Memorandum

Date: May 29, 2012

To: Erick Neher, Regional Administrator, DEQ-IFRO
Greg Eager, Engineering Manager, DEQ-IFRO

From: Tom Rackow, Staff Engineer, DEQ-IFRO

Re: Staff Analysis to review minor and major permit modification requests for the INL Materials and Fuels Complex Industrial Wastewater Reuse Permit WRU-I-0160-01 (formerly LA-000160-01).

1. **Purpose**
The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400.05, 58.01.17.700.02 and 58.01.17.700.03 for issuing wastewater reuse permit modifications. It briefly states the principal facts and significant questions considered, and provides a summary of the basis for the permit modifications. The analysis references applicable requirements and supporting materials as appropriate.

2. **Process Description**
A full analysis and review of the industrial waste system permitted under wastewater reuse permit LA-000160-01 is provided in the original staff analysis dated January 7, 2008 included with the draft permit issued May 21, 2008. A copy of the January 7, 2008 staff analysis is included for reference.

3. **Summary of Events**
Wastewater Reuse Permit LA-000160-01 was issued to the INL Materials and Fuels Complex (MFC) for discharge of industrial wastewater into the Industrial Waste Pond (IWP). The effective date of the permit is May 1, 2010 and expires on April 30, 2014. The permittee has requested 2 permit modifications:

   - In a letter dated February 23, 2012 the permittee (INL) requested a minor permit modification to change the Responsible Official and Facility Contact personnel listed in Section D of the permit, and to replace the map in Figure 2, Appendix 2 of the permit with a corrected version of the same map.

   - In a letter dated March 20, 2012 the permittee (INL) requested a major permit modification to increase the maximum hydraulic loading rate specified in Section F, Permit Limits and Conditions of the permit to accommodate the installation of new equipment that will discharge non-contact cooling water into the industrial waste system.

   In addition to the modifications requested by the permittee, the DEQ wastewater program office is requesting additional minor modifications throughout the permit to revise formatting issues, correct one typographical error, and to change the permit number to meet the program's new serial number naming convention for new wastewater reuse permits. The formatting changes are not presented for further review as they have no bearing on the permit limits or conditions. The new permit serial number and the typographical error in the Facility Monitoring Table (Ground Water monitoring) of Section G of the permit won't be discussed further in this staff analysis but are shown in underline-strikeout format in the draft permit for review.

4. Discussion

A discussion of the permittee's requested modifications is as follows:

Minor Modifications

The February 23, 2012 letter from the permittee requests the following changes:

- In Section D. Facility Information, remove the IWD Facility Manager David B. Lively and replace with

  Scott L. Lyman
  MFC Facility and Site Services Operation Manager
  Battelle Energy Alliance, LLC
  P.O. Box 1625, MS 6172
  Idaho Falls, ID 83415
  Tel: (208) 533-7438, Fax: (208) 533-7030
  Email: Scott.Lyman@inl.gov

- In Section D. Facility Information, remove the Responsible Official Dwayne E. Coburn and replace with

  Carlo D. Melbihess
  Facilities & Site Services director
  Battelle Energy Alliance, LLC
  P.O. Box 1625, MS 3406
  Idaho Falls, ID 83415
  Tel: (208) 526-9732, Fax: (208) 526-4451
  Email: Carlo.Melbihess@inl.gov

- In Section D. Facility Information, change the Mail Stop for Jo Anna Stenzel from MS 3404 to MS 3405.

- In Appendix 2, Replace Figure 2 with the Figure 2. MFC Facility Map included with the February 23, 2012 minor modification request. The replacement map
  i. Corrects the location of the Industrial Waste Pipeline,
  ii. Shows the section of Ditch A that has been replaced with a buried culvert,
  iii. Corrects the location of the storm water ditch next to the sampler, and
  iv. Includes corrections to the legend and locations of small sections of ditches and pipelines.

Major Modification

The March 20, 2012 major permit modification letter requests an increase in the maximum hydraulic loading rate in Section F. Permit Limits and Conditions, from 13 million gallons/year to 17 million gallons per year.

According to the permittee, the proposed increase will consist of up to 4 million gallons/year of non-hazardous, non-radiological, non-contact cooling water discharged from new equipment being installed in building MFC-794. A new water supply line with appropriate backflow prevention will be installed to supply the non-contact cooling water to the equipment at an approximate rate of 15 gpm. The equipment is expected to only run a few days per week for anticipated annual volume of 3.4 million gallons. Two floor drains and a drain line will be

installed to discharge the non-contact cooling water from the new equipment into the industrial waste system.

The source of the non-contact cooling water will be the facility's potable water supply wells. The cooling system is a single-pass system, and the equipment will not contain any anti-scaling agents or corrosion inhibitors. The only chemical addition to the cooling supply water is chlorination of the potable water supply for disinfection prior to distribution. The data presented in Table 1, below was provided by the permittee to DEQ via email on May 14, 2012. The data provides a comparison of the September 2011 Industrial Waste Pipeline effluent data to the September 2011 data from the potable well that supplies cooling water to the new equipment. Table 1 shows the additional non-contact cooling water will not contribute any additional suspended solids or other contaminants of concern into the industrial waste system.

Table 1. Water Quality of Effluent vs. Potable Water.

	Industrial Waste Pipeline Effluent	**Production/Potable Well EBR-II #2**
Sample Date	**9/7/11**	**9/29/11**
Nitrite + Nitrate as N, mg/L	1.97	1.89[b] 0.05[c] U[d]
Total Kjeldahl nitrogen, mg/L	0.323	NA[e]
Total nitrogen[f], mg/L	2.293	NC[g]
Total suspended solids, mg/L	4 U	NA
Total dissolved solids, mg/L	247	247
Chloride, mg/L	21.1	18.9
Fluoride, mg/L	0.608	NA
pH	8.41	8.11
Total phosphorus, mg/L	0.103	0.0134
Sulfate, mg/L	17.8	17.2
Arsenic, ug/L	3.0	1.6
Barium, ug/L	35.8	35.2
Cadmium, ug/L	1.0 U	0.25 U
Chromium, ug/L	2.5 U	2.5 U
Iron, ug/L	58.3	50 U
Lead, ug/L	0.25 U	0.54
Manganese, ug/L	2.5 U	2.5 U
Mercury, ug/L	0.20 U	0.2 U
Selenium, ug/L	0.62	0.63
Silver, ug/L	5.0 U	5 U
Sodium, ug/L	18800	16600
Zinc, ug/L	7.3	10.6

a. Sample was not filtered.
b. Sample result reported as nitrate as nitrogen.
c. Sample result reported as nitrite as nitrogen.
d. U flag indicates that the result was reported as below the instrument detection limit by the analytical laboratory.
e. NA indicates not analyzed.
f. Total nitrogen is the sum of nitrate/nitrite and total Kjeldahl nitrogen.
g. NC indicates not calculated.

As discussed in the January 7, 2008 staff analysis, the 3-acre Industrial Waste Pond has a design capacity of approximately 285 million gallons. The current wastewater reuse permit limits the maximum hydraulic loading to the pond to 13 million gallons/year which is 4.6% of the infiltration pond's capacity. Increasing the hydraulic loading to a maximum of 17 million gallons/year increases hydraulic loading to 6% of the lagoon's capacity. Because the additional non-contact cooling water originates from the facility's potable water supply wells, it will not contribute any additional suspended solids or other wastewater constituents of concern to the infiltration basin. Infiltration rates of the soil will not be harmed, and ground water quality impacts are not expected as a result of the additional discharge.

5. Recommendation

It is my recommendation that a permit modification be issued to accommodate both the minor and major permit modifications discussed above. The additional hydraulic loading consists of single-pass non-contact cooling water from the potable water system with no additional wastewater streams. The increased loading is still significantly less than the treatment capability of the infiltration basin and is not expected to cause any increased impact to human health or ground water quality. An underline-strikeout version of the modified permit is attached for review.