START

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

0038870

95-PCA-026

OCT 2 6 1994

Mr. David L. Lundstrom
Section Manager
200 Areas
Nuclear Waste Program
State of Washington
Department of Ecology
1315 West 4th Avenue
Kennewick, Washington 99336

Mr. Douglas R. Sherwood
Hanford Project Manager
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, Washington 99352

9413293.4368

Dear Messrs. Lundstrom and Sherwood:

TRANSMITTAL OF THE NOTICE OF DEFICIENCY RESPONSE TABLE FOR THE HANFORD FACILITY DANGEROUS WASTE PART B PERMIT APPLICATION, 242-A EVAPORATOR, REVISION 0 (TSD: T-2-6)

On June 28, 1991, the Hanford Facility Dangerous Waste Part B Permit Application (Part B), 242-A Evapoarator, Revision 0, was submitted to the State of Washington Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) in accordance with Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Milestone M-20-17. On June 29, 1994, a Notice of Deficiency (NOD) for the 242-A Evaporator Part B was received by the U.S. Department of Energy, Richland Operations Office (RL). Enclosed is a NOD response table which provides the responses to Ecology's comments. The NOD response table was prepared for submittal to Ecology and the EPA by October 26, 1994, to comply with the 120-day response requirement specified in the Tri-Party Agreement.

15822

37134

OCT 2 6 1994

Should you have any questions, please contact Mr. C. E. Clark, RL, on (509) 376-9333 or Mr. R. C. Bowman, Westinghouse Hanford Company, on (509) 376-4876.

Sincerely,

James E Rasmussen

for James D. Bauer, Program Manager
Office of Environmental Assurance,
Permits, and Policy
DOE Richland Operations Office

EAP:CEC

W T Dixon

William T. Dixon, Manager
Environmental Services
Westinghouse Hanford Company

Enclosure:
Hanford Facility Dangerous Waste
Permit Application,
242-A Evaporator,
Revision 0, Notice of
Deficiency Response Table

cc w/encl:
Admin. Records, TSD: T-2-6, H6-08
R. Bowman, WHC
D. Duncan, EPA
M. Jaraysi, Ecology
D. Nylander, Ecology
S. Price, WHC
A. Stone, Ecology

cc w/o encl:
B. Burke, CTUIR
W. Dixon, WHC
R. Jim, YIN
D. Powaukee, NPT

No.	Comment/Response	Ecology Concurrence

GENERAL COMMENTS:

There are a number of comments that are applicable throughout the complete permit application. These are:

1. It is the reviewer's understanding that the Part B Permit Application for the 242-A Evaporator will be combined with those for the 200 Area Liquid Effluent Retention Facility (LERF) and the 200 Area Effluent Treatment Facility (ETF), thereby combining three separate units into one complete system. The new document that will be produced by this compilation will require detailed review, as the issues that face each facility individually will substantially change when all three facilities are combined. Therefore, the following permit review is not as strenuous as would be typical for a permit that was expected to undergo less substantial revision. Topics that will be addressed in more detail once the facilities are combined are given only a cursory evaluation and a complete and detailed inspection of the new Part B permit application will be necessary once it is issued. There are points, however, where issues that need to be addressed in the combined permit are mentioned to provide an indication of what detail is needed. This type of comment, however, is meant as an indication of the level of detail that will be required throughout the new, combined Part B Permit application.

   DOE-RL/WHC Response: The revised document will be submitted to Ecology for review. Also, Ecology will have an opportunity to review the draft text during the NOD workshops.

2. It is the reviewer's understanding that not all sections of the present permit application will be enforceable. There are sections that will be superseded because of inconsistencies with the conditions of the Hanford Facility Wide Permit for the Treatment, Storage and Disposal of Dangerous Waste. Assuming this understanding is correct, Ecology and USDOE will have to discuss and determine which sections of the application will be "permit conditions" (i.e., enforceable), and which sections will be considered general information. Pending issuance of the above referenced Facility Wide permit, this deficiency may remain "open" if necessary. This issue is addressed at several points throughout the NOD comments to provide further information on the topics that need to be clarified. In general, however, this permit application is in variance at several points with the proposed Facility Wide permit and it is necessary to address potential conflicts at this point.

   DOE-RL/WHC Response: The application will be made consistent with the Hanford Facility RCRA Permit.

No.	Comment/Response	Ecology Concurrence

3. Throughout this permit application, there exists insufficient reference to the regulations along with the general comment that the criteria delineated in these citations will be fulfilled. An effort should be made to quote the regulations in the appropriate sections along with the commitment to fulfill the regulatory requirements within.

DOE-RL/WHC Response: The revised permit application documentation will cite applicable regulations.

4. The Part B Permit for the 242-A Evaporator, sections of which were reviewed for these NOD comments, is seriously dated. The reviewed version is dated June 6, 1991, and in the past three years, plans and objectives dealing with the cleanup of the Hanford Site have altered substantially. Therefore, a major requirement for the next revision of the Part B Permit application is to review all sections and update the information where necessary. Several NOD comments provide examples of information that has changed (See NODs 3,5,8, et al). These NODs, however, are not to be treated as the only areas where improvement is necessary, but solely as an indication of the type of update which is necessary.

DOE-RL/WHC Response: Refer to response to General Comment No. 1.

5. It is the reviewer's understanding that the 242-A Evaporator began operation in April 1994, and is either currently condensing waste or has just recently completed the first campaign. The Part B Permit needs to be updated to present the results from this and any subsequent campaign before the next revision is submitted for review. In addition, it is important to encompass as much detail as possible about future campaigns including the tanks that will be used as a source of material for condensation, the types of wastes expected in the process condensate, and any unusual variables that must be addressed for the specific wastes involved. It is also important to note how information gleaned from future campaigns will be reflected in later permit revisions. It would be appropriate to incorporate all pertinent operational information including a schedule of expected campaigns along with the downtime between and the procedures that will be followed at this time.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The Part B permit application documentation was drafted in 1990 and it is apparent that certain portions are out of date. Changes made to the 242-A Evaporator, based on the previous campaign 94-1 such as placing the ion exchange column on optional status, will be reflected in the revised permit application documentation. Sampling data were collected and will continue to be collected each campaign. Sample results from current or future campaigns will be added to permit application documentation only if the waste processed represents a new and different type than previously processed. General information has been included throughout the text and in response to several NOD comments by Ecology that will ensure sources of material to be processed, process condensate chemistry, and variables are addressed. Schedules, compliance data, and other information that is continuously revised or generated will continue to be communicated to Ecology as requested through the informational exchange systems that the program and Ecology have successfully established.

242-A Evaporator Dangerous Waste Permit Application

1. Foreword: Page i, line 2

"The radioactive portion of mixed waste is interpreted by the US Department of Energy to be regulated under the *Atomic Energy Act of 1954*."

It is the reviewer's understanding that the Hanford Facility Wide Draft Permit for the Treatment, Storage and Disposal of Dangerous Waste addresses this issue. It is the reviewer's preference that such statements be identified as interpretations and that all applicable parties' interpretations be included. If this preference is not agreeable to the applicable parties, it would be the reviewer's preference to delete such statements. Pending issuance of the above referenced permit, this definition may remain open. See general comment #2 on the first page of this document.

DOE-RL/WHC Response: DOE-RL/WHC contends that the FFACO and federal law must be followed. By federal law the DOE must retain jurisdiction over the source, special nuclear, and byproduct material components of mixed waste in accordance with the Atomic Energy Act (AEA). However, the DOE-RL intends to work with Ecology and the EPA, Region 10, in a cooperative manner in the development of any future regulatory programs that apply to radionuclides. This subject was evaluated previously and formally addressed in the negotiations to the FFACO. The resolution incorporated into the FFACO recognizes the distinction between hazardous waste subject to the RCRA and radioactive waste subject to the AEA.

No.	Comment/Response	Ecology Concurrence

2. Part A Form 1: 1st Page , line 2

"Name & Title: Lawrence, Michael J., Mgr."

Provide the name and phone number of the current Facility contact and any information in the Part A that needs to be updated.

DOE-RL/WHC Response: The Dangerous Waste Part A (Part A), Form 3, instructions do not require a Facility contact, telephone number, or management change as part of the submittal of this Part A, Form 3. However, the 242-A Evaporator Part A, Form 3, is scheduled to be updated to add the Dangerous Waste Number F039 (multisource leachate) as required by WAC 173-303-805. This revision of the Part A, Form 3, also will change the Manager of DOE-RL from 'Michael J. Lawrence' to 'John D. Wagoner.'

Chapter 2: FACILITY DESCRIPTION AND GENERAL PROVISIONS

3. 2.1.4 The 242-A Evaporator Description: Page 2-, lines 18-2

"Currently (1991), the 242-A Evaporator has been taken out of service for general maintenance and upgrade . . ."

This information needs to be updated to coincide with the current status of the evaporator that began operation earlier in the year (1994).

DOE-RL/WHC Response: The paragraph will be deleted. The permit application documentation should not attempt to provide operational status of the plant. Status has been and should continue to be provided through direct communication with Ecology.

4. 2.1.4.1 Process Buildings: Page 2-4, lines 12-16

"Figures 2-5 and 2-6 provide floor plans . . . Figure 2-7 provides building elevations."

Additional information needs to be provided in Figure 2-7 including height, length, and width measurements for all buildings and indication of ground level.

DOE-RL/WHC Response: Figures 2-5, 2-6, and 2-7 will be revised to show elevations or appropriate dimensions as required.

No.	Comment/Response	Ecology Concurrence

5. 2.1.4.1.10 Ion Exchange Column Room: Page 2-9, lines 1-10

"The ion exchange enclosure is a small area that holds the ion exchange column . . ."

This information needs to be updated, as it is the current understanding of the reviewer that the ion exchange column has been removed from the treatment train. The Part B permit application needs to be changed to reflect this revision of the process.

DOE-RL/WHC Response: A third paragraph will be added to this section to reflect that the ion exchange column is operable but currently offline. The option remains to place the ion exchange column online if the need to reduce the radionuclide content exists.

6. 2.3.1 Seismic Consideration: Page 2-12, line 16-19

"The 242-A Evaporator is located in Benton County, Washington, and is not . . ."

WAC 173-303-420 (3) (c) does not provide an exemption to seismic consideration for USDOE facilities and therefore needs to be addressed. Seismic considerations have been included within the Part B permit application for other treatment, storage, and disposal facilities within the Hanford Site near the 242-A Evaporator (the 200 Area Effluent Treatment Facility is an example). This section needs to be rewritten to reflect compliance with seismic regulations.

DOE-RL/WHC Response: Text will be revised to comply with seismic considerations.

7. 2.3.2.1 Demonstration of Compliance: Page 2-13, lines 1-15

"The 242-A Evaporator is not located within a 100-year floodplain. Therefore, no demonstration of compliance is required."

Flood plain compliance is required. Flood plain considerations have been included within the Part B permit application for other treatment, storage and disposal facilities within the Hanford Site near the 242-A Evaporator (the ETF, for example). This section needs to be rewritten to include flood compliance considerations.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The 242-A Evaporator text is identical to the 616 Nonradioactive Dangerous Waste Storage Facility text, which has been approved and entered into the Hanford Facility RCRA Permit. Therefore, the text will remain unchanged, as the 242-A Evaporator is not within a 100-year floodplain.

8. 2.5.1.4 Process Condensate: Pages 2-17, lines 7-9

"The process condensate will be stored at the LERF until an appropriate effluent treatment system becomes operational. The waste will then be disposed of."

This section needs to be rewritten to increase clarity. Currently, waste from the 242-A Evaporator will be stored in LERF until the 200 Area Effluent Treatment Facility (ETF) becomes operational. At that point further discharge to the LERF basins will be discontinued. This may change if current efforts underway to permit continued use of the LERF basins after the ETF becomes operational are successful. In any case, the permit needs to be rewritten to reflect the situation before the next version is issued.

DOE-RL/WHC Response: Text will be revised to reflect the situation at the time of the revision.

9. 2.5.1.4 Process Condensate: Pages 2-17, lines 9-17

"A portion of the ion exchange discharge stream is routed through a radiation monitoring and diversion system (Chapter 4.0) and returned to the process condensate tank. High radiation readings, which provide an early warning of constituents in the process condensate exceeding limits for discharge to the LERF . . ."

It is the reviewer's understanding that the ion exchange system has been removed from the process stream. This section needs to be updated to indicate how the removal of the ion exchange system affects the above mentioned safety measures.

DOE-RL/WHC Response: The text will be revised to reflect that currently the ion exchange column is offline; however, it is still optional as described in the reply to NOD comment 5. The safety measures mentioned in this paragraph are not compromised because of the low radionuclide content of the waste processed. The monitoring and diversion system is still online; candidate feed tank samples are evaluated before processing and the column is still available if needed.

No.	Comment/Response	Ecology Concurrence

10. 2.5.8 Measures to Prevent the Use of Processes That Do Not Treat, Detoxify, Recycle, Reclaim, and Recover Waste Material to the Extent Economically Feasible
Page 2-23, lines 19-23

"Recent additions and future planned additions of the monitoring and control . . ."

It is the reviewer's understanding that future updates have been restricted. Therefore, this section needs to be updated to reflect current conditions.

DOE-RL/WHC Response: Text will be revised as follows.

"Upgrades completed before the 1994 startup include the addition of a monitor and control system (MCS), larger recirculation and slurry pumps, replacement of critical control valves and pumps, insulation installed on the main evaporator vessel (CA1) and recirculation piping, and an increase in the amount of process monitoring instrumentation. These upgrades enhance the efficiency and operation of the process used to treat and recover waste material."

Future upgrades will be implemented and the text revised as necessary.

11. 2.7.1 Notification: Page 2-25, lines 49-50

"In case of any release of dangerous waste, the building emergency direction immediately notifies Environment Protection."

This section is unclear on what groups are involved in notification. For example, the above quote referring to Environment Protection does not make clear if it is a regulatory agency or an office within Westinghouse/USDOE. The section needs to be updated and expanded to improve clarity.

DOE-RL/WHC Response: The permit application documentation will be made consistent with the Hanford Facility RCRA Permit.

No.	Comment/Response	Ecology Concurrence

12. 2.7.2.3 Restoration of Impacted Area: Page 2-29, lines 42-46

"Because of the remote location of the 242-A Evaporator (near the center of the Hanford Site), spills or discharges occurring on property that . . ."

WAC 173-303-806 (C) requires that methods leading to the restoration of impacted areas be described. The federal government is not exempt from these regulations. This section therefore needs to be updated and expanded to fulfill the requirements of 173-303-806 (C).

DOE-RL/WHC Response: Section 173-303-806(4)(a)(xxii)(C) applies to incineration facilities and is not applicable to the 242-A Evaporator. Text will be revised as follows: "Restoration of property outside the 242-A Evaporator that is impacted by releases or discharges of dangerous waste, a fire, or an explosion will be accomplished in accordance with the applicable provisions of WAC 173-303-600.".

13. 2.8.1 Procedures for Receiving Shipments: Page 2-30, line 9

- "Process condensate transfer from the 242-A Evaporator to the LERF"

Under current conditions, this statement is valid only until the ETF becomes operational, at which point the LERF basins can no longer be used. The possibility of extending the usage of the LERF basins is currently under discussion. The Part B Permit application needs to be updated to reflect the conditions at the time the permit is reissued.

DOE-RL/WHC Response: Refer to response to Comment No. 8.

14. 2.8.3 Provisions for Nonacceptance of Shipment Page 2-32 and 2-33, lines 47-49 and lines 1-4, respectively

"Transfers into the feed tank, 241-AW-102, are preapproved and designated . . ."

Additional information needs to be provided within this section concerning the conditions that exist which would prevent a transfer into the feed tank as well as what designation process is used. It is insufficient to state that a transfer is "preapproved and designated" without including information on what exactly is entailed within those processes.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: This section will be revised to clarify the conditions for acceptance of waste into the 241-AW-102 feed tank. Specific sampling of candidate feed tanks is performed to determine if the waste is acceptable for transfer to the 241-AW-102 feed tank in preparation for processing. This section will reference the waste analysis plan, which provides the waste acceptability parameters for the candidate feed tanks. No designation is performed as the waste already is designated by the generating units before transfer to the Double-Shell Tank (DST) System.

Chapter 3.0: WASTE CHARACTERISTICS

15. 3.1.1 Waste Generators: Page 3-2, lines 9-10

"Waste feed to the 242-A Evaporator is generated by various Hanford Site operating plants . . ."

This section needs to be updated to reflect current information concerning potential waste streams. It is the reviewer's understanding that several additional waste sources have been identified and need to be reflected within the Part B Permit application. An example of an additional source not reflected in this application is PUREX deactivation flush solutions.

DOE-RL/WHC Response: Section 3.1.1 "Waste Generators" will be updated. The following additional waste streams will be added to the existing list under Section 3.1.1:

- 100 Area storage basin stabilization and cleanout waste
- Waste Sampling and Characterization Facility (WSCF) waste
- Mixed Waste Landfill Trench 31 leachate
- Terminal cleanout waste for all TSD units (which includes PUREX deactivation flush solutions)
- Dilution waste from single-shell tank solids and DST retrieval activities
- Aging waste supernate from DST in-tank washing activities

No.	Comment/Response	Ecology Concurrence

16. 3.1.3.1 The 242-A Evaporator Waste Feed Analysis Data: Page 3-4, lines 40-44

"Waste analysis data for the 242-A Evaporator waste feed from the most recent 4 years of operation are summarized in Table 3-2. The source data . . ."

Additional information needs to be provided in the section that explains exactly what information is contained in Table 3-2. Examples of points that are unclear are what is exactly meant by N (number of samples) and why N is zero for several species (barium, cadmium, mercury, nickel and total organic halides). In addition, the whole table can be updated using information from current campaigns.

DOE-RL/WHC Response: As part of the revision of the permit application documentation, a reassessment of Section 3.1.3.1 and/or Table 3-2 will be performed and explanations will be included. All analytes that were detected in the process condensate but not in the feed or slurry were given a value of "-" and an N = 0 in the feed and slurry tables. The assumption is that if the analyte is present in the process condensate, it must have been present in the feed and slurry as well. However, the high salt content of the feed and slurry often makes detection of low levels of analytes, such as barium and nickel, impossible.

The strategy for sample data in the permit application documentation is to include data that are representative of all the types of waste processed at the 242-A Evaporator. Sample results from current or future campaigns will be added to permit application documentation only if the waste processed represents a new and different type than previously processed. The present campaign is a dilute waste similar to what has been seen in past campaigns and will not be included. Sample data from each campaign will be made available to Ecology for review.

17. 3.1.10.1.1 Slurry Product: Page 3-11, lines 30-34

"Table 3-6 presents representative constituent analysis for slurry product. The table presents . . ."

The data in this table and the Appendix 3A upon which it is based need to be updated to reflect information from recent campaigns run at the 242-A Evaporator.

DOE-RL/WHC Response: Refer to response to Comment No. 16.

No.	Comment/Response	Ecology Concurrence

18. 3.1.10.1.2 Process Condensate: Page 3-13, lines 2-5

"If the process condensate stream is designated using the data from Table 3-7 . . ."

The data in this table needs to be updated to reflect information from recent campaigns run at the 242-A Evaporator.

DOE-RL/WHC Response: Refer to response to Comment No. 16.

19. 3.1.10.1.5 Vessel Ventilation Exhaust Air: Page 3-14, lines 7-9

"An organic sampling system designed to be equivalent to the volatile organic sampling train method (EPA 1986) currently is being added to the vessel ventilation system."

What is the current status of this upgrade? In addition, provide information on what species will be analyzed, the levels detected, and the particular method used to obtain these results.

DOE-RL/WHC Response: Subsequent to the drafting of this permit application documentation, the decision was made to discontinue plans to perform RCRA sampling of the vessel vent for organic species because such sampling was not cost effective given the small quantities of organics present. Instead, as allowed in 40 CFR 264.1032, equilibrium modeling calculations are used to determine organic emissions. To ensure the limits of 1.4 kilograms (3 pounds) per hour and 2,800 kilograms (3.1 tons) per year are not exceeded, the levels of organics in the waste feed are limited to levels given in Section 3.3 and the waste analysis plan. The text will be revised to reflect this new strategy.

20. 3.2 242-A Evaporator Operation: Page 3-15, lines 8-11

"The 242-A Evaporator is used to reduce the volume . . . that will require treatment and disposal at the Grout Treatment Facility (DOE-RL 1989)."

It is the reviewer's understanding that the Grout Treatment Project has been discontinued and that this section is no longer applicable. Update the information to reflect the current project repository of the wastes concentrated at the evaporator.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The text will be revised to delete reference to the Grout Treatment Facility and to state that the concentrated waste will be stored in DSTs until further treatment options are available.

21. 3.2.2 Modeling the 242-A Evaporator Operation: Pages 3-17 through 3-23

"This section discusses the models used for determining the organic and inorganic separation capabilities of the 242-A Evaporator. Included are . . ."

The section deals with predictive models that approximate the various outputs from the evaporator. This information needs to be compared with the results from the current and any subsequent evaporator campaigns to determine both the validation of the model itself and the usefulness of the information provided.

DOE-RL/WHC Response: Feed, slurry, vessel vent, and process condensate sample analysis from future campaigns will be used to confirm the models are adequate for their intended uses. However, sample results from the most recent campaign 94-1 indicate that the constituent levels in the vessel vent and process condensate are so low that these do not provide adequate information for confirming the model. Because the organic levels in the upcoming 94-2 campaign also are low, no vessel vent sampling for comparison to the model will be performed. An adequate confirmation of the model may have to wait until waste feed with higher levels of constituents are processed. Such confirmatory analysis will be made available to Ecology.

22. 3.2.3.1.1 Model Application: Page 3-20, lines 17-39

"Typically, a continuous stirred tank reactor model is applicable to systems in which the fluid phase is not particularly viscous and the reactor is well mixed (Hill 1977)."

The above paragraph provides considerable information on why the model is applicable to the evaporator system because the matrix is well mixed. However, the viscosity problem is barely addressed. Information needs to be provided on viscosities of the waste material being condensed and how these viscosities affect the use of the model. In addition, the issue of the increase in viscosity with time as the waste is condensed and the effect this increased viscosity has upon the validity of model needs to be presented and discussed.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The text will be revised to clarify the significance of viscosity in the mixing and concentration process. The 242-A Evaporator modeling assumes the feed stream mixes rapidly with the waste volume in the recirculation loop so that a 'continuous stirred tank reactor' can be used for the calculations. This allows the calculations to assume the vapor is in equilibrium with the slurry in the evaporator bottoms. Viscosity affects the ability of the waste to mix properly. The reynolds number, used as a measure of the mixing ability (turbulence), is proportional to the velocity of the waste through the recirculation loop and inversely proportional to the viscosity of the solution. The higher the reynolds number, the better the mixing. The greater the viscosity, the lower the reynolds number and the lower the turbulence. In general, reynolds numbers above 2,100 indicate adequate mixing. The viscosity of the most concentrated slurry typically ranges between 20 and 40 cP. However, the velocity of the solution through the recirculation loop is very high because of the volumetric flow rate of 52,996 liters (14,000 gallons) per minute. This results in a very high reynolds number (250,000 is given in the text) and excellent mixing.

23. 3.3 Waste Analysis Plan Waste Feed: Page 3-27, lines 20-21

"This section presents the waste analysis plan . . ."

This section needs to be updated to include reference to the Data Quality Objective (DQO) process currently being conducted along with an explanation of the DQO process and the objects of the various steps.

DOE-RL/WHC Response: The DQO document will be referenced and the waste analysis plan in Appendix 3G will be revised to include the results of the DQO.

24. 3.3.1 Parameters and Rationale: Page 3-27, lines 49-50

"Further detail on the specific analyses to be performed is provided in Appendix 3G, Section 5.1.2."

Appendix 3G was not available for review. In the next Part B Permit application, include the information designated for Appendix 3G. Review and comments will be provided at that time.

DOE-RL/WHC Response: Appendix 3G was submitted to Ecology with the permit application documentation and was reviewed by previous Ecology unit managers. However, a revised waste analysis plan will be included in the next revision. Also the waste analysis plan will be available to Ecology for review during the NOD workshops.

No.	Comment/Response	Ecology Concurrence

25. Table 3-9 Constituent Concentrations for the 242-A Evaporator Used Raw Water Effluent Streams: Page T3-9

A number of concentrations are listed in this table as BDL (Below Detection Limit). This listing needs to be changed to reflect the detection limit preceded by a less than sign (<) to denote below detection limit.

DOE-RL/WHC Response: The table will be updated with the proper detection limits and the 'less than' sign. This table shows that the used raw water (cooling water) is not a dangerous waste. Sampling and analysis of this nondangerous waste will not be included in the waste analysis plan. Sample analysis plans have been developed for the cooling water (WHC-SD-WM-EV-078) and steam condensate (WHC-SD-WM-EV-079) per the requirements of the Tri-Party Agreement.

26. Table 3-12 The Land Disposal Restriction Treatment Standards for F003 through F005 Solvent Contaminated Waste: Page T3-9

This table contains a column of "LDR treatment standard for nonwaste water (mg/L)," which needs to be updated to reflect the current LDR limits.

DOE-RL/WHC Response: This table will be deleted. These nonwaste water treatment standards were included because the slurry needed to meet these standards for disposal at the Grout Treatment Facility. Grouting of the waste is no longer planned and regulatory compliant LDR treatment standards and methods will be resolved before the dispositioning of DST waste.

Chapter 4.0: PROCESS INFORMATION

27. 4.0 Process Information: Page 4-3, lines 2-3

"Noncondensable vapors are drawn through a series of filters and vented to the atmosphere."

Additional information needs to be provided on the type and relative quantity of "noncondensable vapors" that are discharged from the facility. If this information is available in documents for other regulatory agencies such as the State of Washington's Department of Health, then a reference needs to be provided along with a general summary of the information.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The text will be revised to briefly describe the sources of noncondensible vapors and to give approximate air flow rates. The noncondensible air flow is routinely around 19.8 ± 2.8 cubic meters (700 ± 100 cubic feet) per minute, and consists of the following:

- Air drawn in from filter F-C-2 used to control vacuum in the evaporator
- Air drawn in from filter F-C-7 used to optimize air flow for the exhaust fan
- Compressed air used to continuously purge the pressure instrument sensing lines
- Air in-leakage (because the system is under vacuum)
- Trace process vapors such as ammonia, volatile organics, and water vapor.

Any reference to other permits will be included in Chapter 13.0.

28. 4.0 Process Information: Page 4-3, lines 8-13

"Condensed vapors that contain the volatile organic constituents . . . are passed through an ion exchange column . . ."

This information needs to be updated as it is the reviewer's understanding that the ion exchange column has been removed from the process.

DOE-RL/WHC Response: The text will be revised to describe the current status of the ion exchange column as described in the response to NOD Comment No. 5.

29. 4.0 Process Information: Page 4-3, lines 33-35

"During standby, the evaporator is monitored to detect changes in radiation levels or process variables . . ."

Additional information needs to be provided on how this monitoring process is effected. This information should include the parameters monitored and the permissible ranges for all the variables involved.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: Text will be revised to reflect the following: After a campaign is completed, the main evaporator loop is emptied and flushed with water. Holdup of waste is mainly in the process condensate collection tank (TK-C-100), which typically contains 26,498 to 30,283 liters (7,000 to 8,000 gallons) of condensate. Parameters monitored during this time and the method of monitoring are as follows.

Plant Air System - Power operator rounds are used to monitor cooling water temperature, pressure, inlet and outlet air temperatures, oil pressure, air receiver pressure, dew point, and air dryer tower temperatures. A loss of process air cannot cause a release of waste to the environment.

Area Radiation Monitors - Area radiation monitors are located in various rooms and are equipped with local and remote alarms (annunciated at the MCS).

HVAC System - Power operator rounds are used to monitor room differential pressures, filter differential pressures, steam pressure, and air flow rates. Building exhaust is monitored continuously for radionuclide emission by a stack monitoring system that relays critical information to the MCS (refer to Section 2.5.2.2 for system description and interlock action).

Tank/Sump Levels - The Operator monitors level trends on TK-C-100, C-A-1, and the pump room sump. If the level trends show an increase or decrease in tank/sump levels, the operator takes action to correct the problem. During a shutdown condition, the C-A-1 vessel and recirculation loop are empty; therefore, a change in C-A-1 level or the pump room sump level would be extremely unlikely.

30. 4.2.2.1 Waste Feed System: Page 4-5, line 26

"The feed pipeline is equipped with leak detection systems."

Additional information needs to be provided on the leak detection systems. This information should include details on how a leak is detected, along with location of the detectors and what the final any leaked material.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The text will be revised to reflect the following: The feed pipeline is sloped towards the feed tank (TK-241-AW-102). A failure of the primary containment piping would result in waste being transferred through the encasement to the feed pit (242-AW-02E), which in turn drains back into the feed tank. A conductivity probe is located in the pipe encasement before the feed pit. On detection of a leak, interlock action is initiated that shuts down the associated feed pump.

31. 4.2.2.1 Waste Feed System: Page 4-5, line 33

"A sample can be taken from the waste feed when needed."

Additional information needs to be provided on exactly what the words "when needed" means. This information should include the conditions that determine when a sample is required along with the species monitored. Lastly, it is important to include details on how the process is altered based upon this information.

DOE-RL/WHC Response: Text will be revised to reflect the following: Feed stream samples are taken when additional process information is desired and the data are used for process control purposes. Although feed is characterized initially before processing in the evaporator, these intermediate feed samples are taken at various times during an evaporator campaign. These feed samples are used to help monitor the conditions of the evaporator process and to evaluate that analytes in the stream are at expected concentrations. Feed stream characteristics such as specific gravity, percent solids, pH, anion concentration, and radionuclide concentration are monitored. Process parameters such as slurry and feed flowrate, vacuum, reboiler steam flow, and in-tank feed mixing may be adjusted based on feed sample data.

32. 4.2.2.3 Slurry System: Page 4-13, lines 12-13

"The slurry system removes treated waste from the recirculation loop when specified process parameters are met."

Additional information needs to be provided on the process parameters mentioned in the above quote. Important details include the species evaluated and the levels that define any actions.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: Text will be revised to reflect the following: "The slurry system transfers concentrated waste from the evaporator recirculation loop to the designated slurry tank. The rate of slurry transfer is the primary means of controlling waste concentration or specific gravity in the evaporation process. The slurry system typically operates in a continuous mode as a portion of the process liquid is withdrawn from the recirculation loop upstream of the waste feed addition connection and pumped to the slurry tank."

33. 4.2.2.4.1 Primary Condenser: Page 4-16, lines 28-29

"Condensed vapors drain through a 20-inch (0.51-meter) hot well . . ."

No definition of the term "hot well" is provided. Throughout this Part B Permit application terms such as hot well are used without a definition that would allow one to understand both the function and purpose of the items involved. It is recommended that a glossary be constructed and technical terms throughout the document be defined within.

DOE-RL/WHC Response: The determination of which technical terms should be included in the glossary is subjective. Therefore, a glossary will not be included in the document. For information, the hot well is the lowest point on the E-C-1 condenser and serves as the transition from the condenser to the 10.2-centimeter (4-inch) drain pipe.

34. 4.2.2.4.1 Primary Condenser: Page 4-16, lines 36-38

"Temperature and pressure of the vapors discharged . . . are closely monitored to ensure that these remain within operating limits."

What are the "operating limits" described in the above quote? This information should include the variables being monitored and the levels of these variables that precipitate a response.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The variables being monitored with respect to the referenced statement are described within the applicable paragraph (lines 39-44). With the exception of pressure indicator PI-EC1-5 (equipped with a 100 pounds per square inch gauge high alarm), the other indicators listed are not monitored closely. The purpose of the remaining indicators listed is to allow condenser heat transfer efficiencies to be calculated; therefore, no alarms are associated with these indicators.

The operating variables are to measure the efficiency of the primary condenser and to ensure excessive water pressures, which could damage the condenser or cooling water lines, are not reached. These variables are measured to maintain process equipment and for worker protection and will not be included when the permit application is revised.

35. 4.2.2.4.1 Primary Condenser: Page 4-16, lines 45-46

"This monitor will shut off valve HV-EC1-2 . . ."

Under what conditions and to what purpose does this monitor take effect? This type of information is lacking throughout Chapter 4, which needs to be rewritten to make sure that when such statements are made, the appropriate information is provided.

DOE-RL/WHC Response: The text will be revised to reflect that this is a flowmeter and control system that measures the cooling water flow rate and controls valve HV-EC1-2, as necessary, to maintain cooling water flow. Cooling water flowrate is in turn controlled by temperature instrumentation that monitors the process condensate temperature. The process condensate is controlled to ensure the temperature does not exceed 62 °C (145 °F).

Limits on process variables such as temperature and pressure are established to maintain optimum operating conditions, protect equipment from damage that could result in downtime, protect workers from injury, and prevent releases of radioactive and hazardous materials. Only process variables related to the prevention of releases of dangerous waste will be specified in the permit application documentation. Limits established for equipment protection, worker safety, nuclear safety, etc., are required and documented elsewhere.

No.	Comment/Response	Ecology Concurrence

36. 4.2.2.4.3 Aftercondenser: Page 4-18, lines 16-17

"The tubes are arranged with a 0.937 inch (0.024) pitch."

This sentence is unclear and needs to be rewritten to clarify exactly what is meant by the information provided.

DOE-RL/WHC Response: The pitch reference will be deleted. For information, the pitch of a heat exchanger is the center to center distance between the tubes. Based on a 1.9 centimeter (0.75 inch) tube diameter and a 2.38 centimeter (0.9375 inch) pitch, the distance between two adjacent tube walls is .48 centimeter (3/16 inch).

37. 4.2.2.4.3 Aftercondenser: Page 4-18, lines 22-24

"Used raw water flow . . . is controlled to achieve the desired temperatures . . ."

This sentence needs to be expanded to provide information on what are the "desired temperatures" and what actions are taken to assure that these correct temperatures are maintained.

DOE-RL/WHC Response: Text will be revised as follows:

"Used raw water flow through the inter and aftercondenser is controlled using flow controller FIC-EC3-1 and flow control valve FV-EC3-1. Sufficient flow is maintained through both inter and aftercondensers to ensure the condensate tank (TK-C100) temperature remains below approximately 62.8 °C (145 °F)."

38. 4.2.2.5.1 Condensate Collection Tank: Page 4-19, lines 36-37

"An array of monitoring devices are used to continuously detect problems . . ."

This sentence must be expanded to include additional information on what "problems" can be expected and how the list of devices that follows addresses the potential problems.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: When the text is revised, only instrumentation to measure the process condensate temperature and the specific gravity will be included. The temperature must be limited to reduce organic emissions out the vessel vent system. The modeling in the permit application documentation assumes a maximum temperature of 75 °C (167 °F) but the temperature is maintained not to exceed 62.8 °C (145 °F). The specific gravity must be monitored so that no organic phase is transferred to the LERF which could potentially damage the liner.

Tank TK-C-100 is monitored for level, temperature, and specific gravity by indicators WFIC-C100, TI-C100-1, LI-C100-1, and LI-C100-2, respectively. Using WFIC-C100, tank level is maintained at approximately 50 percent. Indicator TI-C100-1 is used to ensure the condensate temperature does not exceed 62.8 °C (145 °F). If process condensate temperature exceeds 62.8 °C (145 °F), raw water flow through the condensers is increased to provide additional cooling. Indicators LI-C100-1 and LI-C100-2 are used to monitor for a potential organic layer formation within TK-C-100. If an organic layer is detected, the tank is overflowed to the feed tank (TK-241-AW-102) for reprocessing.

39. 4.2.2.5.4 Ion Exchange Columns: Pages 4-20 and 4-21, lines 46-52 and 1-32, respectively

"Process condensate flows from the primary condensate filter . . ."

It is the reviewer's understanding that the ion exchange column has been removed from the process stream. Therefore, this section needs to be removed. It would be advantageous if the ion exchange information is included in a section that deals with processes that no longer exist, as the ion exchange facilities will have to be addressed at some point in the future when the 242-A Evaporator is closed according to the regulatory requirements stated in 173-303-610.

DOE-RL/WHC Response: Text will be revised as necessary to reflect the current operational status of the ion exchange column as described in the response to NOD Comment No. 5. The disposition of the ion exchange column is discussed in Chapter 11.0, Section 11.1.6.

No.	Comment/Response	Ecology Concurrence

40. 4.2.2.5.5 Radiation Monitoring and Sampling: Page 4-21, lines 47-48

"The system will alarm if radiation levels exceed the established threshold."

This sentence needs to be rewritten to include information directly addressing the "established threshold." Information needs to be included which defines these thresholds and what dangers exist if the thresholds are exceeded.

DOE-RL/WHC Response: The radiation monitoring system is discussed for information only because it is used to monitor and divert the process condensate in case of process upset. The setpoint is set to ensure the radiation levels will not exceed 5,000 X derived concentration guidelines in the process condensate. Text will be revised as follows:

"The system alarms and a hardwired interlock 5 immediately divert the process condensate effluent stream if excess radiation is detected. The interlock 5 actuation point is set in terms of the readily detectable gamma signature of cesium 137 and its ratio with respect to other radionuclides to conservatively meet LERF discharge limits. Interlock 5 performs the following actions:" The actions are contained in the following sections of the permit.

41. 4.2.2.5.6 Seal Pot: Page 4-18, lines 45-47

"A seal pot collects the drainage before discharge into the condensate collection tank."

The previous page of this document addresses radiation monitoring and sampling, and it is stated "a portion of the process condensate stream is diverted into the radiation monitoring and sampling enclosures." In this section, however, it states that an additional source of contamination is sent to the condensate collection tank and no information is included to demonstrate that this additional source is also sampled. If it is not sampled, the effect this source has upon the overall chemical quality of the material within the collection tank needs to be addressed. In addition, it is necessary to indicate any other streams into the collection tank that are not included in the process condensate sampling routine.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The seal pot collects minute quantities of condensed vapor draining from the vessel vent system. This drainage would be trace vapor that did not condense in the condensers but in ventilation piping downstream. The purpose of the drain is to ensure moisture will not enter the ventilation HEPA filters, potentially damaging the filters. Because no additional chemicals are added to the system in the vessel vent, the condensed vapor entering the seal pot would have the same chemical makeup as the process condensate. Thus, no additional sampling is necessary.

42. 4.2.3.2.1 Flow Measurement Tank: Page 4-30, lines 1-3

"The flow quantity of the steam condensate from . . . some 242-A building drains . . ."

This section needs to be expanded to include information on exactly which drains are involved, their source, and the potential contaminants from these drains.

DOE-RL/WHC Response: Text will be revised to reflect the following: In addition to the steam condensate collected in the weir (TK-C-103), the following drain lines are routed to the weir (drain line source also is given):

Drain Line:	Source:
1.3 centimeter (1/2 inch) DR-M31	3.8 centimeter (1 1/2 inch) FRW-653-M9 filter catch pan
1.3 centimeter (1/2 inch) FRW-667-M31	PCV-CA1-1/2
1.3 centimeter (1/2 inch) DR-M33	P-105 catch pan
2.5 centimeter (1 inch) DR-M5	PSV-EC2/EC3-1
2.5 centimeter (1 inch) DR-405-M2	Capped
1.3 centimeter (1/2 inch)-RW-DRAIN-M5	SC sample cooler

No.	Comment/Response	Ecology Concurrence

All sources are either raw water or filtered raw water only (uncontaminated). The following two drain lines are no longer in use:

- 5.08 centimeter (2 inch) EL-901-M42 vacuum breaker that is on the eluant system. This vacuum breaker will not provide a source because the eluant system is no longer in use (refer to Comment No. 49).
- 3.8 centimeter (1 1/2 inch) DR-352-M42 from P-AS-1 that no longer provides a source. The air sampling system vacuum pump (P-AS-1), had a water seal in the past. The system has been replaced by a model without the water seal.

43. 4.2.3.2.1 Flow Measurement Tank: Page 4-30, lines 18-20

"If excess radiation levels are detected . . ."

Information needs to be included on the type of analyses involved and the levels that precipitate a response.

DOE-RL/WHC Response: The radiation limit is based on best management practices for implementing U.S. Department of Energy Order 5400.5 and will not be included in the revised permit application documentation. The radiation level is measured by gamma radiation detector RE-EA1-1. The setpoint for the radiation detector alarm is routinely set at 80 counts per second but is adjusted depending on background radiation levels. When the alarm engages, the steam condensate automatically diverts to the feed tank. The steam condensate is not a dangerous waste.

44. 4.2.3.2.2 Radiation Monitor and Sampling System: Page 4-30, lines 35-37

"If either radiation monitor detects radiation above normal background levels, . . ."

Information should be included either defining the exact background levels or a reference must be made directing the reader where the information can be found.

No.	Comment/Response	Ecology Concurrence

DOE-RL/WHC Response: The radiation level is measured by gamma radiation detector RE-RC1-1 and by taking a sample from composite sampler RC1. The setpoint for the radiation detector alarm is set routinely at 80 counts per second but is adjusted depending on background radiation levels. When the alarm engages, the steam condensate automatically diverts to the feed tank. The composite sample is taken when the discharge basin is filled. The analytical limits are: total beta < 2.0 times 10^{-2} microcuries per liter and total alpha < 6.0 times 10^{-5} microcuries per liter. If the results exceed these limits, the basin will not be discharged. Resampling or recycling of the basin will be performed. The steam condensate is not a dangerous waste. These radionuclide limits are based on best management practices for implementing U.S. Department of Energy Order 5400.5 and will not be included in the revised permit application documentation.

45. 4.2.3.2.3 Steam Condensate Basins: Page 4-31, lines 34-36

"The three steam condensate collection basins each have . . . 2 feet (0.62 meters) of freeboard."

This section needs to include a definition for the term "freeboard" or place it in a glossary along with an appropriate definition.

DOE-RL/WHC Response: The text will be revised to reflect the definition of "freeboard", which is the elevational difference between the liquid level and the top of the basin.

46. 4.2.4.1.2 Strainers: Page 4-33, lines 29-30

"The strainer screens are fabricated of 20 mesh monel."

Either a definition needs to be provided for the term "monel" or it should be included in a glossary along with an appropriate definition.

DOE-RL/WHC Response: Text will be deleted. For information, monel is an alloy commonly used for strainer screens where high corrosion resistance is necessary. The chemical composition consists of 30 percent nickel and 70 percent copper.

No.	Comment/Response	Ecology Concurrence

47. 4.2.4.1.2 Strainers: Page 4-33, lines 38-40

"The valves are operated automatically . . . above preset limits."

It is necessary to include information on the variables being monitored and the levels of each variable that trigger a response.

DOE-RL/WHC Response: This is a process equipment concern and will not be included in the revision of the permit application documentation. The valves are set to open automatically when the differential pressure between the inlet and outlet of the strainer exceeds a value that indicates possible plugging. The flush solution drains to a collection sump in the 242-A-81 Building, which in turn overflows to the 30.5 centimeter (12 inch) drain line to the B Pond System. The operation of the strainer flush system is to ensure the strainers do not plug.

48. 4.2.5.1 Decontamination System: Page 4-37, lines 29-31

"The decontamination cycles are followed by water washes . . ."

The reviewer was unable to determine the final destination of both the decontamination and water washes. This information needs to be included in the next permit revision.

DOE-RL/WHC Response: Text will be revised to reflect the following: The destination of both the decontamination and water washes is the DST TK-241-AW-102 (evaporator feed tank).

49. 4.2.5.2 Effluent System: Page 4-39, lines 28-30

"The eluant pump . . . pump eluant from the eluant tank . . ."

The reviewer was unable to determine the chemical composition of the "eluant" mentioned in the above quote. This information needs to be included in the next permit revision.

DOE-RL/WHC Response: Text will be revised to reflect the following: In the past, the ion exchange eluant tank (TK-E-101) was used for the makeup and storage of sodium nitrate ($NaNO_3$). In 1987, the ion exchange column media was changed to clinoptilolite, which can be regenerated adequately with water flushes only. Consequently, there are no current plans to makeup the described eluant solution in TK-E-101 to flush the ion exchange column.

No.	Comment/Response	Ecology Concurrence

50. 4.2.5.6 Condenser Corrosion Inhibitor System: Page 4-42 lines 37-38

"The corrosion inhibitor tank, TK-C-500, holds 3 gallons (11.4 liters) of corrosion inhibitor liquid."

The reviewer was unable to determine the chemical composition of the "corrosion inhibitor liquid" mentioned in the above quote. This information needs to be included in the next permit revision.

DOE-RL/WHC Response: Text will be revised to reflect the following: There currently are no plans to use the corrosion inhibitor system. Previous trial uses of the system indicated little benefit. Prior failures of the primary condenser were due to raw water induced internal erosion of the tubes, not external corrosion. Currently, a "corrosion inhibiting liquid" is not identified for use in this system.

51. 4.2.6.3.4 Air Sampling and Monitoring System: Page 4-49, lines 48-49

"An air sampling pump, P-AS-1, draws air through the room radiation monitors, which alarm if radiation levels exceed preset limits."

The reviewer was unable to determine either the variables monitored or the "preset limits" mentioned in the above quote. This information needs to be included in the next permit revision.

DOE-RL/WHC Response: The continuous air monitors (CAMs) are used for radiation protection for workers and will not be discussed in the revised permit application documentation. The room air monitors described are CAMs that read the beta-gamma radiation levels in the room. The CAMs require a constant airflow to operate properly. To provide the airflow, all the CAMs are connected to a vacuum header system that uses pump P-AS-1 as a vacuum source. The air is filtered before entering the vacuum pump, then discharges to the vessel vent header. The CAMs are equipped with local alarms (bells and lights) to alert personnel in the room of airborne contamination. The setpoints on the monitors are set as low as possible without causing false alarms.

No.	Comment/Response	Ecology Concurrence
52.	4.2.7.6 Response to Spills or Leaks and Disposition of Unfit-for-Use Tanks: Page 4-51, lines 9-11 "If the condensate collection tank is determined to be unfit for use before the planned closure of the 242-A Evaporator, the tank will be decontaminated and disposed of in accordance with the closure plan (Chapter 11.0)." This phrase "and in accordance with the regulations as defined in 173-303-640 (8)" needs to be included in the above quotation. The lack of citations of the regulations is a serious deficiency that is found throughout this document (refer to General Comment #3). **DOE-RL/WHC Response: Refer to response to General Comment No. 3.**	