



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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September 16, 1998

Ms. Donna L. Powauke  
Nez Perce Tribe  
P.O. Box 365  
Lapwai, ID 83540-0365



Dear Ms. Powauke:

The Washington State Department of Ecology (Ecology) would like to thank you for your comments concerning the 100N Area Proposed Plans, Corrective Measures Studies, Closure Plans, and Engineering Evaluation/Cost Analysis documents. In response, Ecology has prepared a responsiveness summary (enclosed) which addresses the comments received.

In consideration of the proposal, comments received, and in conjunction with the United States Environmental Protection Agency, Ecology will prepare two Interim Action Records of Decision, modification to the Hanford Resource Conservation and Recovery Act (RCRA) Site-wide Permit, and an Action Memorandum which advises the U.S. Department of Energy of the selected remedial alternatives.

Should you have any questions or concerns regarding this letter or the enclosed responsiveness summary, please contact me at (509) 736-3029.

Sincerely,

Phillip R. Staats, Project Manager  
Nuclear Waste Program

PRS:sdb  
Enclosure

cc: Owen Robertson, USDOE  
Doug Sherwood, EPA  
Administrative Record

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**PUBLIC COMMENT DRAFT RESPONSES  
100-N AREA DECISION DOCUMENTS**

**Hanford Generating Plant, Supply System General Comments**

1. **Comment:** Based on the HGP site's location, the Supply System believes that the selection of a rural residential cleanup level is not warranted.

**Response:** The selection of the rural residential cleanup level reflects precedence set in the remediation of the 100-BC-1, 100-DR-1, and 100-HR-1 liquid effluent waste sites. The Record of Decision for these remediation actions states 'for the purposes of this interim action, the remedial action objectives are for "unrestricted use."

2. **Comment:** The Supply System, as a fiscally responsible municipal corporation of the State of Washington, wants to minimize any undue burden on our customers. Therefore, it is in our best interest to immediately proceed with D&D as necessary to restore the HGP site. The resources are available and we intend to proceed at a quicker rate than proposed by 100 Area remediation schedule.

**Response:** The proposed schedule identified in the *Engineering Evaluation/Cost Analysis for the 100-N Area Ancillary Facilities and Integration Plan* is a duration-only schedule, which does not include specific start or end dates, and is intended to indicate the relative priority and critical path of cleanup activities. Specifically, the schedule was established taking into consideration the priority of remediation activities, while ensuring that interference between facility decontamination and demolition and waste site remediation is minimized. Another consideration was to develop a schedule with a relatively even distribution of funding. However, as funding availability fluctuates, the schedule can be delayed or accelerated accordingly within the ten-year time frame.

3. **Comment:** The proposed schedule should provide the flexibility to permit immediate completion of the restoration work at HGP.

**Response:** See response to General Comment 2 under Hanford Generating Plant, Supply System General Comments.

**Hanford Generating Plant, Supply System Specific Comments**

- A. *Engineering Evaluation Cost Analysis for the 100-N Area Ancillary Facilities and Integration Plan*, DOE/RL-97-22, Rev. 1.

1. **Comment:** Page 1-2, Line 11: The Supply System would like to follow its own schedule to complete with work earlier than scheduled. This EE/CA should allow the Supply System to fund and contract for cleanup, decontamination, and demolition to a selected contractor of our own selection in accordance with our procedures as long as the cleanup, etc. meets the technical requirements of this

EE/CA.

**Response:** See response to General Comment 2 under Hanford Generating Plant, Supply System General Comments.

2. **Comment:** Page 2-9: In the first bullet, it is on the northwest wall.

**Response:** Comment noted. The word *wall* was omitted from the description.

3. **Comment:** Page 2-15: The physical description for 181-NE is incorrect. The facility houses four circulating pumps and their respective lubricating water pumps in addition to the three fire protection pumps.

**Response:** Comment noted. The physical description for 181-NE should state that it houses four circulating pumps and their respective lubricating water pumps in addition to the three fire protection pumps.

4. **Comment:** Page 2-16: There is no 1605-NE Observation Post at HGP. Also see Figure 2-1.

**Response:** At the time the EE/CA was prepared, available information indicated the existence of a 1605-NE observation post. The NE designation references facilities associated with the Hanford Generating Plant, which is managed by the Washington Power Supply System. A subsequent investigation has indicated that the facility is located in the 100-N Area, not within the boundaries of the Hanford Generating Plant, and is managed and controlled by the Project Hanford Management Contractor.

5. **Comment:** Page 3-1: In third paragraph, it should be clarified that areas inside the HGP fence do not interfere with any other cleanup operations.

**Response:** Comment noted. The areas inside the HGP fence do not interfere with any other cleanup operations.

6. **Comment:** Pages A-6, 7: The availability of basic utilities is essential to keep demolition costs under control. However, we are already addressing the loss of power to HGP and there is no potable water or sewer system. In addition, the rail lines should be maintained for demolition. The large transformers are normally moved by rail.

**Response:** Comment noted. As stated in the EE/CA, if there is no justification for keeping services functional, they should be removed. Therefore, the proposed actions provides flexibility to keep rail lines in operation as long as justified.

7. **Comment:** Appendix C: The cost estimates were based on a model that the Supply System has already shown to be unreliable for our work.

**Response:** An EE/CA is a document that assesses the various remediation alternatives of a collection of facilities or remediation units. In order to effectively compare one alternative to another, it is most helpful if the alternative estimates are developed using the same estimating methodology. This allows for an equitable comparison of alternative actions without concern over the use of differing estimating tools. Because the MCACES models have been approved by the DOE for out year baseline estimates, MCACES was applied to the 100-N Area EE/CA facilities as the estimating tool. MCACES meets the U.S. Environmental Protection Agency's guidance for accuracy of cost estimates, which states that typically "study estimate" costs are expected to provide an accuracy of +50 percent to -30 percent and are prepared using available data. During the remedial design, and when additional information becomes available, the cost estimates will be refined.

B. *Corrective Measures Study for the 100-NR-1 and 100-NR-2 Operable Units, DOE/RL-95-111, Rev. 0*

1. **Comment:** Page 1-2, line 15: Please note that the BPA Substation and transmission lines are still in service with no intent to demolish.

**Response:** Comment noted. As stated on page 2-4, facilities to remain active are not addressed in this EE/CA. Appendix B Table B-2 identifies the BPA Substation as an active facility. Therefore, the BPA Substation is not addressed for removal in this EE/CA.

2. **Comment:** Page 3-75: We believe item 37 is a transformer oil spill and not a dump site. See also Table 3-7.

**Response:** A review of the Waste Identification Data System (WIDS) listing report for the site in question (100-N-39) has indicated the site was a dumping area. The WIDS report references a Bonneville Power Administration memorandum (1981) that states that the site was used as a dump for construction debris. There is another site identified in WIDS, UPR-100-N-37, which was an unplanned release of transformer oil. The CMS addresses both 100-N-39 and UPR-100-N-37.

3. **Comment:** Page 3-83: In item 10 the facility in the third column should be 1701-NE.

**Response:** Comment noted. The building listed (1710-NE) should be 1701-NE.

4. **Comment:** Page 3-93: The concrete and soil below the steam line trestle drains should also be listed.

**Response:** Waste sites listed in the CMS were obtained from the Waste Identification Data System (WIDS). WIDS is the official database recognized by

the Tri-Parties containing information on all identified waste sites at Hanford. The concrete and soil below the stream line trestle were not included in the WIDS system during preparation of the CMS. However, an evaluation of the site will be made to determine appropriateness for inclusion in WIDS. If the site is added to WIDS, it will be addressed in accordance with the applicable action memorandum or record of decision.

5. **Comment:** Page 9-6, 9.2.4: The schedule should be flexible for the Supply System HGP activities.

**Response:** See response to General Comment 2 under Hanford Generating Plant, Supply System General Comments.

6. **Comment:** Page 9-6: The Supply System will meet the training requirements with our own program.

**Response:** All DOE-RL and DOE-RL contractor personnel working at the Hanford Site, including at sites associated with the 100-NR-1 Operable Unit, will be provided with and will successfully complete general site training as specified in Condition II.C.2 of the Hanford Facility Dangerous Waste Permit. Personnel working at the Hanford Generating Plant, which is operated by the Washington Public Power Supply System (WPPSS), will be trained in accordance with WPPSS training programs.

### Geosafe Comments

- A. *100-NR-1 Treatment, Storage and Disposal Units Corrective Measures Study/Closure Plan, DOE/RL-96-39*

1. **Comment:** The in situ vitrification (ISV) discussion should include a brief discussion of past ISV work performed at Hanford. Performance information regarding ISV's treatment effectiveness for plutonium, strontium and cesium should also be discussed.

**Response:** In situ vitrification was included as a component in four of the alternatives that were evaluated in the screening process described in Section 5.2. The purpose of the assessment in Section 5.1 is to make a qualitative evaluation of effectiveness, implementability, and cost of potentially useful technologies. The qualitative evaluation against these factors relied on a variety of information, including the performance of in situ vitrification methodologies employed at Hanford. The in situ vitrification technology was carried forward for further evaluation, implying that the technology was considered potentially beneficial for remediating the sites under consideration, which could include treatment for plutonium, strontium, and cesium.

2. **Comment:** The discussion on the presence of excessive moisture effecting ISV

treatment cost is irrelevant and should be removed. This is true only if there is a substantial amount of groundwater moving into the treatment zone. Note in Figure 2-2 and 2-3, the groundwater elevation is approximately 60 and 70-ft below grade and would not be an issue.

**Response:** The discussion regarding the effect of moisture on the technology (Section 5.1.4.4) is provided in the context of discussing some of the advantages and disadvantages of the technology. The fact that the technology was carried forward for further evaluation implies that excessive moisture was not considered a factor in selecting remediation alternatives at these sites.

3. **Comment:** The discussion should include some mention of the added benefits resulting from vitrification such as: the product will exhibit no hazardous characteristic and should easily pass TCLP testing, the vitrified product has an extremely low leaching rate-even if ground to a fine powder and inundated in water and the vitrified product is expected to have a geologic life expectancy substantially greater than 10,000 years.

**Response:** Chapter 6 discusses the implementation of the in situ vitrification technology and how it would be implemented under four different alternatives. In two of the cases, in situ vitrification was rejected because of the potential for intrusion into the vitrified monolith, and the third case it was rejected because of depth limitations of the technology. In the fourth case, in situ vitrification was retained for detailed evaluation. During the detailed evaluation of alternatives, in situ vitrification was rejected because it had a higher cost of implementation than that of the preferred option (remove/dispose). The durability of the vitrified product was never called into question.

**B.** *Proposed Plan for Interim Remedial Action and Dangerous Waste Modified Closure of the TSD Units Associated Sites in 100-NR-1 Operable Unit, DOE/RL-97-30, Rev. 0*

1. **Comment:** Given the high concentration of radionuclides in the 116-N-1 and N-3 Cribs and Trenches, a discussion should be provided on how this material will meet the ERDF waste acceptance criteria (WAC). I assume the waste is not being diluted to meet the WAC requirements. A table showing the WAC criteria versus available characterization information from the subject units should be included.

**Response:** Clean or slightly contaminated soil would be added to the high contamination soil fraction for the purpose of controlling radiation exposure to workers and to meet some operational limitations at ERDF concerning ambient air quality. The need to blend the soil is not related to the ERDF WAC.

2. **Comment:** Given that plutonium concentrations greater than 100 nCi/g are considered to be a TRU regulated waste, some discussion should be provided on the TRU components of the waste being shipped to ERDF.

**Response:** There are a few samples that showed localized plutonium concentrations in excess of 100 nCi/g, but the contaminated soil in the cribs and trenches, taken in aggregate and without addition of any other soil, is expected to be significantly below the 100 nCi/g threshold. The radionuclide content will be verified by sampling that will be done during the remedial design phase.

3. **Comment:** Given that the proposed plan is selected for implantation the 116-N-1 and 116-N-3 units will still require institutional controls for the radionuclide plume that will be left in place; thus elimination of purely in situ treatment options for similar reasoning does not seem to be justified or logical. Additional discussion on why in situ treatment alternatives have not been evaluated should be provided.

**Response:** Under the preferred option (remove/dispose), radionuclide contamination will be removed to a depth of at least 15 ft, thereby reducing the potential for exposure from near-surface intrusion. In contrast, the vitrification alternative would result in radionuclide contaminants remaining in relatively close proximity to the ground surface (and to potential intruders).

#### Amy Hilderbrand Comments

1. **Comment:** In evaluating a number of Hanford Annual environmental reports it appears for 1996 the dose from Strontium-90 was .-18 mrem per year. Which equated to 126 person mrems for the Tri-Cities. The government is spending \$1,374,000,000.00 per mrem reduction (i.e., .062 Ci/yr flux reduction) or about 20 million dollars per person mrem reduction. Are these costs per mrem or person mrem reduction justified? In my review of cost benefit ALARA Analysis – number of ten thousand dollars per mrem reduction is what I remember being justified. Please provide references to dose reductions that justify this level of spending for such a small dose reduction.

**Response:** There are no specific references to dose reductions to justify this level of expenditure. The concentrations of Strontium-90 in the groundwater reaching the Columbia River (which is a point of compliance) are 1000 to 2000 times the Maximum Concentration Level (8 pCi/L) allowed by law. Upon reaching the Columbia River, the incoming Strontium-90 is diluted by the Columbia River to levels which are below the MCL. However, because the groundwater at the river's edge is above the MCL, the DOE is required by law to address this problem. The DOE can achieve this requirement by either a remedial action that will clean-up the site to below the MCL's or by setting an alternative concentration limit (ACL). The ACL can only be set after demonstrating that it is impracticable to remediate the site. The present pump-and-treat is scheduled to last five years, and is part of a process to determine the practicability of remediating the site.

2. **Comment:** Page 2-3, 120-N-1 and 120-N-2 TSDs: Respectfully request Ecology delete TSDs 120-N-1 and 120-N-2 from this continued monitoring as a modified RCRA/CERCLA closure plan and provide a plan that is reflective of the current conditions of clean closure of TSD sites 120-N-1 and 120-N-2. Ecology and DOE provide only an inventory of acid or caustic liquids that were deposited at these sites. The documentation says nothing was detected in the soil samples – therefore the site is clean. No elevated sulfate observed in the groundwater are probably the result of discharging Sulfuric Acid and is not of major concern or major health problem for the concentration observed. The water will still meet general house hold and irrigation uses (Davis and DeWiest, Hydrogeology). The elevated Sulfate will only provide and odor or taste that is not harmful. I respectfully requested that the money currently being spent on RCRA groundwater monitoring of 120-N-1 and 2 be refocused to something more constructive like removing 1500 drums of uranium and oil in the 300 Area.

**Response:** While the 120-N-1 and 120-N-2 TSD units are subject to RCRA closure requirements, the groundwater underlying these units is currently being monitored as part of the on-going CERCLA program. The current groundwater monitoring regimen will be followed until a final action for groundwater remediation is determined. The proposed plan for continued groundwater monitoring does not call for the expenditure of any additional resources than are currently being expended to meet CERCLA monitoring requirements.

3. **Comment:** Page 2-3, 116-N-1, 116-N-3, and UPR-100-N-31. As is provided in DOE/RL-96-39 the modeling performed indicates that Strontium-90 will not significantly reach the Columbia River. And as was provided in earlier analysis more remediation of Strontium-90 occurs through natural attenuation than through pump and treat systems (i.e., .1 Ci remove from pump and treat and 2.2 Ci from natural attenuation- decay). The natural attenuation provides 96% of the Strontium-90 remediation in the 100-N Area – Ecology and DOE need to explain why such efforts are being taken to expend such monetary resources for such little return of 5% of the Strontium-90 – it will still take 270-300 years potentially to remediate this site with either of these two technologies? Respectfully request the cessation of the 100 N Area expenditure on pump and treat of \$1,000,000 per year and refocus the money on solving the 200 Area Carbon tetrachloride plume which is of real concern as demonstrated in BHI's model predictions of contaminant plumes (BHI-00608 and BHI-00469) and is observed by the rate of spending in the Annual groundwater reports (i.e., 1997, 1996, 1995, 1994). With the current pump and treat and further analysis there appears to be a 2.55 Ci per year contribution to the Columbia River as calculated from the 1996 average Strontium-90 in the Columbia River and average flow of 4500 cubic meters per second (Table Annual average Sr-90 Dose) and not the claimed .063 Ci/yr flux. Request Ecology reconcile these differences in Flux.

**Response:** It is unclear what the commentor's calculation of 2.55 Ci/yr

represents. However, this number appears to be the average number of curies/year in the Columbia River. The 0.063 Ci/year is calculated by taking the concentrations of groundwater at the river shore and multiplying the concentration by the total flux of water discharging through the contaminated zone into the river for each year. It is agreed that the current pump-and-treat system will not significantly reduce the clean-up time over natural attenuation. The purpose of the current pump-and-treat system is to accomplish the following:

- (1) remove Sr-90 from the groundwater,
- (2) reduce the flow of water through the aquifer (by reducing the flow of water, it also reduces the amount of Sr-90 being released to the river),
- (3) and collect data for either additional remedial alternatives and/or help set an alternative concentration limit for this site.

4. **Comment:** Provide the cost estimate for the Barrier Wall – Passive Remedial action. The earlier analyses are missing from these current document. Ecology's earlier estimate demonstrate pump and treat cost approximately \$300,000,000 more than the Barrier Wall which makes pump and treat less effective.

**Response:** The estimated cost of a permeable reactive barrier is \$28,000,000 (DOE/RL-96-11). However, a constructibility test for installation of an impermeable barrier showed that the required sheet pile could not be installed using drive techniques.

5. **Comment:** The current approach of putting out these four documents (DOE/RL-96-102, DOE/RL-97-30, DOE-RL-96-30, and DOE/RL-95-111) is very confusing. Request Ecology and DOE provide one single document that provide a clear plan for Remedial Actions for 100 N Area. It is very unclear what was evaluate and against what to determine what is the right approach to remediate groundwater at 100 N Area. In reviewing these documents it appears previous analysis are not now considered. Please provide the detail written analysis that has lead Ecology to recommended alternative on continued pump and treat.

**Response:** With regard to the approach for publishing documents for the 100-N Area remedial actions, it should be noted that both the RCRA and CERCLA regulatory processes require a detailed evaluation of alternatives in the form of a corrective measures study (RCRA) or a feasibility study (CERCLA). The alternatives recommended as a result of these studies are presented to the public in a proposed permit modification (RCRA) or a proposed plan (CERCLA). In order to provide the public with convenient access to the greatest amount of information and to minimize the expense of producing both RCRA and CERCLA documents for proposed actions in the 100-N Area, the RCRA and CERCLA procedural requirements were integrated. The proposed plans, along with the appropriate corrective measures studies, were issued to meet the RCRA and CERCLA requirements. Each of the proposed plan documents is accompanied by a summary that describes the integration of RCRA and CERCLA requirements and

discusses other actions that are underway or planned in the 100-N Area. In addition, the issuance of these documents meets two milestones established by the Tri-Party Agreement: M-15-12B required documentation to cover the TSD units and M-15-12C required coverage of the 100-NR-1 and 100-NR-2 source units.

With regard to the analysis associated with continuing the pump-and-treat operations, the current pump-and-treat system is part of Emergency Remedial Action installed in 1995. It is not the final remedy. Data collected during the operation of the pump-and-treat will be used to select the final remedy. That final remedy will also solicit public comments. At present, it is very difficult to remove Strontium-90 adsorbed onto the sediments. As long as Sr-90 adsorbed onto the sediments is in contact with the groundwater, the concentrations in the groundwater will exceed the maximum concentration limit by three orders of magnitude. This is due to the chemical equilibrium between the Strontium-90 on the sediments and in the groundwater.

#### **Heather Trumble Comment**

1. **Comment:** As a taxpayer I am concerned that excessive amount of money would be proposed to be spent cleaning up a single site along the river to pristine conditions when I cannot foresee the future need of the public to utilize this specific small area for agricultural or residential use. Even if the 100 N Area is "cleaned UP", there is no sampling protocol which can guarantee the public that it is clean and safe to habitate with no risk. The same applies to the entire Hanford Site. Which I am not knowledgeable about the treaty rights of the tribes, nor the specifics of the MTCA, I feel recreational/industrial use is a reasonable alternative, which adequately reduces the dose to the public, removes the bulk of the source term from near the river, and doesn't cost an exorbitant amount of money.

**Response:** See response to General Comment 1 under the HGP comments.

#### **Nez Perce Comments**

1. **Comment:** It is difficult to ascertain the impact of these actions upon our people as none of the Native American Scenarios outlined in the Columbia River Comprehensive Impact Assessment (CRCIA) were assessed.

**Response:** The future land use for the Hanford Site has not yet been determined. To provide a basis for evaluating the various remediation technologies, two land-use scenarios were used. One reflects a conservative approach in which the land would be used extensively (i.e., rural residential) and the other reflects a less conservative approach in which the land would be used in a less intensive way (i.e., ranger/industrial). Once the land use for the entire Hanford site has been determined, past and future actions throughout the site will be assessed to ensure consistency with the intended use.

2. **Comment:** Chromium contamination of the 100-N Area is not being addressed. During Fiscal Year 1968, N reactor operations consumed more than 15,000 lb. of Sodium Dichromate (**Chemical Discharged to the Columbia River from DUN Facilities, Fiscal Year 1968 DUN\_4668**). Chromium concentrations in groundwater samples from Well 199-N-80 are consistently above drinking water standards of 50 ug/L, but remediation of chromium in groundwater is postponed until the final remedial action.

**Response:** Well 199-N-80 was drilled and completed in 1992 to RCRA well standards and is completed in a confined sand unit. This confined sand unit is about 15 ft below the upper unconfined aquifer and is separated from it by a clay layer (Hartman and Lindsey 1993). The chromium values at 199-N-80 are above the drinking water standard (50  $\mu$ g/L) and above the values determined for the upper unconfined aquifer. The upper unconfined aquifer contains the groundwater that can be directly influenced by discharge to 100-N Facilities (1324N/NA, 1301-N and 1325-N) and other surface activities. The only other well that may be screened in the same unit as 199-N-80 is well 199-N-8P. This is a piezometer located within 50 to 75 ft of the river. Samples are collected from this piezometer on an irregular basis. Chromium was not detected in a sample from 199-N-8P collected in April 1992. It is also important to note that wells screened in the uppermost unconfined aquifer (199-N-75), in the bottom of the unconfined aquifer (199-N-69) and adjacent to the river (199-N-8T, 199-N-8S), all within the general areal location of well 199-N-80 do not have chromium values above the drinking water standard. The chromium values at well 199-N-80 appear to be well-specific and not related to overall aquifer water quality. Hartman and Lindsey (1993) comment that high chromium values may be a result of the stainless steel used for the well casing and screen. The potential for deep contamination will be further evaluated as part of the interim action.

Reference: Hartman, M.J., and K.A. Lindsey, 1993, *Hydrogeology of the 100-N Area, Hanford Site, Washington*, WHC-SD-EN-EV-027, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

### Washington Department of Fish and Wildlife (WDFW) General Comment

1. **Comment:** The 100-N Area has multiple contaminants of concern that must be addressed by the proposed remedial actions of the 100-NR-1/100-NR-2 Operable Units. The 100-NR-2 groundwater operable unit affects the shoreline site of the 100-NR-1 operable unit. Proposed interim actions should not foreclose final remedial actions, which address all contaminants of concern above maximum concentration levels.

**Response:** The Tri Parties agree with the comment. The proposed interim action is to continue the existing pump and treat system, which will not preclude a final remedial action.

## Washington Department of Fish and Wildlife (WDFW) Specific Comments

1. **Comment:** WDFW concurs with the interim remedial actions for the 100 NR-1 sites.

**Response:** Comment accepted.

2. **Comment:** WDFW concurs with the interim remedial action of the Sr-90 pump and treat while an evaluation of the effects of tritium, Sr-90, and hexavalent chromium on aquatic receptors is performed. The pump and treat establishes a hydraulic gradient preventing the other contaminants of concern from reaching the river. Furthermore, the effectiveness of the interim remedial action should be evaluated.

**Response:** Comment accepted. The interim remedial action will be evaluated formally at the end of the first five years of operation under the interim record of decision. Informal evaluation of the system will occur throughout its operation and at each yearly budget review cycle.

3. **Comment:** WDFW strongly agrees with the tri-party agencies that "more information must be obtained to determine whether Sr-90 concentrations are causing short- or long-term impacts to these [aquatic] receptors" and that "further evaluation of potential impacts to aquatic and riparian resources is considered a vital part of the proposed interim action". The contaminated groundwater is an exposure pathway to aquatic receptors, and aquatic receptors are currently exposed to contaminants of concern. WDFW requests studies be initiated to evaluate the impacts to aquatic receptors. We are dismayed that studies have not already been initiated.

**Response:** Comment accepted. Discussions being held by the Tri-Parties and interested stakeholders under the Innovative Technology Remediation Demonstration project have included the proposal to further evaluate the impacts of the N Area groundwater on the ecological receptors in the area. It is expected that these discussions will lead to field sampling and subsequent impact analysis.

4. **Comment:** Terrestrial cleanup is occurring in the 100 Area. As part of the cleanup effort in the 100-N area, WDFW urges USDOE to initiate a moderate level biological evaluation of contaminants to terrestrial and avian species, and cooperatively work with WDFW, U.S. Fish and Wildlife Service and the Hanford Natural Resource Trustee Council in developing the biological studies. WDFW also would encourage the evaluation be expanded to include the entire 100 Area National Priority List site.

**Response:** Ecology, EPA, and USDOE are also members of the Hanford Natural

Resource Trustee Council and expect to work cooperatively with WDFW and others in developing a plan to access impacts of the remedial actions on terrestrial receptors in the 100 Area.

5. **Comment:** WDFW has not been provided adequate information to enable us to make any recommendations toward a final remedy for the 100 NR-2 operable unit and the shoreline site of the 100-NR-1 operable unit.

**Response:** This is an interim action aimed at making substantial progress in an area of substantial contamination. The Tri-Parties are not currently in a position to issue a recommendation on a final action.

6. **Comment:** WDFW would like to point out to USDOE project staff that USDOE is a trustee and has responsibilities to the public concerning natural resources. The documents include I&I language identifying commitment of resources for each alternative response action. We believe such commitments are appropriate only after full mitigation, including compensatory mitigation, has been provided. It should be clearly stated that the intent of the I&I statements are being included as important public information, not as an attempt to circumvent natural resource damage liability.

**Response:** The language included in the documents speaks to the commitment of resources such as diesel fuel, backfill, and expendable equipment. The intent was to provide relevant information, as it became available.

7. **Comment:** The Corrective Measures Study is deficient due to a lack of environmental analysis, and as such, it is premature to consider final remedial alternative(s) and/or corrective action(s). Studies need to be initiated to evaluate impacts from tritium, Sr-90, and hexavalent chromium to aquatic receptors.

**Response:** The Corrective Measures Study is sufficient to support the interim actions proposed.

#### **Alton Haymaker, General Comment**

1. **Comment:** Of the two alternatives I prefer alternative support, not remedial.

**Response:** It is assumed that the commentor misunderstood the range of alternatives evaluated and the alternative recommended for implementation. Alternative support was not evaluated as part of this study, nor was a specific alternative called out as remedial.

#### **Washington State Department of Health (DOH) General Comments**

1. **Comment:** We are pleased that work is starting on this unit because we believe that 100-N is currently the main area of the Hanford Site where the public can

receive radiation exposure from Hanford pollutants. The evaluation of the cleanup levels based on various land uses and controls coincides with the approach that DOH has recommended in its Hanford Guidance for Radiological Cleanup. DOH hopes that remediation of this area can proceed on schedule and using a sound technical basis that will give priority to those areas that have a current measurable dose impact on the public.

**Response:** Comment accepted. The Tri-Parties have agreed to proceed with the remediation of the N Area using the schedule included with the corrective measures study.

### DOH Specific Comments

1. **Comment:** The rural residential scenario used to evaluate future potential risks is sometimes referred as an unrestricted use scenario (for example, DOE/RL-97-30, page 13). This scenario also is implied to not preclude any future land use (for example, DOE/RL-96-102, page 4). Since this scenario restricts the use of 100-N Area groundwater, terms other than 'unrestricted use' or 'not precluding any future land use' would be more appropriate when referring to this scenario.

**Response:** The term rural residential scenario is defined in DOE/RL-97-30, page 3, paragraph 4 and in DOE/RL-96-102, page 3, paragraph 8 as a scenario which includes restrictions on groundwater use, including a follow-on statement that drinking and irrigation water would need to be supplied from an offsite source (additional details of the scenarios are provided in Appendix F of the CMS.)

2. **Comment:** Reference is made to a 15 mrem/y dose standard for cleanup of sites contaminated with radioactivity. This cleanup level is sometimes referred to as an EPA standard, other times as an EPA draft standard, and other times as EPA guidance. For members of the public not familiar with radiation regulations, use of the term 'EPA standard' implies an EPA regulation with legally binding requirements. Since this EPA cleanup level has not been promulgated and has been withdrawn from consideration for promulgation, it would be more appropriate to consistently refer to it as EPA guidance.

**Response:** Comment accepted. Consistently referring to the 15mrem/y dose standard for cleanup as an EPA guidance would be appropriate. This guidance is included under the category of 'to be considered' in the regulatory applicability section of the corrective measures studies and proposed plans and will be used to define the interim cleanup standards applicable to the proposed actions.

3. **Comment:** DOE/RL-96-102, page 19, Receptor Pathway Descriptions The text states that 'access control by the DOE currently prevents potential exposure to contaminated groundwater emanating at 100-N-Springs'. This is not the case at times of very low river stage, where ample dry land is exposed above the water line but below the marked radiation zones. This land is below the

river's high water mark and is accessible to humans.

**Response:** Warning signs at the N-Springs, which face the river, are intended to inform the potential trespasser of the dangers in the area. In addition, the Hanford Patrol and remediation personnel are in the area and are keenly aware of the contamination present at N Springs and the need to prevent intruder access.

4. **Comment:** The documents discuss cases where radiological contaminants either exist or may exist at concentrations above cleanup standards at depths greater than 4.6 meters below grade (for example, DOE/RL-97-30, page 8, and DOE/RL-96-102, page 12). Are these cleanup standards the soil concentrations corresponding to 15 mrem/y from contaminants in the first 4.6 meters below grade, for example those listed in Table 3, page 12 of DOE/RL-97-30?

**Response:** The cleanup standards for these actions will be applied from current grade to 4.6 meters below grade. As described on page 16 of DOE/RL-97-30 and page 12 of DOE/RL-96-102 for those sites which have residual contamination above the cleanup standards at a depth greater than 4.6 meters several factors will be considered to determine the extent of additional remediation. These factors include reduction of risk by decay of short-lived radionuclides, protection of human health and the environment, remediation costs, size of ERDF, worker safety, presence of ecological and cultural resources, the use of institutional controls, and long-term monitoring. The cleanup standards are listed in Table 3, page 12 of DOE/RL-97-30 and in Table 2, page 9 of DOE/RL-96-102. The constituent concentrations listed in both tables represent an individual contaminate level equivalent to 15 mrem/y and would therefore result in a more restrictive cleanup concentration when more than one constituent is present at a waste site

5. **Comment:** Exactly how contaminants at depth are dealt with, and how they correspond to the depths of concern for the two exposure scenarios (4.6m for rural residential and 3m for ranger/industrial), is not clear. For example, the discussion in the CMS for the 116-N-1 Trench (DOE/RL-96-39) indicates remediation to 21 feet (6.4m) below grade, or 5 feet below the bottom of the engineered structure (located 16 feet below grade) for both exposure scenarios. The document did not make it clear why remediation to this depth was needed to meet the dose criterion for these scenarios, particularly for the ranger/industrial scenario.

**Response:** The background information for the excavation depth to five feet below the normally required depth of 4.6 meters for these sites can be found in DOE/RL-96-39, page 4-6, Section 4.5. This section, entitled, Area of Contamination for Radiological Sites, refers to the Limited Field Investigation (DOE/RL 1996b), which documents the results of boreholes drilled along side and through the 1301 crib and trench and the 1325 crib. The samples collected from this event indicate a concentrated layer of radionuclides including plutonium-239-240, approximately 3-5 feet thick at a depth of 20 feet below surrounding grade.

The Tri-Parties have agreed that this layer of concentrated soil could not be left behind and would therefore be part of the planned excavation.

### Gerald Pollet Comments

1. **Comment:** The use of an interim action containing 15 mrem/y does not accomplish MTCA cleanup by 2011 as promised by the Tri-Parties.

**Response:** The Tri-Party commitment to complete cleanup in the 100 Area is documented in Milestone M-16 of the Tri-Party Agreement. It is anticipated that the milestone completion date of 2018 will be achieved using the agreed upon path forward.

2. **Comment:** 15 mrem/y is inconsistent with MTCA's  $1 \times 10^{-5}$  cumulative risk level for carcinogens.

**Response:** The use of 15 mrem/y above background and MTCA is consistent. MTCA provides for the use of reasonable restoration timeframes which would include natural processes in the form of decay. The 15 mrem/y cleanup standard is consistent with EPA guidance for cleanup of radiological contamination at Superfund sites, WDOH Hanford Guidance for Radiological Cleanup and is less than the current NRC standard approved in 1997.

The Tri-Parties have examined cleanup levels above 15 to 25 mrem/y and found them not protective of human health and the environment at Hanford. Cleanup levels below 15 mrem/y, although perhaps more protective, present substantial difficulties. In many cases, existing field measurement methods cannot accurately measure less than 15 mrem above background. Laboratory quality analyses would be required but will only measure low enough in some cases. Requiring a more stringent cleanup level, unprecedented elsewhere in the DOE complex or in the international community, would significantly increase excavation costs and the areal footprint of ERDF. Further, it is anticipated that the WDOH will adopt the NRC regulation which uses 25 mrem/y as the cleanup standard by July, 2000.

3. **Comment:** The N documents recommend a rural residential cleanup scenario while a native subsistence scenario is more likely.

**Response:** The Tri-Parties issued the Interim Action Record of Decision for the 100-BC, DR, and HR operable units using the rural residential land use scenario so as not preclude future land uses as may be determined by the appropriate agencies. The agencies responsible for land use determination have yet to make such a determination on the Hanford site. Therefore, the rural residential scenario being applied at 100-N is consistent with previous actions in absence of other determinations. The Tri-Parties will continue to engage in dialogue with stakeholders concerning the Native American subsistence scenario and other scenarios which may be applicable to the Hanford site cleanup evaluations.

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