40,000 gpd. Lagoon Cell Nos. 3 and 4 each have a designed retention time of 4.5 days at the maximum flow of 80,000 gpd to each cell. Because the flow splits, with 20,000 gpd going to each cell, the calculated retention time for each cell is approximately 18 days.

As discussed in more detail in Section 5.2, the additional aeration from operating both blowers in Cell Nos. 1 and 2 and the surface aerators in Cell No. 3 was expected to increase the removal of ammonia from the wastewater. Ammonia is removed through the process of air stripping and thereby, reduces the concentration of total nitrogen in the effluent.

5.2 Status of Special Compliance Conditions

In accordance with the permit, the INTEC STP was required to meet the total nitrogen limit of 20 mg/L measured at the influent to the RI trenches (CPP-773, effluent) within 2 years of permit issuance or submit a preliminary engineering report outlining modifications that would bring the STP into compliance. Because the total nitrogen had not exceeded 20 mg/L since permit issuance (September 20, 1995), it was agreed during a conference call on April 1, 1997, between DEQ and the INEEL that an approved engineering plan was not required. However, in December of 1997, the total nitrogen limit was exceeded for the first time. Due to this and several subsequent exceedences, an engineering study and a corrective action plan were submitted to DEQ on November 11, 1998 (Graham 1998).

The majority of corrective actions identified in the corrective action plan were completed prior to the start of the 2002 permit year. However, work continued on the Shear Gate Replacement Project during the 2002 permit year. The intent of the corrective action plan was to bring the existing STP up to maximum treatment capability by preventing water from bypassing the treatment system and increasing retention time. In April 2002, one of the slide gates installed in control structure CPP-773 in 2001 was replaced. Upon inspection, it was discovered that the new slide gate was still leaking. During the inspection, two other slide gates were also found to be leaking in control structure CPP-773. An engineering decision was made to plug the piping associated with these three slide gates. Plugging the piping associated with the three slide gates will not affect the operation of the STP. At the end of the 2002 permit year, Project Management was proceeding with closeout of the activities associated with the Shear Gate Replacement Project.

In addition to the corrective actions identified in the corrective action plan, the effects of additional aeration to strip ammonia from the wastewater were evaluated. The simultaneous operation of two blowers, providing increased aeration to lagoon Cell Nos. 1 and 2, and the installation and operation of two surface aerators in lagoon Cell No. 3 were tested. Section 5.3.1 discusses the removal of nitrogen in the STP lagoons and the effectiveness of the corrective actions and increased aeration in maintaining the effluent total nitrogen level below 20 mg/L.

5.3 Influent and Effluent Monitoring Results

The permit sets effluent (CPP-773, wastewater from the STP to the RI trenches) limits for total nitrogen (TKN + NNN) and total suspended solids (TSS) and requires that the influent and effluent be sampled and analyzed monthly for several parameters. Influent samples were collected from control station CPP-769, and effluent samples were collected from control station CPP-773. The samples were analyzed for the parameters required by Schedule B of the permit. The permit-required data are summarized in Tables 5-1 and 5-2.

Except for the monthly total coliform grab sample, all samples are to be collected as 24-hour flow-proportional composites. All permit-required samples were collected as scheduled with the exception of the November 2001 samples for chloride and TDS from the effluent. The DEQ was notified of this permit noncompliance on December 20, 2001 (Guymon 2001c). Sampling procedures were modified to include a post-sampling verification check to ensure that sampling personnel verify that all WLAP samples were collected as required. No other sampling anomalies occurred during the 2002 permit year.

Table 5-1. Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant influent data (WW-011501).

Sample Month	Sample Date	TKN (mg/L)	NNN[a] (mg/L)	Total Phosphorus (mg/L)	TSS (mg/L)	BOD (mg/L)
November	11/07/2001	44.50	2.65	3.58	24.9	88.7
December	12/04/2001	40.60	0.043	4.18	43.8	63.7
January	1/9/2002	47.70	0.06	6.38	88.5	139.0
February	2/27/2002	44.00	0.199	4.76	172.0	151.0
March	3/20/2002	39.10	0.014	4.90	45.4	85.4
April	4/9/2002	42.80	0.037	4.80	64.7	91.0
May	5/8/2002	42.20	0.01 U[b]	5.39	215.0	93.6
June	6/19/2002	42.00	0.025	4.61	51.6	80.3
July	7/24/2002	39.90	0.039	4.13	49.3	67.1
August	8/7/2002	31.40	0.104	4.60	98.7	125.0
September	9/11/2002	42.30	0.129	4.44	112.0	104.0
October	10/16/2002	17.20	0.03	5.29	341.0	131.0
Yearly Average[c]		39.48	0.28	4.76	108.9	101.7

a. NNN—Nitrate + nitrite as nitrogen.

b. U flag indicates that the result was reported as below the detection limit.

c. Yearly average is determined from the average of the monthly values. Half the detection limit was used in the average calculation for those results reported as below the detection limit.

Table 5-2. Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant effluent data (WW-011502).

Sample Month	Sample Date	TKN (mg/L)	NNN[a] (mg/L)	BOD (mg/L)	TSS (mg/L)	Total Phosphorus (mg/L)	EC (umhos/ cm)	TDS (mg/L)	Cl (mg/L)	Total Coliform[b] (col/100 mL)
November	11/7/2001	11.70	0.011	9.86	43.50	4.64	1014	—[c]	—[c]	710
December	12/4/2001	12.60	4.42	12.20	20.10	3.76	951.5	564.0	160.0	1,560
January	1/9/2002	16.80	3.53	8.78	6.40	4.00	992.1	546.0	150.0	7,200
February	2/27/2002	22.50	2.39	7.51	6.20	4.45	938.4	466.0	125.0	7,800
March	3/20/2002	23.70	1.67	10.10	12.40	4.61	835.3	460.0	94.10	16,000
April	4/9/2002	16.90	1.33	13.20	25.70	3.78	588.1	312.0	63.40	300
May	5/8/2002	9.99	2.04	26.00	75.80	3.36	529.1	376.0	67.00	820
June	6/19/2002	6.50	0.551	21.00	79.60	2.41	686.2	434.0	111.0	220
July	7/24/2002	5.61	0.326	12.90	26.30	1.51	858.8	562.0	148.0	100
August	8/7/2002	6.10	0.359	17.30	33.80	1.79	915.8	567.0	164.0	260
September	9/11/2002	7.63	0.884	21.60	37.00	2.34	948.1	579.0	163.0	360
October	10/16/2002	8.02[d]	1.48[d]	16.60[d]	30.40[d]	3.41[d]	835.8	560.5[d]	158.5[d]	460
Yearly Average[e]		12.34	1.58	14.75	33.10	3.34	841.1	452.2	117.0	2,983

a. NNN—Nitrate + nitrite as nitrogen.

b. Coliform samples were collected independent of the other effluent samples on 11/8/2001, 12/6/2001, 1/10/2002, 2/28/2002, 3/21/2002, 4/9/2002, 5/9/2002, 6/20/2002, 7/25/2002, 8/8/2002, 9/12/2002, and 10/16/2002.

c. TDS and chloride samples were not taken as required in November 2001.

d. The result shown is a monthly average of duplicate sample taken for the month.

e. Yearly average is determined from the average of the monthly values.

Monthly average effluent TSS concentrations remained below the monthly average limit of 100 mg/L, with an annual average of 33 mg/L. During the 2002 permit year, the average monthly total nitrogen exceeded the monthly average limit of 20 mg/L during January, February, and March (Guymon 2002b, Guymon 2002f, Guymon 2002g). Typically, the highest nitrogen concentrations occur during the colder months. The nitrogen results are discussed further in Section 5.3.1.

Yearly average concentrations were below the 2001 reported yearly averages for all influent permit-required parameters, except for nitrate + nitrite, as nitrogen. The November 2001 concentration (2.65 mg/L) represents the historical high. For the effluent, yearly average concentrations were below the 2001 reported yearly averages for all permit-required parameters, except for nitrate + nitrite as nitrogen, and total coliform. However, with the exception of total coliform, all permit-required parameters were within the range of concentrations reported in past years. The March 2002 total coliform count (16,000 col/100 mL) is slightly higher than the previous historical high of 15,800 col/100 mL. Coliform counts for the 2002 permit year were more consistent with previous permit years than the 2001 permit year, which had the lowest reported yearly average coliform counts since the permit was issued.

Table 5-3 summarizes calculated removal efficiencies (REs) for total nitrogen, BOD, and TSS. As in previous years, in general, BOD and TSS continue to be treated more efficiently than total nitrogen by a lagoon system, with yearly average REs of 84% for BOD, 71% for TSS, and 64% for total nitrogen. All REs for the 2002 permit year were lower than those for the 2001 permit year.

Table 5-3. Removal efficiency[a] for permit monitoring parameters at the Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant.

Sample Month	Total Nitrogen[b] (%)	BOD (%)	TSS (%)
November 2001	75	89	NC[c]
December 2001	58	81	54
January 2002	57	94	93
February 2002	44	95	96
March 2002	35	88	73
April 2002	57	85	60
May 2002	71[d]	72	65
June 2002	83	74	NC
July 2002	85	81	47
August 2002	79	86	66
September 2002	80	79	67
October 2002	45	87	91
Yearly Average RE	64	84	71

a. Removal efficiency (RE) = [(average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration)] × 100.

b. Total nitrogen includes NNN and TKN.

c. NC—Not calculated. The reported effluent result exceeded that reported for the influent.

d. Half the detection limit was used in the RE calculation for the influent NNN concentration, which reported as below the detection limit.

5.3.1 Wastewater Nitrogen Concentrations

During the 2002 permit year, total nitrogen concentrations in the effluent exceeded the permit limit three times. These exceedances occurred in January, February, and March (Figure 5-2). Total nitrogen in the effluent typically increases during the winter months when the cold temperatures decrease removal efficiencies.

As discussed in the 2001 WLAP report (INEEL 2002b), it had been determined through sampling and analysis that the majority of total nitrogen in the wastewater entering the STP (CPP-769) is in the form of ammonia (Figure 5-3). It had also been determined that the majority of ammonia was being removed in lagoon Cell Nos. 1 and 2 through the process of air stripping. Transfer structure CPP-771 directs the wastewater from lagoon Cell No. 2 to lagoon Cell Nos. 3 and 4. Figure 5-3 shows the ammonia concentration in CPP-771 after the wastewater has passed through Cell Nos. 1 and 2.

Two blowers are available to aerate lagoon Cell Nos.1 and 2. Normal operation had been to operate one blower at a time. However, to remove additional ammonia, both blowers were put into operation in mid-June of 2000. Operating both blowers approximately doubles the airflow rate to Cell Nos. 1 and 2. Winter conditions (i.e., ice formation on pond Cell No. 2) can prevent the operation of both blowers. For the 2002 permit year, both blowers provided aeration to lagoon Cell Nos.1 and 2 from November 1, 2001,

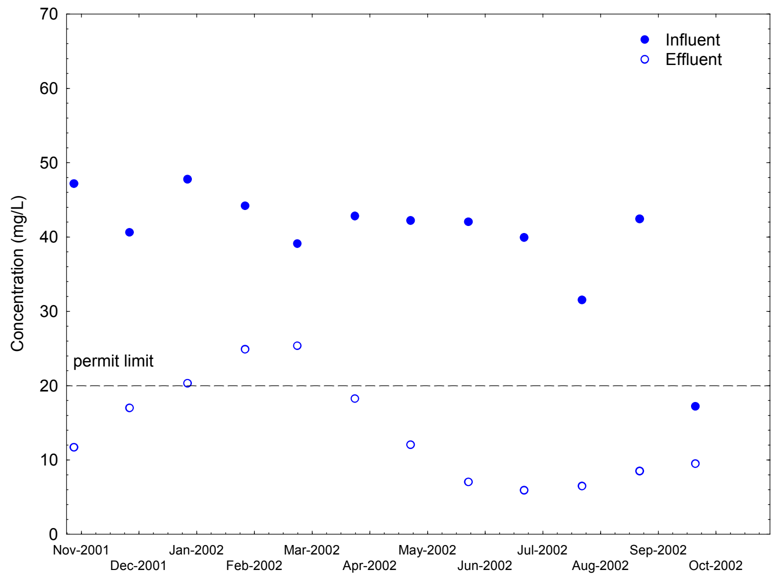

Figure 5-2. Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant influent (CPP-769) and effluent (CPP-773) total nitrogen concentrations.

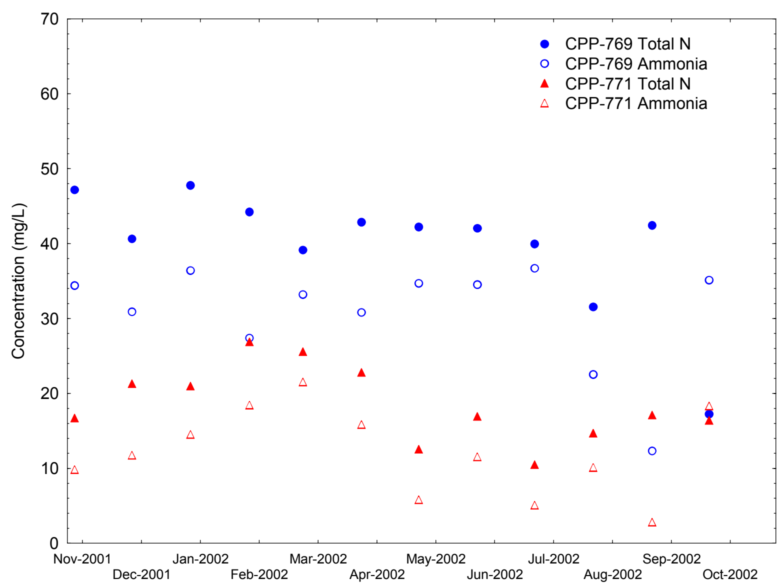

Figure 5-3. Comparison of total nitrogen and ammonia concentrations at sampling locations CPP-769 and CPP-771.

through January 30, 2002. On January 31, 2002, one blower was taken out of service for repair. On March 23, 2002, the second blower was placed back into service. Both blowers remained in service for the rest of the permit year. Ammonia removal (i.e., the difference between ammonia concentrations prior to aeration [CPP-769] and after aeration [CPP-771]) appeared to decrease (Figure 5-3) when the second blower was out of service and increase after it was placed back into service on March 23, 2002.

In addition to operating the two blowers, two 5-horsepower surface aerators were installed in lagoon Cell No. 3 on April 26, 2001, and placed into operation on June 4, 2001. No aerators were installed in lagoon Cell No. 4. In this way, lagoon Cell No. 4 could be used as a control to compare the effects of aeration vs. no aeration on stripping ammonia and reducing the total nitrogen concentration. For the 2002 permit year, both surface aerators in lagoon Cell No. 3 were operational with the following exceptions when only one aerator was operational:

- December 17, 2001, through January 9, 2002
- January 20, 2002, through March 5, 2002
- August 4, 2002, through October 31, 2002.

A study was performed to determine whether increasing aeration would be an effective method for maintaining effluent total nitrogen levels below the permit limit of 20 mg/L (INEEL 2002c). This aeration study, submitted to DEQ on October 23, 2002 (Guymon 2002h), covered April 11, 2001, through April 26, 2002 and included an independent review by CH2M HILL of possible treatment options for meeting the 20 mg/L limit.

The aeration study found that surface aeration in lagoon Cell No. 3 worked well during the summer but not the winter. During the study period, the surface aerators decreased ammonia nitrogen in lagoon Cell No. 3 by an average of 54.2%. Ammonia nitrogen was reduced by 83.2% during the summer (June 6, 2001, to October 31, 2001), but only reduced by 10.4% during the winter (November 1, 2001, to April 26, 2002). The decreased ammonia stripping efficiency in Cell No. 3 was due to the surface aerators becoming either partially or totally frozen over and the increased solubility of ammonia in water at the colder temperatures.

Over the same period, ammonia nitrogen in lagoon Cell No. 4 (the control pond) reduced 44.3%. During the summer, it reduced 45.5%, and during the winter it reduced 32.0%. Lagoon Cell No. 4 relies on the nitrification/denitrification cycle.

The aeration study, discussed above, concluded that using aeration to remove ammonia nitrogen from the wastewater would not guarantee the total nitrogen concentration in the effluent would remain below the WLAP limit of 20 mg/L. The study recommended considering other options for meeting the total nitrogen limit.

The CH2M HILL independent review evaluated various treatment options to meet the effluent total nitrogen limit. Options evaluated included:

- A mechanically activated sludge treatment system
- A less mechanized biological system which would utilize an aerated lagoon with additional polishing
- Land application (slow rate infiltration) of wastewater to rangeland vegetation.

Other options not specifically addressed in the CH2M HILL report have also been evaluated (Guymon 2002h). These include discharging the STP treated effluent into the INTEC Service Waste System (with disposal to the INTEC New Percolation Ponds) and covering the ponds to elevate the winter wastewater temperature. The preferred alternative will be submitted to DEQ in 2003 for review and approval prior to implementation.

5.3.2 Flow Volumes

Influent flow is measured by two ultrasonic, dual transducer, clamp-on-design flow meters attached to the force main lines coming from final lift stations CPP-728 and CPP-733. These flow meters are located just prior to the CPP-769 (influent to the STP) control structure. The effluent (CPP-773, wastewater from the STP to the RI trenches) flow meter consists of an ultrasonic level sensor and a V-notch weir plate. The two influent flow meters and the effluent flow meter provide continuous flow data. However, the point of compliance is the effluent flow measurement. Daily flow readings are taken and recorded in gpd. Table 5-4 summarizes monthly and total flow volume, and Appendix D presents daily flow readings and copies of the required electronic WLAP data files (DEQ 2002).

Table 5-4. Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant flow summaries.

	Influent (WW-011501)				Effluent (WW-011502)			
Sample Month[a]	Average (gpd[b])	Minimum[c] (gpd)	Maximum (gpd)	Total (MG[d])	Average (gpd)	Minimum[c] (gpd)	Maximum (gpd)	Total (MG)
November 2001	38,939	21,652	59,075	1.17	26,674	14,472	42,893	0.80
December 2001	31,840	18,278	59,603	0.99	26,050	14,808	37,316	0.81
January 2002	29,960	16,226	43,390	0.93	38,458	23,836	53,841	1.19
February 2002	28,093	13,062	44,661	0.79	94,142	11,955	241,372	2.64
March 2002	26,924	14,898	72,879	0.84	48,642	1,461	141,012	1.51
April 2002	27,310	14,760	40,629	0.82	NM[e]	NM	NM	NM
May 2002	26,137	13,388	44,072	0.81	9,608	7,959	14,295	0.30
June 2002	33,273	13,620	45,861	1.00	9,370	7,569	14,472	0.28
July 2002	34,216	22,718	55,202	1.06	8,898	223	20,157	0.28
August 2002	34,671	19,537	50,892	1.08	11,503	2,069	19,570	0.36
September 2002	40,668	5,124	195,622[f]	1.22	12,626	1,316	24,004	0.38
October 2002	36,127	20,302	49,303	1.12	19,150	7,623	34,667	0.59
Yearly Summary	32,352	5,124	195,622	11.81	25,007	223	241,372	9.13

a. Accuracy of influent flow readings from September 17, 2002, through the end of the permit year is suspect due to problems discovered during instrument calibration. Accuracy of effluent flow readings from January 1, 2002, through March 19, 2002, is suspect due to ice build up. Accuracy of effluent flow readings from July 4, 2002, through July 7, 2002, is suspect due to abnormally low readings. The influent flow meters were out of service from March 24, 2002, until April 1, 2002. The effluent flow meter was out of service from March 31, 2002, until May 1, 2002.

b. gpd—Gallons per day.

c. Minimums shown for the month are based on days when the flow meters were operational.

d. Monthly and annual permit totals are shown in million gallons (MG).

e. NM—Not measured. The effluent flow meter was out of service from March 31, 2002, until May 1, 2002. Therefore, no flow measurement was taken during the month.

f. The high maximum flow is suspect due to problems discovered during instrument calibration.

Beginning March 17, 1997, the rotation frequency of the infiltration trenches was changed from 2 weeks to 1 week. This increased rotation frequency allowed greater soil wetting and drying in an effort to maximize nitrogen removal. Table 5-5 summarizes the monthly flow to each trench. The 1-week rotation frequency was maintained during the 2002 permit year, even during periods of no flow, with three exceptions. Trench 1 was out of service from December 6, 2001, until July 22, 2002, due to repairs required on the valve. Flow was diverted to Trench 2 on May 16, 2002, and remained there through June 30, 2002, during construction to repair the valve for Trench 1. Flow was diverted to Trench 3 on July 29, 2002, because the valve associated with Trench 2 was not working properly. The Trench 2 valve was fixed prior to the next scheduled rotation.

Total annual effluent flow to the trenches (measured by the flow meters) was 9.13 MG during the 2002 permit year, which is well below the permit limit of 30 MG/year. During 1997, a disparity between the measured influent and effluent values was identified. Since 1997 (as documented in past annual reports), engineering studies, corrective actions, and flow studies have been performed to address the disparity. During the 2002 permit year, several discrepancies were identified with both influent and effluent flow measurements. Accuracy of influent flow readings from September 17, 2002, through the end of the permit year is suspect due to problems discovered during instrument calibration (Guymon 2002i). Accuracy of effluent flow readings from January 1, 2002, through March 19, 2002, is suspect due to ice build up (Guymon 2002b). Accuracy of effluent flow readings from July 4, 2002, through July 7, 2002, is suspect due to abnormally low readings. The influent flow meter was taken out of service from March 24, 2002, until April 1, 2002, for reprogramming (Guymon 2002g). The effluent flow meter was taken out of service from March 31, 2002, until May 1, 2002, to replace a faulty ultrasonic transducer (Guymon 2002g). For each of these discrepancies, average daily flows were estimated based on historical flow data and assumed worst-case scenarios. The estimated flows for the effluent were:

- 21,207 gpd for the period of January 1, 2002, through March 19, 2002
- 21,746 gpd for the period of March 31, 2002, through May 1, 2002
- 11,374 gpd for the period of July 4, 2002, through July 7, 2002.

The estimated flows for the influent were:

- 45,779 gpd for the period of March 24, 2002, through April 1, 2002
- 50, 581 gpd for the period of September 17, 2002, though October 31, 2002.

Using these estimated average daily flows, the total annual effluent flow is estimated to be 6.46 MG, which is below the total annual flow reported by the flow meters (9.13 MG) and below the permit limit (30 MG).

Due to the ongoing problems with the flow instruments, the following corrective actions are being implemented:

- Install insulating blankets and incorporate use of stock tank heaters in CPP-773 to help prevent ice build up
- Install hour meters for the lift stations that supply the STP and use them as a backup flow measurement if the influent flow meters fail in the future.

Table 5-5. Monthly flow to each trench.

Sample Month	Trench 1 (MU-011501) (MG)[a]	Trench 2 (MU-011502) (MG)	Trench 3 (MU-011503) (MG)	Trench 4 (MU-011504) (MG)
November 2001	0.15	0.19	0.19	0.27
December 2001	NF[b]	0.20	0.30	0.31
January 2002	NF	0.27	0.32	0.60
February 2002	NF	0.60	0.73	1.31
March 2002	NF	0.36	0.43	0.73
April 2002	NF	NF	NF	NF
May 2002	NF	0.15	0.08	0.07
June 2002	NF	0.28	NF	NF
July 2002	0.09	NF	0.07	0.11
August 2002	0.07	0.08	0.13	0.08
September 2002	0.08	0.07	0.12	0.11
October 2002	0.10	0.12	0.16	0.22
Yearly Total	0.49	2.32	2.52	3.80

a. Trench totals are in million gallons (MG).

b. NF—No flow.

5.4 Groundwater Monitoring Results

To measure potential STP impacts to groundwater, the permit requires that groundwater samples be collected from three monitoring wells (see Figure 5-4):

- One background aquifer well (USGS-121) upgradient of INTEC
- One perched water well (ICPP-MON-PW-024) immediately adjacent to the STP
- One aquifer well (USGS-052) downgradient of the STP, which serves as the point of compliance.

Sampling must be conducted semiannually (April and October) and must include a list of specified parameters for analysis. Contaminant concentrations in USGS-052 are limited by primary constituent standards (PCS) and secondary constituent standards (SCS) specified in IDAPA 58.01.11, “Ground Water Quality Rule.” All permit-required samples are collected as unfiltered samples.

During the 2002 permit year, groundwater samples were collected in April and October. Duplicate samples were collected from USGS-052 in April and October. Table 5-6 shows the water levels (collected prior to purging and sampling) and analytical results for all parameters required by the permit. Groundwater samples collected from USGS-052 were in compliance with all permit limits during 2002. Chloride and nitrate concentrations in USGS-052 were elevated compared to USGS-121, as in previous years.

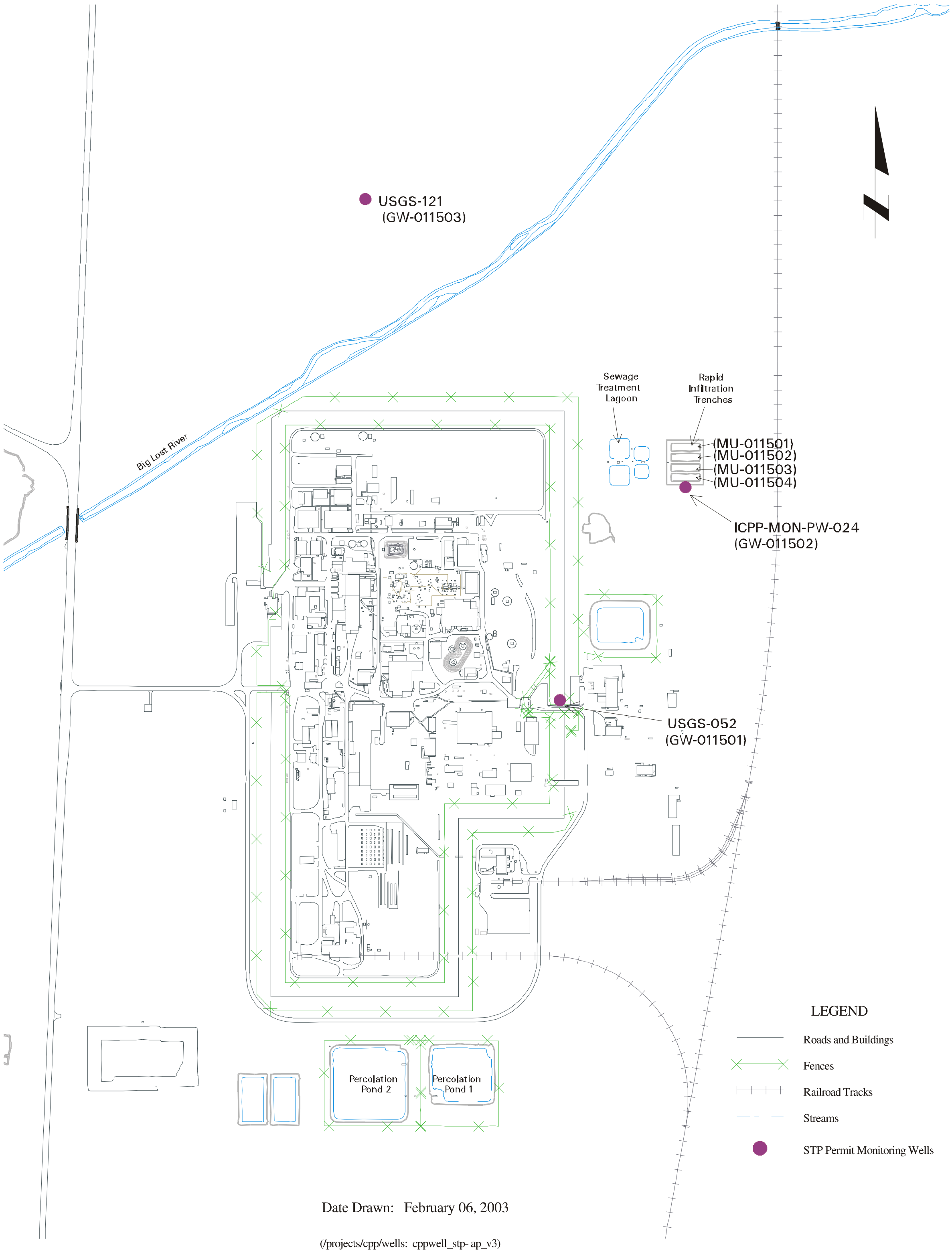

Figure 5-4. Locations of Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant WLAP monitoring wells.

Table 5-6. Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant groundwater data for April and October 2002.

	ICPP-MON-PW-024 (GW-011502)		USGS-052 (GW-011501)				USGS-121 (GW-011503)		PCS/SCS[a]
Depth to Water Table (ft)	61.9	61.6	454.10	454.10	456.26	456.26	457.64	456.51	
Sample Date	4/8/02	10/16/02	4/16/02	4/16/02[b]	10/7/02	10/7/02[b]	4/17/02	10/16/02	
(units)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
TKN	1.0 U[c]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA[d]
Chloride	103	145	29.6	29.9	29.8	28.6	12.0	12.0	250
TDS	555	574	266	263	275	270	206	222	500
NO_3-N	14.3	5.97	4.7	4.8	4.41	4.4	0.79 R[e]	0.79	10
NO_2-N	0.10 U	0.10 U	0.1 U	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U	1
NO_2-N +NO_3-N	14.1	6.0	4.57	4.59	4.55	4.60	0.77	0.77	10
NH_4-N	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA
BOD	2.0 U	9.6	2.1	2.4	9	8.7	2.5	9.5	NA
Total phosphorus	2.6	2.4	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.1 U	NA
Total coliform	Absent	30[f]	Absent	Absent	Absent	Absent	38[g]	Absent	1 col/100 mL
Fecal coliform	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	NA

a. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in IDAPA 58.01.11.200.01.a and b.

b. Duplicate sample.

c. U flag indicates that the result was reported as below the detection limit.

d. NA—Not applicable.

e. R flag indicates that the result was rejected during validation due to the holding time being greatly exceeded. The result was not used in the annual average calculations.

f. *Enterobacter cloacae* was speciated in this sample.

g. *Citrobacter fruendii* was speciated in this sample.

Background aquifer well USGS-121 exceeded the PCS level for total coliform in the April sample (Guymon 2002c). The sample result was 38 colonies/100 mL total coliform (Table 5-6). The laboratory identified the coliform species as *Citrobacter fruendii*. Since this is the upgradient (background) well, contamination from the INTEC STP is not expected. Total coliform was absent in the October sample, and fecal coliform was absent in the April and October samples.

Monitoring well ICPP-MON-PW-024 was constructed in the perched water zone approximately 70 ft below the surface of the infiltration trenches. It is used as an indicator of treatment efficiency of the soil, rather than serving as a point of compliance. Similar to previous years, TDS and chloride concentrations in ICPP-MON-PW-024 approximated those of the effluent.

Total coliform was detected in the October 2002 ICPP-MON-PW-024 sample and was also detected in the effluent. The species of bacteria detected in ICPP-MON-PW-024 was *Enterobacter cloacae* and was detected at a concentration of 30 colonies/100 mL. Speciation was not required on the effluent sample. Total coliform was not detected in the April sample. Fecal coliform was also absent in both the April and October samples. Given that fecal coliform was not detected in ICPP-MON-PW-024 and the total coliform in the effluent was not speciated, it is uncertain whether the INTEC STP effluent is the cause of the coliform contamination in ICPP-MON-PW-024.

Total nitrogen concentrations (comprised of NO_2-N, NO_3-N and TKN) in the perched water closely followed those of the effluent prior to 1997 (Figure 5-5), the difference being that nearly all the total nitrogen in the perched water was comprised of NO_3-N, while the effluent was primarily comprised of NH_3-N. This suggests significant nitrification (a process whereby NH_3-N is converted to NO_3-N) by the soil, but little denitrification to a gas. In March 1997, the trench rotation frequency was increased from biweekly to weekly to increase denitrification in the soil column. As shown in Figure 5-5, total nitrogen concentrations in the perched water appear to be reduced compared to that of the effluent, with concentrations generally falling between that of the effluent and that measured at USGS-052. Weekly trench rotation will continue, and concentrations of these parameters will continue to be observed and tracked.

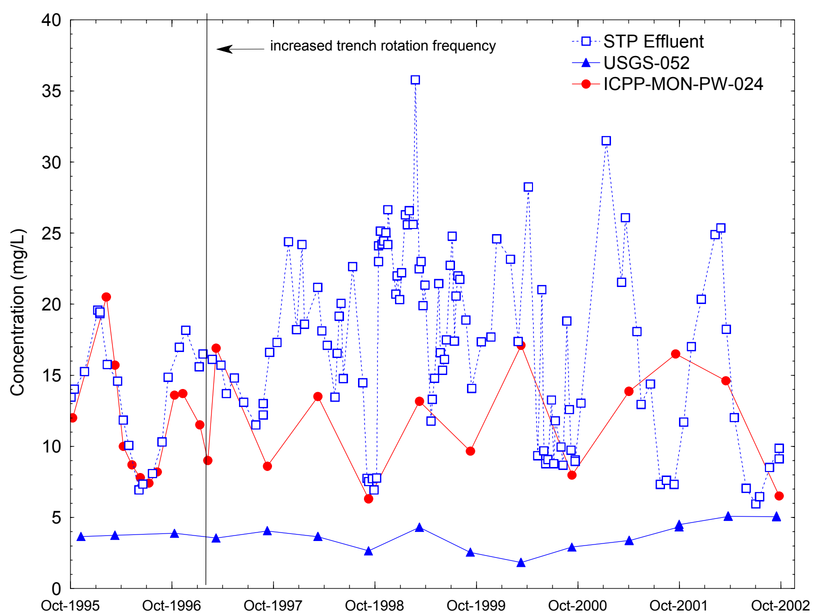

Figure 5-5. Total nitrogen concentrations in Sewage Treatment Plant effluent, ICPP-MON-PW-024, and USGS-052.

5.5 Summary of Environmental Impacts

INTEC STP effluent flow volumes, effluent TSS, and groundwater concentrations were all within permit limits. Total nitrogen concentrations in the effluent exceeded the permit limit (20 mg/L) 3 months during the 2002 permit year. Maintenance and operational corrective actions continued during the permit year. An aeration study, covering April 11, 2001, through April 26, 2002, concluded that using aeration to remove ammonia nitrogen from the wastewater would not guarantee the total nitrogen concentration in the effluent would remain below the WLAP limit of 20 mg/L. As a result, various options were evaluated to meet the total nitrogen limit. The preferred alternative will be submitted to DEQ for review and approval prior to implementation.

During the 2002 permit year, the problems with the influent and effluent flow meters persisted. Several discrepancies were identified during the permit year, which resulted in inaccurate readings. Measures are being implemented to reduce the ice buildup during the colder months and to install hour meters, which can be used as backup measurements to the permanent flow meters.

Concentrations of permit-required parameters in groundwater samples collected from the aquifer compliance well (USGS-052) were all within permit limits during 2002. However, concentrations of chloride and nitrate in the aquifer well were elevated, while concentrations of TKN, TDS, and total phosphorus in the aquifer well were only slightly elevated or indistinguishable from background (USGS-121), when measured at the compliance well. Concentrations of chloride, TDS, nitrate, and total phosphorus were elevated in the perched water well (ICPP-MON-PW-024) compared to background well concentrations. Total coliform was detected in the perched water well in October 2002 and in the background well in April 2002. Coliform in the INTEC STP effluent is suspected to be the cause of the contamination in the perched water well, but not the upgradient background well.

6. TEST AREA NORTH/TECHNICAL SUPPORT FACILITY SEWAGE TREATMENT PLANT DATA SUMMARY AND ASSESSMENT

6.1 Site Description

The Test Area North (TAN) is located at the north end of the INEEL. Major facilities at TAN include:

- Technical Support Facility (TSF)
- Containment Test Facility (formerly the Loss-of-Fluid-Test Facility)
- Specific Manufacturing Capability Facilities.

Test Area North was initially built between 1954 and 1961 to support the Aircraft Nuclear Propulsion Program sponsored by the U.S. Air Force and the Atomic Energy Commission.

The TSF area currently has approximately 40 buildings and a work force of about 65 people. The TAN/TSF STP only serves the buildings in the TSF area. The TAN/TSF STP and Disposal Pond are southwest of the TSF area and over 1,500 ft away from the nearest drinking water well. A public road passes approximately ¼ mi southeast of the area, and the nearest inhabited building is approximately 1,000 ft from the wastewater application area (Figure 6-1). Groundwater generally flows to the southeast.

6.2 System Description and Operation

The TAN/TSF STP was constructed in 1956. It was designed to treat raw wastewater by biologically digesting the majority of the organic waste and other major contaminants, then applying it to land for infiltration and evaporation. The STP consists of:

- Wastewater-collection manhole
- Imhoff tank
- Sludge drying beds
- Trickle filter and settling tank
- Contact basin
- Infiltration disposal pond.

The TAN/TSF Disposal Pond was constructed in 1971; prior to that, treated wastewater was disposed of through an injection well.

The Disposal Pond consists of a primary disposal area and an overflow section, both of which are located within an unlined, fenced 35-acre area. The overflow pond is rarely used; it is used only when the water is diverted to it for brief periods of cleanup and maintenance. The Disposal Pond and overflow pond areas are approximately 39,000 ft^2 (0.9 acres) and 14,400 ft^2 (0.330 acres), respectively, for a combined area of approximately 53,400 ft^2 (1.23 acres). In addition to receiving treated sewage wastewater, the pond also receives process wastewater, which enters the facility at the TAN-655 lift station.

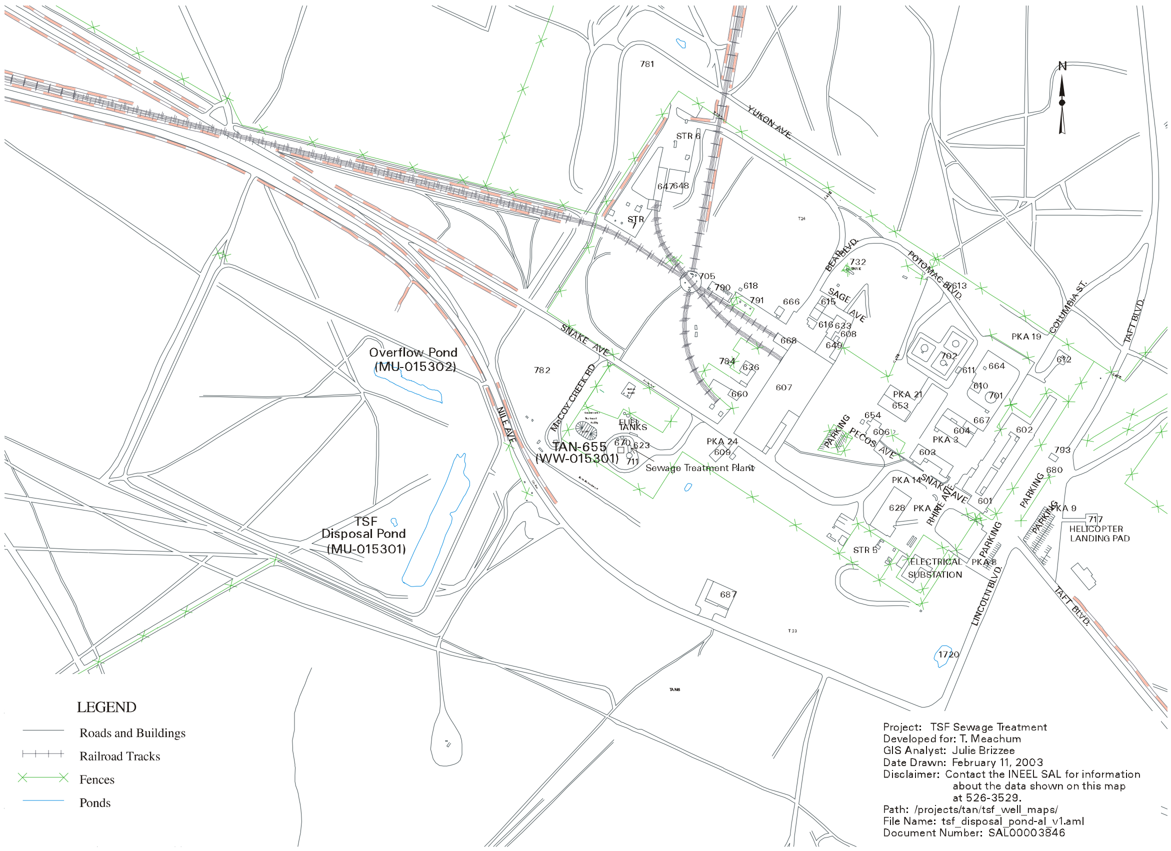

Figure 6-1. Test Area North/Technical Support Facility Sewage Treatment Plant and Wastewater Disposal Pond.

The TSF sewage primarily consists of spent water containing wastes from rest rooms, sinks, and showers. The wastewater goes to the TAN-623 STP, and then to the TAN-655 lift station, which pumps to the Disposal Pond.

The process drain system collects wastewater from process drains and building sources originating from various TAN facilities. The process wastewater consists of effluent, such as steam condensate; water softener and demineralizer discharges; and cooling water, heating, ventilating, air conditioning, and air scrubber discharges. The process wastewater is transported directly to the TAN-655 lift station, where it is mixed with treated sanitary wastewater before being pumped to the Disposal Pond.

Designed output of the STP is 28,800 gpd, but can go up to 36,000 gpd, if necessary. The TAN-655 lift station has a capacity of about 800 gallons per minute (well over 1 million gpd). The pond's capacity, taking into consideration volume losses from evaporation and infiltration, is estimated at 33 MG/yr (Kaminsky et al. 1993).

On February 13, 2002, it was discovered that the industrial waste line from the TAN-603 boiler sump to the Disposal Pond had frozen. This caused the boiler blowdown water to build up in the sump. The concern was that if the capacity of the sump was exceeded, the water would overflow into an adjacent radioactive sump. The INEEL contacted DEQ on February 13, 2002, and obtained approval to discharge the boiler blowdown water to the storm water drain as an immediate action until repairs could be made, with the understanding that every effort would be made to terminate the discharge as soon as possible (Graham 2002). Approximately 750 gallons of boiler blowdown water were pumped to the storm water drain during the evening of February 13, 2002, and the morning of February 14, 2002. A tank truck then became available to haul the boiler blowdown water to a downstream manhole that transferred the water to the Disposal Pond. The tank truck was used until normal operations were restored on February 18, 2002.

At the request of DEQ, a sample of the boiler blowdown water was collected and analyzed for pH and TDS. The sample pH was 11.9, and the TDS was 1,600 mg/L. A letter (Guymon 2002j) was submitted to DEQ on April 11, 2002, which provided a description of the events as they occurred, the analytical results, and the material safety data sheets of the chemicals used to condition the boiler water.

6.3 Status of Special Compliance Conditions

No special compliance conditions were in effect during the 2002 permit year.

6.4 Effluent Monitoring Results

The permit for the TAN/TSF STP sets concentration limits for TSS and total nitrogen (measured at the effluent to the Disposal Pond) and requires that the effluent be sampled and analyzed monthly for several parameters. During the 2002 permit year, 24-hour composite samples (except fecal and total coliform, which were grab samples) were collected at the TAN-655 lift station effluent monthly. The permit requires that monthly samples be collected as 24-hour, flow-proportional composites. However, due to the configuration of the piping and location of the flow meter, a compositor that collects flow-proportional samples based on real-time measurement of the two incoming waste streams could not be installed. As a result, an annual flow study was started in 1997 to determine the average fluctuations in flow over a 24-hour period. The flow study is repeated every year, and the compositor is reprogrammed based on the average flows measured during different periods of the day to simulate a flow-proportional sample for the year. This method has been used to collect time-weighted, flow-proportional samples since August 1997. The DEQ verbally authorized this method of flow-proportional sampling, and written approval is pending.

Table 6-1 shows the effluent monitoring results for the 2002 permit year. Monthly concentrations of TSS were well below the permit limits (100 mg/L) throughout the entire permit year, with a maximum monthly concentration of 13.1 mg/L in March 2002. All monthly total nitrogen (TKN + NNN) concentrations were well below the permit limit of 20 mg/L, with the maximum monthly concentration of 6.25 mg/L in October 2002.

Yearly 2002 average concentrations were lower than those for the previous permit year for most of the parameters. The average fecal coliform concentration (3,786 col/100 mL) was a factor of 10 lower than that of the previous permit year and the lowest average since permit year 1996. The average total coliform concentration (122,024 col/100 mL) was approximately one-third lower than that reported for the previous permit year, even though the November 2001 concentration represented the historical high (780,000 col/100 mL). The low coliform readings for January and February (refer to Table 6-1) were related to a blockage in the inlet to the TAN-623 lift station that reduced the flow into the Imhoff tank. During maintenance performed in February 2002, rags were found blocking flow to the inlet. Once the blockage was removed, normal flow resumed. Coliform readings for the remainder of the 2002 permit year, while higher than in January and February, remained lower than those reported at the start of the permit year.

With the incorporation of the 2002 permit year data, significant increasing trends discussed in previous annual reports were no longer evident for TKN or TDS. Average yearly concentrations for both TKN and TDS were reduced from the previous permit year. The decreases in TKN and TDS are most

Table 6-1. Test Area North/Technical Support Facility water data for effluent to the TAN/TSF Disposal Pond (WW-015301).

	November	December	January	February	March	April	May	June	July	August	September	October	Yearly
Sample Date	11/29/2001	12/11/2001	1/23/2002	2/7/2002[a]	3/13/2002	4/9/2002	5/2/2002	6/6/2002	7/16/2002	8/20/2002	9/5/2002	10/24/2002	Average[b]
Parameter (units)													
TKN (mg/L)	2.68	1.72	0.655	2.34	2.01	0.500 U[c]	0.242	0.525	0.168	1.28	0.774	2.18	1.24
NH_4-N (mg/L)	1.19	0.612	0.070	1.88	1.18	0.372	0.138	0.048	0.033	1.44	0.689	1.08	0.727
NNN (mg/L)	3.08	2.37	1.17	1.58	3.45	2.81	3.73	1.80	1.33	2.01	0.01 U	4.07	2.28
BOD (mg/L)	16.90	11.60	5.11	11.65	10.40	4.08	3.23	2.90	2.85	7.14	4.90	6.90	7.31
Total phosphorus (mg/L)	0.564	0.431	0.179	0.461	0.494	0.380	0.423	0.204	0.094	0.491	0.465	0.520	0.392
Total coliform (col/100 mL)[d]	780,000	50,000	1,000	500	80,000	12,667	130,000	8,000	4,200	8,000	8,000	8,000	90,864
Fecal coliform (col/100 mL)[d]	10,000	2,667	200	100	12,000	500	1,667	400	100	6,000	6,000	5,800	3,786
Chloride (mg/L)	140.0	128.0	16.70	132.5	158.0	21.20	16.20	14.20	15.20	17.00	18.30	17.70	57.92
Arsenic (mg/L)	0.0025 U	0.0025 U	0.0035	0.0034	0.0037	0.0026	0.0030	0.0033	0.0029	0.0025 U	0.0025 U	0.0025 U	0.0024
Barium (mg/L)	0.106	0.101	0.084	0.103	0.111	0.095	0.091	0.091	0.096	0.099	0.098	0.095	0.097
Chromium (mg/L)	0.0025 U	0.0025 U	0.0031	0.0038	0.0027	0.0029	0.0028	0.0030	0.0039	0.0029	0.0025 U	0.0025 U	0.0025
Fluoride (mg/L)	0.276	0.273	0.249	0.234	0.213	0.200 U	0.222	0.242	0.245	0.234	0.294	0.237	0.235
Lead (mg/L)	0.0015 U	0.0024	0.0015 U	0.0012	0.0015 U	0.0015 U	0.0015 U	0.0022	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0011
Iron (mg/L)	0.031	0.048	0.013 U	0.061	0.394	0.013 U	0.013 U	0.034	0.040	0.082	0.036	0.013 U	0.062
Manganese (mg/L)	0.0056	0.0045	0.0034	0.0043	0.015	0.0025 U	0.0025 U	0.0027	0.0025 U	0.0038	0.0031	0.0035	0.0041
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)	0.0025 U	0.0025 U	0.0025 U	0.0017	0.0008	0.0012	0.0012	0.001	0.0024	0.0015	0.0017	0.0020	0.0014
Sodium (mg/L)	85.50	85.10	32.70	93.40	84.20	13.40	9.53	7.97	8.72	8.79	9.31	10.10	37.39
Sulfate (mg/L)	41.0	43.1	39.3	44.0	34.3	34.5	33.5	32.0	35.9	36.0	36.4	35.4	37.1
TDS (mg/L)	494.0	471.0	285.0	460.5	480.0	274.0	293.0	271.0	288.0	279.0	283.0	281.0	346.6
Zinc (mg/L)	0.026	0.033	0.019	0.055	0.053	0.031	0.027	0.019	0.016	0.076	0.022	0.032	0.034
TSS (mg/L)	4.20	4.90	4.00 U	3.85	13.10	4.00 U	4.00 U	4.00 U	4.00 U	4.40	4.00 U	4.00 U	3.79

a. Duplicate samples were taken on 2/7/2002 for all parameters except total and fecal coliform. For these parameters, the result shown is the average of the duplicate results using half the detection limit for individual results reported as below the detection limit. For those parameters with all results for the month reported as below the detection limit, the result shown is the reported detection limit with a U flag.

b. Half the detection limit was used in the yearly average calculations for those results reported as below the detection limit. However, for those parameters with all results for the year reported as below the detection limit, the result shown is the reported detection limit with a U flag.

c. U flag indicates that the result was reported as below the detection limit.

d. Coliform samples were collected independent of the composite samples on 11/29/2001, 12/13/2001, 1/23/2002, 2/6/2002, 3/14/2002, 4/9/2002, 5/2/2002, 6/6/2002, 7/18/2002, 8/22/2002, 9/5/2002, and 10/24/2002.

likely attributed to the new water softener system that was installed in late 2000, which has reduced the salt usage.

6.4.1 Flow Volumes

In addition to effluent concentration limits, the permit also specifies a limit for annual effluent flow volume to the Disposal Pond. The flow meter at TAN-655 measures the combined STP and the process wastewater flows, which are joined at the TAN-655 sump before being pumped to the TAN/TSF Disposal Pond. The Disposal Pond consists of a primary disposal area (MU-015301) and an overflow section (MU-015302), which is rarely used. All of the flow during 2002 went to the primary disposal area. Table 6-2 summarizes monthly and total flow volumes, and Appendix E presents daily flow readings and copies of the required electronic WLAP data files (DEQ 2002).

The permit flow limit is 34 MG per year discharged to the pond. Total effluent to the pond for the 2002 permit year was 7.83 MG. Of that amount, 1.46 MG was comprised of sewage wastewater, and the remainder (6.37 MG) was comprised of process wastewater.

Table 6-2. Test Area North/Technical Support Facility flow summaries.

	Effluent to Disposal Pond (WW-015301)			
Sample Month	Average (gpd)[a]	Minimum (gpd)	Maximum (gpd)	Total to Primary Disposal Pond (MU-015301) (MG)[b]
November 2001	23,867	9,000	40,000	0.72
December 2001	32,032	23,000	38,000	0.99
January 2002	27,355	17,000	34,000	0.85
February 2002	30,000	20,000	40,000	0.84
March 2002	29,935	6,000	49,000	0.93
April 2002	22,800	13,000	35,000	0.68
May 2002	14,516	10,000	27,000	0.45
June 2002	20,567	8,000	35,000	0.62
July 2002	12,194	8,000	27,000	0.38
August 2002	16,161	7,000	34,000	0.50
September 2002	23,067	10,000	37,000	0.69
October 2002	6,032	4,000	10,000	0.19
Yearly Summary	21,463	4,000	49,000	7.83

a. gpd—Gallons per day.

b. Annual flow totals are shown in million gallons (MG).

6.5 Groundwater Monitoring Results

To measure potential Disposal Pond impacts to groundwater, the permit requires that groundwater samples be collected from four monitoring wells (see Figure 6-2):

- One background aquifer well (TANT-MON-A-001) upgradient of the Disposal Pond

- Three aquifer wells (TAN-10A, TAN-13A, and TANT-MON-A-002) downgradient of the Disposal Pond that serve as points of compliance.

Sampling must be conducted semiannually and must include several specified parameters for analysis. Contaminant concentrations in TAN-10A, TAN-13A, and TANT-MON-A-002 are limited by the permit to the PCS and SCS levels in IDAPA 58.01.11, "Ground Water Quality Rule." All permit-required samples are collected as unfiltered samples.

During the 2002 permit year, groundwater samples were collected in April and October. Table 6-3 shows water levels (recorded prior to purging and sampling) and analytical results for all parameters specified by the permit. Iron concentrations exceeded the SCS of 0.3 mg/L in TANT-MON-A-001 (the background well) and TAN-13A in April and in TAN-10A in April and October (Guymon 2002c). Iron concentrations in additional filtered samples collected in October 2002 from TAN-10A also exceeded the SCS of 0.3 mg/L. Elevated iron concentrations historically have been detected in the TAN WLAP monitoring wells. Due to increased iron concentrations in all four of the TAN WLAP wells in 1999, a corrosion evaluation (CORRPRO 2000) was performed at TAN wells that exhibited similar increases. This evaluation confirmed that the riser pipes at several TAN wells were significantly corroded and attributed the increased iron concentrations to the corrosion. The riser pipes attached to the dedicated submersible pumps were replaced with stainless steel riser pipes in all four TAN WLAP monitoring wells during August 2001. Video log information gathered during the well maintenance showed that the stainless steel well casings in wells TAN-13A, TANT-MON-A-001, and TANT-MON-A-002 appeared relatively free of rust to the water table. Iron concentrations decreased in all three of these wells, based on samples collected prior to the maintenance (April 2001) and those collected after the maintenance. The iron concentrations in these three wells continued to decrease between the April and October 2002 sampling events (Table 6-3).

The April 2001 video log information gathered on TAN-10A showed that the carbon steel well casing appeared to be corroded most of the way to the water table. The iron concentrations in TAN-10A increased after the maintenance, and the October iron concentrations for TAN-10A were the highest reported for the four wells. The condition of the well casing, coupled with the residual effects relating to the replacement of the galvanized riser pipe, may have resulted in the increased iron concentrations in TAN-10A.

All samples and duplicate samples collected from well TAN-10A in April and October exceeded the permit limit (SCS) for TDS of 500 mg/L (Table 6-3). The TDS increased from 509 mg/L and 540 mg/L in the April samples to 568 mg/L and 627 mg/L in the October samples. The condition of the well casing and the residual effects from replacing the riser pipe may also be contributing to the increase of the TDS in well TAN-10A.

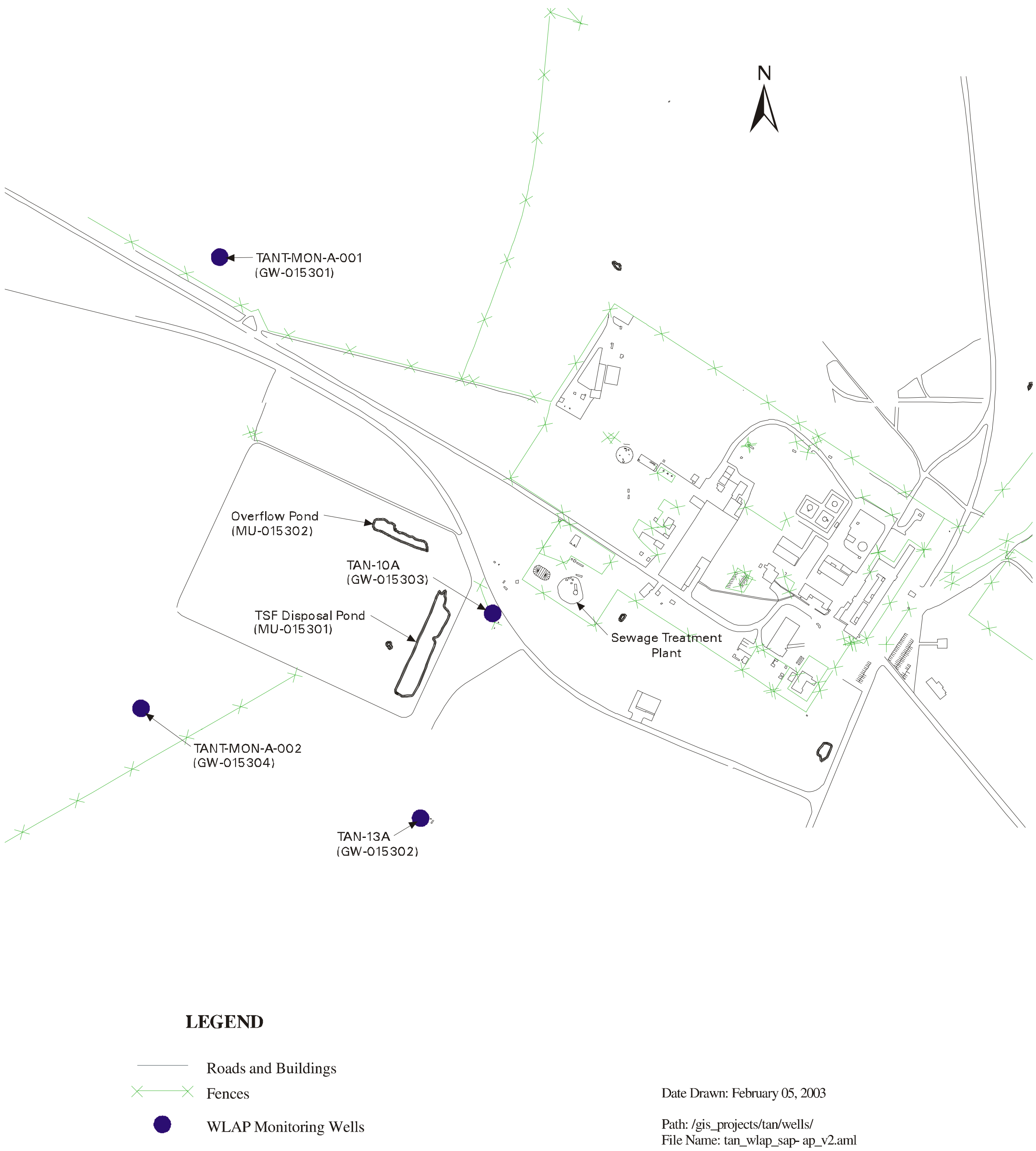

Figure 6-2. Locations of Test Area North/Technical Support Facility WLAP monitoring wells.

Table 6-3. Test Area North/Technical Support Facility Sewage Treatment Plant groundwater data for April and October 2002.

	TANT-MON-A-001 (GW-015301)		TANT-MON-A-002 (GW-015304)		TAN-10A (GW-015303)				TAN-13A (GW-015302)		PCS/SCS[a]
Depth to Water Table (ft)	204.52	208.45	208.76	211.72	205.65	205.65	208.60	208.60	207.04	209.00	
Sample Date	4/3/2002	10/9/2002	4/3/2002	10/9/2002	4/1/2002	4/1/2002[b]	10/2/2002	10/2/2002[b]	4/2/2002	10/2/2002	
(units[c])	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
TKN	1.0 U[d]	2.2	1.0 U	1.0 U	1.0 U	1.0 U	3.9	1.7	1.0 U	1.0 U	NA[e]
BOD	8.0 U	10.7	8.0 U	15.2	7.7	10	2.7	2.6	10.2	12.0	NA
Chloride	12.0	11.4	4.1	3.8	107	108	103	103	3.7	3.1	250
TDS	209	224	181	170	509	540	568	627	167	297	500
Total phosphorus	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA
Sodium	7.94	8.26	6.46	6.64	49.1	48.8	50.7	51.9	6.14	6.14	NA
NO_3-N	0.967	1.02	0.581	0.61	1.78	1.77	1.47	1.48	0.432	0.43	10
NO_2-N	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1
NO_2-N +NO_3-N	0.9	0.93	0.53	0.56	1.73	1.73	1.26	1.22	0.39	0.43	10
NH_4-N	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.15	0.10 U	0.10 U	0.13	NA
Arsenic	0.0179	0.0039	0.0048	0.0036	0.0063	0.0029 U	0.0029	0.0029	0.0029	0.0028	0.05
Barium	0.0845	0.0836	0.0847	0.0776	0.246	0.251	0.235	0.243	0.0776	0.0747	2
Chromium	0.0056	0.0045	0.0066	0.006	0.0040	0.0009 U	0.0008 U	0.0008 U	0.0054	0.0046	0.1
Mercury	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.002
Selenium	0.0033 U	0.0026 U	0.0033 U	0.0026 U	0.0033 U	0.0033 U	0.0026 U	0.0026 U	0.0033 U	0.0026 U	0.05
Fluoride	0.3	0.20	0.3	0.20	0.2	0.2	0.10	0.10	0.2	0.2	4
Iron	1.990	0.027 U	0.229	0.0981	1.160	0.603	3.03	3.22	0.411	0.027 U	0.3
Lead	0.0034	0.0028 U	0.003 U	0.0028 U	0.003 U	0.003 U	0.0028 U	0.0028 U	0.003 U	0.0028 U	0.015
Manganese	0.0027	0.0004 U	0.0109	0.0034	0.0167	0.0126	0.0146	0.013	0.0053	0.0042	0.05
Sulfate	32.9	28.7	15.6	16.8	42	43.5	43.8	43.2	20.8	16.2	250
Zinc	0.405	0.0453	0.383	0.157	0.103	0.0798	0.201	0.195	0.366	0.280	5

Table 6-3. (continued).

	TANT-MON-A-001 (GW-015301)		TANT-MON-A-002 (GW-015304)		TAN-10A (GW-015303)				TAN-13A (GW-015302)		PCS/SCS[a]
Depth to Water Table (ft)	204.52	208.45	208.76	211.72	205.65	205.65	208.60	208.60	207.04	209.00	
Sample Date	4/3/2002	10/9/2002	4/3/2002	10/9/2002	4/1/2002	4/1/2002[b]	10/2/2002	10/2/2002[b]	4/2/2002	10/2/2002	
(units[c])	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Total coliform	Absent	1[f]	Absent	700[g]	Absent	Absent	Absent	Absent	Absent	Absent	1 col/100 mL
Fecal coliform	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	NA

a. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in IDAPA 58.01.11.200.01.a and b.

b. Duplicate sample.

c. The units for all parameters listed are as shown, except for total and fecal coliform, which are unitless.

d. U flag indicates that the result was reported as below the detection limit.

e. NA—Not applicable.

f. *Enterobacter agglomerans* was speciated in this sample.

g. *Enterbacter sakazakii* was speciated in this sample.

Fecal coliform was absent in all samples and wells during the 2002 permit year. However, total coliform was present in TANT-MON-A-001 (background well) and TANT-MON-A-002 (compliance well) in the October samples. The PCS for total coliform is 1 colony/100 mL. The total coliform in wells TANT-MON-A-001 and TANT-MON-A-002 were 1 colony/100 mL and 700 colonies/100 mL, respectively. The coliform species identified by the laboratory was *Enterobacter agglomerans* in well TANT-MON-A-001 and *Enterobacter sakazakii* in well TANT-MON-A-002. The TAN/TSF Disposal Pond effluent contains total coliform bacteria; however, it is unlikely the coliform detected in these two wells was the result of the Disposal Pond effluent. TANT-MON-A-001 is the background well and is not influenced by the Disposal Pond. TANT-MON-A-002 is northwest of the Disposal Pond (Figure 6-2), and groundwater flows at TAN are primarily to the south or southeast (DOE-ID 2002a, Roback et al. 2001, Johnson et al. 2000); therefore, it is unlikely that bacteria could be transported into the well without significant transverse dispersivity in the vadose zone. A possible source of the bacteria in TANT-MON-A-002 could be the formation of a biofilm due to long periods of inactivity.

Zinc concentrations in the TAN WLAP wells have sporadically increased over the past several years, with the first exceedance occurring in October 2000 in TAN-13A. However, starting with April 2002, the zinc concentrations in all WLAP wells (Table 6-3), except TAN-10A, have decreased compared to the 2001 permit year. For 2002, zinc concentrations decreased in well TANT-MON-A-001 from 0.405 mg/L in the April sample to 0.0453 mg/L in the October sample, well TANT-MON-A-002 from 0.383 mg/L to 0.157 mg/L, and well TAN-13A from 0.366 mg/L to 0.280 mg/L. Past increased zinc concentrations in these three wells is believed to be the result of the riser pipe corrosion. Zinc concentrations in well TAN-10A are down slightly when compared to the 2001 permit year concentrations. No zinc exceedances were reported for the 2002 permit year for any of the TAN WLAP wells.

Of the three compliance monitoring wells, the upgradient well (TAN-10A) exhibited the highest contaminant concentrations when compared to the background monitoring well. It is difficult, however, to establish a strong relationship between the water quality in TAN-10A and the Disposal Pond due to two factors. First, contaminants resulting from the injectate from a former injection well (located close to TAN-10A and previously used for disposal of numerous waste streams, including those now discharged to the Disposal Pond) are still present in the groundwater and continue to substantially impact groundwater quality. Second, groundwater remediation studies now underway near the former injection well significantly influence local hydraulic gradients and contaminant concentrations near TAN-10A. Groundwater monitoring will continue in TAN-10A (as well as the other three wells) as a part of normal WLAP activities.

No other parameters exceeded permit limits during the 2002 permit year. Monitoring results will continue to be reviewed to specifically monitor parameter concentration changes and the impact of the riser replacements completed during the 2001 permit year.

Four monitoring wells associated with TAN/TSF have been approved for a “no-longer-contained-in” (NLCI) determination from DEQ (Monson 1999). The DEQ requires that the volume of purge water placed into the TAN/TSF Disposal Pond as a result of the NLCI determination be reported in the annual WLAP report. These wells include two of the monitoring wells associated with the Wastewater Land Application Permit (TAN-10A and TAN-13A) and wells TAN-27 and TSFAG-05. During the 2002 permit year, no purge water was discharged to the TAN/TSF Disposal Pond as a result of sampling these wells.

The purge water associated with the April 2002 and October 2002 WLAP sampling of wells TAN-10A and TAN-13A was collected at the time of sampling and turned over to the INEEL Waste Generator Services (WGS). The containerized purge water is held in a Resource Conservation and

Recovery Act (RCRA) 90-Day Storage Area until characterization of the water is completed by WGS. Based on this characterization, a determination is made on the appropriate disposal path. Currently, if the results of the characterization show that the purge water is not an "F" listed waste in accordance with the NLCI determination, the water is either placed into the TAN-607 Pool or shipped to an off-Site disposal facility. If the water is determined to be an "F" listed waste, the water is shipped to an approved RCRA disposal facility.

During the 2002 permit year, two of these wells (TAN-10A and TAN-27) were sampled in support of the TAN groundwater remediation project, Operable Unit (OU) 1-07B. These sampling efforts are not a requirement of the TAN/TSF WLAP. The purge water generated during the OU 1-07B sampling of wells TAN-10A and TAN-27 was managed in accordance with the OU 1-07B Record of Decision (ROD) (DOE-ID 1995), the OU 1-07B ROD Amendment (DOE-ID 2001), and associated CERCLA documentation, which records agreements reached between the EPA, DEQ, and DOE-ID.

Well TSFAG-05 was not sampled during the 2002 permit year.

6.6 Summary of Environmental Impacts

The TAN/TSF effluent flow volumes and concentrations were within permit limits. The iron concentration in the April 2002 sample for TANT-MON-A-001 (background well) was above the SCS. Iron concentrations exceeded the permit limit in TAN-13A in April and in TAN-10A in the April and October 2002 samples. In addition, all samples collected from well TAN-10A in 2002 exceeded the permit limit for TDS. Elevated iron concentrations historically have been detected in the TAN WLAP monitoring wells. The riser pipes attached to the dedicated submersible pumps were replaced with stainless steel riser pipes in all four TAN WLAP monitoring wells during August 2001. Iron concentrations have decreased in TAN-13A, TANT-MON-A-001, and TANT-MON-A-002 since the riser pipes were replaced, and continued to decrease between the April and October 2002 sampling events. Of the four TAN WLAP wells, TAN-10A is cased with a carbon steel well casing that is corroded most of the way to the water table. The iron concentrations in TAN-10A increased after the riser pipes were replaced, and the October 2002 iron concentrations for TAN-10A were the highest reported for the four wells. The condition of the well casing, coupled with the residual effects of replacing the galvanized riser pipe, may have resulted in the increased iron concentrations in TAN-10A. The condition of the well casing (i.e., riser pipe corrosion) may also be contributing to the increase of the TDS in well TAN-10A.

Total coliform was present in the TANT-MON-A-001 (background well) and TANT-MON-A-002 (compliance well) in the October samples. However, it is unlikely that the coliform detected in these two wells was the result of the Disposal Pond effluent. Overall, environmental impacts from TAN/TSF STP operations are considered negligible.

Four monitoring wells associated with the TAN/TSF facility have been approved for a "no-longer-contained-in" determination from DEQ. During the 2002 permit year, no purge water was discharged to the TAN/TSF Disposal Pond as a result of sampling these wells.

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Appendix A

Central Facilities Area Sewage Treatment Plant Daily Influent and Effluent Flow Readings, Sewage Treatment Plant Photographs, and Electronic Data Files

Appendix A

Central Facilities Area Sewage Treatment Plant Daily Influent and Effluent Flow Readings, Sewage Treatment Plant Photographs, and Electronic Data Files

Table A-1. Central Facilities Area Sewage Treatment Plant daily influent and effluent flows.

Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])	Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])
12/1/2001	43,214	NF[b]	12/25/2001	54,191	NF
12/2/2001	49,713	NF	12/26/2001	55,957	NF
12/3/2001	51,259	NF	12/27/2001	57,956	NF
12/4/2001	100,914	NF	12/28/2001	50,790	NF
12/5/2001	98,336	NF	12/29/2001	50,371	NF
12/6/2001	69,417	NF	12/30/2001	52,873	NF
12/7/2001	64,730	NF	12/31/2001	52,743	NF
12/8/2001	50,003	NF	1/1/2002	49,261	NF
12/9/2001	39,394	NF	1/2/2002	63,017	NF
12/10/2001	51,882	NF	1/3/2002	78,780	NF
12/11/2001	64,955	NF	1/4/2002	67,830	NF
12/12/2001	75,260	NF	1/5/2002	77,043	NF
12/13/2001	76,896	NF	1/6/2002	85,560	NF
12/14/2001	82,148	NF	1/7/2002	65,076	NF
12/15/2001	70,768	NF	1/8/2002	95,385	NF
12/16/2001	66,329	NF	1/9/2002	100,696	NF
12/17/2001	68,047	NF	1/10/2002	94,720	NF
12/18/2001	79,860	NF	1/11/2002	83,743	NF
12/19/2001	90,886	NF	1/12/2002	70,957	NF
12/20/2001	90,414	NF	1/13/2002	67,009	NF
12/21/2001	81,735	NF	1/14/2002	72,031	NF
12/22/2001	65,748	NF	1/15/2002	95,123	NF
12/23/2001	62,214	NF	1/16/2002	96,327	NF
12/24/2001	57,012	NF	1/17/2002	90,174	NF

Table A-1. (continued).

Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])	Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])
1/18/2002	72,921	NF	2/16/2002	54,525	NF
1/19/2002	66,973	NF	2/17/2002	63,190	NF
1/20/2002	54,423	NF	2/18/2002	59,390	NF
1/21/2002	75,041	NF	2/19/2002	88,881	NF
1/22/2002	86,221	NF	2/20/2002	93,103	NF
1/23/2002	101,030	NF	2/21/2002	107,471	NF
1/24/2002	78,691	NF	2/22/2002	94,596	NF
1/25/2002	67,979	NF	2/23/2002	61,502	NF
1/26/2002	66,553	NF	2/24/2002	69,742	NF
1/27/2002	57,336	NF	2/25/2002	79,458	NF
1/28/2002	69,204	NF	2/26/2002	78,975	NF
1/29/2002	102,089	NF	2/27/2002	84,651	NF
1/30/2002	64,838	NF	2/28/2002	85,869	NF
1/31/2002	85,699	NF	3/1/2002	74,442	NF
2/1/2002	73,267	NF	3/2/2002	65,732	NF
2/2/2002	49,337	NF	3/3/2002	58,842	NF
2/3/2002	60,583	NF	3/4/2002	65,909	NF
2/4/2002	65,382	NF	3/5/2002	94,650	NF
2/5/2002	82,895	NF	3/6/2002	92,011	NF
2/6/2002	77,541	NF	3/7/2002	109,982	NF
2/7/2002	85,620	NF	3/8/2002	119,839	NF
2/8/2002	82,988	NF	3/9/2002	67,259	NF
2/9/2002	59,373	NF	3/10/2002	59,463	NF
2/10/2002	56,658	NF	3/11/2002	84,296	NF
2/11/2002	75,662	NF	3/12/2002	100,787	NF
2/12/2002	85,212	NF	3/13/2002	124,691	NF
2/13/2002	81,981	NF	3/14/2002	87,393	NF
2/14/2002	86,652	NF	3/15/2002	74,586	NF
2/15/2002	77,620	NF	3/16/2002	70,292	NF

Table A-1. (continued).

Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])	Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])
3/17/2002	69,406	NF	4/15/2002	86,386	NF
3/18/2002	58,801	NF	4/16/2002	104,440	NF
3/19/2002	84,374	NF	4/17/2002	110,450	NF
3/20/2002	88,584	NF	4/18/2002	102,927	NF
3/21/2002	94,962	NF	4/19/2002	103,253	NF
3/22/2002	89,779	NF	4/20/2002	73,280	NF
3/23/2002	66,056	NF	4/21/2002	76,515	NF
3/24/2002	61,868	NF	4/22/2002	80,615	NF
3/25/2002	64,656	NF	4/23/2002	136,918	NF
3/26/2002	96,193	NF	4/24/2002	77,234	NF
3/27/2002	108,130	NF	4/25/2002	109,415	NF
3/28/2002	93,344	NF	4/26/2002	108,669	NF
3/29/2002	99,934	NF	4/27/2002	92,006	NF
3/30/2002	72,175	NF	4/28/2002	83,107	NF
3/31/2002	66,767	NF	4/29/2002	99,004	NF
4/1/2002	83,096	NF	4/30/2002	115,257	NF
4/2/2002	103,348	NF	5/1/2002	117,447	NF
4/3/2002	100,357	NF	5/2/2002	122,016	NF
4/4/2002	108,446	NF	5/3/2002	101,925	NF
4/5/2002	104,237	NF	5/4/2002	95,331	NF
4/6/2002	76,556	NF	5/5/2002	86,624	NF
4/7/2002	81,512	NF	5/6/2002	79,285	NF
4/8/2002	71,934	NF	5/7/2002	113,687	NF
4/9/2002	106,131	NF	5/8/2002	91,582	NF
4/10/2002	115,319	NF	5/9/2002	104,551	NF
4/11/2002	111,960	NF	5/10/2002	98,682	NF
4/12/2002	94,577	NF	5/11/2002	93,816	NF
4/13/2002	75,065	NF	5/12/2002	88,769	NF
4/14/2002	81,352	NF	5/13/2002	98,611	NF

Table A-1. (continued).

Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])	Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])
5/14/2002	123,930	NF	6/12/2002	133,319	NF
5/15/2002	133,120	NF	6/13/2002	130,717	NF
5/16/2002	131,078	NF	6/14/2002	148,642	NF
5/17/2002	121,711	NF	6/15/2002	135,837	NF
5/18/2002	82,216	NF	6/16/2002	140,681	NF
5/19/2002	101,837	NF	6/17/2002	140,274	NF
5/20/2002	118,557	NF	6/18/2002	153,485	196,800
5/21/2002	120,345	NF	6/19/2002	145,031	200,900
5/22/2002	100,591	NF	6/20/2002	172,871	198,500
5/23/2002	122,417	NF	6/21/2002	145,907	NF
5/24/2002	99,986	NF	6/22/2002	150,152	NF
5/25/2002	89,465	NF	6/23/2002	132,459	NF
5/26/2002	101,208	NF	6/24/2002	155,042	199,600
5/27/2002	103,063	NF	6/25/2002	168,016	197,600
5/28/2002	118,876	NF	6/26/2002	170,244	177,600
5/29/2002	122,294	NF	6/27/2002	186,348	156,025
5/30/2002	143,863	NF	6/28/2002	169,445	156,025
5/31/2002	146,057	NF	6/29/2002	148,367	156,025
6/1/2002	89,639	NF	6/30/2002	147,685	156,025
6/2/2002	99,865	NF	7/1/2002	160,198	194,900
6/3/2002	104,619	NF	7/2/2002	171,765	196,900
6/4/2002	134,188	NF	7/3/2002	160,759	194,500
6/5/2002	132,866	NF	7/4/2002	152,776	194,500
6/6/2002	169,777	NF	7/5/2002	152,776	194,500
6/7/2002	135,114	NF	7/6/2002	152,776	194,500
6/8/2002	134,245	NF	7/7/2002	152,776	194,500
6/9/2002	106,437	NF	7/8/2002	152,776	197,300
6/10/2002	114,556	NF	7/9/2002	168,676	197,100
6/11/2002	133,949	NF	7/10/2002	194,956	168,300

Table A-1. (continued).

Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])	Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])
7/11/2002	140,766	NF	8/9/2002	141,840	192,825
7/12/2002	148,249	NF	8/10/2002	127,231	192,825
7/13/2002	135,557	NF	8/11/2002	136,805	192,825
7/14/2002	124,261	NF	8/12/2002	133,683	190,800
7/15/2002	129,943	NF	8/13/2002	165,219	193,600
7/16/2002	160,910	161,800	8/14/2002	164,654	196,800
7/17/2002	171,610	150,600	8/15/2002	166,876	158,575
7/18/2002	60,459	150,600	8/16/2002	155,572	158,575
7/19/2002	60,459	150,600	8/17/2002	139,655	158,575
7/20/2002	60,459	150,600	8/18/2002	136,538	158,575
7/21/2002	60,459	150,600	8/19/2002	147,731	158,400
7/22/2002	60,459	149,600	8/20/2002	200,389	158,200
7/23/2002	109,582	185,700	8/21/2002	109,194	159,300
7/24/2002	172,414	186,400	8/22/2002	163,926	156,900
7/25/2002	160,988	158,800	8/23/2002	162,724	156,900
7/26/2002	110,814	158,800	8/24/2002	111,005	156,900
7/27/2002	146,163	158,800	8/25/2002	133,285	156,900
7/28/2002	115,632	158,800	8/26/2002	131,171	155,900
7/29/2002	152,257	194,000	8/27/2002	154,562	152,800
7/30/2002	135,664	193,900	8/28/2002	152,746	160,400
7/31/2002	162,442	195,100	8/29/2002	152,800	160,200
8/1/2002	166,310	197,650	8/30/2002	139,165	NF
8/2/2002	153,230	197,650	8/31/2002	128,615	NF
8/3/2002	144,543	197,650	9/1/2002	125,533	NF
8/4/2002	143,123	197,650	9/2/2002	122,210	NF
8/5/2002	149,584	197,600	9/3/2002	129,816	159,200
8/6/2002	162,045	185,900	9/4/2002	157,559	159,500
8/7/2002	153,414	188,300	9/5/2002	150,270	NF
8/8/2002	161,753	192,825	9/6/2002	168,035	NF

Table A-1. (continued).

Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])	Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])
9/7/2002	122,707	NF	10/6/2002	98,534	NF
9/8/2002	115,208	NF	10/7/2002	108,194	NF
9/9/2002	127,517	155,100	10/8/2002	124,655	NF
9/10/2002	137,837	158,700	10/9/2002	114,703	NF
9/11/2002	141,221	159,900	10/10/2002	127,319	NF
9/12/2002	153,539	159,175	10/11/2002	117,223	NF
9/13/2002	123,031	159,175	10/12/2002	75,410	NF
9/14/2002	108,029	159,175	10/13/2002	27,518	NF
9/15/2002	104,670	159,175	10/14/2002	57,445	NF
9/16/2002	110,376	NF	10/15/2002	123,241	NF
9/17/2002	128,455	159,300	10/16/2002	102,918	NF
9/18/2002	115,906	160,800	10/17/2002	100,354	NF
9/19/2002	114,913	160,400	10/18/2002	88,990	NF
9/20/2002	118,850	160,400	10/19/2002	76,908	NF
9/21/2002	93,739	160,400	10/20/2002	78,545	NF
9/22/2002	94,712	160,400	10/21/2002	85,981	NF
9/23/2002	84,181	160,100	10/22/2002	112,341	NF
9/24/2002	119,138	160,100	10/23/2002	119,184	NF
9/25/2002	113,091	156,700	10/24/2002	124,273	NF
9/26/2002	118,259	160,000	10/25/2002	110,590	NF
9/27/2002	118,050	NF	10/26/2002	105,065	NF
9/28/2002	101,064	NF	10/27/2002	115,287	NF
9/29/2002	96,387	NF	10/28/2002	92,289	NF
9/30/2002	127,213	NF	10/29/2002	105,558	NF
10/1/2002	87,952	NF	10/30/2002	99,905	NF
10/2/2002	108,834	NF	10/31/2002	95,838	NF
10/3/2002	123,479	NF	11/1/2002	90,260	NF
10/4/2002	113,430	NF	11/2/2002	76,112	NF
10/5/2002	96,373	NF	11/3/2002	80,250	NF

Table A-1. (continued).

Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])	Date	Influent to Lagoon (WW-014101) (gpd[a])	Effluent to Pivot (WW-014102) (gpd[a])
11/4/2002	72,947	NF	11/17/2002	72,139	NF
11/5/2002	89,910	NF	11/18/2002	69,900	NF
11/6/2002	101,071	NF	11/19/2002	101,458	NF
11/7/2002	108,250	NF	11/20/2002	100,834	NF
11/8/2002	92,564	NF	11/21/2002	108,988	NF
11/9/2002	77,065	NF	11/22/2002	97,131	NF
11/10/2002	84,385	NF	11/23/2002	93,601	NF
11/11/2002	68,738	NF	11/24/2002	76,102	NF
11/12/2002	94,618	NF	11/25/2002	70,164	NF
11/13/2002	96,495	NF	11/26/2002	89,811	NF
11/14/2002	98,918	NF	11/27/2002	83,973	NF
11/15/2002	105,343	NF	11/28/2002	83,332	NF
11/16/2002	75,633	NF	11/29/2002	65,678	NF
			11/30/2002	70,859	NF

a. gpd—Gallons per day.

b. NF—No flow.

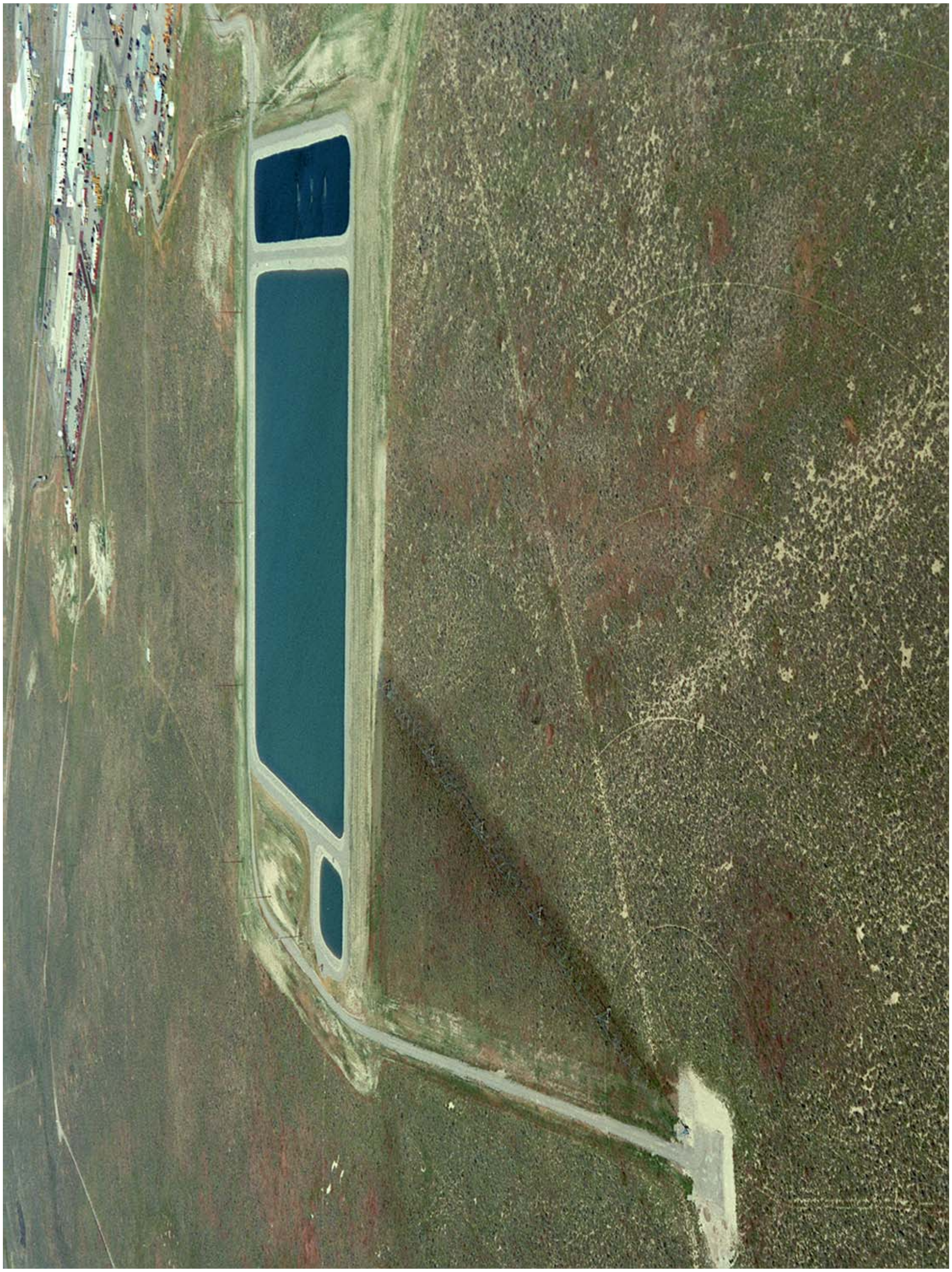

Figure A-1. Central Facilities Area Sewage Treatment Plant, 1995 (95-627-7-4).

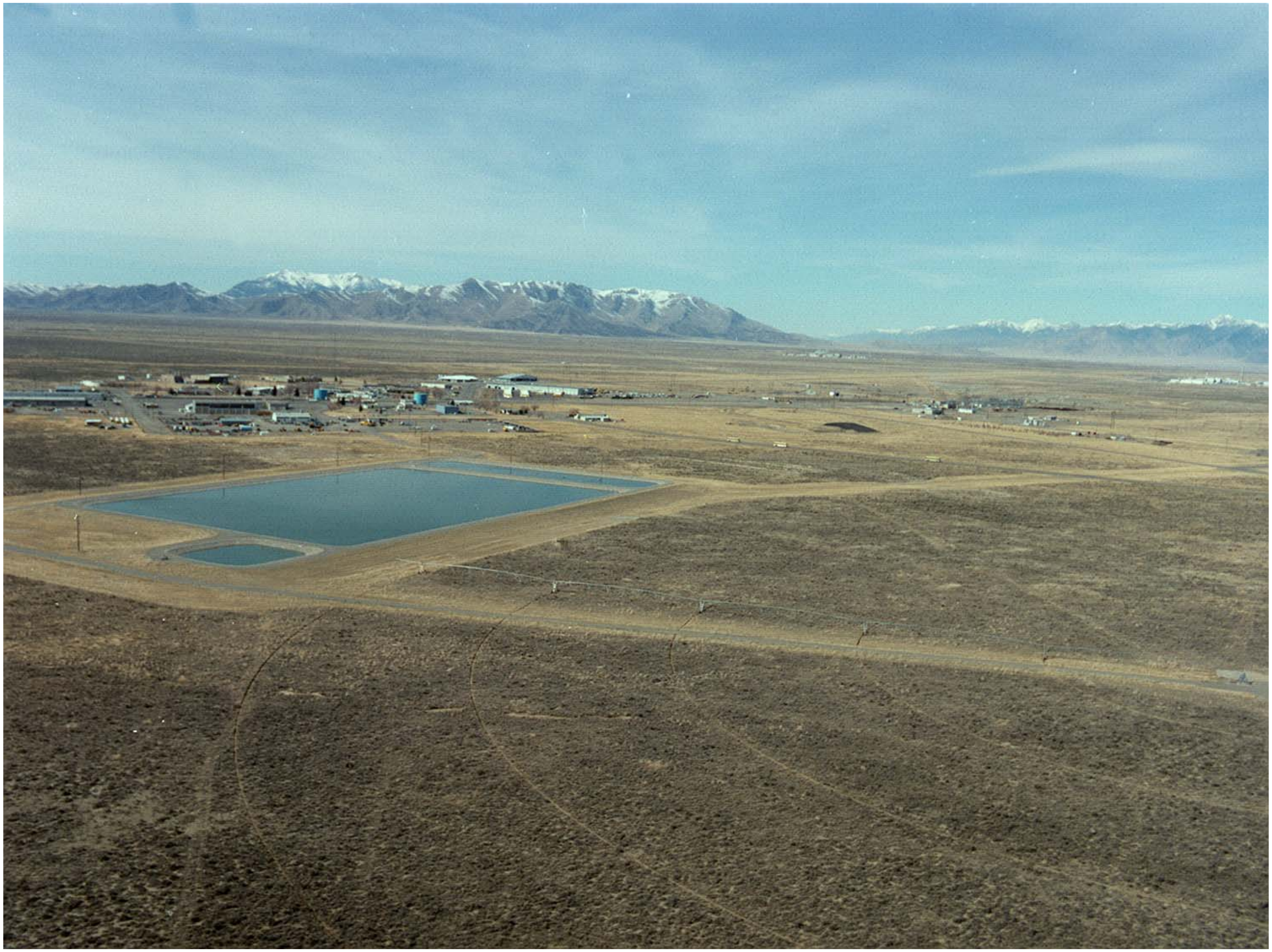

Figure A-2. Central Facilities Area Sewage Treatment Plant, 1996 (96-174-9-8).

Figure A-3. Central Facilities Area Sewage Treatment Plant, 1997 (97-620-5-14).

Figure A-4. Central Facilities Area Sewage Treatment Plant, 1998 (98-454-11-6).

Figure A-5. Central Facilities Area Sewage Treatment Plant, 1999 (99-344-10-9).

Figure A-6. Central Facilities Area Sewage Treatment Plant, 2000 (00-296-2-2).

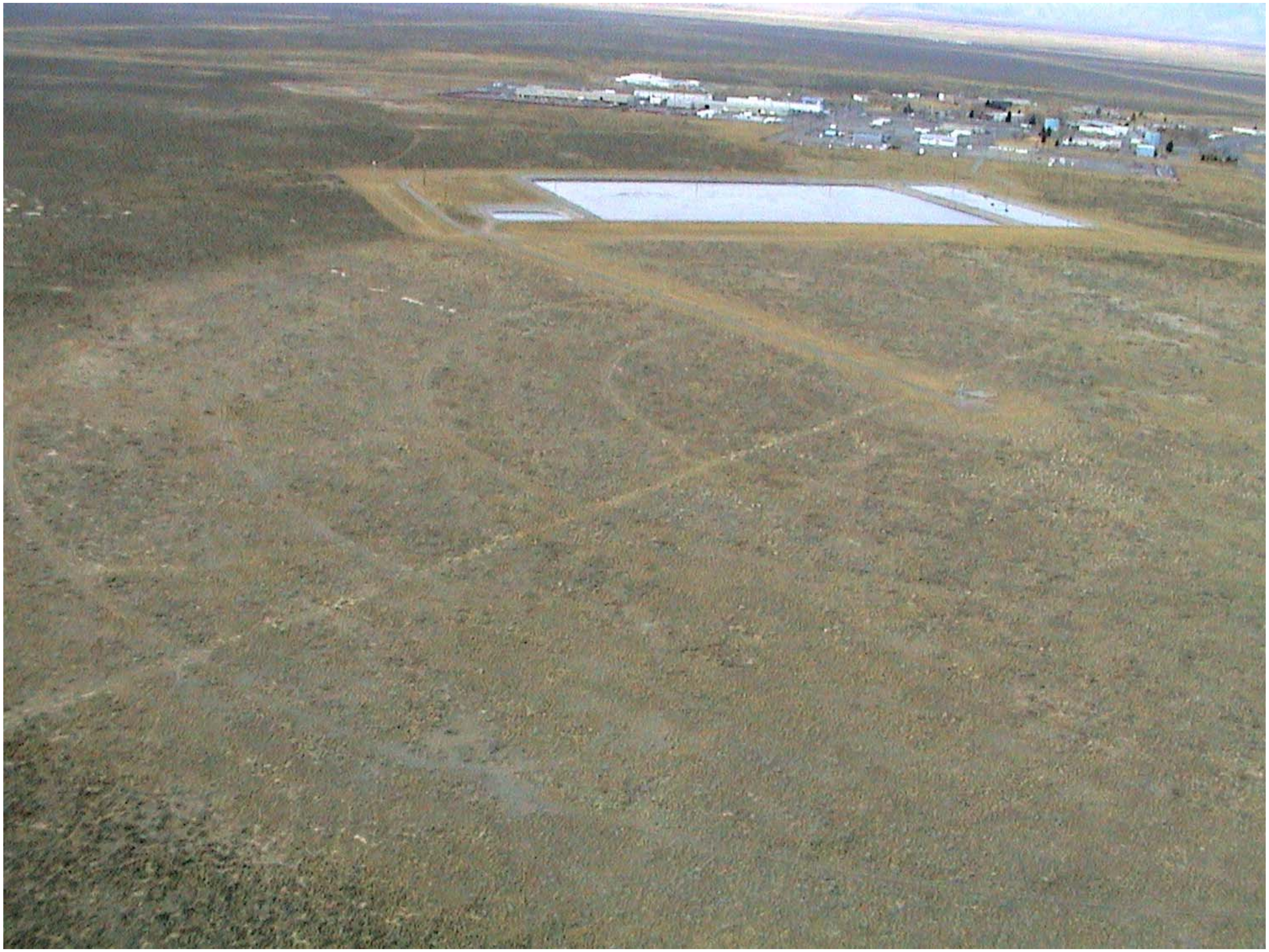

Figure A-7. Central Facilities Area Sewage Treatment Plant, 2002 (PD020741-02).

The following tables (Tables A-2 through A-6) represent hardcopies of the electronic WLAP data files required by the DEQ (DEQ 2002). In Section 5, "Electronic Data Entry," of DEQ 2002, it says to "assemble data tables (electronic tables) with other parts of the annual report." The following tables were first compiled as worksheets within the WLAP Data Entry for LA-141-1.xls file using Microsoft Excel 97. The individual worksheets were saved as text files and incorporated as tables in this appendix. Other than formatting to fit the page, and tabulating the data columns, no other formatting was performed. Columns for those parameters not required by the permit are not included in the tables, nor are rejected results shown in these data tables.

Table A-2. Hydraulic Worksheet from WLAP Data Entry for LA-141-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000141-01
Software and Version no.:-----> MS Excel 97 SR-2

HYDRAULIC APPLICATION RATE

				Suppl		
	Month	Manage-	WW	Irrig W		
Permit	(use 15th	ment	Applied	Applied		
No.	as date)	Unit	(MG)	(MG)		
permitno	month	mangunit	wwapp	irrwapp		
LA-000141	6/15/02	MU-014101	1.80			
LA-000141	7/15/02	MU-014101	4.58			
LA-000141	8/15/02	MU-014101	5.08			
LA-000141	9/15/02	MU-014101	3.03			

Note:
1. Dates here denote each month of the year.
2. These dates by convention shall be the 15th of the month.
3. Each twelve month cycle is repeated for each management unit.
4. If the management unit was not used for land application, enter all zeros.
5. For monthly date, use date function.
6. Do not change any protected cell.
3. Make sure units for data entered are consistent with units specified in column headings.

Table A-3. MU Summary Worksheet from WLAP Data Entry for LA-141-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000141-01
Software and Version no.:-----> MS Excel 97 SR-2

Management Unit Summary Format

Permit No.	Reporting Year	Management Unit	(1) WW Applied MGA	(2) WW Applied Non-Growing Season in/ac/yr	(3) WW Applied Growing Season in/ac/yr	(4) Suppl Irrig W Applied in/ac/yr	(5) N from WW Applied lb/ac/yr	(6) Fert N Applied lb/ac/yr	(7) Crop Type	(8) Crop Yield lb/ac/yr	(9) Crop N Removed lb/ac/yr	(10) COD Applied Non-Growing Season lb/ac/d	(11) COD Applied Growing Season lb/ac/d	(12) COD Applied Yearly Ave lb/ac/d	(13) P Applied lb/ac/yr
permitno	repyear	mangunit	wwapp	wwngs	wwgs	irrapp	napplied	fertnapp	croptype	cropyield	cnrem	codngs	codgs	codapp	phosapp
LA-000141	2002	MU-014101	14.49				2.56							0.13	0.38

(1) Total of twelve months WW loadings (million gallons per annum MGA).
(2) Non-growing season WW application.
(3) Growing season WW application.
(4) Growing season Irrigation water application.
(5) Multiply total WW loading (in MG) by flow-weighted total constituent concentration (ppm); then multiply by 8.327; divide by acreage of management unit
(6) Multiply pounds of fertilizer applied by the nitrogen fertilizer guarentee number; then divide by 100 and divide again by acreage of management unit
(7) Crop type (e.g. wheat, corn). Use standard names provided in documentation
(8) Weight per acre of harvested portion of crop.
(9) multiply crop yield (converted to pounds/acre) by total nitrogen percent (from tissue test);
(10) Multiply NGS WW loading (MG) by flow-weighted constituent concentration (ppm); then multiply by 8.327; divide by acreage of management unit and number of NGS days
(11) Multiply GS WW loading (MG) by flow-weighted constituent concentration (ppm); then multiply by 8.327; divide by acreage of management unit and number of GS days
(12) Multiply total WW loading (MG) by flow-weighted constituent concentration (ppm); then multiply by 8.327; divide by acreage of management unit and 365 days
(13) See No (5)

All columns are formatted for the appropriate decimal places - do not modify.
Do not change any protected cell.
All units should be as noted below each column heading.

Table A-4. Soils Worksheet from WLAP Data Entry for LA-141-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000141-01
Software and Version no.:-----> MS Excel 97 SR-2

Soil Analyses

		depth	depth	Soil	organic				EC		Plant Avail
Permit	Sample	top	bottom	Mon.	matter	Nitrate	Ammonia		(umhos/	pH	Phos
No.	Date	(inches)	(inches)	Unit	(%)	(ppm)	(ppm)	SAR	cm)	(S.U.)	(ppm)
permitno	smpldate	depthtop	depthbot	soilunit	ssom	ssnitrate	ssammonia	sssar	ssec	ssph	ssp_avail
LA-000141	11/14/2002	0	12	SU-014101-5	0.442	0.676	-0.81	3.23	1007	7.6	3.69
LA-000141	11/14/2002	12	24	SU-014101-5	0.841	4.17	-0.84	1.82	802	7.61	1.39

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign. Contact your laboratory for the MDL if not known.
2. If a parameter was not analyzed, leave blank.
3. Make sure units for data entered are consistent with units specified in column headings.
4. For Date field, utilize date cell.
5. All columns are formatted for appropriate decimal places - do not modify.
6. Do not change any protected cell. You may add parameters on right hand side of spreadsheet if needed. You may hide columns that are not typically used.

Table A-5. Wastewater Worksheet from WLAP Data Entry for LA-141-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000141-01
Software and Version no.:-----> MS Excel 97 SR-2

Wastewater Quality Data

		Sampling		total			total			fecal	nitrate+
Permit	Sample	Location	COD	coli	TKN	pH	phos	TSS	BOD	coli	nitrite
No.	Date	(Station)	(ppm)	(count)	(ppm)	(S.U.)	(ppm)	(ppm)	(ppm)	(count)	(ppm)
permitno	smpldate	station	wwcod	wwtotalc	wwtkn	wwph	wwphostot	wwtss	wwbod	wwfecalc	wwnnn
LA-000141	12/20/01	WW-014101	142.00		21.30	7.74		58.20	78.70		1.87
LA-000141	01/15/02	WW-014101	159.00		17.50	8.51		60.50	59.00		0.26
LA-000141	02/14/02	WW-014101	109.00		21.20	6.87		36.60	46.50		0.54
LA-000141	03/27/02	WW-014101	75.60		14.30	8.16		-4.00	38.00		0.52
LA-000141	04/17/02	WW-014101	99.50		16.50	8.92		54.90	54.40		0.57
LA-000141	05/21/02	WW-014101	153.00		11.30	8.87		33.20	19.30		1.02
LA-000141	06/26/02	WW-014101	74.10		7.60	7.74		31.10	13.00		1.00
LA-000141	07/30/02	WW-014101	370.00		10.50	8.31		52.80	44.20		1.13
LA-000141	08/27/02	WW-014101	114.00		16.90	7.95		30.90	33.90		1.01
LA-000141	09/17/02	WW-014101	933.00		19.60	8.17		223.00	88.70		0.51
LA-000141	09/17/02	WW-014101	173.00		19.60			132.00	42.20		0.51
LA-000141	10/01/02	WW-014101	175.00		12.50	7.87		49.90	59.20		0.16
LA-000141	11/05/02	WW-014101	59.50		12.70	8.88		12.40	28.10		0.66
LA-000141	05/23/02	WW-014102		1.00						4.00	
LA-000141	06/26/02	WW-014102	25.80		1.37	9.94	0.19	-4.00	-2.00		0.03
LA-000141	06/27/02	WW-014102		16.00						4.00	
LA-000141	07/30/02	WW-014102	26.40		1.15	9.86	0.25	4.30	-2.00		-0.01
LA-000141	07/31/02	WW-014102		1.00						1.00	
LA-000141	08/27/02	WW-014102	32.10		1.53	9.75	0.21	-4.00	2.12		-0.01
LA-000141	08/29/02	WW-014102		1.00						4.00	
LA-000141	09/17/02	WW-014102	32.80		2.39	9.83	0.26	27.50	-2.00		0.08
LA-000141	09/17/02	WW-014102	30.40		2.15		0.26	33.70	-2.00		0.06
LA-000141	09/19/02	WW-014102		6.00						1.00	
LA-000141	10/01/02	WW-014102	31.60		2.17	9.82	0.26	4.40	-2.00		0.06
LA-000141	10/03/02	WW-014102		1.00						1.00	

Table A-5. (continued)
Wastewater Quality Data

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign.. Contact your laboratory for the MDL if it is not known.
2. If a parameter was not analyzed, leave blank.
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Note also that alkalinity should be expressed as CaCO3.
6. For Date field, utilize a date cell.
7. All columns are formatted for appropriate decimal places - do not modify.
8. Do not change any protected cell. You may add parameter on right hand side of spreadsheet if needed.
9. You may hide columns that are not typically used.

Table A-6. Site Summary Worksheet from WLAP Data Entry for LA-141-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000141-01
Software and Version no.:-----> MS Excel 97 SR-2

Permitted Site Summary

			(2)
		(1)	WW
	Report-	WW	Application
Permit	ing	Applied	Season
No.	Year	MGA	(days)
permitno	repyear	wwgen	wwgenday
LA-000141	2002	14.49	84

(1) Total WW applied in million gallons per annum (MGA).
(2) Length of wastewater application season.

1. There should only be one entry for each permit number on this spreadsheet.
2. Make sure units for data entered are consistent with units specified in column headings.
3. All columns are formatted for the appropriate decimal places - do not modify.
4. Do not change any protected cell.

Appendix B

Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds Daily Effluent Flow Readings and Electronic Data Files

Appendix B

Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds Daily Effluent Flow Readings and Electronic Data Files

Table B-1. Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds daily effluent flows.

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
11/1/2001	1,432,200	11/25/2001	1,575,800
11/2/2001	1,338,700	11/26/2001	1,591,800
11/3/2001	1,326,000	11/27/2001	1,327,900
11/4/2001	1,349,600	11/28/2001	1,300,600
11/5/2001	1,310,100	11/29/2001	1,248,900
11/6/2001	1,355,800	11/30/2001	1,383,900
11/7/2001	1,317,700	12/1/2001	1,539,300
11/8/2001	1,332,800	12/2/2001	1,572,500
11/9/2001	1,465,600	12/3/2001	1,769,100
11/10/2001	1,738,500	12/4/2001	1,667,900
11/11/2001	1,816,600	12/5/2001	2,308,600
11/12/2001	1,650,900	12/6/2001	1,335,000
11/13/2001	1,424,400	12/7/2001	1,897,400
11/14/2001	1,401,100	12/8/2001	1,741,600
11/15/2001	1,186,900	12/9/2001	1,832,700
11/16/2001	1,313,400	12/10/2001	1,672,900
11/17/2001	1,316,200	12/11/2001	1,589,800
11/18/2001	1,241,100	12/12/2001	1,586,000
11/19/2001	1,216,100	12/13/2001	1,452,200
11/20/2001	1,252,300	12/14/2001	1,573,900
11/21/2001	1,381,000	12/15/2001	1,818,100
11/22/2001	1,489,900	12/16/2001	1,718,100
11/23/2001	1,674,000	12/17/2001	1,795,100
11/24/2001	1,545,000	12/18/2001	1,354,200

Table B-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
12/19/2001	1,175,200	1/19/2002	1,500,600
12/20/2001	1,202,600	1/20/2002	1,480,100
12/21/2001	1,342,300	1/21/2002	1,387,200
12/22/2001	1,634,600	1/22/2002	1,617,800
12/23/2001	1,705,100	1/23/2002	1,677,600
12/24/2001	1,383,300	1/24/2002	1,682,100
12/25/2001	1,377,000	1/25/2002	1,820,700
12/26/2001	1,325,900	1/26/2002	1,691,800
12/27/2001	1,532,300	1/27/2002	1,762,000
12/28/2001	1,431,600	1/28/2002	1,739,600
12/29/2001	1,449,100	1/29/2002	1,513,100
12/30/2001	1,585,600	1/30/2002	1,543,100
12/31/2001	1,447,600	1/31/2002	1,364,800
1/1/2002	1,334,400	2/1/2002	1,429,800
1/2/2002	1,390,000	2/2/2002	1,266,600
1/3/2002	1,520,800	2/3/2002	1,155,400
1/4/2002	1,685,300	2/4/2002	1,189,200
1/5/2002	1,803,800	2/5/2002	1,249,200
1/6/2002	1,525,300	2/6/2002	1,415,300
1/7/2002	1,578,300	2/7/2002	1,304,600
1/8/2002	1,556,100	2/8/2002	1,286,300
1/9/2002	1,759,800	2/9/2002	1,373,100
1/10/2002	1,638,600	2/10/2002	1,257,300
1/11/2002	1,724,300	2/11/2002	1,251,300
1/12/2002	1,863,000	2/12/2002	1,279,200
1/13/2002	1,488,300	2/13/2002	1,453,900
1/14/2002	1,467,800	2/14/2002	1,479,000
1/15/2002	1,774,600	2/15/2002	1,353,800
1/16/2002	1,633,100	2/16/2002	1,365,700
1/17/2002	1,454,400	2/17/2002	1,583,700
1/18/2002	1,483,200	2/18/2002	1,608,800

Table B-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
2/19/2002	1,420,300	3/22/2002	1,327,300
2/20/2002	1,371,600	3/23/2002	1,226,300
2/21/2002	1,377,000	3/24/2002	1,278,100
2/22/2002	1,397,600	3/25/2002	1,229,800
2/23/2002	1,315,400	3/26/2002	1,286,900
2/24/2002	1,376,100	3/27/2002	1,228,000
2/25/2002	1,362,200	3/28/2002	1,259,200
2/26/2002	1,374,000	3/29/2002	1,241,800
2/27/2002	1,391,200	3/30/2002	1,246,000
2/28/2002	1,361,300	3/31/2002	1,207,300
3/1/2002	1,343,500	4/1/2002	1,227,700
3/2/2002	1,373,000	4/2/2002	1,231,500
3/3/2002	1,395,300	4/3/2002	1,414,400
3/4/2002	1,330,900	4/4/2002	1,279,100
3/5/2002	1,384,600	4/5/2002	1,308,100
3/6/2002	1,332,500	4/6/2002	1,305,000
3/7/2002	1,286,700	4/7/2002	1,183,200
3/8/2002	1,298,900	4/8/2002	1,143,000
3/9/2002	1,413,000	4/9/2002	1,144,300
3/10/2002	1,467,000	4/10/2002	1,167,300
3/11/2002	1,352,000	4/11/2002	1,116,200
3/12/2002	1,387,900	4/12/2002	1,072,800
3/13/2002	1,401,700	4/13/2002	1,020,600
3/14/2002	1,297,300	4/14/2002	1,203,300
3/15/2002	1,422,100	4/15/2002	1,272,600
3/16/2002	1,483,500	4/16/2002	1,317,800
3/17/2002	1,423,200	4/17/2002	1,205,800
3/18/2002	1,451,800	4/18/2002	1,184,700
3/19/2002	1,350,200	4/19/2002	1,148,400
3/20/2002	1,372,300	4/20/2002	1,038,200
3/21/2002	1,356,600	4/21/2002	1,088,400

Table B-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
4/22/2002	1,057,900	5/23/2002	1,037,700
4/23/2002	996,600	5/24/2002	978,100
4/24/2002	1,066,000	5/25/2002	990,700
4/25/2002	1,029,900	5/26/2002	1,066,000
4/26/2002	1,055,900	5/27/2002	1,074,700
4/27/2002	976,700	5/28/2002	1,075,600
4/28/2002	1,059,100	5/29/2002	1,052,400
4/29/2002	1,032,500	5/30/2002	1,142,800
4/30/2002	1,044,700	5/31/2002	1,305,300
5/1/2002	1,084,600	6/1/2002	1,230,100
5/2/2002	1,003,400	6/2/2002	1,166,300
5/3/2002	980,900	6/3/2002	1,139,800
5/4/2002	943,000	6/4/2002	1,360,800
5/5/2002	949,700	6/5/2002	1,556,300
5/6/2002	919,400	6/6/2002	1,205,800
5/7/2002	988,700	6/7/2002	1,043,600
5/8/2002	949,000	6/8/2002	1,050,600
5/9/2002	973,400	6/9/2002	1,012,400
5/10/2002	1,013,800	6/10/2002	1,025,500
5/11/2002	973,000	6/11/2002	1,530,500
5/12/2002	976,300	6/12/2002	1,401,900
5/13/2002	931,900	6/13/2002	1,301,700
5/14/2002	993,500	6/14/2002	1,505,300
5/15/2002	982,600	6/15/2002	1,572,500
5/16/2002	938,400	6/16/2002	1,559,000
5/17/2002	992,100	6/17/2002	1,486,200
5/18/2002	982,200	6/18/2002	878,250[b]
5/19/2002	976,800	6/19/2002	700,544[b]
5/20/2002	973,000	6/20/2002	735,528[b]
5/21/2002	1,030,400	6/21/2002	932,142[b]
5/22/2002	1,000,100	6/22/2002	1,352,000

Table B-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
6/23/2002	1,194,000	7/24/2002	1,417,500
6/24/2002	825,700[b]	7/25/2002	1,448,700
6/25/2002	742,100[b]	7/26/2002	1,442,900
6/26/2002	893,300	7/27/2002	1,470,000
6/27/2002	729,400[b]	7/28/2002	1,407,200
6/28/2002	1,416,400	7/29/2002	1,431,600
6/29/2002	1,277,300	7/30/2002	1,340,300
6/30/2002	1,717,800	7/31/2002	1,276,000
7/1/2002	851,100	8/1/2002	1,511,800
7/2/2002	809,395[b]	8/2/2002	1,800,300
7/3/2002	1,494,700	8/3/2002	1,838,200
7/4/2002	1,442,900	8/4/2002	1,850,000
7/5/2002	1,439,300	8/5/2002	1,842,100
7/6/2002	1,475,600	8/6/2002	1,752,600
7/7/2002	1,444,600	8/7/2002	1,525,100
7/8/2002	1,450,700	8/8/2002	1,298,100
7/9/2002	1,580,100	8/9/2002	1,345,100
7/10/2002	1,589,000	8/10/2002	1,350,800
7/11/2002	1,491,800	8/11/2002	1,321,300
7/12/2002	1,531,400	8/12/2002	1,289,600
7/13/2002	1,560,800	8/13/2002	1,314,900
7/14/2002	1,555,200	8/14/2002	1,299,200
7/15/2002	1,563,200	8/15/2002	1,286,400
7/16/2002	1,565,000	8/16/2002	1,332,300
7/17/2002	1,335,430[b]	8/17/2002	1,309,900
7/18/2002	1,477,900	8/18/2002	1,357,300
7/19/2002	1,442,500	8/19/2002	1,304,600
7/20/2002	1,453,600	8/20/2002	1,317,700
7/21/2002	1,454,000	8/21/2002	1,325,000
7/22/2002	1,444,300	8/22/2002	1,303,000
7/23/2002	1,422,600	8/23/2002	1,303,000

Table B-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
8/24/2002	1,307,100	8/26/2002	686,600[c]
8/25/2002	1,316,400		

a. gpd—Gallons per day.
b. Flow shown is the reported daily total minus the water sent to the New Percolation Ponds during system operability testing.
c. Discharge of wastewater was switched from the existing INTEC Percolation Ponds to the INTEC New Percolation Ponds at approximately 13:00 hours. Flow shown is the estimated portion of the total daily flow that went to the existing INTEC Percolation Ponds.

The following tables (Tables B-2 through B-5) represent hardcopies of the electronic WLAP data files required by the DEQ (DEQ 2002). In Section 5, "Electronic Data Entry," of DEQ 2002, it says to "assemble data tables (electronic tables) with other parts of the annual report." The following tables were first compiled as worksheets within the WLAP Data Entry for LA-130-2.xls file using Microsoft Excel 97. The individual worksheets were saved as text files and incorporated as tables in this appendix. Other than formatting to fit the page, and tabulating the data columns, no other formatting was performed. Columns for those parameters not required by the permit are not included in the tables, nor are rejected results shown in these data tables.

Table B-2. Hydraulic Worksheet from WLAP Data Entry for LA-130-2.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000130-02
Software and Version no.:-----> MS Excel 97 SR-2

HYDRAULIC APPLICATION RATE

				Suppl
	Month	Manage-	WW	Irrig W
Permit	(use 15th	ment	Applied	Applied
No.	as date)	Unit	(MG)	(MG)
permitno	month	mangunit	wwapp	irrwapp
LA-000130	11/15/2001	MU-013001	42.30	
LA-000130	12/15/2001	MU-013001	48.82	
LA-000130	1/15/2002	MU-013001	49.46	
LA-000130	2/15/2002	MU-013001	38.05	
LA-000130	3/15/2002	MU-013001	41.45	
LA-000130	4/15/2002	MU-013001	34.39	
LA-000130	5/15/2002	MU-013001	31.28	
LA-000130	6/15/2002	MU-013001	35.54	
LA-000130	7/15/2002	MU-013001	44.11	
LA-000130	8/15/2002	MU-013001	36.49	

Note:
1. Dates here denote each month of the year.
2. These dates by convention shall be the 15th of the month.
3. Each twelve month cycle is repeated for each management unit.
4. If the management unit was not used for land application, enter all zeros.
5. For monthly date, use date function.
6. Do not change any protected cell.
3. Make sure units for data entered are consistent with units specified in column headings.

Table B-3. Groundwater Worksheet from WLAP Data Entry for LA-130-2.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000130-02
Software and Version no.:-----> MS Excel 97 SR-2

Ground Water Quality Data

				Static									
				Water									
Permit	Sample	Sampling	Well	Level	chloride	nitrate	pH	Fe	Mn	Na	TDS	fluoride	TKN
No.	Date	Station	ID	(feet)	(ppm)	(ppm)	(S.U.)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wellid	wtrdepth	chloride	nitrate	ph	irontotal	mangtotal	sodium	tds	fluoride	tkn
LA-000130	04/09/02	03N 30E 19ccc01	GW-013004	461.32	28.20	2.770	7.85	0.0741	-0.0005		268.0	0.20	-1.00
LA-000130	04/09/02	03N 29E 25dca01	GW-013001	473.57	108.00	3.510	7.92	1.4000	0.0154		406.0	0.20	-1.00
LA-000130	04/16/02	03N 29E 25ddb01	GW-013002	470.14	175.00	2.500	7.81	0.0558	-0.0005		542.0	0.20	-1.00
LA-000130	04/17/02	03N 30E 18ccc01	GW-013003	457.64	12.00		8.02	-0.0387	-0.0005		206.0	0.20	-1.00
LA-000130	10/16/02	03N 30E 19ccc01	GW-013004	463.61	43.70	3.430	7.88	-0.0270	-0.0004	22.40	276.0	0.300	3.90
LA-000130	09/25/02	03N 29E 25dca01	GW-013001	480.56	106.00	3.140		1.7900	0.0225	51.70	463.0	0.200	-1.00
LA-000130	09/25/02	03N 29E 25ddb01	GW-013002	481.25	169.00	2.020	7.64	-0.0270	-0.0004	79.00	672.0	0.200	-1.00
LA-000130	10/16/02	03N 30E 18ccc01	GW-013003	456.51	12.00	0.790	8.06	-0.0270	-0.0004	8.59	222.0	0.300	-1.00

				Static								
				Water								
Permit	Sample	Sampling	Well	Level	Hg	nitrite	nitrite	As	Cd	Cr	Se	Ag
No.	Date	Station	ID	(feet)	(ppm)	(ppm)	nitrate	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wellid	wtrdepth	mercury	nitrite		arsenic	cadmium	chromium	selinium	silver
LA-000130	04/09/02	03N 30E 19ccc01	GW-013004	461.32	0.0001	-0.100	2.51	-0.0027	-0.0008	0.0065	-0.0033	-0.0012
LA-000130	04/09/02	03N 29E 25dca01	GW-013001	473.57	-0.0001	-0.100	3.15	-0.0027	-0.0008	0.0070	-0.0033	-0.0012
LA-000130	04/16/02	03N 29E 25ddb01	GW-013002	470.14	-0.0001	-0.100	2.07	-0.0027	-0.0008	0.0062	-0.0033	-0.0012
LA-000130	04/17/02	03N 30E 18ccc01	GW-013003	457.64	-0.0001	-0.100	0.77	-0.0027	-0.0008	0.0047	-0.0033	-0.0012
LA-000130	10/16/02	03N 30E 19ccc01	GW-013004	463.61	0.0001	-0.100	3.40	-0.0022	-0.0006	0.0076	-0.0026	-0.0018
LA-000130	09/25/02	03N 29E 25dca01	GW-013001	480.56	-0.0001	-0.100	3.08	-0.0022	-0.0006	0.0065	-0.0026	-0.0018
LA-000130	09/25/02	03N 29E 25ddb01	GW-013002	481.25	-0.0001	-0.100	2.18	-0.0022	-0.0006	0.0052	-0.0026	-0.0018
LA-000130	10/16/02	03N 30E 18ccc01	GW-013003	456.51	-0.0001	-0.100	0.77	0.0032	-0.0006	0.0050	-0.0026	-0.0018

Table B-3. (continued)

Ground Water Quality Data

				Static						
				Water						
Permit	Sample	Sampling	Well	Level	Cu	Al				
No.	Date	Station	ID	(feet)	(ppm)	(ppm)				
permitno	smpldate	station	wellid	wtrdepth	copper	aluminum	well name			
LA-000130	04/09/02	03N 30E 19ccc01	GW-013004	461.32	-0.0036	-0.0461	USGS-48			
LA-000130	04/09/02	03N 29E 25dca01	GW-013001	473.57	-0.0120	-0.0461	USGS-112			
LA-000130	04/16/02	03N 29E 25ddb01	GW-013002	470.14	-0.0036	-0.0461	USGS-113			
LA-000130	04/17/02	03N 30E 18ccc01	GW-013003	457.64	-0.0036	-0.0461	USGS-121			
LA-000130	10/16/02	03N 30E 19ccc01	GW-013004	463.61	0.0078	-0.0212	USGS-48			
LA-000130	09/25/02	03N 29E 25dca01	GW-013001	480.56	0.0162	0.0221	USGS-112			
LA-000130	09/25/02	03N 29E 25ddb01	GW-013002	481.25	-0.0032	-0.0212	USGS-113			
LA-000130	10/16/02	03N 30E 18ccc01	GW-013003	456.51	-0.0032	-0.0212	USGS-121			

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign. Contact your laboratory for the MDL if not known.a -1.0
2. If a parameter was not analyzed, leave blank
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Alkalinity should be expressed as CaCO3; static water level in feet.
6. For Date field, utilize date cell.
7. All columns are formated for appropriate decimal places- do not modify.
8. Sample methods are listed in the DEQ "Handbook for Land Application of Municipal and Industrial Wasteawter", April 1996, page IV-99-1 through 10.
9. Do not change any protected cell. You may add parameters on right hand side of spreadsheet if needed. You may hide columns that are not typically used.

Table B-4 Wastewater Worksheet from WLAP Data Entry for LA-130-2.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS   For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000130-02
Software and Version no.:-----> MS Excel 97 SR-2

Wastewater Quality Data

		Sampling										
Permit	Sample	Location	chloride	nitrate	TKN	pH	Na	TDS	fluoride	Fe	Mn	Arsenic
No.	Date	(Station)	(ppm)	(ppm)	(ppm)	(S.U.)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wwchloride	wwnitrate	wwtkn	wwph	wwsodium	wwtds	wwflride	wwiron	wwmn	wwarsenic
LA-000130	11/06/01	WW-013001	228.00	0.93	-0.15	8.30	129.00	595.00	0.20	0.03	0.0008	-0.0026
LA-000130	12/05/01	WW-013001	131.00	1.10	-0.14	8.10	84.20	407.00	0.23	-0.03	0.0012	-0.0046
LA-000130	01/29/02	WW-013001	96.40	0.90	-0.15		58.80	399.00	0.21	-0.02	-0.0008	-0.0033
LA-000130	02/19/02	WW-013001	360.00	0.81	-0.15	8.13	192.00	835.00	0.21	-0.02	0.0007	-0.0033
LA-000130	03/05/02	WW-013001	210.00	0.89	-0.15	8.12	144.00	579.00	0.21	-0.03	0.0008	-0.0033
LA-000130	04/02/02	WW-013001	223.00	0.92	-0.21	8.15	156.00	578.00	0.22	0.02	0.0010	-0.0033
LA-000130	05/28/02	WW-013001	110.00	0.93	-0.21	8.30	87.00	392.00	0.23	-0.02	-0.0005	-0.0047
LA-000130	06/11/02	WW-013001	98.70	0.87	-0.21	7.93	91.20	379.00	0.27	0.02	0.0006	-0.0047
LA-000130	07/09/02	WW-013001	273.00	0.87	-0.21	7.90	159.00	648.00	0.21	-0.02	0.0009	-0.0047
LA-000130	08/13/02	WW-013001	87.30	0.75	0.21	8.00	68.40	375.00	0.20	0.02	0.0012	-0.0047

		Sampling										
Permit	Sample	Location	Chromium	Mercury	Selenium	Nitrite	Aluminum	Silver	Copper	Cadmium	pH_grab	
No.	Date	(Station)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)		
permitno	smpldate	station	wwchromium	wwmercury	wwselenium	wwnitrite	wwalumin	wwsilver	wwcopper	wwcadmium	wwphgrb	
LA-000130	11/06/01	WW-013001	0.0055	-0.0001	-0.0031	-0.0030	0.0079	-0.0012	0.0050	-0.0003	8.40	
LA-000130	12/05/01	WW-013001	0.0064	-0.0001	-0.0046	-0.0140	-0.0183	-0.0019	0.0057	-0.0008	8.10	
LA-000130	01/29/02	WW-013001	0.0056	-0.0001	-0.0036	-0.0030	0.0096	-0.0020	0.0035	-0.0003	7.60	
LA-000130	02/19/02	WW-013001	0.0056	-0.0001	-0.0036	-0.0033	0.0084	-0.0020	0.0030	-0.0003	7.84	
LA-000130	03/05/02	WW-013001	0.0050	-0.0001	0.0036	-0.0045	-0.0063	-0.0020	0.0034	-0.0003	8.02	
LA-000130	04/02/02	WW-013001	0.0061	-0.0001	-0.0036	-0.0045	0.0073	-0.0020	0.0053	-0.0003	8.48	
LA-000130	05/28/02	WW-013001	0.0055	-0.0001	-0.0037	-0.0040	-0.0079	-0.0014	0.0013	-0.0006	8.20	
LA-000130	06/11/02	WW-013001	0.0058	-0.0001	-0.0037	-0.0040	-0.0079	-0.0014	0.0014	-0.0006	8.36	
LA-000130	07/09/02	WW-013001	0.0057	-0.0001	-0.0037	-0.0044	0.0084	-0.0014	0.0019	-0.0006	7.60	
LA-000130	08/13/02	WW-013001	-0.0063	-0.0001	-0.0040	-0.0046	-0.0110	-0.0018	0.0021	-0.0006	7.49	

Table B-4. (continued)
Wastewater Quality Data

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign.. Contact your laboratory for the MDL if it is not known.
2. If a parameter was not analyzed, leave blank.
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Note also that alkalinity should be expressed as CaCO3.
6. For Date field, utilize a date cell.
7. All columns are formatted for appropriate decimal places - do not modify.
8. Do not change any protected cell. You may add parameter on right hand side of spreadsheet if needed.
9. You may hide columns that are not typically used.

Table B-5 Site Summary Worksheet from WLAP Data Entry for LA-130-2.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000130-02
Software and Version no.:-----> MS Excel 97 SR-2

Permitted Site Summary

			(2)
		(1)	WW
	Report-	WW	Application
Permit	ing	Applied	Season
No.	Year	MGA	(days)
permitno	repyear	wwgen	wwgenday
LA-000130	2002	401.90	299

(1) Total WW applied in million gallons per annum (MGA).
(2) Length of wastewater application season.

1. There should only be one entry for each permit number on this spreadsheet.
2. Make sure units for data entered are consistent with units specified in column headings.
3. All columns are formatted for the appropriate decimal places - do not modify.
4. Do not change any protected cell.

Appendix C

Idaho Nuclear Technology and Engineering Center New Percolation Ponds Daily Effluent Flow Readings and Electronic Data Files

Appendix C

Idaho Nuclear Technology and Engineering Center New Percolation Ponds Daily Effluent Flow Readings and Electronic Data Files

Table C-1. Idaho Nuclear Technology and Engineering Center New Percolation Ponds daily effluent flows.

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
8/26/2002	581,200[b]	9/19/2002	1,401,000
8/27/2002	1,084,900	9/20/2002	1,453,300
8/28/2002	1,304,200	9/21/2002	1,531,900
8/29/2002	1,424,700	9/22/2002	1,372,200
8/30/2002	1,416,500	9/23/2002	1,114,700
8/31/2002	1,263,100	9/24/2002	1,282,000
9/1/2002	1,186,300	9/25/2002	1,293,300
9/2/2002	1,702,200	9/26/2002	1,567,000
9/3/2002	1,785,600	9/27/2002	1,651,400
9/4/2002	1,786,600	9/28/2002	1,630,700
9/5/2002	1,822,000	9/29/2002	1,634,300
9/6/2002	1,782,800	9/30/2002	1,657,600
9/7/2002	1,774,600	10/1/2002	1,653,100
9/8/2002	1,758,600	10/2/2002	2,303,100
9/9/2002	1,739,700	10/3/2002	1,491,800
9/10/2002	1,729,100	10/4/2002	1,892,300
9/11/2002	1,658,300	10/5/2002	1,745,000
9/12/2002	1,612,100	10/6/2002	1,841,200
9/13/2002	1,637,200	10/7/2002	1,781,600
9/14/2002	1,651,300	10/8/2002	1,641,200
9/15/2002	1,717,400	10/9/2002	1,319,000
9/16/2002	1,697,900	10/10/2002	1,270,600
9/17/2002	1,502,200	10/11/2002	1,283,900
9/18/2002	1,358,400	10/12/2002	1,258,000

Table C-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
10/13/2002	1,261,100	10/23/2002	1,256,600
10/14/2002	1,294,500	10/24/2002	1,231,500
10/15/2002	1,295,600	10/25/2002	1,275,900
10/16/2002	1,270,400	10/26/2002	1,373,600
10/17/2002	1,297,500	10/27/2002	1,422,200
10/18/2002	1,281,500	10/28/2002	1,360,200
10/19/2002	1,281,200	10/29/2002	1,393,800
10/20/2002	1,260,500	10/30/2002	1,450,800
10/21/2002	1,262,000	10/31/2002	1,457,100
10/22/2002	1,306,500		

a. gpd—Gallons per day.

b. Discharge of wastewater was switched from the existing INTEC Percolation Ponds to the INTEC New Percolation Ponds at approximately 13:00 hours. Flow shown is the estimated portion of the total daily flow that went to the INTEC New Percolation Ponds.

The following tables (Tables C-2 through C-5) represent hardcopies of the electronic WLAP data files required by the DEQ (DEQ 2002). In Section 5, "Electronic Data Entry," of DEQ 2002, it says to "assemble data tables (electronic tables) with other parts of the annual report." The following tables were first compiled as worksheets within the WLAP Data Entry for LA-130-3.xls file using Microsoft Excel 97. The individual worksheets were saved as text files and incorporated as tables in this appendix. Other than formatting to fit the page, and tabulating the data columns, no other formatting was performed. Columns for those parameters not required by the permit are not included in the tables, nor are rejected results shown in these data tables.

Table C-2. Hydraulic Worksheet from WLAP Data Entry for LA-130-3.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000130-03
Software and Version no.:-----> MS Excel 97 SR-2

HYDRAULIC APPLICATION RATE

				Suppl
	Month	Manage-	WW	Irrig W
Permit	(use 15th	ment	Applied	Applied
No.	as date)	Unit	(MG)	(MG)
permitno	month	mangunit	wwapp	irrwapp
LA-000130-03	08/15/2002	MU-013003	0.04	
LA-000130-03	09/15/2002	MU-013003	14.74	
LA-000130-03	10/15/2002	MU-013003	7.34	
LA-000130-03	08/15/2002	MU-013004	7.04	
LA-000130-03	09/15/2002	MU-013004	32.76	
LA-000130-03	10/15/2002	MU-013004	37.17	

Note:
1. Dates here denote each month of the year.
2. These dates by convention shall be the 15th of the month.
3. Each twelve month cycle is repeated for each management unit.
4. If the management unit was not used for land application, enter all zeros.
5. For monthly date, use date function.
6. Do not change any protected cell.
3. Make sure units for data entered are consistent with units specified in column headings.

Table C-3. Groundwater Worksheet from WLAP Data Entry for LA-130-3.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000130-03
Software and Version no.:-----> MS Excel 97 SR-2

Ground Water Quality Data

Permit No.	Sample Date	Sampling Station	Well ID	Static Water Level (feet)	chloride (ppm)	nitrate (ppm)	pH (S.U.)	Fe (ppm)	Mn (ppm)	Na (ppm)	TDS (ppm)	fluoride (ppm)	total phos (ppm)
permitno	smpldate	station	wellid	wtrdepth	chloride	nitrate	ph	irontotal	mangtotal	sodium	tds	fluoride	phostot
LA-000130	10/15/2002	03N R29 26cab01	GW-013005	494.65	8.4	0.24	7.9	6.18	0.112	14.1	219	0.2	0.45
LA-000130	10/14/2002	03N 29E 35bac01	GW-013006	501.5	8.9	0.83	7.74	-0.027	0.00056	9.87	234	0.3	-0.1
LA-000130	10/15/2002	03N 29E 34aaa01	GW-013007	503.97	8.1	0.17	7.7	0.409	0.0947	12.6	187	0.3	-0.1
LA-000130	10/14/2002	03N 29E 26cbd01	GW-013009	111.04	33.6	1.1	7.78	0.213	0.0047	65.9	323	0.3	-0.1

Permit No.	Sample Date	Sampling Station	Well ID	Static Water Level (feet)	TKN (ppm)	Hg (ppm)	nitrite (ppm)	As (ppm)	Cd (ppm)	Cr (ppm)	Se (ppm)	Ag (ppm)	Cu (ppm)
permitno	smpldate	station	wellid	wtrdepth	tkn	mercury	nitrite	arsenic	cadmium	chromium	selinium	silver	copper
LA-000130	10/15/2002	03N R29 26cab01	GW-013005	494.65	2.2	-0.0001	-0.1	0.0025	-0.0006	0.0158	-0.0026	-0.0018	0.021
LA-000130	10/14/2002	03N 29E 35bac01	GW-013006	501.5	-1	-0.0001	-0.1	-0.0022	-0.0006	0.0139	-0.0026	-0.0018	-0.0032
LA-000130	10/15/2002	03N 29E 34aaa01	GW-013007	503.97	2.2	-0.0001	-0.1	0.0027	-0.0006	0.0071	-0.0026	-0.0018	-0.0032
LA-000130	10/14/2002	03N 29E 26cbd01	GW-013009	111.04	-1	-0.0001	-0.1	0.0036	-0.0006	0.0077	-0.0026	-0.0018	-0.0032

Permit No.	Sample Date	Sampling Station	Well ID	Static Water Level (feet)	Al (ppm)						
permitno	smpldate	station	wellid	wtrdepth	aluminum	well name					
LA-000130	10/15/2002	03N R29 26cab01	GW-013005	494.65	6	ICPP-MON-A-167					
LA-000130	10/14/2002	03N 29E 35bac01	GW-013006	501.5	-0.0212	ICPP-MON-A-165					
LA-000130	10/15/2002	03N 29E 34aaa01	GW-013007	503.97	0.366	ICPP-MON-A-166					
LA-000130	10/14/2002	03N 29E 26cbd01	GW-013009	111.04	0.137	ICPP-MON-V-200					

Table C-3. (continued)
Ground Water Quality Data

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign. Contact your laboratory for the MDL if not known.a -1.0
2. If a parameter was not analyzed, leave blank
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Alkalinity should be expressed as CaCO3; static water level in feet.
6. For Date field, utilize date cell.
7. All columns are formated for appropriate decimal places- do not modify.
8. Sample methods are listed in the DEQ "Handbook for Land Application of Municipal and Industrial Wasteawter", April 1996, page IV-99-1 through 10.

Do not change any protected cell. You may add parameters on right hand side of spreadsheet if needed. You may hide columns that are not typically used

Table C-4. Wastewater Worksheet from WLAP Data Entry for LA-130-3.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000130-03
Software and Version no.:-----> MS Excel 97 SR-2

Wastewater Quality Data

		Sampling						total				
Permit	Sample	Location	chloride	nitrate	TKN	pH_grab	Na	phos	TDS	fluoride	Fe	Mn
No.	Date	(Station)	(ppm)	(ppm)	(ppm)		(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wwchloride	wwnitrate	wwtkn	wwphgrb	wwsodium	wwphostot	wwtds	wwflride	wwiron	wwmn
LA-000130-03	09/10/02	WW-013001			-0.21	7.66	47.40	0.0258	313.40		-0.0087	0.0005
LA-000130-03	09/18/02	WW-013001	28.47	0.89						0.23		
LA-000130-03	10/08/02	WW-013001			-0.24	7.70	31.70	0.0246	315.00		0.0325	0.0007
LA-000130-03	10/14/02	WW-013001	70.90	0.96						0.18		

		Sampling										
Permit	Sample	Location	Arsenic	Chromium	Mercury	Selenium	Nitrite	Aluminum	Silver	Copper	Cadmium	
No.	Date	(Station)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	
permitno	smpldate	station	wwarsenic	wwchromium	wwmercury	wwselenium	wwnitrite	wwalumin	wwsilver	wwcopper	wwcadmium	
LA-000130-03	09/10/02	WW-013001	-0.0043	0.0056	-0.0001	-0.0030		0.0080	-0.0020	-0.0038	-0.0006	
LA-000130-03	09/18/02	WW-013001					-0.0140					
LA-000130-03	10/08/02	WW-013001	-0.0047	0.0070	-0.0001	-0.0040		-0.0110	-0.0018	-0.0016	-0.0006	
LA-000130-03	10/14/02	WW-013001					-0.0061					

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign.. Contact your laboratory for the MDL if it is not known.
2. If a parameter was not analyzed, leave blank.
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Note also that alkalinity should be expressed as CaCO3.
6. For Date field, utilize a date cell.
7. All columns are formatted for appropriate decimal places - do not modify.
8. Do not change any protected cell. You may add parameter on right hand side of spreadsheet if needed.
9. You may hide columns that are not typically used.

Table C-5 Site Summary Worksheet from WLAP Data Entry for LA-130-3.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000130-03
Software and Version no.:-----> MS Excel 97 SR-2

Permitted Site Summary

			(2)
		(1)	WW
	Report-	WW	Application
Permit	ing	Applied	Season
No.	Year	MGA	(days)
permitno	repyear	wwgen	wwgenday
LA-000130	2002	99.08	67

(1) Total WW applied in million gallons per annum (MGA).
(2) Length of wastewater application season.

1. There should only be one entry for each permit number on this spreadsheet.
2. Make sure units for data entered are consistent with units specified in column headings.
3. All columns are formatted for the appropriate decimal places - do not modify.
4. Do not change any protected cell.

Appendix D

Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant Influent and Effluent Flow Readings and Electronic Data Files

Appendix D

Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant Daily Influent and Effluent Flow Readings and Electronic Data Files

Table D-1. Idaho Nuclear Technology and Engineering Center Sewage Treatment Plant daily influent and effluent flows.

Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])	Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])
11/1/2001	48,761	31,249	11/25/2001	37,634	31,930
11/2/2001	44,985	31,550	11/26/2001	35,116	19,741
11/3/2001	34,121	21,510	11/27/2001	50,235	32,700
11/4/2001	34,363	22,480	11/28/2001	38,576	28,283
11/5/2001	31,501	18,439	11/29/2001	40,286	32,942
11/6/2001	54,104	34,843	11/30/2001	33,839	28,700
11/7/2001	56,654	42,893	12/1/2001	22,785	16,150
11/8/2001	59,075	40,681	12/2/2001	23,019	25,130
11/9/2001	46,839	35,164	12/3/2001	24,473	28,885
11/10/2001	26,115	16,040	12/4/2001	40,500	28,600
11/11/2001	31,000	18,445	12/5/2001	38,559	27,340
11/12/2001	28,358	14,472	12/6/2001	35,603	33,431
11/13/2001	43,043	28,558	12/7/2001	43,904	33,342
11/14/2001	41,280	27,197	12/8/2001	26,092	17,081
11/15/2001	40,810	29,357	12/9/2001	22,346	16,209
11/16/2001	32,331	28,051	12/10/2001	27,156	14,808
11/17/2001	21,652	17,340	12/11/2001	34,716	27,716
11/18/2001	23,908	18,740	12/12/2001	54,432	37,316
11/19/2001	26,504	14,486	12/13/2001	40,986	31,115
11/20/2001	41,400	26,966	12/14/2001	40,539	36,979
11/21/2001	47,374	31,717	12/15/2001	25,154	24,125
11/22/2001	44,702	32,259	12/16/2001	26,355	20,423
11/23/2001	37,922	21,896	12/17/2001	49,301	21,949
11/24/2001	35,684	21,594	12/18/2001	29,608	31,784

Table D-1. (continued).

Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])	Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])
12/19/2001	59,603	37,024	1/18/2002	34,340	33,046[b]
12/20/2001	26,077	25,789	1/19/2002	21,214	30,129[b]
12/21/2001	28,607	30,106	1/20/2002	23,483	40,754[b]
12/22/2001	18,523	18,618	1/21/2002	22,423	40,653[b]
12/23/2001	18,278	16,174	1/22/2002	33,830	40,878[b]
12/24/2001	33,256	23,832	1/23/2002	42,660	39,202[b]
12/25/2001	25,132	20,493	1/24/2002	35,918	43,824[b]
12/26/2001	32,343	28,669	1/25/2002	30,363	41,874[b]
12/27/2001	24,422	21,886	1/26/2002	18,018	42,647[b]
12/28/2001	29,363	28,254	1/27/2002	16,226	45,252[b]
12/29/2001	30,201	29,667	1/28/2002	18,825	39,857[b]
12/30/2001	28,193	26,603	1/29/2002	38,016	51,395[b]
12/31/2001	27,521	28,065	1/30/2002	35,894	53,841[b]
1/1/2002	23,259	27,710[b]	1/31/2002	22,423	40,653[b]
1/2/2002	20,358	26,527[b]	2/1/2002	34,366	42,819[b]
1/3/2002	36,745	27,007[b]	2/2/2002	25,275	50,749[b]
1/4/2002	40,576	49,150[b]	2/3/2002	15,770	34,652[b]
1/5/2002	21,492	32,570[b]	2/4/2002	24,190	39,631[b]
1/6/2002	26,521	44,560[b]	2/5/2002	37,083	41,396[b]
1/7/2002	23,983	35,181[b]	2/6/2002	33,101	38,623[b]
1/8/2002	37,989	43,184[b]	2/7/2002	34,038	39,176[b]
1/9/2002	38,525	49,836[b]	2/8/2002	35,219	72,643[b]
1/10/2002	38,051	35,294[b]	2/9/2002	13,062	76,498[b]
1/11/2002	36,256	33,326[b]	2/10/2002	18,259	134,064[b]
1/12/2002	27,380	39,028[b]	2/11/2002	23,738	150,360[b]
1/13/2002	18,491	23,836[b]	2/12/2002	31,757	64,337[b]
1/14/2002	24,634	26,072[b]	2/13/2002	34,553	171,129[b]
1/15/2002	40,427	32,569[b]	2/14/2002	35,383	214,985[b]
1/16/2002	37,039	38,875[b]	2/15/2002	32,186	241,372[b]
1/17/2002	43,390	43,477[b]	2/16/2002	15,862	172,059[b]

Table D-1. (continued).

Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])	Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])
2/17/2002	20,297	231,798[b]	3/19/2002	44,277	97,856[b]
2/18/2002	18,920	179,591[b]	3/20/2002	39,928	26,001
2/19/2002	32,214	203,200[b]	3/21/2002	30,169	31,971
2/20/2002	36,320	64,721[b]	3/22/2002	45,905	36,771
2/21/2002	36,815	12,490[b]	3/23/2002	39,872	26,204
2/22/2002	39,472	92,299[b]	3/24/2002	OOS[c]	26,632
2/23/2002	18,435	135,015[b]	3/25/2002	OOS[c]	17,168
2/24/2002	13,399	11,955[b]	3/26/2002	OOS[c]	50,813
2/25/2002	18,788	12,930[b]	3/27/2002	OOS[c]	7,952
2/26/2002	29,956	32,712[b]	3/28/2002	OOS[c]	11,866
2/27/2002	44,661	52,481[b]	3/29/2002	OOS[c]	24,214
2/28/2002	33,491	22,292[b]	3/30/2002	OOS[c]	10,512
3/1/2002	42,291	27,852[b]	3/31/2002	OOS[c]	1,461[d]
3/2/2002	14,898	43,634[b]	4/1/2002	OOS[c]	OOS[d]
3/3/2002	20,855	28,863[b]	4/2/2002	34,458	OOS[d]
3/4/2002	23,920	77,024[b]	4/3/2002	40,629	OOS[d]
3/5/2002	33,356	28,445[b]	4/4/2002	38,333	OOS[d]
3/6/2002	34,573	21,357[b]	4/5/2002	35,041	OOS[d]
3/7/2002	45,091	74,886[b]	4/6/2002	21,054	OOS[d]
3/8/2002	54,098	64,002[b]	4/7/2002	19,926	OOS[d]
3/9/2002	27,922	76,032[b]	4/8/2002	21,774	OOS[d]
3/10/2002	30,866	118,449[b]	4/9/2002	37,941	OOS[d]
3/11/2002	25,246	93,154[b]	4/10/2002	35,546	OOS[d]
3/12/2002	43,613	141,012[b]	4/11/2002	35,014	OOS[d]
3/13/2002	72,879	111,235[b]	4/12/2002	33,068	OOS[d]
3/14/2002	42,075	50,529[b]	4/13/2002	20,094	OOS[d]
3/15/2002	48,708	39,658[b]	4/14/2002	18,701	OOS[d]
3/16/2002	24,367	42,655[b]	4/15/2002	20,161	OOS[d]
3/17/2002	27,164	53,074[b]	4/16/2002	35,538	OOS[d]
3/18/2002	22,564	46,613[b]	4/17/2002	37,791	OOS[d]

Table D-1. (continued).

Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])	Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])
4/18/2002	37,791	OOS[d]	5/18/2002	13,776	9,515
4/19/2002	30,322	OOS[d]	5/19/2002	13,388	8,666
4/20/2002	18,147	OOS[d]	5/20/2002	18,118	8,127
4/21/2002	16,160	OOS[d]	5/21/2002	30,260	8,096
4/22/2002	15,964	OOS[d]	5/22/2002	29,904	8,916
4/23/2002	34,295	OOS[d]	5/23/2002	30,629	10,366
4/24/2002	30,923	OOS[d]	5/24/2002	31,573	12,871
4/25/2002	34,803	OOS[d]	5/25/2002	15,044	9,238
4/26/2002	31,838	OOS[d]	5/26/2002	15,998	9,901
4/27/2002	15,874	OOS[d]	5/27/2002	14,887	9,144
4/28/2002	14,760	OOS[d]	5/28/2002	16,708	8,179
4/29/2002	17,213	OOS[d]	5/29/2002	30,679	8,534
4/30/2002	36,131	OOS[d]	5/30/2002	29,600	8,013
5/1/2002	33,137	OOS[d]	5/31/2002	44,072	7,959
5/2/2002	32,521	12,924	6/1/2002	13,620	7,640
5/3/2002	29,426	14,295	6/2/2002	23,229	8,130
5/4/2002	15,003	11,438	6/3/2002	30,709	7,722
5/5/2002	15,386	10,768	6/4/2002	41,259	8,627
5/6/2002	16,717	9,741	6/5/2002	45,861	8,927
5/7/2002	35,192	9,972	6/6/2002	35,027	8,842
5/8/2002	38,256	9,515	6/7/2002	38,890	8,753
5/9/2002	33,701	10,314	6/8/2002	30,321	8,614
5/10/2002	29,576	10,802	6/9/2002	27,045	8,891
5/11/2002	25,713	10,419	6/10/2002	26,493	7,569
5/12/2002	15,402	9,941	6/11/2002	42,808	8,176
5/13/2002	28,350	9,176	6/12/2002	30,671	8,581
5/14/2002	34,429	9,519	6/13/2002	32,187	8,212
5/15/2002	32,532	10,380	6/14/2002	35,360	9,239
5/16/2002	30,090	10,171	6/15/2002	25,480	8,981
5/17/2002	30,171	10,956	6/16/2002	34,543	8,683

Table D-1. (continued).

Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])	Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])
6/17/2002	28,077	8,738	7/17/2002	43,964	18,979
6/18/2002	44,579	8,677	7/18/2002	43,274	18,397
6/19/2002	38,417	9,006	7/19/2002	36,627	13,792
6/20/2002	41,732	9,635	7/20/2002	27,564	6,913
6/21/2002	36,508	9,984	7/21/2002	31,801	8,001
6/22/2002	22,993	7,950	7/22/2002	27,877	5,178
6/23/2002	28,227	9,934	7/23/2002	55,202	20,157
6/24/2002	26,685	8,549	7/24/2002	37,638	17,211
6/25/2002	34,837	8,771	7/25/2002	52,186	15,418
6/26/2002	38,897	13,806	7/26/2002	32,931	19,582
6/27/2002	42,474	14,236	7/27/2002	24,424	7,256
6/28/2002	42,513	14,472	7/28/2002	23,550	2,266
6/29/2002	23,755	12,136	7/29/2002	29,541	2,874
6/30/2002	34,978	9,626	7/30/2002	37,551	9,787
7/1/2002	27,795	9,377	7/31/2002	40,409	10,954
7/2/2002	41,660	9,038	8/1/2002	40,619	8,022
7/3/2002	34,790	10,486	8/2/2002	37,544	13,442
7/4/2002	34,801	223[e]	8/3/2002	24,144	4,948
7/5/2002	23,242	NF[e,f]	8/4/2002	22,030	8,152
7/6/2002	24,196	NF[e]	8/5/2002	23,118	4,304
7/7/2002	25,321	NF[e]	8/6/2002	41,411	14,254
7/8/2002	24,235	3,201	8/7/2002	46,439	16,858
7/9/2002	22,906	4,813	8/8/2002	46,428	17,479
7/10/2002	42,105	15,372	8/9/2002	44,194	17,670
7/11/2002	38,246	14,291	8/10/2002	19,537	6,129
7/12/2002	38,669	12,658	8/11/2002	22,394	4,199
7/13/2002	22,718	5,382	8/12/2002	23,609	2,069
7/14/2002	25,226	4,172	8/13/2002	38,602	12,554
7/15/2002	49,784	1,400	8/14/2002	37,091	14,042
7/16/2002	40,478	8,646	8/15/2002	35,363	9,226

Table D-1. (continued).

Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])	Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])
8/16/2002	30,871	12,559	9/15/2002	15,184	3,020
8/17/2002	37,211	7,331	9/16/2002	18,159	1,316
8/18/2002	34,475	6,966	9/17/2002	19,887[g]	9,535
8/19/2002	27,211	6,966	9/18/2002	32,595[g]	19,789
8/20/2002	50,892	17,363	9/19/2002	42,194[g]	15,447
8/21/2002	30,396	12,267	9/20/2002	20,988[g]	13,692
8/22/2002	42,920	16,412	9/21/2002	195,622[g]	5,875
8/23/2002	38,966	16,510	9/22/2002	175,659[g]	4,033
8/24/2002	24,697	7,134	9/23/2002	—[g]	8,360
8/25/2002	32,410	7,554	9/24/2002	—[g]	15,641
8/26/2002	34,821	12,272	9/25/2002	32,706[g]	12,960
8/27/2002	45,456	19,570	9/26/2002	32,906[g]	13,622
8/28/2002	40,190	16,809	9/27/2002	39,390[g]	22,683
8/29/2002	37,246	16,284	9/28/2002	20,131[g]	17,229
8/30/2002	39,945	17,891	9/29/2002	23,634[g]	16,258
8/31/2002	24,574	9,356	9/30/2002	34,632[g]	20,491
9/1/2002	21,524	7,133	10/1/2002	30,827[g]	21,950
9/2/2002	5,124	3,309	10/2/2002	40,409[g]	18,920
9/3/2002	60,896	5,402	10/3/2002	48,426[g]	20,428
9/4/2002	52,525	14,251	10/4/2002	41,995[g]	25,017
9/5/2002	74,064	18,376	10/5/2002	28,629[g]	13,921
9/6/2002	33,093	20,154	10/6/2002	26,859[g]	10,653
9/7/2002	35,195	24,004	10/7/2002	28,988[g]	10,998
9/8/2002	26,954	9,899	10/8/2002	42,748[g]	20,967
9/9/2002	38,204	7,344	10/9/2002	40,453[g]	20,581
9/10/2002	44,682	16,221	10/10/2002	41,228[g]	19,353
9/11/2002	42,360	17,378	10/11/2002	39,553[g]	18,811
9/12/2002	41,269	16,106	10/12/2002	29,266[g]	9,741
9/13/2002	27,289	15,122	10/13/2002	32,035[g]	13,216
9/14/2002	13,160	4,133	10/14/2002	22,527[g]	7,623

Table D-1. (continued).

Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])	Date	Influent (WW-011501) (gpd[a])	Effluent to Trenches (WW-011502) (gpd[a])
10/15/2002	48,973[g]	20,879	10/24/2002	44,069[g]	28,793
10/16/2002	34,894[g]	17,289	10/25/2002	49,303[g]	34,667
10/17/2002	41,828[g]	23,479	10/26/2002	20,302[g]	13,634
10/18/2002	33,063[g]	19,637	10/27/2002	32,149[g]	28,811
10/19/2002	41,036[g]	13,941	10/28/2002	28,728[g]	14,756
10/20/2002	25,181[g]	12,401	10/29/2002	37,604[g]	26,331
10/21/2002	26,636[g]	10,744	10/30/2002	36,573[g]	25,983
10/22/2002	40,914[g]	20,877	10/31/2002	42,178[g]	28,237
10/23/2002	42,553[g]	21,010			

a. gpd—Gallons per day.

b. Reading shown is that from the effluent flow meter. However, the accuracy of effluent flow reading is suspect due to ice build up. Based on historical data and worst-case scenario calculations, the effluent flow is estimated to be 21,207 gpd.

c. Influent flow meters were taken out of service (OOS) for reprogramming. Based on historical data and worst-case scenario calculations, the influent flow is estimated to be 45,779 gpd.

d. Effluent flow meter was taken out of service (OOS) to replace a faulty ultrasonic transducer. Based on historical data and worst-case scenario calculations, the effluent flow is estimated to be 21,746 gpd.

e. Reading shown is that from the effluent flow meter. However, the accuracy of effluent flow reading is suspect due to abnormally low reading. Based on historical data and worst-case scenario calculations, the effluent flow is estimated to be 11,374 gpd.

f. NF—No flow.

g. Reading shown is that from the influent flow meters. However, the accuracy of the influent flow reading is suspect due to problems discovered during instrument calibration. Based on historical data and worst-case scenario calculations, the influent flow is estimated to be 50,581 gpd.

The following tables (Tables D-2 through D-5) represent hardcopies of the electronic WLAP data files required by the DEQ (DEQ 2002). In Section 5, "Electronic Data Entry," of DEQ 2002, it says to "assemble data tables (electronic tables) with other parts of the annual report." The following tables were first compiled as worksheets within the WLAP Data Entry for LA-115-2.xls file using Microsoft Excel 97. The individual worksheets were saved as text files and incorporated as tables in this appendix. Other than formatting to fit the page, and tabulating the data columns, no other formatting was performed. Columns for those parameters not required by the permit are not included in the tables, nor are rejected results shown in these data tables.

Table D-2. Hydraulic Worksheet from WLAP Data Entry for LA-115-2.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000115-02
Software and Version no.:-----> MS Excel 97 SR-2

HYDRAULIC APPLICATION RATE

				Suppl
	Month	Manage-	WW	Irrig W
Permit	(use 15th	ment	Applied	Applied
No.	as date)	Unit	(MG)	(MG)
permitno	month	mangunit	wwapp	irrwapp
LA-000115	11/15/01	MU-011501	0.15	
LA-000115	12/15/01	MU-011501		
LA-000115	01/15/02	MU-011501		
LA-000115	02/15/02	MU-011501		
LA-000115	03/15/02	MU-011501		
LA-000115	04/15/02	MU-011501		
LA-000115	05/15/02	MU-011501		
LA-000115	06/15/02	MU-011501		
LA-000115	07/15/02	MU-011501	0.09	
LA-000115	08/15/02	MU-011501	0.07	
LA-000115	09/15/02	MU-011501	0.08	
LA-000115	10/15/02	MU-011501	0.10	
LA-000115	11/15/01	MU-011502	0.19	
LA-000115	12/15/01	MU-011502	0.20	
LA-000115	01/15/02	MU-011502	0.27	
LA-000115	02/15/02	MU-011502	0.60	
LA-000115	03/15/02	MU-011502	0.36	
LA-000115	04/15/02	MU-011502		
LA-000115	05/15/02	MU-011502	0.15	
LA-000115	06/15/02	MU-011502	0.28	
LA-000115	07/15/02	MU-011502		
LA-000115	08/15/02	MU-011502	0.08	
LA-000115	09/15/02	MU-011502	0.07	
LA-000115	10/15/02	MU-011502	0.12	
LA-000115	11/15/01	MU-011503	0.19	
LA-000115	12/15/01	MU-011503	0.30	
LA-000115	01/15/02	MU-011503	0.32	
LA-000115	02/15/02	MU-011503	0.73	
LA-000115	03/15/02	MU-011503	0.43	
LA-000115	04/15/02	MU-011503		
LA-000115	05/15/02	MU-011503	0.08	
LA-000115	06/15/02	MU-011503		
LA-000115	07/15/02	MU-011503	0.07	
LA-000115	08/15/02	MU-011503	0.13	
LA-000115	09/15/02	MU-011503	0.12	
LA-000115	10/15/02	MU-011503	0.16	
LA-000115	11/15/01	MU-011504	0.27	
LA-000115	12/15/01	MU-011504	0.31	
LA-000115	01/15/02	MU-011504	0.60	
LA-000115	02/15/02	MU-011504	1.31	
LA-000115	03/15/02	MU-011504	0.73	
LA-000115	04/15/02	MU-011504		
LA-000115	05/15/02	MU-011504	0.07	
LA-000115	06/15/02	MU-011504		
LA-000115	07/15/02	MU-011504	0.11	
LA-000115	08/15/02	MU-011504	0.08	
LA-000115	09/15/02	MU-011504	0.11	
LA-000115	10/15/02	MU-011504	0.22	

Table D-2. (continued)

HYDRAULIC APPLICATION RATE

Note:
1. Dates here denote each month of the year.
2. These dates by convention shall be the 15th of the month.
3. Each twelve month cycle is repeated for each management unit.
4. If the management unit was not used for land application, enter all zeros.
5. For monthly date, use date function.
6. Do not change any protected cell.
3. Make sure units for data entered are consistent with units specified in column headings.

Table D-3. Groundwater Worksheet from WLAP Data Entry for LA-115-2.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000115-02
Software and Version no.:-----> MS Excel 97 SR-2

Ground Water Quality Data

				Static							
				Water						fecal	total
Permit	Sample	Sampling	Well	Level	chloride	nitrate	ammonium	TDS	BOD	coli	coli
No.	Date	Station	ID	(feet)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(count)	(count)
permitno	smpldate	station	wellid	wtrdepth	chloride	nitrate	ammonia	tds	bod	fecalcoli	totalcoli
LA-000115	04/08/02	03N 30E 19bda01	GW-011502	61.90	103.00	14.300	-0.100	555.0	-2.0	0	0
LA-000115	04/16/02	03N 30E 19cac01	GW-011501	454.10	29.60	4.700	-0.100	266.0	2.1	0	0
LA-000115	04/16/02	03N 30E 19cac01	GW-011501	454.10	29.90	4.800	-0.100	263.0	2.4	0	0
LA-000115	04/17/02	03N 30E 18ccc01	GW-011503	457.64	12.00		-0.100	206.0	2.5	0	38
LA-000115	10/16/02	03N 30E 19bda01	GW-011502	61.60	145.00	5.970	-0.100	574.0	9.6	0	30
LA-000115	10/07/02	03N 30E 19cac01	GW-011501	456.26	29.80	4.410	-0.100	275.0	9.0	0	0
LA-000115	10/07/02	03N 30E 19cac01	GW-011501	456.26	28.60	4.400	-0.100	270.0	8.7	0	0
LA-000115	10/16/02	03N 30E 18ccc01	GW-011503	456.51	12.00	0.790	-0.100	222.0	9.5	0	0

Table D-3. (continued)

Ground Water Quality Data

				Static					
				Water	total				
Permit	Sample	Sampling	Well	Level	phos	TKN	nitrite	nitrate	
No.	Date	Station	ID	(feet)	(ppm)	(ppm)	(ppm)	nitrite	
permitno	smpldate	station	wellid	wtrdepth	phostot	tkn	nitrite	(ppm)	well name
LA-000115	04/08/02	03N 30E 19bda01	GW-011502	61.90	2.60	-1.00	-0.100	14.10	ICPP-MON-PW-024
LA-000115	04/16/02	03N 30E 19cac01	GW-011501	454.10	-0.10	-1.00	-0.100	4.57	USGS-52
LA-000115	04/16/02	03N 30E 19cac01	GW-011501	454.10	-0.10	-1.00	-0.100	4.59	USGS-52 (duplicate)
LA-000115	04/17/02	03N 30E 18ccc01	GW-011503	457.64	-0.10	-1.00	-0.100	0.77	USGS-121
LA-000115	10/16/02	03N 30E 19bda01	GW-011502	61.60	2.40	-1.00	-0.100	6.00	ICPP-MON-PW-024
LA-000115	10/07/02	03N 30E 19cac01	GW-011501	456.26	-0.10	-1.00	-0.100	4.55	USGS-52
LA-000115	10/07/02	03N 30E 19cac01	GW-011501	456.26	-0.10	-1.00	-0.100	4.60	USGS-52 (duplicate)
LA-000115	10/16/02	03N 30E 18ccc01	GW-011503	456.51	-0.10	-1.00	-0.100	0.77	USGS-121

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign. Contact your laboratory for the MDL if not known.a -1.0
2. If a parameter was not analyzed, leave blank
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Alkalinity should be expressed as CaCO3; static water level in feet.
6. For Date field, utilize date cell.
7. All columns are formated for appropriate decimal places- do not modify.
8. Sample methods are listed in the DEQ "Handbook for Land Application of Municipal and Industrial Wasteawter", April 1996, page IV-99-1 through 10.
9. Do not change any protected cell. You may add parameters on right hand side of spreadsheet if needed. You may hide columns that are not typically used

Table D-4. Wastewater Worksheet from WLAP Data Entry for LA-115-2.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000115-02
Software and Version no.:-----> MS Excel 97 SR-2

Wastewater Quality Data

		Sampling	total	sp cond			total				No3-N +
Permit	Sample	Location	coli	(umhos/	chloride	TKN	phos	TSS	TDS	BOD	No2-N
No.	Date	(Station)	(count)	cm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wwtotalc	wwspcond	wwchloride	wwtkn	wwphostot	wwtss	wwtds	wwbod	wwnnn
LA-000115	11/07/01	WW-011501				44.50	3.58	24.90		88.70	2.65
LA-000115	12/04/01	WW-011501				40.60	4.18	43.80		63.70	0.04
LA-000115	01/09/02	WW-011501				47.70	6.38	88.50		139.00	0.06
LA-000115	02/27/02	WW-011501				44.00	4.76	172.00		151.00	0.20
LA-000115	03/20/02	WW-011501				39.10	4.90	45.40		85.40	0.01
LA-000115	04/09/02	WW-011501				42.80	4.80	64.70		91.00	0.04
LA-000115	05/08/02	WW-011501				42.20	5.39	215.00		93.60	-0.01
LA-000115	06/19/02	WW-011501				42.00	4.61	51.60		80.30	0.03
LA-000115	07/24/02	WW-011501				39.90	4.13	49.30		67.10	0.04
LA-000115	08/07/02	WW-011501				31.40	4.60	98.70		125.00	0.10
LA-000115	09/11/02	WW-011501				42.30	4.44	112.00		104.00	0.13
LA-000115	10/16/02	WW-011501				17.20	5.29	341.00		131.00	0.03
LA-000115	11/07/01	WW-011502		1014.00		11.70	4.64	43.50		9.86	0.01
LA-000115	11/08/01	WW-011502	710.00								
LA-000115	12/04/01	WW-011502		951.50	160.00	12.60	3.76	20.10	564.00	12.20	4.42
LA-000115	12/06/01	WW-011502	1560.00								
LA-000115	01/09/02	WW-011502		992.10	150.00	16.80	4.00	6.40	546.00	8.78	3.53
LA-000115	01/10/02	WW-011502	7200.00								
LA-000115	02/27/02	WW-011502		938.40	125.00	22.50	4.45	6.20	466.00	7.51	2.39
LA-000115	02/28/02	WW-011502	7800.00								
LA-000115	03/20/02	WW-011502		835.30	94.10	23.70	4.61	12.40	460.00	10.10	1.67
LA-000115	03/21/02	WW-011502	16000.00								

Table D-4. (continued)

Wastewater Quality Data

Permit No.	Sample Date	Sampling Location (Station)	total coli (count)	sp cond (umhos/ cm)	chloride (ppm)	TKN (ppm)	total phos (ppm)	TSS (ppm)	TDS (ppm)	BOD (ppm)	No3-N + No2-N (ppm)
permitno	smpldate	station	wwtotalc	wwspcond	wwchloride	wwtkn	wwphostot	wwtss	wwtds	wwbod	wwnnn
LA-000115	04/09/02	WW-011502	300.00								
LA-000115	04/09/02	WW-011502		588.10	63.40	16.90	3.78	25.70	312.00	13.20	1.33
LA-000115	05/08/02	WW-011502		529.10	67.00	9.99	3.36	75.80	376.00	26.00	2.04
LA-000115	05/09/02	WW-011502	820.00								
LA-000115	06/19/02	WW-011502		686.20	111.00	6.50	2.41	79.60	434.00	21.00	0.55
LA-000115	06/20/02	WW-011502	220.00								
LA-000115	07/24/02	WW-011502		858.80	148.00	5.61	1.51	26.30	562.00	12.90	0.33
LA-000115	07/25/02	WW-011502	100.00								
LA-000115	08/07/02	WW-011502		915.80	164.00	6.10	1.79	33.80	567.00	17.30	0.36
LA-000115	08/08/02	WW-011502	260.00								
LA-000115	09/11/02	WW-011502		948.10	163.00	7.63	2.34	37.00	579.00	21.60	0.88
LA-000115	09/12/02	WW-011502	360.00								
LA-000115	10/16/02	WW-011502		835.80	157.00	8.41	3.51	29.60	554.00	16.90	1.45
LA-000115	10/16/02	WW-011502			160.00	7.63	3.30	31.20	567.00	16.30	1.50
LA-000115	10/17/02	WW-011502	460.00								

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign.. Contact your laboratory for the MDL if it is not known.
2. If a parameter was not analyzed, leave blank.
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Note also that alkalinity should be expressed as CaCO3.
6. For Date field, utilize a date cell.
7. All columns are formatted for appropriate decimal places - do not modify.
8. Do not change any protected cell. You may add parameter on right hand side of spreadsheet if needed.
9. You may hide columns that are not typically used.

Table D-5. Site Summary Worksheet from WLAP Data Entry for LA-115-2.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000115-02
Software and Version no.:-----> MS Excel 97 SR-2

Permitted Site Summary

			(2)
		(1)	WW
	Report-	WW	Application
Permit	ing	Applied	Season
No.	Year	MGA	(days)
permitno	repyear	wwgen	wwgenday
LA-000115	2002	9.13	365

(1) Total WW applied in million gallons per annum (MGA).
(2) Length of wastewater application season.

1. There should only be one entry for each permit number on this spreadsheet.
2. Make sure units for data entered are consistent with units specified in column headings.
3. All columns are formatted for the appropriate decimal places - do not modify.
4. Do not change any protected cell.

Appendix E

Test Area North/Technical Support Facility Sewage Treatment Plant Daily Effluent Flow Readings and Electronic Data Files

Appendix E

Test Area North/Technical Support Facility Sewage Treatment Plant Daily Effluent Flow Readings and Electronic Data Files

Table E-1. Test Area North/Technical Support Facility Sewage Treatment Plant daily effluent flows.

Date	Effluent (WW-015301) (gpd[a])	Date	Effluent (WW-015301) (gpd[a])
11/1/2001	16,000	11/26/2001	34,000
11/2/2001	16,000	11/27/2001	38,000
11/3/2001	10,000	11/28/2001	24,000
11/4/2001	22,000	11/29/2001	37,000
11/5/2001	12,000	11/30/2001	30,000
11/6/2001	17,000	12/1/2001	31,000
11/7/2001	22,000	12/2/2001	34,000
11/8/2001	21,000	12/3/2001	34,000
11/9/2001	30,000	12/4/2001	26,000
11/10/2001	32,000	12/5/2001	38,000
11/11/2001	25,000	12/6/2001	35,000
11/12/2001	32,000	12/7/2001	33,000
11/13/2001	30,000	12/8/2001	36,000
11/14/2001	27,000	12/9/2001	32,000
11/15/2001	17,000	12/10/2001	32,000
11/16/2001	11,000	12/11/2001	35,000
11/17/2001	12,000	12/12/2001	34,000
11/18/2001	13,000	12/13/2001	36,000
11/19/2001	9,000	12/14/2001	23,000
11/20/2001	19,000	12/15/2001	33,000
11/21/2001	29,000	12/16/2001	30,000
11/22/2001	29,000	12/17/2001	36,000
11/23/2001	40,000	12/18/2001	33,000
11/24/2001	26,000	12/19/2001	32,000
11/25/2001	36,000	12/20/2001	29,000

Table E-1. (continued).

Date	Effluent (WW-015301) (gpd[a])	Date	Effluent (WW-015301) (gpd[a])
12/21/2001	30,000	1/21/2002	30,000
12/22/2001	33,000	1/22/2002	31,000
12/23/2001	27,000	1/23/2002	23,000
12/24/2001	35,000	1/24/2002	23,000
12/25/2001	31,000	1/25/2002	28,000
12/26/2001	34,000	1/26/2002	28,000
12/27/2001	32,000	1/27/2002	25,000
12/28/2001	29,000	1/28/2002	33,000
12/29/2001	26,000	1/29/2002	27,000
12/30/2001	32,000	1/30/2002	26,000
12/31/2001	32,000	1/31/2002	33,000
1/1/2002	32,000	2/1/2002	33,000
1/2/2002	27,000	2/2/2002	23,000
1/3/2002	25,000	2/3/2002	32,000
1/4/2002	28,000	2/4/2002	25,000
1/5/2002	29,000	2/5/2002	32,000
1/6/2002	28,000	2/6/2002	27,000
1/7/2002	32,000	2/7/2002	40,000
1/8/2002	23,000	2/8/2002	38,000
1/9/2002	31,000	2/9/2002	36,000
1/10/2002	34,000	2/10/2002	37,000
1/11/2002	21,000	2/11/2002	27,000
1/12/2002	21,000	2/12/2002	22,000
1/13/2002	17,000	2/13/2002	20,000
1/14/2002	23,000	2/14/2002	28,000
1/15/2002	27,000	2/15/2002	32,000
1/16/2002	31,000	2/16/2002	33,000
1/17/2002	31,000	2/17/2002	30,000
1/18/2002	29,000	2/18/2002	30,000
1/19/2002	30,000	2/19/2002	34,000
1/20/2002	22,000	2/20/2002	30,000

Table E-1. (continued).

Date	Effluent (WW-015301) (gpd[a])	Date	Effluent (WW-015301) (gpd[a])
2/21/2002	28,000	3/24/2002	35,000
2/22/2002	26,000	3/25/2002	35,000
2/23/2002	27,000	3/26/2002	34,000
2/24/2002	34,000	3/27/2002	26,000
2/25/2002	33,000	3/28/2002	25,000
2/26/2002	31,000	3/29/2002	22,000
2/27/2002	30,000	3/30/2002	32,000
2/28/2002	22,000	3/31/2002	30,000
3/1/2002	6,000	4/1/2002	32,000
3/2/2002	49,000	4/2/2002	35,000
3/3/2002	26,000	4/3/2002	23,000
3/4/2002	21,000	4/4/2002	32,000
3/5/2002	30,000	4/5/2002	24,000
3/6/2002	27,000	4/6/2002	20,000
3/7/2002	31,000	4/7/2002	28,000
3/8/2002	30,000	4/8/2002	33,000
3/9/2002	28,000	4/9/2002	32,000
3/10/2002	33,000	4/10/2002	34,000
3/11/2002	35,000	4/11/2002	25,000
3/12/2002	35,000	4/12/2002	26,000
3/13/2002	41,000	4/13/2002	27,000
3/14/2002	33,000	4/14/2002	17,000
3/15/2002	30,000	4/15/2002	21,000
3/16/2002	30,000	4/16/2002	24,000
3/17/2002	24,000	4/17/2002	19,000
3/18/2002	25,000	4/18/2002	17,000
3/19/2002	34,000	4/19/2002	17,000
3/20/2002	30,000	4/20/2002	32,000
3/21/2002	31,000	4/21/2002	16,000
3/22/2002	28,000	4/22/2002	13,000
3/23/2002	32,000	4/23/2002	28,000

Table E-1. (continued).

Date	Effluent (WW-015301) (gpd[a])	Date	Effluent (WW-015301) (gpd[a])
4/24/2002	16,000	5/25/2002	11,000
4/25/2002	17,000	5/26/2002	11,000
4/26/2002	14,000	5/27/2002	11,000
4/27/2002	14,000	5/28/2002	18,000
4/28/2002	14,000	5/29/2002	25,000
4/29/2002	18,000	5/30/2002	27,000
4/30/2002	16,000	5/31/2002	26,000
5/1/2002	16,000	6/1/2002	28,000
5/2/2002	15,000	6/2/2002	27,000
5/3/2002	14,000	6/3/2002	32,000
5/4/2002	16,000	6/4/2002	28,000
5/5/2002	16,000	6/5/2002	16,000
5/6/2002	15,000	6/6/2002	20,000
5/7/2002	15,000	6/7/2002	13,000
5/8/2002	15,000	6/8/2002	20,000
5/9/2002	18,000	6/9/2002	13,000
5/10/2002	12,000	6/10/2002	13,000
5/11/2002	10,000	6/11/2002	13,000
5/12/2002	11,000	6/12/2002	14,000
5/13/2002	13,000	6/13/2002	8,000
5/14/2002	12,000	6/14/2002	12,000
5/15/2002	13,000	6/15/2002	10,000
5/16/2002	12,000	6/16/2002	11,000
5/17/2002	12,000	6/17/2002	13,000
5/18/2002	12,000	6/18/2002	30,000
5/19/2002	11,000	6/19/2002	11,000
5/20/2002	15,000	6/20/2002	35,000
5/21/2002	11,000	6/21/2002	31,000
5/22/2002	12,000	6/22/2002	28,000
5/23/2002	12,000	6/23/2002	29,000
5/24/2002	13,000	6/24/2002	28,000

Table E-1. (continued).

Date	Effluent (WW-015301) (gpd[a])	Date	Effluent (WW-015301) (gpd[a])
6/25/2002	30,000	7/26/2002	15,000
6/26/2002	33,000	7/27/2002	17,000
6/27/2002	35,000	7/28/2002	18,000
6/28/2002	19,000	7/29/2002	9,000
6/29/2002	8,000	7/30/2002	11,000
6/30/2002	9,000	7/31/2002	15,000
7/1/2002	11,000	8/1/2002	10,000
7/2/2002	13,000	8/2/2002	15,000
7/3/2002	11,000	8/3/2002	19,000
7/4/2002	11,000	8/4/2002	16,000
7/5/2002	10,000	8/5/2002	17,000
7/6/2002	9,000	8/6/2002	16,000
7/7/2002	13,000	8/7/2002	16,000
7/8/2002	12,000	8/8/2002	10,000
7/9/2002	11,000	8/9/2002	10,000
7/10/2002	11,000	8/10/2002	8,000
7/11/2002	10,000	8/11/2002	9,000
7/12/2002	10,000	8/12/2002	8,000
7/13/2002	9,000	8/13/2002	19,000
7/14/2002	10,000	8/14/2002	20,000
7/15/2002	12,000	8/15/2002	17,000
7/16/2002	10,000	8/16/2002	26,000
7/17/2002	14,000	8/17/2002	31,000
7/18/2002	10,000	8/18/2002	31,000
7/19/2002	9,000	8/19/2002	28,000
7/20/2002	9,000	8/20/2002	18,000
7/21/2002	8,000	8/21/2002	23,000
7/22/2002	15,000	8/22/2002	23,000
7/23/2002	14,000	8/23/2002	34,000
7/24/2002	14,000	8/24/2002	7,000
7/25/2002	27,000	8/25/2002	7,000

Table E-1. (continued).

Date	Effluent (WW-015301) (gpd[a])	Date	Effluent (WW-015301) (gpd[a])
8/26/2002	10,000	9/26/2002	25,000
8/27/2002	8,000	9/27/2002	25,000
8/28/2002	12,000	9/28/2002	25,000
8/29/2002	12,000	9/29/2002	20,000
8/30/2002	11,000	9/30/2002	21,000
8/31/2002	10,000	10/1/2002	5,000
9/1/2002	14,000	10/2/2002	10,000
9/2/2002	20,000	10/3/2002	7,000
9/3/2002	29,000	10/4/2002	8,000
9/4/2002	17,000	10/5/2002	6,000
9/5/2002	13,000	10/6/2002	5,000
9/6/2002	19,000	10/7/2002	5,000
9/7/2002	16,000	10/8/2002	5,000
9/8/2002	29,000	10/9/2002	6,000
9/9/2002	32,000	10/10/2002	4,000
9/10/2002	31,000	10/11/2002	7,000
9/11/2002	23,000	10/12/2002	5,000
9/12/2002	37,000	10/13/2002	4,000
9/13/2002	27,000	10/14/2002	9,000
9/14/2002	25,000	10/15/2002	5,000
9/15/2002	34,000	10/16/2002	8,000
9/16/2002	29,000	10/17/2002	7,000
9/17/2002	27,000	10/18/2002	4,000
9/18/2002	29,000	10/19/2002	5,000
9/19/2002	27,000	10/20/2002	6,000
9/20/2002	12,000	10/21/2002	4,000
9/21/2002	18,000	10/22/2002	5,000
9/22/2002	14,000	10/23/2002	10,000
9/23/2002	10,000	10/24/2002	4,000
9/24/2002	18,000	10/25/2002	4,000
9/25/2002	26,000	10/26/2002	6,000

Table E-1. (continued).

Date	Effluent (WW-015301) (gpd[a])	Date	Effluent (WW-015301) (gpd[a])
10/27/2002	5,000	10/30/2002	7,000
10/28/2002	4,000	10/31/2002	10,000
10/29/2002	7,000		

a. gpd—Gallons per day.

The following tables (Tables E-2 through E-5) represent hardcopies of the electronic WLAP data files required by the DEQ (DEQ 2002). In Section 5, "Electronic Data Entry," of DEQ 2002, it says to "assemble data tables (electronic tables) with other parts of the annual report." The following tables were first compiled as worksheets within the WLAP Data Entry for LA-153-1.xls file using Microsoft Excel 97. The individual worksheets were saved as text files and incorporated as tables in this appendix. Other than formatting to fit the page, and tabulating the data columns, no other formatting was performed. Columns for those parameters not required by the permit are not included in the tables, nor are rejected results shown in these data tables.

Table E-2. Hydraulic Worksheet from WLAP Data Entry for LA-153-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000153-01
Software and Version no.:-----> MS Excel 97 SR-2

HYDRAULIC APPLICATION RATE

				Suppl
	Month	Manage-	WW	Irrig W
Permit	(use 15th	ment	Applied	Applied
No.	as date)	Unit	(MG)	(MG)
permitno	month	mangunit	wwapp	irrwapp
LA-000153	11/15/2001	MU-015301	0.72	
LA-000153	12/15/2001	MU-015301	0.99	
LA-000153	1/15/2002	MU-015301	0.85	
LA-000153	2/15/2002	MU-015301	0.84	
LA-000153	3/15/2002	MU-015301	0.93	
LA-000153	4/15/2002	MU-015301	0.68	
LA-000153	5/15/2002	MU-015301	0.45	
LA-000153	6/15/2002	MU-015301	0.62	
LA-000153	7/15/2002	MU-015301	0.38	
LA-000153	8/15/2002	MU-015301	0.5	
LA-000153	9/15/2002	MU-015301	0.69	
LA-000153	10/15/2002	MU-015301	0.19	

Note: 1. Dates here denote each month of the year.
2. These dates by convention shall be the 15th of the month.
3. Each twelve month cycle is repeated for each management unit.
4. If the management unit was not used for land application, enter all zeros.
5. For monthly date, use date function.
6. Do not change any protected cell.
3. Make sure units for data entered are consistent with units specified in column headings.

Table E-3. Groundwater Worksheet from WLAP Data Entry for LA-153-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000153-01
Software and Version no.:-----> MS Excel 97 SR-2

Ground Water Quality Data

				Static								
				Water								
Permit	Sample	Sampling	Well	Level	sulfate	chloride	nitrate	ammonium	Fe	Mn	Na	TDS
No.	Date	Station	ID	(feet)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wellid	wtrdepth	sulfate	chloride	nitrate	ammonia	irontotal	mangtotal	sodium	tds
LA-000153	04/03/02	06N 31E 14aad01	GW-015301	204.52	32.9	12	0.967	-0.1	1.99	0.0027	7.94	209
LA-000153	04/03/02	06N 31E 14dad01	GW-015304	208.76	15.6	4.1	0.581	-0.1	0.229	0.0109	6.46	181
LA-000153	04/01/02	06N 31E 13cba01	GW-015303	205.65	42	107	1.78	-0.1	1.16	0.0167	49.1	509
LA-000153	04/01/02	06N 31E 13cba01	GW-015303	205.65	43.5	108	1.77	-0.1	0.603	0.0126	48.8	540
LA-000153	04/02/02	06N 31E 13cca01	GW-015302	207.04	20.8	3.7	0.432	-0.1	0.411	0.0053	6.14	167
LA-000153	10/09/02	06N 31E 14aad01	GW-015301	208.45	28.7	11.4	1.02	-0.1	-0.027	-0.0004	8.26	224
LA-000153	10/09/02	06N 31E 14dad01	GW-015304	211.72	16.8	3.8	0.61	-0.1	0.0981	0.0034	6.64	170
LA-000153	10/02/02	06N 31E 13cba01	GW-015303	208.6	43.8	103	1.47	0.15	3.03	0.0146	50.7	568
LA-000153	10/02/02	06N 31E 13cba01	GW-015303	208.6	43.2	103	1.48	-0.1	3.22	0.013	51.9	627
LA-000153	10/02/02	06N 31E 13cca01	GW-015302	209	16.2	3.1	0.43	0.13	-0.027	0.0042	6.14	297

				Static								
				Water		fecal	total		total			
Permit	Sample	Sampling	Well	Level	BOD	coli	coli	fluoride	phos	TKN	Hg	nitrite
No.	Date	Station	ID	(feet)	(ppm)	(count)	(count)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wellid	wtrdepth	bod	fecalcoli	totalcoli	fluoride	phostot	tkn	mercury	nitrite
LA-000153	04/03/02	06N 31E 14aad01	GW-015301	204.52	-8	0	0	0.3	-0.1	-1	-0.0001	-0.1
LA-000153	04/03/02	06N 31E 14dad01	GW-015304	208.76	-8	0	0	0.3	-0.1	-1	-0.0001	-0.1
LA-000153	04/01/02	06N 31E 13cba01	GW-015303	205.65	7.7	0	0	0.2	-0.1	-1	-0.0001	-0.1
LA-000153	04/01/02	06N 31E 13cba01	GW-015303	205.65	10	0	0	0.2	-0.1	-1	-0.0001	-0.1
LA-000153	04/02/02	06N 31E 13cca01	GW-015302	207.04	10.2	0	0	0.2	-0.1	-1	-0.0001	-0.1
LA-000153	10/09/02	06N 31E 14aad01	GW-015301	208.45	10.7	0	1	0.2	-0.1	2.2	-0.0001	-0.1
LA-000153	10/09/02	06N 31E 14dad01	GW-015304	211.72	15.2	0	700	0.2	-0.1	-1	-0.0001	-0.1
LA-000153	10/02/02	06N 31E 13cba01	GW-015303	208.6	2.7	0	0	0.1	-0.1	3.9	-0.0001	-0.1
LA-000153	10/02/02	06N 31E 13cba01	GW-015303	208.6	2.6	0	0	0.1	-0.1	1.7	-0.0001	-0.1
LA-000153	10/02/02	06N 31E 13cca01	GW-015302	209	12	0	0	0.2	-0.1	-1	-0.0001	-0.1

Table E-3. (continued)
Ground Water Quality Data

				Static								
				Water	nitrite +							
Permit	Sample	Sampling	Well	Level	nitrate	As	Cr	Se	Ba	Pb	Zn	
No.	Date	Station	ID	(feet)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	
permitno	smpldate	station	wellid	wtrdepth	nnn	arsenic	chromium	selinium	barium	lead	zinc	well name
LA-000153	04/03/02	06N 31E 14aad01	GW-015301	204.52	0.9	0.0179	0.0056	-0.0033	0.0845	0.0034	0.405	TANT-MON-A-001
LA-000153	04/03/02	06N 31E 14dad01	GW-015304	208.76	0.53	0.0048	0.0066	-0.0033	0.0847	-0.003	0.383	TANT-MON-A-002
LA-000153	04/01/02	06N 31E 13cba01	GW-015303	205.65	1.73	0.0063	0.004	-0.0033	0.246	-0.003	0.103	TAN-10A
LA-000153	04/01/02	06N 31E 13cba01	GW-015303	205.65	1.73	-0.0029	-0.0009	-0.0033	0.251	-0.003	0.0798	TAN-10A (duplicate)
LA-000153	04/02/02	06N 31E 13cca01	GW-015302	207.04	0.39	0.0029	0.0054	-0.0033	0.0776	-0.003	0.366	TAN-13A
LA-000153	10/09/02	06N 31E 14aad01	GW-015301	208.45	0.93	0.0039	0.0045	-0.0026	0.0836	-0.0028	0.0453	TANT-MON-A-001
LA-000153	10/09/02	06N 31E 14dad01	GW-015304	211.72	0.56	0.0036	0.006	-0.0026	0.0776	-0.0028	0.157	TANT-MON-A-002
LA-000153	10/02/02	06N 31E 13cba01	GW-015303	208.6	1.26	0.0029	-0.0008	-0.0026	0.235	-0.0028	0.201	TAN-10A
LA-000153	10/02/02	06N 31E 13cba01	GW-015303	208.6	1.22	0.0029	-0.0008	-0.0026	0.243	-0.0028	0.195	TAN-10A (duplicate)
LA-000153	10/02/02	06N 31E 13cca01	GW-015302	209	0.43	0.0028	0.0046	-0.0026	0.0747	-0.0028	0.28	TAN-13A

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign. Contact your laboratory for the MDL if not known.a -1.0
2. If a parameter was not analyzed, leave blank
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Alkalinity should be expressed as CaCO3; static water level in feet.
6. For Date field, utilize date cell.
7. All columns are formated for appropriate decimal places- do not modify.
8. Sample methods are listed in the DEQ "Handbook for Land Application of Municipal and Industrial Wasteawter", April 1996, page IV-99-1 through 10.
9. Do not change any protected cell. You may add parameters on right hand side of spreadsheet if needed. You may hide columns that are not typically used

Table E-4. Wastewater Worksheet from WLAP Data Entry for LA-153-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000153-01
Software and Version no.:-----> MS Excel 97 SR-2

Wastewater Quality Data

		Sampling	total					total			
Permit	Sample	Location	coli	chloride	TKN	ammonium	Na	phos	TSS	TDS	BOD
No.	Date	(Station)	(count)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wwtotalc	wwchloride	wwtkn	wwammonia	wwsodium	wwphostot	wwtss	wwtds	wwbod
LA-000153	11/29/01	WW-015301	780000.00	140.00	2.68	1.19	85.50	0.56	4.20	494.00	16.90
LA-000153	12/11/01	WW-015301		128.00	1.72	0.61	85.10	0.43	4.90	471.00	11.60
LA-000153	12/13/01	WW-015301	50000.00								
LA-000153	01/23/02	WW-015301	1000.00	16.70	0.66	0.07	32.70	0.18	-4.00	285.00	5.11
LA-000153	02/06/02	WW-015301	500.00								
LA-000153	02/07/02	WW-015301		135.00	3.34	1.95	94.10	0.47	5.70	458.00	12.70
LA-000153	02/07/02	WW-015301		130.00	1.34	1.80	92.70	0.45	-4.00	463.00	10.60
LA-000153	03/13/02	WW-015301		158.00	2.01	1.18	84.20	0.49	13.10	480.00	10.40
LA-000153	03/14/02	WW-015301	80000.00								
LA-000153	04/09/02	WW-015301	12667.00	21.20	-0.50	0.37	13.40	0.38	-4.00	274.00	4.08
LA-000153	05/02/02	WW-015301	130000.00	16.20	0.24	0.14	9.53	0.42	-4.00	293.00	3.23
LA-000153	06/06/02	WW-015301	8000.00	14.20	0.53	0.05	7.97	0.20	-4.00	271.00	2.90
LA-000153	07/16/02	WW-015301		15.20	0.17	0.03	8.72	0.09	-4.00	288.00	2.85
LA-000153	07/18/02	WW-015301	4200.00								
LA-000153	08/20/02	WW-015301		17.00	1.28	1.44	8.79	0.49	4.40	279.00	7.14
LA-000153	08/22/02	WW-015301	8000.00								
LA-000153	09/05/02	WW-015301	8000.00	18.30	0.77	0.69	9.31	0.47	-4.00	283.00	4.90
LA-000153	10/24/02	WW-015301	8000.00	17.70	2.18	1.08	10.10	0.52	-4.00	281.00	6.90

Table E-4. (continued)
Wastewater Quality Data

		Sampling	fecal				nitrate+				
Permit	Sample	Location	coli	fluoride	Fe	Mn	nitrite	arsenic	barium	chromium	lead
No.	Date	(Station)	(count)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
permitno	smpldate	station	wwfecalc	wwflride	wwiron	wwmn	wwnnn	wwarsenic	wwbarium	wwchrom	wwlead
LA-000153	11/29/01	WW-015301	10000.00	0.28	0.03	0.0056	3.08	-0.003	0.106	-0.003	-0.002
LA-000153	12/11/01	WW-015301		0.27	0.05	0.0045	2.37	-0.003	0.101	-0.003	0.002
LA-000153	12/13/01	WW-015301	2667.00								
LA-000153	01/23/02	WW-015301	200.00	0.25	-0.01	0.0034	1.17	0.004	0.084	0.003	-0.002
LA-000153	02/06/02	WW-015301	100.00								
LA-000153	02/07/02	WW-015301		0.23	0.08	0.0046	1.58	0.004	0.103	0.004	0.002
LA-000153	02/07/02	WW-015301		0.23	0.04	0.0039	1.57	0.003	0.102	0.004	-0.002
LA-000153	03/13/02	WW-015301		0.21	0.39	0.0148	3.45	0.004	0.111	0.003	-0.002
LA-000153	03/14/02	WW-015301	12000.00								
LA-000153	04/09/02	WW-015301	500.00	-0.20	-0.01	-0.0025	2.81	0.003	0.095	0.003	-0.002
LA-000153	05/02/02	WW-015301	1667.00	0.22	-0.01	-0.0025	3.73	0.003	0.091	0.003	-0.002
LA-000153	06/06/02	WW-015301	400.00	0.24	0.03	0.0027	1.80	0.003	0.091	0.003	0.002
LA-000153	07/16/02	WW-015301		0.25	0.04	-0.0025	1.33	0.003	0.096	0.004	-0.002
LA-000153	07/18/02	WW-015301	100.00								
LA-000153	08/20/02	WW-015301		0.23	0.08	0.0038	2.01	-0.003	0.099	0.003	-0.002
LA-000153	08/22/02	WW-015301	6000.00								
LA-000153	09/05/02	WW-015301	6000.00	0.29	0.04	0.0031	-0.01	-0.003	0.098	-0.003	-0.002
LA-000153	10/24/02	WW-015301	5800.00	0.24	-0.01	0.0035	4.07	-0.003	0.095	-0.003	-0.002

Table E-4. (continued)
Wastewater Quality Data

		Sampling									
Permit	Sample	Location	mercury	selenium	sulfate	zinc					
No.	Date	(Station)	(ppm)	(ppm)	(ppm)	(ppm)					
permitno	smpldate	station	wwmercury	wwselen	wwsulfate	wwzinc					
LA-000153	11/29/01	WW-015301	-0.0002	-0.003	41	0.026					
LA-000153	12/11/01	WW-015301	-0.0002	-0.003	43.1	0.033					
LA-000153	12/13/01	WW-015301									
LA-000153	01/23/02	WW-015301	-0.0002	-0.003	39.3	0.019					
LA-000153	02/06/02	WW-015301									
LA-000153	02/07/02	WW-015301	-0.0002	0.002	45.3	0.059					
LA-000153	02/07/02	WW-015301	-0.0002	0.002	42.7	0.052					
LA-000153	03/13/02	WW-015301	-0.0002	0.001	34.3	0.053					
LA-000153	03/14/02	WW-015301									
LA-000153	04/09/02	WW-015301	-0.0002	0.001	34.5	0.031					
LA-000153	05/02/02	WW-015301	-0.0002	0.001	33.5	0.027					
LA-000153	06/06/02	WW-015301	-0.0002	0.001	32	0.019					
LA-000153	07/16/02	WW-015301	-0.0002	0.002	35.9	0.016					
LA-000153	07/18/02	WW-015301									
LA-000153	08/20/02	WW-015301	-0.0002	0.002	36	0.076					
LA-000153	08/22/02	WW-015301									
LA-000153	09/05/02	WW-015301	-0.0002	0.002	36.4	0.022					
LA-000153	10/24/02	WW-015301	-0.0002	0.002	35.4	0.032					

1. If a parameter was analyzed but not detected, put the method detection limit (MDL) preceeded by a minus (-) sign.. Contact your laboratory for the MDL if it is not known.
2. If a parameter was not analyzed, leave blank.
3. Make sure units for data entered are consistent with units specified in column headings.
4. Bacteria are plate counts; pH in standard units; sp cond in umhos/cm; gross alpha & beta in pCi/L.
5. Note also that alkalinity should be expressed as CaCO3.
6. For Date field, utilize a date cell.
7. All columns are formatted for appropriate decimal places - do not modify.
8. Do not change any protected cell. You may add parameter on right hand side of spreadsheet if needed.
9. You may hide columns that are not typically used.

Table E-5. Site Summary Worksheet from WLAP Data Entry for LA-153-1.XLS

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS For Reporting Year -> 2001-2002
WLAP Permit No.--> LA-000153-01
Software and Version no.:-----> MS Excel 97 SR-2

Permitted Site Summary

			(2)
		(1)	WW
	Report-	WW	Application
Permit	ing	Applied	Season
No.	Year	MGA	(days)
permitno	repyear	wwgen	wwgenday
LA-000153	2002	7.83	365

(1) Total WW applied in million gallons per annum (MGA).
(2) Length of wastewater application season.

1. There should only be one entry for each permit number on this spreadsheet.
2. Make sure units for data entered are consistent with units specified in column headings.
3. All columns are formatted for the appropriate decimal places - do not modify.
4. Do not change any protected cell.