Department of Energy
Richland Operations Office
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9001431

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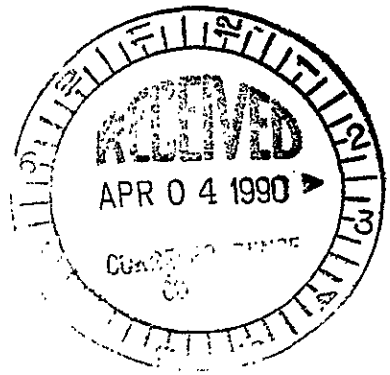
MAR 30 1990



Mr. Terry Husseman, Assistant Director
State of Washington
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504-8711

Mr. Charles E. Findley, Director
Hazardous Waste Division
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101

Dear Messrs. Husseman and Findley:

2101-M POND CLOSURE PLAN - NOTICE OF DEFICIENCY RESPONSE TABLE

The Notice of Deficiency (NOD) Response Table for the 2101-M Pond Closure Plan is being forwarded to the Washington State Department of Ecology, and the U.S. Environmental Protection Agency Region X, in accordance with the March 30, 1990 schedule.

If you have any questions regarding the NOD Response Table for the 2101-M Pond Closure Plan, please contact Mr. C. E. Clark of the U.S. Department of Energy, Richland Operations Office on (509) 376-9333, or Ms. C. J. Geier of the Westinghouse Hanford Company on (509) 376-2237.

Sincerely,

R. D. Izatt, Director
Environmental Restoration Division
Richland Operations Office

R. E. Lerch, Manager
Environmental Division
Westinghouse Hanford Company

Enclosure:
2101-M Pond Closure Plan NOD
Response Table

cc: P. T. Day, EPA
[redacted]
R. F. Stanley, Ecology

DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
R. D. Izatt, DOE-RL	T. Husseman, Ecology C. Findley, EPA	Incoming: 9001431

Subject

2101-M POND CLOSURE PLAN-NOTICE OF DEFICIENCY RESPONSE TABLE

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2101-M POND CLOSURE PLAN
NOD RESPONSE TABLE

No.	Comment/Response	Ecology Concurrence

1. Title Page. The plan is entitled 2101-M Pond Interim Status Closure Plan. Note that the Hanford Federal Facility Agreement Consent Order (FFACO), "All TSD units that undergo closure, irrespective of permit status, shall be closed ... in accordance with WAC 173-303-610." The 2101-M Pond should close under final closure status (in accordance with WAC 173-303-610 and references therein), not interim status.
Response: 'Interim Status' will be deleted from the title.

2. Table of Contents. The Table of Contents should have the appropriate column headed with 'page'.
Response: The column header 'Page' will be added to the Table of Contents.

3. Section I. Acronyms and Abbreviations. Change the abbreviation p/b to ppb (throughout the plan).
Response: The abbreviation p/b will be changed to ppb throughout the closure plan.

4. Section I. Acronyms and Abbreviations. Change the abbreviation p/m to ppm (throughout the plan).
Response: The abbreviation p/m will be changed to ppm throughout the closure plan.

5. Section I. General Closure Requirements. The subsections in this section are not numbered consistently with the rest of the plan.

   Ecology Recommendation: Give each subsection a number; for example, I-1 for Location and General Description, I-2 for 2101-M Pond Location and General Description.
   Response: The subsections will be renumbered accordingly.

6. Section I. General Closure Requirements, Introduction. The stated closure strategy is to, "clean close the 2101-M Pond in its current condition." Clean close is defined in this plan to mean that no waste or waste contaminated soils, structures, or equipment remain onsite that pose a substantial threat to human health or the environment. The plan discusses health and environmental based risks in Section B-5g. The health and environmental standards for clean closure have not been shown to be appropriate at this site; therefore, the current clean closure strategy is unacceptable.

   Ecology Recommendation: The clean closure strategy should be amended to be in compliance with the requirements of WAC 173-303-610 as stipulated in the FFACO. Clean closure under WAC 173-303-650(6) (as referenced in the closure requirements of WAC 173-303-610), all extremely hazardous waste must be removed and all dangerous waste (as designated under WAC 173-303-040) must be reduced to background levels for clean closure.

No.	Comment/Response	Ecology Concurrence

6. (Cont'd)
Response: The closure strategy for the 2101-M Pond is clean closure. As defined in the plan, clean closure implies that no waste or waste contaminated soils, structures, or equipment will remain onsite that pose a substantial threat to human health or the environment. The plan will be revised to reflect documentation and sampling activities that will be used to demonstrate if the site is 'clean' in its current condition; to what extent (if any) remediation is required for clean closure; or if clean closure is possible. Clean closure is to be predicated on criteria appropriate for the demonstration of a lack of contamination that pose a substantial threat to human health or the environment.

The text referring to the adequacy of clean closure will be modified to reflect the additional documentation required to justify clean closure. These activities may include flow-transport and geochemical evaluations, additional sampling and analysis, and the re-evaluation of data.

7. Section I. 2101-M Pond Location and General Description. The 2101-M Pond is described in general terms and illustrated in minimal detail by Figure I-4. Additionally, the standing water in the 2101-M Pond is described in general terms with no quantitative values on the amounts, locations, or sources. Further, the plan states that the 2101-M Pond does not backflow into the adjacent run-off ditch without adequate justification.

Ecology Recommendation: These descriptions do not adequately describe the site or the surrounding areas. Unambiguous descriptions may be achieved by providing the following information:

1) A detailed illustration with elevations of the 2101-M Pond should be provided; a topographical map of the surrounding area with a scale of 1 inch:200 feet would be appropriate.

2) Data on the maximum, minimum, and average amounts of water standing in the pond along with information on depths and location should be provided. A surface effluent map would be useful for describing effluent sources outside of the 2101-M Building.

3) The assumption that there is no backflow from the 2101-M Pond to the ditch is used as justification for exclusion of the ditch from the closure plan. Documentation that water from the 2101-M Pond does not percolate through the connecting earthen barrier or otherwise flow between the two structures should be submitted.

No.	Comment/Response	Ecology Concurrence

7. (Cont'd)
Response:

1) A topographical map with an appropriate scale will be provided in the revised closure plan.

2) The 2101-M Pond environment is a dynamic, not steady state system. Records do not exist for the type of data requested. The numbers and description presented in the plan includes the requested information to the extent that is available and reliable.

   Along with the topographical map, a figure will be developed that will show any outside sources of effluent to the 2101-M Pond and/or rainwater run-off ditch (i.e., storm drains, etc.)

3) The topographical map will help define any surface relationship in liquid movement between the rainwater run-off ditch and the 2101-M Pond.

   The soil that composes the barrier between the run-off ditch and 2101-M Pond is a sandy soil that prohibits the lateral movement of water beyond 0.5 - 0.75 feet in unsaturated conditions. Furthermore, in this type soil, the hydraulic grade line falls off rapidly in saturated conditions. This phenomenon will be referenced in the 2101-M Pond Closure Plan.

8. Section I. 2101-M Building General Description and Process Information. Current usage of the 2101-M Building includes an insulator's shop.

   Ecology Recommendation: The plan should state whether any asbestos products (particularly friable) are or were handled in the insulator's shop.
   Response: It was established that there has been no asbestos within the shop for approximately 10 to 12 years. This information covers the period of time in which drains were located in the insulator's shop.

   A statement similar to the following will be added to the text: "No asbestos products have been handled in the insulator's shop since the shop was equipped with drains that discharge to the 2101-M Pond."

No.	Comment/Response	Ecology Concurrence

9. Section I. 2101-M Building General Description and Process Information. Current usage of the 2101-M Building includes a substation maintenance shop.

   Ecology Recommendation: The plan should state whether any PCB, pentachlorophenol, or creosote products are or were handled there.
   Response: It will be verified that the substation maintenance shop is not plumbed into the drain that discharges to the 2101-M Pond. Information will only be included in the revised closure plan if it is determined that the substation maintenance shop is plumbed into the drain that discharges to the 2101-M Pond.

10. Section I. 2101-M Building General Description and Process Information. There is a vague discussion of possible future uses of 2101-M Building space. It is also asserted that, "some of the drains have been removed" and that the only additional drains plumbed into the heating, ventilation, and air conditioning drainage system belonged to the BWIP laboratories. These descriptions do not provide adequate information about current and future effluent sources to the 2101-M Pond.

    Ecology Requirement: The plan should include copies of the current building plans that indicate which drains are plumbed to flow into the 2101-M Pond. Refer to comment 27, below.
    Response: Current building plans indicating which rooms are plumbed to the 2101-M Pond will be provided in the revised closure plan.

11. Section A. Closure Performance Standards. The word 'hazardous' should be replaced with the word 'dangerous' in the statement labeled (b) to be consistent with the usage in WAC 173-303.
    Response: The word 'hazardous' will be replaced with 'dangerous'.

12. Section A. Closure Performance Standards. The plan states that the 2101-M Pond will be closed in compliance with the specific closure requirements of WAC 173-303-650.

    Ecology Requirement: This statement should not be construed as limiting closure requirements to those stipulated in WAC 173-303-650. According to the FFACO, "All TSD units that undergo closure, irrespective of permit status, shall be closed pursuant to the authorized State Dangerous Waste Program in accordance with WAC 173-303-610." Therefore, closure should be in compliance with WAC 173-303-610.

No.	Comment/Response	Ecology Concurrence

12. (Cont'd)
Response: The statement "complies with the specific closure requirements of WAC 173-303-650" is the fourth item of a list of requirements on page A-1 that was taken from WAC 173-303-610; therefore, the statement is not construed as limiting closure requirements to those stipulated in WAC 173-303-650.

13. Section A. Closure Performance Standards. The plan states that, "There are no contaminated containment system components, associated structures and equipment, or dangerous waste inventory and waste residues that pose a substantial present or potential threat to human health or the environment; or that require removal, decontamination, or treatment." These assertions are not demonstrated by the analytical data presented within the plan.

Ecology Recommendation: The above statement should be deleted from the plan or appropriate supporting data supplied. Refer to comment 6, above.
Response: See response to comment number 6.

14. Section A. Closure Performance Standards. The pond water has not been analyzed for contamination.

Ecology Requirement: The pond water should be analyzed using the appropriate standards and the resulting data and conclusions should be presented in the plan. Analysis of the 2101-M Building effluent is not sufficient to demonstrate that the pond water is clean.
Response: To support clean closure of the 2101-M Pond, the pond water will be sampled to designate clean closure according to WAC 173-303 regulations.

15. Section A-2. Protection of Human Health and the Environment. Proposed action levels are introduced as standards for clean closure of the facility. These action levels are presented in further detail in Section B-5g. Comparisons with proposed action levels are not sufficient for compliance with the closure requirements stipulated in the FFACO. Refer to comment 6.
Response: The definition and use of reference standards such as background and health-based risk criteria, and the definition of significant deviation from background, is being developed by Westinghouse Hanford and the DOE for use at the Hanford Site. Criteria such as those identified by EPA (Risk Assessment Guidance for Superfund, 1989; IRIS, 1988; Role of Acute Toxicity Bioassays in the Remedial Action Process at hazardous Waste Site, 1987) are under consideration as interim measures (Risk Assessment, Final Interim Statistical Guidance, etc.).

No.	Comment/Response	Ecology Concurrence

16. Section A-2. Protection of Human Health and the Environment. Only two quarters of groundwater data are examined, yet four quarters are currently available.

Ecology Requirement: All available data should be analyzed and submitted within the plan.
Response: To expedite an assessment of the liability of the Nuclear Waste Fund for closure of this facility, the two quarters of analytical data that were available at the writing of the closure plan were submitted. The remaining two quarters of data, which became available after the writing of this closure plan, were submitted to Ecology in the quarterly reports on RCRA facility groundwater monitoring at Hanford. Furthermore, all the data and the statistical analyses thereof will be submitted to Ecology in the 2101-M Pond RCRA Site Characterization Report. For completeness, the data on analyses of groundwater samples received to date will be put in an appendix of the revised closure plan.

17. Section A-3. Land Restoration. The plan states, "Returning the land to the appearance and use of surrounding land areas would be impractical, as the 2101-M Pond is still needed to receive condensate liquid from the 2101-M Building heating, ventilation, and air conditioning system." Declining to perform a required part of the closure procedure under WAC 173-303-610 because it is 'impractical' is not adequate.
Response: This statement will be revised and the word impractical will be deleted.

18. Section A-4. Specific Closure Requirements of WAC 173-303-650. This section only discusses the requirements under WAC 173-303-650, while under the FFACO, all TSD units should be closed under WAC 173-303-610. Refer to comments 6 and 12.
Response: Section A-4 was only intended to cover the requirements of WAC 173-303-650. Sections A-1 through A-3 cover WAC 173-303-610. See response to comment number 12.

19. Section A-4. Specific Closure Requirements of WAC 173-303-650. The plan states "... there also is no waste to remove from the 2101-M Pond or pond soil..." It has not been demonstrated that there is no contamination of the 2101-M Pond or pond soil under WAC 173-303-610. Refer to comment 6.
Response: See response to comment number 6.

20. Section A-4. Specific Closure Requirements of WAC 173-303-650. It is stated that no post-closure requirements for a landfill are anticipated. The requirements for clean closure have not yet been met.

Ecology Requirement: A post-closure plan should be provided. Refer to comment 6.
Response: A post-closure plan will be provided in the revised closure plan.

No.	Comment/Response	Ecology Concurrence

21. Section B-1. Description of Final Closure. The plan states, "There are no contaminated containment system components, associated structures and equipment, or dangerous waste inventory and waste residues that pose a substantial present or potential threat to human health or the environment, or that require removal, decontamination, or treatment." It has not been demonstrated that there is no contamination of the 2101-M Pond or pond soil under WAC 173-303-610.

Ecology Recommendation: This statement may be deleted. Refer to comments 6 and 13.
Response: See response to comment number 6.

22. Section B-1. Description of Final Closure. Analytes with all concentration values below detection limits were not evaluated. Only contaminants with concentration values below the limits stipulated under WAC 173-303-610(2) may be eliminated from consideration.

Ecology Requirement: Ensure and document within the plan that all analyses are in compliance with WAC 173-303-610.
Response: Concentration values below detection limits are interpreted as undetectable, i.e., not present within the analytical capabilities of the instrumentation techniques stipulated by SW-846. Analytes with all concentrations below detection limits shall be eliminated from consideration.

23. Section B-1. Description of Final Closure. It is asserted that, "The concentration of constituents in the pond soil ... does not pose a substantial present or potential threat to human health or the environment. Therefore, soil removal is not required..." The standard for clean closure is removal of all dangerous wastes to background levels under WAC 173-303-610.

Ecology Recommendation: The sentences containing these statements may be deleted. Refer to comment 6.
Response: See response to comment number 6.

No.	Comment/Response	Ecology Concurrence

24. Section B-1. Description of Final Closure. A groundwater monitoring program under 40 CFR Part 265, Subpart F (EPA 1988b) has been implemented.

Ecology Requirement: Groundwater monitoring should be implemented under the Dangerous Waste Regulations, WAC 173-303-645.
Response: The analytical results taken from filtered samples of groundwater for four quarters from 2101-M Pond indicate that the groundwater beneath 2101-M Pond has not been impacted by operations at the 2101-M facility. These samples have been analyzed for drinking water standards (WAC 173-303-645 Table 1), indicator parameters, water quality parameters, total organic halides, total organic carbon, and volatile organic analyses. A complete analysis for all dangerous wastes in the WAC 173-303-9905 list was also performed on samples collected in November 1988 and all constituents were found to be below standards or detection limits. All dangerous and extremely hazardous wastes known to be in the BWIP research laboratory inventory have been analyzed and found to be either not present in groundwater, below detection limits, or below values given in Table 1 of WAC 173-303-645. While it is difficult to absolutely prove the direction of groundwater flow beneath 2101-M Pond, and thus whether Well E18-1 is upgradient and representative of background, the issue of background is moot because groundwater beneath 2101-M Pond has not been degraded by operations in the 2101-M facility. Groundwater monitoring wells constructed at 2101-M Pond conform to WAC 173-160. The facility does not have a permit so specific constituents and concentrations have not been established by Ecology. However, the analyses stipulated above indicates that compounds present in 2101-M analytical laboratories were either not detected or were present in groundwater in concentrations below those in Table 1 of WAC 173-303-645. Other wells not impacted by Hanford Site operations will be checked to verify that the quality of groundwater in the 2101-M Pond groundwater monitoring wells is comparable to the quality of groundwater in these non-impacted wells. Therefore, although the reference in the closure plan was to 40 CFR 265, groundwater monitoring at 2101-M Pond is in compliance with WAC 173-303-645. Well E18-1 provides background water quality per the definition of Appendix A in the Hanford Federal Facility Agreement and Consent Order. The closure plan will be modified to indicate the above information and to reference WAC 173-303-645.

25. Section B-1. Description of Final Closure. The plan states that initial groundwater monitoring will establish background concentrations near the 2101-M Pond site. Equating initial concentrations of contaminants with background levels at a potentially contaminated site is scientifically unsound.

No.	Comment/Response	Ecology Concurrence

25. (Cont'd)
Ecology Requirement: Groundwater monitoring should be in compliance with WAC 173-303-645. Background should be established at a site not affected by past or current practices at the 2101-M Pond or other offsite locations, such as U.S. Ecology.
Response: The similarity of groundwater quality in all four groundwater monitoring wells has been interpreted by Ecology to indicate that Well E18-1 has been impacted by discharges to the 2101-M Pond. Other wells not impacted by Hanford Site operations will be checked to verify the similarity in groundwater quality to confirm that the groundwater beneath the 2101-M Pond has not been impacted by operations in the 2101-M Building and discharges to the pond. An alternative hypothesis, that the groundwater beneath the 2101-M Pond has been unaffected by operations in the 2101-M Building and discharges to the pond, was apparently not considered and is equally viable.

26. Section B-1. Description of Final Closure. The plan discusses closure under an interim status closure plan.

Ecology Requirement: The 2101-M Pond should be closed under final closure in compliance with the FFACO and WAC 173-303-610. Refer to comment 6.
Response: See response to comment number 6 and 24.

The only interim status requirements discussed in the closure plan pertain to groundwater monitoring. The interim status regulations were relevant to the 2101-M Pond when the groundwater monitoring program was developed; therefore it is appropriate to discuss the interim status groundwater monitoring program and the data collected under that program. The plan will be modified, however, to include a discussion of WAC 173-303-645 regulations.

27. Section B-2. Maximum Extent of Operation. The plan states, "The 2101-M Pond is no longer receiving dangerous wastes and is currently undergoing closure." Although there are administrative controls on the materials that may be routinely disposed of in the 2101-M Pond drains, there are no protective measures in case of accidental addition of dangerous wastes to the effluent stream.

No.	Comment/Response	Ecology Concurrence

27. (Cont'd)
Ecology Requirement: The possibility of dangerous wastes entering the 2101-M Building effluent should be prevented by physical safeguards. Several possible ways to accomplish this are as follows:

1) Isolate and collect effluent in a holding tank with regular monitoring. Alternate disposal methods for contaminated waste water should be in place
2) Permanently close or remove all drains not related to the heating, ventilation, and air conditioning system
3) Plumb non-heating, ventilation, and air conditioning drains into a treated waste system.

The chosen method should be documented entirely in the plan and implemented as soon as possible. Refer to comment 10.

Response: A review of the present and predicted activities in the 2101-M Building was conducted by the building landlord to identify potential sources of dangerous waste. Little possibility for routine dangerous waste generation exists, with the possible exception of the Environmental Technology Applications Laboratory (ETAL). The ETAL will be used to test soil samples from Hanford RCRA and CERCLA remediation sites. All wastes generated from ETAL sample management activities will be designated and managed accordingly. Activities conducted in the laboratory that generate potentially dangerous waste (e.g., sample and equipment washing) will be conducted over sinks that drain to collection vessels. The text will be revised to incorporate the types of controls that will be implemented to ensure dangerous wastes are not discharged to the 2101-M Pond.

Restricted use of some 2101-M Building sinks that drain to the pond may continue. Several actions have been or will be taken to ensure that discharge to the 2101-M Pond remains nondangerous. The 2101-M Building residents will be informed in writing by the building landlord of their responsibilities to implement the following requirements.

- **All sinks that drain to the 2101-M Pond that are not crucial to present or future building activities will be removed from service.**
- **The remaining operable sinks will be posted with signs reading, "Do Not Use For Waste Disposal," or an equivalent legend.**

No.	Comment/Response	Ecology Concurrence

27. (Cont'd)

- Disposal of wastes will be prohibited to operable sinks unless the waste material has first been designated by the Westinghouse Hanford Site Hazardous Waste Engineering Support Unit as nonregulated and/or nonhazardous.

- Written procedures will be prepared and implemented to ensure proper management and disposal of regulated wastes that are generated.

- Independent, bimonthly inspections of all laboratory spaces with active sinks will be conducted by the building landlord to ensure no activities are present that may introduce a dangerous waste to the 2101-M Pond discharge. In addition, at least twice a year, random, unannounced inspections of the above nature will be conducted. These inspections will be used to identify 2101-M Building activities that may generate regulated wastes and ensure the proper management of those wastes.

Administrative and physical controls described above will be implemented within the 2101-M Building to prevent discharge of dangerous waste to the facility. Samples will be taken at the 2101-M Pond weir at least every three months and analyzed for pH, conductivity, and total organic carbon. The resulting data will be used to support designation of the waste stream and will be tracked for trending purposes. This criteria is in accordance with the Federal Facility Agreement and Consent Order to eliminate liquid effluent discharges to the soil column (Milestone M-17-10).

28. Section B-3a(1). Inventory of Types of Wastes That May Have Been Discharged to the 2101-M Pond from the BWIP Laboratory. The plan states that, "...small quantities of laboratory chemical waste water" have been generated.

Ecology Requirement: Quantify 'small' with an amount and document the types of chemical waste.
Response: This statement is part of the introductory paragraphs for the following sections that details the types and quantities of waste generated. To clarify this, a statement similar to the following will be added after the first sentence in Section B-3a(1): "Estimates of waste generation volumes are provided in the following three sections."

No.	Comment/Response	Ecology Concurrence

29. Section B-3a(1). Inventory of Types of Wastes That May Have Been Discharged to the 2101-M Pond from the BWIP Laboratory. The plan states, "...there is no written evidence that... dangerous waste or waste constituents from the BWIP Laboratory were discharged down the drains. ...if any chemicals were discharged down the laboratory drains to the 2101-M Pond, the chemicals would have been used or spent materials."

These statements infer that used or spent chemicals are not dangerous waste. This may not be true; used or spent chemicals may in themselves constitute dangerous waste.

Ecology Requirement: Clarify the paragraph containing these statements in language that is not misleading regarding the nature of materials disposed of from the BWIP laboratories or document conclusively that no dangerous waste was disposed of from the BWIP laboratories into the 2101-M Pond.
Response: The statements in the referenced paragraph are clarified in the second paragraph of Page B-5: "It is possible that if chemicals on the BWIP Laboratory inventory were disposed of as used or spent materials, that they may have been discharged to the 2101-M Pond through July 1985. Many of these chemicals possibly could have been designated as dangerous wastes under the provisions of WAC 173-303-84 or WAC 173-303-090 (Ecology 1989). In addition, some of these chemicals could be listed as dangerous waste solvents under F002, F003, and F005 (Ecology 1989) if they were disposed of to the 2101-M Pond as spent solvents."

30. Section B-3a(1). Inventory of Types of Wastes That May Have Been Discharged to the 2101-M Pond from the BWIP Laboratory. In 1985, formal written disposal procedures were instituted. The plan states that, "The evidence to date indicates that BWIP followed these written procedures."

Ecology Requirement: This evidence should be documented within the plan.
Response: The statement will be deleted from the closure plan.

31. Section B-3a(1). Inventory of Types of Wastes That May Have Been Discharged to the 2101-M Pond from the BWIP Laboratory. The plan states, "small quantities of ... chemicals ... could have been discharged to the 2101-M Pond." Small does not quantify the amount discharged.

No.	Comment/Response	Ecology Concurrence

31. (Cont'd)
Ecology Requirement: 'Small' should be replaced with an amount.
Response: This statement is part of the introductory paragraphs for the following sections that detail the types and quantities of wastes discharged. A statement similar to the following will be added to the third paragraph on page B-5, "An estimate of the quantity of dangerous wastes that may have been discharged is provided in the following sections."

32. Section B-3a(1.2). Acids. The plan states, "...there is no evidence that these (wastes) were disposed of via laboratory drains." Unless there is evidence that wastes were not disposed of via laboratory drains, they should be assumed to have been disposed of in this manner.

Ecology Recommendation: This statement should be deleted from the plan.
Response: This statement will be deleted from the closure plan.

33. Section B-3a(1.3). Other Wastes That May Have Been Discharged to the 2101-M Pond From the BWIP Laboratory. In subsection B-3a(1.1), the estimated amount of barium containing dangerous waste discharged is 10,250 pounds from 1982 to July 1984. In subsection B-3a(1.3), the same amount of barium containing waste (10,250 pounds) is estimated to have been discharged over the longer time period of 1981 to July 1985.

Ecology Requirement: This discrepancy should be explained or corrected.
Response: The following sentence will be deleted from the fourth paragraph on page B-6: "Including the barium, as estimated in the previous section, a total of approximately 14,000 lbs of dangerous waste water ... (3,750 lb plus 10,250 lb of waste water containing barium)." In the last sentence of the fourth paragraph on page B-6, '14,000 lbs' will be replaced with '3,750 lbs'.

34. Section B-3a(1.3). Other Wastes That May Have Been Discharged to the 2101-M Pond From the BWIP Laboratory. The estimated amount of waste water given in the Part A permit application is referred to.

Ecology Requirement: The values from the Part A Permit Application should be stated within the plan.
Response: The Part A is included in the plan in Appendix A. The last paragraph on page B-6 will be changed as follows: "The Part A permit application (see Appendix A) states that

No.	Comment/Response	Ecology Concurrence

34. (Cont'd)
the 2101-M Pond receives approximately 18,750 gallons per day of waste water. The historic discharge of dangerous waste constitutes approximately 6 percent of the total.

35. Section B-3a(3.2). Heating/Cooling Waste Waters. Table B-1 shows that the amount of heating, ventilation, and air conditioning condensate water discharged to the 2101-M Pond ranged from 0.87 to 2.44 million gallons per year for 1982 to 1988. However, the amount reported by DOE-RL for 1977 is 5.03 million gallons. The plan states that, "...the heating, ventilation, and air conditioning system was scheduled to be modified..." in a 1978 DOE-RL document. Additionally, it is stated that, "...the assumption is made that the heating, ventilation, and air conditioning system was modified in 1979..." Changes to the 2101-M Building should not be assumed.

Ecology Requirement: Information reported in the plan should be substantiated by documentation.
Response: The project files document when modifications to the heating, ventilation, and air conditioning system were completed. This information will be reflected in the revised text and references to assumptions will be deleted.

36. Section B-3a(3.2). Heating/Cooling Waste Waters. Effluent volumes are reported to the tenth of a gallon. The data does not support this degree of accuracy.

Ecology Requirement: Amounts should be reported to reflect the proper degree of uncertainty. Please correct the statement here and elsewhere in the plan.
Response: Volumes will be reported to reflect the degree of accuracy.

37. Section B-3a(4). Analyses of the 2101-M Building Effluent Discharges to the 2101-M Pond. The waste water effluent is designated as not dangerous waste. The justifications for this designation are not in compliance with the requirements of WAC 173-303-075.

Ecology Requirement: In order to designate the waste water correctly, the criteria listed in WAC 173-303-075 should be met.
Response: The waste stream discharged to the 2101-M Pond will be designated in accordance with WAC 173-303-070(4) and will be certified in accordance with WAC 173-303-075 as part

No.	Comment/Response	Ecology Concurrence

37. (Cont'd)
of a Hanford Sitewide study. In response to public comments received on the Hanford Federal Facility Agreement and Consent Order, and at the request of Ecology and EPA, the DOE-RL is undertaking a study to provide a detailed discharge history and radiological and chemical characteristics of liquid discharges to the soil column at the Hanford Site. This study is described in WHC-EP-0275, Revision 1, Draft Liquid Effluent Study Project Plan.

As described in WHC-EP-0275, this study will provide the data necessary to determine if any of the 33 liquid effluent streams, which includes the 2101-M Pond waste stream, are a dangerous waste according to WAC 173-303-070(4). A proposed designation of the waste streams will be conducted as part of the scope of this study, and an application for certification of this proposed designation will be submitted to Ecology in accordance with WAC 173-303-075. The data contained in Table B-2 of the 2101-M Pond Closure Plan was obtained during a Hanford Sitewide project that was initiated in 1985 and was conducted to provide a preliminary evaluation of liquid waste streams discharged to the soil column at the Hanford Site. This data will be used in the current study to designate the waste stream.

A statement similar to the following will be added to Section B-3a(4). The waste stream discharged to the 2101-M Pond will be designated in accordance with WAC 173-303-075. This will be completed as part of a current study to characterize liquid waste streams that discharge to the soil column at the Hanford Site. This study is described in WHC-EP-0275, Revision 1.

38. Section B-3a(4). Analyses of the 2101-M Building Effluent Discharges to the 2101-M Pond.
The presence of low levels of acetone in the effluent is discussed with regard to its concentration or proximity to the detection level. Note also that acetone was found in the soil and may well be discharged on an infrequent basis through the laboratory drains (a possibility not entrained in this discussion). The presence of this acetone may be sufficient to determine the waste water as dangerous waste.

Ecology Requirement: Sufficient quality control should be performed while testing and documented within the plan in order to eliminate outside sources of contamination from consideration. Refer to comment 56.
Response: The quality control data is currently under review. The text may be modified, depending on the data available.

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39. Section B-3a(4). Analyses of the 2101-M Building Effluent Discharges to the 2101-M Pond. Table B-2 is titled "The 2101-M Pond Waste Water Analytical Data." The water analyzed is the 2101-M Building effluent, not the 2101-M Pond water.

Ecology Recommendation: Change the title of this table to reflect what was actually analyzed. Refer to comment 14.
Response: The title of Table B-2 will be changed to 2101-M Building Waste Water Analytical Data.

40. Section B-3a(4). Analyses of the 2101-M Building Effluent Discharges to the 2101-M Pond. The raw data from which Table B-2 is compiled is not presented in the plan.

Ecology Requirement: All raw data should be reported within the plan.
Response: The available raw data associated with the 2101-M Building effluent samples will be provided in the revised closure plan.

41. Section B-3a(5). Analyses of Soil in the 2101-M Pond. The plan states, "Analytes with all values below detection limits were eliminated from further consideration. Analytes with concentrations above detection limits were evaluated statistically where possible and compared to background concentrations and/or threshold values..."

There are several difficulties with the above approach, they are as follows:
1) The detection limits should be within the constraints stipulated in WAC 173-303-610
2) Analytes for a certain site that are above detection limits should also be considered separately; the values for several sites should not be simply consolidated and analyzed statistically
3) Threshold values based on health-based standards are not applicable under WAC 173-303-610.

Ecology Requirement: Analytes should be evaluated to determine if their values exceed the concentration limits as stipulated by WAC 173-303-610. In addition, each sample from the contaminated site should also be compared individually against the background; they should not be merely lumped together. Refer to comments 6, 76, and 113.
Response:
1) See response to comment number 22.
2) See response to comment number 45.
3) See response to comment numbers 6 and 15.

No.	Comment/Response	Ecology Concurrence

42. Section B-3a(5.1). Designation of the 2101-M Pond Soil. The presence of the organic chemicals (acetone, methylene chloride, and toluene) in the 2101-M Pond soil are discussed in terms of health-based standards and present or are a potential threat to human health or the environment. Refer to comment 6.
Response: See response to comment numbers 6 and 15.

43. Section B-3a(5.1). Designation of the 2101-M Pond Soil. The plan states that acetone, methylene chloride, and toluene were detected in five, three, and one samples, respectively, out of a total of 23 samples. These chemicals were analyzed for in 13 out of 23 samples collected. These statements are misleading as to the known extent of contamination of the 2101-M Pond site by these species.

Ecology Requirement: Both the number of samples actually analyzed and the number of samples taken should be clearly stated to avoid misleading statements.
Response: The number '23' will be replaced with '13'. The first sentence of the fifth paragraph on page B-13 will be changed to read as follows: "Toluene was reported above the detection limit at a concentration of 0.072 ppm in 1 of 13 samples."

44. Section B-3a(5.1). Designation of the 2101-M Pond Soil. Both methylene chloride and toluene are attributed to introduction during sampling or analysis. Unless there is evidence that these chemicals (or any others detected) were introduced during the analysis, they will be assumed to be sample constituents.

Ecology Requirement: Adequate quality control measures during analysis should be performed and documented within the plan to eliminate this type of conjecturing. Refer to comment 56.
Response: Analytical quality assurance/quality control is presently being reviewed to establish, at a greater level of confidence, that these constituents are analytical laboratory contaminants. Until investigations into the quality assurance/quality control data is completed, these chemicals will be assumed to be sample constituents. The text will be modified to include this information as necessary.

45. Section B-3a(5.1). Designation of the 2101-M Pond Soil. Analytes with significant variability were evaluated statistically and compared with background.

Ecology Requirement: Each sample should also be compared individually to the background levels.
Response: A re-evaluation of these data will be performed using statistical guidance such as that provided in EPA (1989). Also see response to comment number 15.

No.	Comment/Response	Ecology Concurrence

46. Section B-3a(5.1). Designation of the 2101-M Pond Soil. The plan states, "Inorganic carcinogens are not known to be present in the 2101-M Pond soil."

Ecology Requirement: The contaminants detected at the 2101-M Pond site should be designated under WAC 173-303-103 and the results stated conclusively within the plan.
Response: The constituents detected in the 2101-M Pond soil will be designated under WAC 173-303-103 and the results will be provided within the revised closure plan.

47. Section B-3a(5.1). Designation of the 2101-M Pond Soil. The plan states "...the pond soil does not warrant handling as dangerous waste." Refer to comment 6.
Response: See response to comment number 6.

48. Section B-3a(5.2). Organic Constituents. Health-based standards for cleanup are again referred to. Refer to comment 6.
Response: See response to comment numbers 6 and 15.

49. Section B-3a(5.3). Barium. Barium levels were compared statistically with background levels. Refer to comment 41.
Response: See response to comment number 45.

50. Section B-3a(5.5). Inorganic Constituents. Typographical error "pond soil.that"
Response: The text will be modified accordingly.

51. Section B-3a(5.5). Inorganic Constituents. The summation of data refers to "substantial present or potential threat to human health or the environment." Refer to comment 6.
Response: See response to comment numbers 6 and 15.

52. Section B-3a(5.5). Inorganic Constituents. Conclusion (2) states that the, "...maximum inventory of dangerous wastes and dangerous waste constituents present in the 2101-M Pond is limited to extremely low concentrations of a few residual organic and inorganic constituents that do not justify handling of the soil as dangerous waste." There are several problems with this conclusion. First, the 2101-M Pond water has not been evaluated; second, the sample sites have not been compared individually with the background levels; and third, designation should be in compliance with WAC 173-303-070. Refer to comments 6, 14, and 41.
Response: See response to comment numbers 6 and 15. Also see response to comment number 14 concerning analysis of pond water, comment number 45 concerning statistical comparison with background, and comment numbers 37, 46, and 49 concerning designation of water and soil.

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53. Section B-3b. Detailed Description of the Removal of Dangerous Waste Inventory. The plan states, "...dangerous wastes...are no longer present at levels that cause the pond soils to warrant handling as dangerous waste." It further contends that, "The concentrations of constituents in the soil do not pose a substantial present or potential threat to human health or the environment. Therefore, no dangerous waste inventory remains at the 2101-M Pond..." Refer to comments 6 and 14.
Response: See response to comment numbers 6, 14, and 15.

54. Section B-3c. Detailed Identification and Type of Offsite Dangerous Waste Management Units. The plan states that this section is not applicable due to the lack of dangerous waste at the 2101-M Pond.

Ecology Requirement: This section should be provided. Refer to comments 6 and 14.
Response: See response to comment numbers 6, 14, and 15. In addition, the section will be provided.

55. Section B-4. Description of Decontamination and Removal of Dangerous Waste Residues. The criteria of human health and the environment are again used to substantiate the cleanliness of the site. The plan states that, "...criteria for determining the extent of decontamination ...are not necessary." The information required by WAC 173-303-610(3)(a)(v) should be provided. Refer to comments 6, 14, and 41.
Response: See response to comment numbers 6, 14, and 15. The criteria required to satisfy the closure performance standards will be provided.

56. Section B-5. Soil Sampling and Analysis Plan for the 2101-M Pond. The plan states that the analytical results, "...were judged for reliability..."

Ecology Requirement: Give a detailed description of how the data was determined to be reliable. At a minimum, this should include information regarding the accuracy and precision of the analyses and how these values were obtained. Note that the information provided in Appendix C-4 is not sufficient as it generally consists of statements with no supporting data or, if there is data, it is not explained nor is the source described.
Response: The data validation is being examined. Appendix C-4, which addresses quality assurance and quality control of the data analyses, will be reviewed and a detailed description of the procedures and techniques used in this section will be written. The available precision and accuracy (and how it was obtained) will be incorporated into the revised 2101-M Pond Closure Plan.

No.	Comment/Response	Ecology Concurrence

57. Section B-5a(1.1). Sampling Locations. This section discusses the selection of soil sampling locations and states, "The stratification enabled the use of a random sampling approach without raising the possibility of clustering the four sample locations in one area of the pond as might occur using a simple random design. Within each sample area, the specific sample location was determined using a random-numbers generator to identify a unique point along the centerline of the pond proper..."

Ecology Recommendation: Please provide a detailed explanation concerning how the random-numbers generator identified and determined the sampling points. Also justify how soil samples obtained at specific depths may be termed 'random'.
Response: Although the samples are taken from specific depths at the sample point, they are random because they are taken from a point picked at random. The concept is to characterize a random sample point, not random depths beneath a sample point.

The following will be added to the text after the referenced statement to clarify the selection of these random points:

These random numbers were generated in the following manner:

- **A point in the random number table was selected by dropping a pencil onto the random number table.**
- **This number was used to determine the column and row within the table that was used as the starting point (i.e., if 63 was the number that the pencil landed closest to, the 6th column, 3rd row was the starting point).**
- **The table was evaluated from left to right until a number which met the criterion for that arm of the 2101-M Pond was reached.**

This process was done for each of the three arms of the pond. An identical process was used in determining the sample points for the rainwater run-off ditch.

58. Section B-5a(1.1). Sampling Locations. The plan states that background samples, "were collected...from a locale near the 2101-M Pond, but sufficiently distant (approximately 1,000 feet) to be unaffected by past operations (Figure B-3)." Because past disposal practices from different operations impacted such large areas on the Hanford Site, the DOE should demonstrate that onsite 'background' sample results (e.g., 2101-M Pond background values) are comparable to background conditions offsite of the Hanford Site.

No.	Comment/Response	Ecology Concurrence

58. (Cont'd)
Ecology Recommendation: Conduct an investigation offsite in an area that is documented to not be affected by any past practice to determine true background soil conditions. If the background sites already examined fulfill this requirement, this information should be documented within the plan. Following this investigation, the value obtained for soil constituents can then be applied to the background cleanup standards for the 2101-M Pond closure.
Response: There is no evidence that the subsurface soil in this area has been impacted by past practices. The nature of data obtained from these background sites corroborate their use as background. Moreover, past practice influences such as those that exist at other sites are considered as part of the pre-facility baseline under RCRA that are to be regulated under CERCLA; however, there is no CERCLA/RCRA overlap at the 2101-M Pond site and, therefore, no obvious reason for concern. The integrity of background sample data will be assessed and documented in the 2101-M Pond closure plan.

59. Section B-5a(1.2). Site Modifications. The plan states that an access ramp was excavated at each sampling site in the 2101-M Pond and fill was added at three (sites 2, 3, and 4).

Ecology Requirement: Clarify what the source of the fill material was and state what was done with the excavated and fill material after the samples were collected.
Response: The following statement will be added to the revised closure plan: "The fill material was placed over the sample points as the access ramps were excavated into the banks. The berms alongside the north and south arms of the pond were used as borrow sites for this fill material. Upon completion of sampling, the fill material was returned to its original location."

60. Section B-5a(1.3). Soil Sampling Depths. The plan states that a soil sampling depth of 12 feet was chosen based on the following:
1) Cost effectiveness
2) Ability to detect significant changes in chemical concentration with depth and extrapolate this information to greater depths
3) Deeper samples in the vadose zone could be obtained during well drilling
4) Soluble compounds would likely be detected in the groundwater.

No.	Comment/Response	Ecology Concurrence

60. (Cont'd)
The cost effectiveness of an analysis should not be a primary driving force in determining the scope of an investigation. Note that the depth to groundwater in this vicinity is roughly 300 feet; 12 feet is only 4 percent of the vadose zone.

Ecology Requirement: To adequately understand the soil profile, the entire vadose zone should be investigated. In lieu of this, provide a detailed explanation of how an investigation of the top 12 feet of the vadose zone and opportunistic samples obtained during well drilling is an adequate substitute for a complete soil characterization of the vadose zone. Include substantiation for percolation of all soluble materials to the groundwater; i.e., a model or documentation giving expected depths to which the waste water will travel must also be provided.
Response: Westinghouse Hanford is currently in the process of developing and running a flow-transport/geochemistry model of the vadose zone to document the expected movement of constituents below the 12-foot sample zone. This will be made available to Ecology when it has been verified and finalized.

61. Section B-5a(1.3). Soil Sampling Depths. The plan states that the chemical constituents from the waste nitric and hydrochloric acids were not expected to leach or move to significant depths. Both nitrate and chloride salts are generally soluble in water.

Ecology Recommendation: Reassess this expectation using known solubilities of nitrate and chloride salts and the fact that the heating, ventilation, and air conditioning system discharges approximately 1 to 2 million gallons of waste water per year to the 2101-M Pond.
Response: Yes, nitrate and chloride salts are soluble in water, but the formation of nitrate and chloride salts is not necessarily a valid assumption. There are a number of other chemical interactions that would take place within the pond environment before the formation of these salts.

Even if it were assumed that these salts were formed, they would be in an ionic solution and would still be reactive with other elements and compounds present. When sediment analysis was done, the full designation list was analyzed for; therefore, any constituent above detection level has already been identified for these sediments. Ecology is directed to Table B-6 where it can be seen that chloride is present in only a few samples, and there are no nitrate values present in any of the samples.

No.	Comment/Response	Ecology Concurrence

62. Section B-5a(3). Sampling Equipment and Samples Collection. This section states that a B-24 mobile power auger rig was employed in conjunction with the continuous flight hollow-stem auger sampling method modified from the American Society for Testing and Materials (ASTM) Standard D1452-80 (ASTM 1985).

Ecology Recommendation: State whether this method provides an undisturbed sample. That is, does the sample represent an in-situ core of the soil at the sample location?
Response: The text will be modified as follows: "A B-34 mobile power auger rig was employed in conjunction with the continuous flight hollow-stem auger sampling method modified from American Society for Testing and Materials (ASTM) standard D 1586-84 (ASTM 1985). A stainless.....depending on availability. This method provides a representative, continuous sample of the sample point.

63. Section B-5a(3.1). Vadose Zone Sampling. The vadose zone analyses of the samples obtained during well drilling using the ICP method did not follow the protocols required. The testing methods must be in compliance with the applicable regulations (WAC 173-303-110).

Ecology Requirement: All analyses used in characterizing the site must be within the specifications designated; analyses that are not within the specifications should not be relied on for final decisions. Refer to comment 60.
Response: It is stated in the closure plan that the results of these analyses (XRF and ICP) are used for 'informational purposes only." The plan does not state that they are relied on or used in making final decisions.

64. Section B-5a(3.2). Precharacterization Soil Sampling. The soil samples from the run-off ditch were acquired at the same time as the precharacterization samples. However, the precharacterization samples were not analyzed by the analytical laboratory for as long as 44 days after sampling.

It is not clear that the run-off ditch samples were analyzed within the time constraints specified in WAC 173-303.

Ecology Requirement: State if these samples were analyzed in compliance with holding times or resample the run-off ditch.
Response: Sample numbers M101X were all analyzed within a 43 day timeframe. Holding times are being checked against SW-846 accepted holding times for the analyzed constituents.

No.	Comment/Response	Ecology Concurrence

65. Section B-5b. Analytical Parameters and Procedures. The plan states, "to facilitate a more cost-effective sampling program... [soil samples were] collected at depths of 0.0 to 2.0 feet..."

Because insoluble contaminants are expected to collect in the top layer of sediments near the effluent source in the 2101-M Pond, analysis of a composite of the upper 2 feet of soil rather than smaller segments could lead to erroneous conclusions.

Ecology Requirement: Resample the upper soil layers with narrower stratification (Ecology typically accepts 2 inch strata for homogenization) in order to provide a more accurate portrayal of the pattern (or lack thereof) of contamination of the site by insoluble materials.

Response: The ability to sample the soil sediment in the 2101-M Pond to the degree that Ecology is requesting (2-inch intervals) is not technically feasible. There are a number of constraints that limit the ability to sample this soil on such a small interval. There is a minimum sample volume required to supply the analytical laboratory so that analysis can be done. WAC 173-303-110 cites the method for sampling soil or rock-like material in ASTM D420-69, which references D1586. A modification of D1586 was used to sample the 2101-M Pond site. A diagram in D1586 gives the acceptable dimensions for use with this sampling protocol. These dimensions help in determining the sample depth that is necessary to provide sufficient amounts of soil to the laboratory for analysis. Also, the 2-inch interval margin of error is so small that the potential for cross contamination between these samples is virtually a given, and therefore, unacceptable.

It is true, methods exist that would allow for using a sampling instrument with the capability to sample a much larger volume. But, the environment associated with the 2101-M Pond does not allow for the use of the power equipment necessary to run this type of sampling effort.

For these reasons, a resampling effort that would sample the upper strata of the 2101-M Pond on a 1-foot sample interval is proposed.

No.	Comment/Response	Ecology Concurrence

66. Section B-5c. Data Evaluation Criteria. In (2) of the data analysis approach, the plan states that groups of chemical constituents are analyzed.

Ecology Recommendation: Clarify the referred to chemical groups. Refer to comment 41.
Response: This is a broad statement covering the approach used to evaluate the data. Further information is unnecessary because this statement only covers the criteria used in the data evaluation process. Table B-6 gives a list of those constituents that were above detection limits in the 2101-M Pond soil. Therefore, if a constituent does not appear on this list, it has been eliminated from consideration because it was below detection limits.

For clarity, the terms 'groups of chemical' and 'or specific analyses' will be deleted from the text.

67. Section B-5c. Data Evaluation Criteria. Location and depth effects are going to be examined by the analysis of variance procedure.

Ecology Requirement: Each sample from the 2101-M Pond site should be examined individually against background. The range of error for the samples should be attributable to sampling and instrument error, not a range determined by a composite of data from several sites. The method for determination of the errors should be clearly stated. Any patterns of contamination for a species over a number of locations should be described completely. Note that a number of the contaminants at the 2101-M Pond site that exceed the background mean are located in sample M159 (the top sample of site number 3, the 2101-M Building outflow site). Refer to comment 41.
Response: See response to comment numbers 15 and 45.

68. Section B-5c. Data Evaluation Criteria. Contaminants that had a significant difference in mean concentration from background samples or insufficient data for statistical analysis were compared to, "accepted regulatory standards on a constituent by constituent basis."

Ecology Requirement: The applicable regulatory standard for comparison is background under WAC 173-303-650(6). Refer to comment 41.
Response: See response to comment numbers 6 and 15.

No.	Comment/Response	Ecology Concurrence

69. Section B-5c. Data Evaluation Criteria. Assessments of contaminants for health and/or environmental concern were made.

Ecology Requirement: The applicable standard is background. Refer to comment 6.
Response: See response to comment numbers 6 and 15. Also, WAC 173-303-610 does not preclude health-based standards within the framework of the definition of 'background'. Groundwater contamination is recognized by EPA and Ecology as a medium for which human health and the environment are more sensitive than soil due to the nature of exposure scenarios. This is reflected by significantly lower concentration standards for water compared to soil. It is, therefore, an apparent inconsistency in Ecology's final status standards in that health-based criteria are identified in WAC 173-303-645 as applicable cleanup criteria for groundwater but not for soil. It is recognized by EPA (1989) that these criteria are logically applicable to all media. Therefore, it is a reasonable approach to consider the type and level of health and environmental effects of very low levels of residual contamination that may exist above background or detection limits at a treatment, storage, and/or disposal facility.

70. Section B-5d(1). Inorganic Chemical Analyses. The plan states, "laboratory duplicates were within ... quality control limits for inorganic analytes with the exception of copper, barium, and manganese. Significant percent differences outside quality control limits ... occur in samples M132 and M143."

Ecology Recommendation: Clarify what the quality control limits are. Quantify what is meant by a significant percent difference.
Response: A reference to the location of the quality control limits will be made in the text. (Appendix C-4, page 3, contains the quality control limit data from these samples.

Bullet number 4 will be modified as follows: "...Significant percent differences outside quality control limits (i.e., CLP validation criteria)..."

71. Section B-5d(1). Inorganic Chemical Analyses. The plan states, "problems with percent recoveries and percent differences are most likely caused by matrix interference and the inhomogeneous [sic] nature of the soil."

No.	Comment/Response	Ecology Concurrence

71. (Cont'd)
Ecology Recommendation: Clarify the types of difficulties that could arise from the heterogeneous nature of the soil. Does this mean that the analytical tests were inadequate? If separate phases were observed, these should be tested individually.
Response: The text will be rewritten to clarify the extent to which matrix effects or other considerations affect percent recoveries. This topic will be obviated by the supplemental sampling effort.

72. Section B-5d(2). Organic Chemical Analyses. The plan states that spike sample recovery for analysis M146 is not acceptable because it is outside quality control limits. The next comment contradicts this by stating that, "...[all] spike recoveries were ... found to meet EPA quality control established limits." Neither of these assertions is evident from the raw data presented in Appendix C-1.

Ecology Recommendation: The discrepancy between these two statements should be corrected. The assertions should be clarified and discussed in terms of the applicable regulations (WAC 173-303) and the data.
Response: The statement will be changed as follows: "Instrument detection limits, blank recoveries, surrogate recoveries, and spike recoveries were all found to meet quality assurance/quality control established limits except for spike sample recovery for TOX analysis of sample M146. However, sample analysis showed a value below the detection limit.

73. Section B-5e. Soil and Sediment Chemical Analyses. The plan states that all data packages for all analyses are provided in Appendix C-1. This comment is not true; for example, the data for the analyses of the 2101-M Building effluent is not reported in this appendix.

Ecology Recommendation: All data should be reported in one section of this plan. Review the other sections of the plan to ensure that this has been done. Note that data for quality control evaluations should also be provided.
Response: The text will be modified as follows: "...the analytical results of the pond sediment samples... in the summary tables. The available raw data for the soil analysis is provided in Appendix C-1..."

74. Section B-5f(1). Statistical Evaluation of Location Effect. Typographical error, "...vanadium and zine are..."
Response: The typographical error will be corrected.

No.	Comment/Response	Ecology Concurrence

75. Section B-5f(2). Statistical Evaluation of Depth Effect. Chemicals exhibiting a statistically significant depth effect generally show elevated contaminant concentrations in the uppermost sampling layer. Note that each of these were composites of the top 2 feet of soil at each sampling site of the 2101-M Pond.

The analyses do not provide enough data on the stratification of contaminants in the top layers of the 2101-M Pond soil.

Ecology Requirement: More analyses should be performed in order to provide better data on the stratification of the upper soil layer of the site.
Response: Ecology is mistaken in its statement that these are 'composites' of the upper 2 feet. To have a composite, one must combine separate, distinct samples. This was not the case with the sediment samples. The upper 2 feet for each sample point was placed in sample jars separately, and analyzed independently.

To address Ecology's concern that sampling on a 2-foot interval may have a dilution effect on the upper portion of the sample, a resampling of the upper strata of the 2101-M Pond sediment profile is proposed. Refer to comment number 65.

76. Section B-5f(3). Statistical Comparison of Pond and Background Soil Data. The plan states "...the 2101-M Pond as one entity was compared to the background as another entity." This is an inadequate analysis of the data; more sampling to greater depths below the pond would probably show results even closer to background using this approach.

Ecology Requirement: Each sample should also be individually compared to background for each contaminant present above the detection limit.
Response: A re-evaluation of these data will be performed using statistical guidance such as that provided in EPA (1989).

77. Section B-5g. Risk to Human Health and the Environment. This section is based on the results presented in Section B-5f(3), Statistical Comparison of Pond and Background Soil Data. It also presumes that whether or not the contaminants pose a risk to human health or the environment is sufficient as a standard for the site. The statistical analyses this section is based on are inadequate. Additionally, under the FFACO the cleanup must be conducted in compliance with WAC 173-303-610, i.e., standards based on risk to human health or the environment are not applicable. Refer to comments 1, 6, and 41.
Response: See response to comment numbers 6, 15, 45, and 69

No.	Comment/Response	Ecology Concurrence

78. Section B-5q(1.1). Apparent Effects Threshold. The plan states, "...the AET approach does not apply directly to the ... 2101-M Pond..." The plan includes AET's for ecosystems that are very different from that associated with the 2101-M Pond. For example, the 2101-M Pond and associated ecosystem is a high desert system and is vastly different from the referenced marine (estuarine) system.

Although the AET is a viable means for determining environmental health standards, it is inappropriate to utilize an AET which was developed for a marine (estuarine) sediment ecosystem and use it as justification for environmental health standards at the 2101-M Pond.

Ecology Requirement: Should the DOE wish to pursue development of AETs further, they would need to be developed on a site-specific basis. This is, Ecology would expect the DOE to fully justify and document a health and environmental based clean closure on the most sensitive organism(s) or ecosystem which may be exposed at the 2101-M Pond site. Refer to comment 6.

Response: The AET criteria was introduced into the closure plan to corroborate the conclusions, not as the primary basis for those conclusions. Because the plan is to be revised to include sampling activities to be used to demonstrate whether the site is "clean" in its current condition, or whether, and to what extent remediation is required for clean closure, criteria such as AETs combined with other information, are required to evaluate whether a substantial threat to human health or the environment exists.

It must be noted, however, that environmental based criteria are not restricted to organisms specific to a given site. Toxicological criteria, in fact, are based on representative organisms for which toxicological data exits. Ecology, required that Westinghouse Hanford evaluate fish toxicity for the desert system (the Hanford Site is not a high desert ecosystem) as environmental-based criteria for the purgewater issue. This is consistent with the approach recommended by the EPA. Information on the biologic effects (i.e., toxicity thresholds) for representative organisms such as bacteria, algae, arthropods, fish, amphibians, and mammals are those used to evaluate environmental-based standards. In most cases it appears that the toxicity standards established by EPA for human health are the most stringent of the reference organisms. It is the intent of the DOE-RL and Westinghouse Hanford to utilize recognized approaches for evaluating health-based and environmental-based standards.

No.	Comment/Response	Ecology Concurrence

79. Section B-5g(1.4). Equivalent Concentration. A composite of the 2101-M Pond soil was designated under WAC 173-303-084(5)(b) for equivalent concentration.

Ecology Requirement: This designation should also be done individually for each sampling site for all listed contaminants.
Response: Each sampling site will be designated in accordance with WAC 173-303-084(5)(b) (Ecology 1989). Ecology is incorrect in its statement that a composite of the 2101-M Pond soil was designated for equivalent concentration. As stated in the closure plan, the elements or compounds that showed a higher statistically significant variation using the F-test for variation of homogeneity as compared to background samples were used as the basis of a waste designation per WAC 173-303-084(5b) (Ecology 1989). For a definition of composite, see response to comment number 75.

80. Section B-5g(1.5). Reference Dose. The explanation for examination of chemical constituents for estimates of the reference dose is not clear.
Response: The explanation will read as follows: " .... The chemical constituents in question were examined using established RFDs."

81. Section B-5g(2.3.4). Methylene Chloride. Methylene chloride is attributed to laboratory contamination. Sufficient quality control during analysis should show whether or not this compound was introduced during sampling.
Response: Attempts are presently being made to determine the validity of these assumptions. For additional information, see response to comment number 44.

82. Section B-5g(2.3.5). Toluene. Toluene is attributed to laboratory contamination. Sufficient quality control during analysis should shown whether or not this compound was introduced during sampling.
Response: Attempts are presently being made to determine the validity of these assumptions. For additional information, see response to comment number 44.

83. Section B-5g(2.5). Biological Pathways. This section mentions that known biological pathways in the Puget Sound benthic and epibenthic ecosystems are different than those of the 2101-M Pond. The biological pathways for the 2101-M Pond ecosystem are not presented, but it is stated that observations over the past 10 years lead to the conclusion that, "...the contaminants in the pond soil do not pose a significant present or future threat to human health or the environment." As stated in the plan, the biological pathways associated with this site are relatively unknown.

No.	Comment/Response	Ecology Concurrence

83. (Cont'd)
Ecology Requirement: If the DOE chooses to pursue standards based on health and environmental risks, a detailed evaluation concentrating on the most sensitive organism(s) or ecosystem which may be exposed must be presented in support of any conclusions. Note that these standards should not be based solely on human health impacts; these evaluations must be based on the most sensitive biological pathway regardless of its identify. Refer to comment 6.
Response: The applicability of health based standards is being reviewed in depth. For additional information, see response to comment number 6.

84. Section B-6. Groundwater Monitoring. The plan states, "installation of groundwater monitoring wells is required for compliance with interim status regulations (40 CFR 265, Subpart F) (EPA 1988b)."

Under the FFACO, the site must close in compliance with final status closure regulations (WAC 173-303-610).

Ecology Requirement: The well monitoring program should be in compliance with WAC 173-303-645 as required by WAC 173-303-610.
Response: See response to comment 24.

85. Section B-6b(1.2). Stratigraphy Beneath the 2101-M Pond. Typographical error "...following th discussion..."
Response: The typographical error will be corrected.

86. Section B-6f. Quality Assurance/Quality Control. This section describes the quality assurance and quality control in place during the groundwater monitoring. Note, however, that the quality assurance and quality control measures used in the soils analyses are presented in Appendix C-4.

Ecology Recommendation: Organization of the text should be consistent throughout the plan.
Response: Quality assurance/quality control data are summarized in Sections B-5d and B-6f. Additional supporting quality assurance/quality control data for the soil analyses are given in Appendix C-4. No additional data are given for groundwater analyses since the data are not complete and will be reported in their entirety in the 2101-M Pond RCRA Site Characterization Report. No modification of the closure plan is proposed for this criteria if Ecology accepts incorporating the groundwater sampling analytical quality assurance and quality control data into the referenced report.

No.	Comment/Response	Ecology Concurrence

87. Section B-6b(2.1). Groundwater Hydrology of the 200 Areas. Table B-19, Ranges of Hydraulic Properties in the 200 Areas indicates ranges for hydraulic conductivity but not storativity or porosity.

Ecology Requirement: Supplement Table B-19 [from Graham et al. (1981)] by including more recent range estimates for hydraulic conductivity, storativity, and porosity.
Response: More recent data merely confirms the ranges of values for hydraulic conductivity, storativity, and porosity given in Graham et al. (1981). The point of this reference is the bounding values and the wide range of values for the Hanford and Ringold Formations. Data specific to the sediments beneath the 2101-M Pond can be found in Table B-23 where results of aquifer testing conducted in the 2101-M Pond groundwater monitoring wells are reported. Additional data on aquifer testing and hydraulic properties of the uppermost aquifer will be contained in the 2101-M Pond RCRA Site Characterization Report.

88. Section B-6b(3.2). Water Levels. The water-level data for wells near the 2101-M Pond are provided in Table B-21. The table indicates that four measurements have been corrected for borehole deviation (i.e., by use of inclinometer). The other measurements reported do not appear to have undergone correction (e.g., barometric efficiency, earth tides). Note that in Section B-6b(3) it is stated that, "...the hydraulic gradient (in the vicinity of the 2101-M Pond) is so small that measurement error could be responsible for incorrectly determining the water levels and thus the direction of groundwater flow beneath the pond."

Clarify what corrections have been made, if any, that could help in alleviating errors in the water levels, and therefore, the gradient in this area, have not been done, these should be applied.
Response: Water-level data in wells other than those at the 2101-M Pond have not been corrected for deviation, as inclinometer surveys were not performed in these wells. However, all the wells in this table were surveyed to the same datum so that the water-level elevations are consistent and comparable.

89. Section B-6b(4.1). Justification for Locations. The DOE has recently defined background water quality as, "the solute content of natural groundwater in the upper geohydrologic [sic] systems on the Hanford Site, where groundwater is unaffected by Hanford Site waste-disposal operations." See DOE/RL 88-36 p. WP-43. The plan asserts that, "groundwater flow in the southwest corner of the 200 East Area is estimated to be to the northeast." Well 299-E18-1, located 280 feet southwest of the southwest corner of the 2101-M Pond is stated to be, "unaffected by discharges to the pond."

No.	Comment/Response	Ecology Concurrence

89. (Cont'd)
It is not clear whether any place in the area surrounding the 2101-M Pond has groundwater which is unaffected by past practices at the 2101-M Pond or any other site. Furthermore, the groundwater flow in this area is not fully understood. Designation of the Well 299-E18-1 as the 'background well' is premature.

Ecology Requirement: A study should be conducted to determine actual background groundwater quality. If it is necessary for this study to be performed offsite and upgradient of the Hanford Site in order to ensure no effect from past practices, then this should be done.
Response: The document referenced in this comment is the 100-HR-3 Operable Unit Work Plan (Revision 0) which is still in draft form. Comments on this draft were received from Ecology and the EPA in a letter dated October 20, 1989. The statement regarding background has been applied inappropriately because; 1) the plan is in draft form, 2) is not a policy statement in regards to RCRA activities, 3) is proposed for use in a CERCLA work plan, and 4) is not a technically meaningful baseline for defining the contribution of a single unit such as the 2101-M Pond which is hydrologically downgradient from numerous other waste disposal facilities (i.e., sources) that may have influenced the quality of groundwater in the vicinity of the pond.

Given the situation that 2101-M Pond is situated above a low in the water table between eastward flowing groundwater coming from the west and westward flowing groundwater coming from the B Pond mound, it is very likely that groundwater flow beneath the 2101-M Pond has varied slightly in direction at various times in the past and will likely do so in the future. However, regardless of changes of a few degrees in direction of flow, groundwater clearly flows eastward from the 200 West Area toward the Columbia River until it reaches the B Pond mound where it is diverted around the high. Thus, areas to the west of the pond are upgradient unless it can be demonstrated that mounding has occurred and resulted in radially outward flow from any mound created by discharges to the pond. Given that the sediments beneath and in the immediate vicinity of the pond are unconsolidated sands of the Hanford 'formation' with little interbedded silt, lateral dispersal of water in the vadose zone is not favored. A modeling study was performed (see page B-94 of the closure plan) and predicted approximately a 0.0033 foot rise in groundwater level suggesting that no significant mounding has been produced by discharges to the 2101-M Pond and thus that no significant flow to the southwest has been induced by discharges to the 2101-M Pond.

No.	Comment/Response	Ecology Concurrence

89. (Cont'd)
Therefore, it is reasonable to assume that Well E18-1 is the upgradient well that can be used to provide background data for groundwater quality for the 2101-M Pond. Other wells to the south and west of the 2101-M Pond will be checked regarding the quality of groundwater and potential use as indicators of 'background' groundwater quality. The definition of background groundwater quality in Appendix A of the Federal Facility Agreement and Consent Order specifies that the intent is to assess the contribution of a specific facility to the degradation of groundwater quality. See response to comment number 93 for identification of specific wells that may be used.

90. Section B-6b(5.2). Borehole Logging. This section states that each well will be geophysically logged with natural gamma, density, and neutron probes.

Ecology Recommendation: Please state what calibration standards will be used before and after logging each borehole.
Response: Geophysical logging was conducted by Pacific Northwest Laboratory for Westinghouse Hanford in these wells shortly after construction and will be described in the 2101-M Pond RCRA Site Characterization Report. Instrument calibration will be discussed in that report. No further logging of these wells is possible, as these wells are now constructed as groundwater monitoring wells using 4-inch stainless steel casing with at least 2 inches of annular seal material between the casing and the natural formation. The closure plan will be modified appropriately to indicate the above.

91. Section B-6b(6.2). Establishing Background. The plan states that background levels are being established from samples obtained from Well 299-E18-1. It is not established that this well is upgradient of contamination sources and unaffected by past practices. Refer to comment 89.
Response: It is the intent of the regulations to assess whether a facility has contributed to the degradation of groundwater quality beneath it by comparing data on the quality of groundwater upgradient of the facility with that downgradient of the facility. It is not the intent of the regulations to compare groundwater quality with that of natural background. The purpose of groundwater monitoring at the 2101-M Pond is to assess whether this facility has contributed to degradation of groundwater quality beneath standards set in the regulations. See response to comment number 88.

No.	Comment/Response	Ecology Concurrence

92. Section B-6d(2). Water Quality Analyses. The plan states, "...these are very close to or below DWS or SMCLs..." Very close is an ambiguous amount.

Ecology Requirement: Quantify 'very close' with specific amounts.
Response: Chromium is up to 12 parts per billion above the drinking water standards of 50 parts per billion in unfiltered analyses in first quarter samples and below the drinking water standards in second quarter analyses. Chromium is below the drinking water standards for filtered analyses for both quarters. Manganese is above the secondary maximum contaminant level of 50 parts per billion in both filtered and unfiltered analyses in first quarter analyses at Well E-18-1 only. First quarter values for filtered manganese are 51 parts per billion and for unfiltered manganese are 70 parts per billion. All other results are below the 50 parts per billion secondary maximum contaminant level--including the resampling that was done after the first sample was taken. All six samples of filtered analyses for manganese in second quarter samples were below the 5 parts per billion detection limit. All unfiltered analyses for manganese were well below the secondary maximum contaminant level of 50 parts per billion; the maximum value was 12 parts per billion. Three (of four) unfiltered samples analyzed for iron were above the secondary maximum contaminant level of 300 parts per billion; values for Wells E18-1, E18-3, and E18-4 for the first quarter were 1,250, 983, and 493 parts per billion. All filtered analyses for iron were well below the secondary maximum contaminant level of 300 parts per billion, with a maximum value reported of 67 parts per billion in Well E18-4. Two of six values above the detection limit of 30 parts per billion for unfiltered analyses for iron in the second quarter exceeded the secondary maximum contaminant level of 300 parts per billion. Almost all values for filtered analyses of iron for the second quarter are below the detection limit of 30 parts per billion. This addition will merely quantify in words what is apparent to the reader in Tables B-16, B-17, and B-18. These values do not alter the statement contained in the closure plan.

93. Section B-6d(2.3). Discussion of Preliminary Analyses. The plan states, "thus from analyses completed to date, the 2101-M Pond and the facilities that discharge to 2101-M Pond may not have contributed regulated wastes to groundwater."

This comment is premature; there is insufficient information to preclude past contamination based on well sampling. More to the point, if groundwater contaminated by past practices at the 2101-M Pond site has moved beyond the regions sampled by these wells, it will never be possible to state that there was no contamination due to discharges to monitoring wells, particularly since administrative controls on discharges were established in 1985.

No.	Comment/Response	Ecology Concurrence

93. (Cont'd)
Ecology Requirement: Delete or amend this sentence (and any similar statements based on insufficient information) so that inferences are supported by the data available.
Response: This sentence needs no modification as it is a qualified statement that is further qualified in the remaining sentences of the paragraph as to what must be done to confirm the interpretation. No modification of the closure plan is necessary.

94. Section B-6d(2.3). Discussion of Preliminary Analyses. In the plan for future groundwater monitoring it is not clear which well(s) will be used for obtaining data on groundwater background levels.

Ecology Requirement: Any well(s) used for obtaining samples for establishing background levels must be upgradient and offsite of the area in question. Because many of the past practices at the Hanford Site impacted large areas, it is possible that background samples may have to be obtained offsite and upgradient of the entire Hanford Site. In any case, any well chosen for setting the background standards must be unambiguously documented within this plan as not impacted by any past or present practice at the 2101-M Pond site. Refer to comment 89.
Response: The facility being considered in this closure plan is the 2101-M Pond, not the entire Hanford Site. There are few wells immediately south and west of the 2101-M Pond (hydrologically upgradient) and a search will be made for those that have not been affected by contaminant plumes migrating eastward in groundwater from past operations in the 200 West Area. Some wells that are candidates to be evaluated are the six wells at U.S. Ecology (they do not analyze their groundwater samples for metals--they analyze only for pH, conductivity, NO3 TOX, TOC and various radionuclides) along with Wells 699-36-61A, and 61B, 699-32-62, 699-33-56, 699-31-53B, and 699-34-51. These wells are not RCRA groundwater monitoring wells and are constructed with a single string of 8-inch carbon steel casing that is perforated over a few tenths of feet of the uppermost aquifer. However, these wells can provide some useful information relevant to the quality of groundwater in the vicinity of the 2101-M Pond. Additional data on groundwater quality from wells south and west (i.e., upgradient) of the 2101-M Pond will be presented in the 2101-M Pond RCRA Site Characterization Report. Also see response to comment number 89.

No.	Comment/Response	Ecology Concurrence

95. Section B-6f(2). Quality Assurance Review of Organic Analyses. Typographical error '1,1-dichloroethylene'.
Response: The typographical error will be corrected.

96. Section B-10. Wastes Treated, Removed, or Disposed of Within 90 Days. The plan asserts there are no wastes present at the 2101-M Pond site which require treatment, removal, or disposal prior to closure. The validity of this assertion has not been demonstrated. Refer to comment 6.
Response: See response to comment 6.

97. Section C. Certification of Closure.

Ecology Requirement: For your information, Ecology is interpreting 'independent' to be defined as avoiding a "conflict of interest or the appearance of a conflict of interest", as described in OSWER Directive 9483.00-3 (excerpt attached). Refer to enclosure.

98. Section III. References. There are typographical errors in the list of references.
Response: The typographical errors will be corrected.

99. Appendix B-1. Laboratory Inventory. There are numerous typographical errors in the list of chemicals.
Response: The typographical errors will be corrected.

100. Appendix C-1. Data Package for Analysis of 2101-M Pond Soil Samples and Background Samples. Some of the analyses had low percent recoveries for the spike analytes (for example, see sample M132, Procedure 733). This is not addressed sufficiently within the plan.

Ecology Recommendation: Acceptance of these analyses should be justified. Refer to comment 56.
Response: The analytical results are being re-evaluated to justify acceptance of the data.

101. Appendix C-1. Data Package for Analysis of 2101-M Pond Soil Samples and Background Samples. One section is entitled "Results of the Vadose Sediment Analyses by the X-Ray Fluorescence Method" while another covering analyses of the same samples is called, "Results of Borehole Sediment Analysis Using ICP Method."

Ecology Recommendation: Related sections of the plan should be labeled consistently.
Response: Titles will be changed to be consistent in the appendices.

No.	Comment/Response	Ecology Concurrence

102. Appendix C-1. Data Package for Analysis of 2101-M Pond Soil Samples and Background Samples. A key to the U.S. Testing sampling methods should be provided in this section to facilitate data interpretation.
Response: A key is provided in Table B-5. A duplicate will be placed at the beginning of this appendix.

103. Appendix C-2. Graphic Representation of Soil Sample Results. The total organic carbon graph is upside down.
Response: This error will be corrected.

104. Appendix C-4. Quality Assurance/Quality Control of Analyses. The plan states, "holding times were acceptable for... cyanide analyses. Cyanide holding times are outside EPA quality control limits of 14 days for samples M131 through M154."

Ecology Recommendation: Amend these two statements so they are consistent with each other.
Response: The cyanide holding times for samples M131 through M154 are outside EPA quality control limits, all other samples are within holding times. The text will be modified to state this more clearly. The term "cyanide" was inadvertently incorporated into the referenced statement, and will be replaced with "cold vapor".

105. Appendix C-4. Quality Assurance/Quality Control of Analyses. The plan states that, "blank results were within quality control limits."

Ecology Recommendation: The quality control limits should be stated. Refer to comment 56.
Response: Quality control limits will be identified and included in the revised closure plan.

106. Appendix C-4. Quality Assurance/Quality Control of Analyses. Typographical error "Cu, BA, and..."
Response: The typographical error will be corrected.

107. Appendix C-4. Quality Assurance/Quality Control of Analyses. The elements Cu, Ba, Mn, As, Cd, Pb, and Se have percent differences outside quality control limits for samples M132, M142, and M143. The percent and quality control limits (%) columns are reported differently for the metals than the main group elements.

No.	Comment/Response	Ecology Concurrence

107. (Cont'd)
Ecology Recommendation: State how these were determined and if the other analytes and samples were treated similarly. Additionally, information should be reported consistently throughout the plan. Refer to comment 56.
Response: Detail on this will be added to the text. The percent and quality control limit columns will be made consistent in the revised closure plan.

108. Appendix C-4. Quality Assurance/Quality Control of Analyses. The plan states "problems with percent recoveries and percent differences most likely are caused by matrix interference and inhomogeneous nature of the soil."

Ecology Recommendation: Inadequacies in the analytical data should be managed by quality control measures. If it is necessary to resample a site due to problems with an original sample, this should be done.
Response: See response to comment number 71.

109. Appendix C-4. Quality Assurance/Quality Control of Analyses. The plan states "the percent spike recovery is outside laboratory-establish quality control limits.." for sample M146 TOX. (Note typographical error: establish should be established.) Refer to comment 56.
Response: The typographical error will be corrected. Analytical laboratory quality control data is being re-evaluated.

110. Appendix C-4. Quality Assurance/Quality Control of Analyses. Acetone, methylene chloride, and toluene were detected in a number of samples. Refer to comment 44.
Response: See response to comment number 44.

111. Appendix C-5. 1.0 Input Data. The plan states "background depth intervals were the same as the pond samples." This statement appears to be inaccurate; samples M136, M137, M138, M144, M145, and M146 were taken from different soil depths than the pond soil samples.

Ecology Recommendation: Clarify which samples were used to determine background.
Response: All of the background data was used to determine the background values. Modification of the text will be examined to clarify the sampling interval discrepancy.

No.	Comment/Response	Ecology Concurrence

112. Appendix C-5. 2.1 Assumptions. It is assumed that metals are log-normally distributed since they are naturally occurring in the soil. Other contaminants are assumed to have normal distributions.

Ecology Recommendation: These assumptions should be tested statistically to the extent possible given the available data. The results of this should be presented within the plan.
Response: This criteria will be referenced and clarified appropriately.

113. Appendix C-5. 2.5 Comparison With Background Samples. The data from the 2101-M Pond were pooled and compared to a composite of the background data. This approach was based on the assumption that the pond data were a simple random sample.

Ecology Recommendation: Note that the pond samples were not taken randomly; the depths were predetermined before sampling. Additionally, pooling the data for comparison to background distorts any location or depth effects that may otherwise be noted. Refer to comments 57, 60, 65, 67, and 78.
Response: The 2101-M Pond sediment samples are a simple random sample with the exception of the effluent point. The 'random' refers to the sample points. The entire sample point is being characterized, not just portions of it. Also, refer to response on comment number 57.