

3.0 Responses to Hanford Solid Waste Draft Environmental Statement Comments

3.1 Federal Agency Comments and Responses

This section presents the comments and then the responses from federal agencies (e.g., USEPA) and DOE's response. The entire letter appears with comments identified in numerical order. DOE's responses to individual comments in the letter follow.

3.1.1 Environmental Protection Agency, Region 10



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

Reply To
Attn Of: ECO-088

JUL 25 2002

97-062-DOE

Mr. Michael S. Collins
HSW EIS Document Manager
U.S. Department of Energy, A6-38
P.O. Box 550
Richland, WA 99352-0550

Dear Mr. Collins:

The U.S. Environmental Protection Agency (EPA) has reviewed the draft Environmental Impact Statement (EIS) for the proposed *Hanford Site Solid (Radioactive and Hazardous) Waste Program* (CEQ# 020200). This draft EIS provides environmental and technical information and examines two action alternatives for managing wastes at the Hanford Site near Richland, Washington. The Hanford Solid Waste (HSW) EIS tiers from the final Programmatic EIS for *Managing, Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* issued by the Department of Energy (DOE) in 1997. The HSW EIS also updates previous environmental reviews prepared for waste management operations at the Hanford Site.

EPA has provided comments, on this and other EISs pertaining to activities affecting the Hanford Site, in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. Generally, EPA's comments on Hanford EISs focus on maintaining the accelerated clean-up schedule agreed to in the Tri-Party Agreement (TPA) and the March 6, 2002 letter of intent by: 1) not creating additional problematic wastes that will require future remediation; and 2) ensuring that proposed activities would not divert resources or capacity from clean-up activities.

We have rated the HSW draft EIS, EO-2 (Environmental Objection – Insufficient Information) because: 1) all action alternatives are predicted to exceed Maximum Contaminant Levels (MCLs) of iodine-129 and that other radionuclides (e.g., technetium-99) would contribute additionally to the exceedance of radionuclide MCLs thereby contaminating or worsening contamination problems in the vadose zone and groundwater, and thus potentially create more required clean-up; and 2) insufficient information exists to fully describe existing and predicted environmental impacts, and if proposed activities would divert resources or capacity from the clean-up scheduled at Hanford. It also appears that predicted contamination from action alternatives could be avoided with mitigation measures and adoption of other alternatives.

EPA believes the following changes to the EIS (with similar commitments in the Record of Decision) are necessary to make the document and proposed project environmentally acceptable:

- Present and analyze a full range of reasonable alternatives with additional mitigation measures [e.g., Environmental Restoration Disposal Facility (ERDF)-like mega-trench, altering volume or WAC of imported waste streams] which would be in compliance with environmental standards, reflect real differences in environmental impacts, and that address scoping comments and comments on the draft EIS;



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- Provide more extensive analyses and description in the EIS disclosing existing impacts [e.g., estimating pre-1970 transuranic waste (TRU) or emissions from remedial actions], elements of action alternatives (e.g., the types of treatment proposed in the T-plant or the M-91 facility), and greater detail about the cumulative impacts as well as a breakdown of impacts from disposing wastes originating at Hanford versus other sites;

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- Ensure consistency between the WAC and regulations of comparable disposal sites or provide a reasonable and scientifically valid explanation of the difference in the EIS; and

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- Provide a clear purpose and need statement preferably identifying disposal of Hanford waste streams as the primary need and treatment and disposal of certain off-site wastes as the secondary need.

Enclosed are a description of our rating system and EPA's detailed comments which discuss the basis of our environmental objections with the proposed project and the EIS as well as methods of addressing our environmental objections. EPA is eager to work with DOE, and when appropriate, the Washington Department of Ecology, in the resolution of these issues. Please contact Mr. Chris Gebhardt, of my staff, at (206) 553-0253 or Mr. David Einan, in EPA's Hanford Operation Office, at (509) 376-3883 to discuss these issues further. Thank you for the opportunity to comment and for providing Mr. Gebhardt the opportunity to visit the Hanford Site.

Sincerely,



Elbert Moore, Director
Office of Ecosystems and Communities

Enclosures

cc: Mike Wilson, Ecology
Richard Gay, CTUIR
Pat Sobotta, Nez Perce Tribe
Russell Jim, Yakama Tribe
Todd Martin, HAB
Ken Niles, OOE

**EPA's Detailed Comments on the Draft Environmental Impact Statement (EIS)
for the Hanford Solid Waste Program**

General Comments

Further Contamination of the Vadose Zone and Groundwater

7 For both Alternatives 1 and 2, the Mixed Low Level Waste (MLLW) estimates for groundwater impacts from iodine-129 show Maximum Contaminant Levels (MCLs) exceeded for both lower and upper bound waste volumes. Other radionuclides (e.g., technetium-99) contribute additionally to the exceedence of radionuclide MCLs. MCL exceedences in groundwater are generally not acceptable as design elements for proposed actions. These results would appear to effectively disqualify both these alternatives. Variations of these alternatives or new alternatives, which restrict radionuclide quantities so as to prevent MCL exceedences, need to be considered.

Alternatives

8 EISs should rigorously explore and objectively evaluate all reasonable alternatives [40 CFR 1502.14(a)] to help ensure that decisionmakers take actions that protect, restore, and enhance the environment [40 CFR 1500.1 (c)]. The range of alternatives in the Hanford Solid Waste (HSW) EIS is essentially limited to existing and enhanced trench options. Wastes are assumed to be disposed consistent with the Waste Acceptance Criteria (WAC). There is no consideration in the range of alternatives of actions that could be taken (in addition to those of the WAC) to mitigate impacts.

9 It appears that alternatives were formulated based on cost concerns rather than environmental ones. The common significant theme found among the elements of Alternative 1 (i.e., modify the T-Plant, treat wastes commercially, and dispose of waste in larger trenches), when compared to the elements of Alternative 2 (i.e., build the new M-91 Plant, treat wastes at Hanford, and dispose of waste in smaller trenches), is reduced cost. This contrasts with the National Environmental Policy Act (NEPA) at 40 CFR 1502.14, which directs lead agencies to present the *environmental impacts* [italics added for emphasis] of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice.

10 At the same time, both action alternatives are environmentally objectionable because they result in predicted impacts that cause or contribute to exceedences of radionuclide MCLs in groundwater. The EIS should be revised to include a fuller range of alternatives with additional mitigation measures, if necessary [40 CFR 1502.14(f) and 1502.16(h)]. Alternatives which EPA believes merit further examination include Environmental Restoration Disposal Facility (ERDF)-like mega trench, varying WAC, volumes imported from offsite, packaging, and capping, and limiting radionuclide concentrations. The Department of Energy (DOE) should issue a supplemental draft Programmatic EIS if adding additional alternatives makes substantial changes relevant to environmental concerns [40 CFR 1502.9(c)].

11 Finally, the EIS should contain a fuller discussion of the no action alternative. The EIS describes how the final Programmatic EIS for *Managing, Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* and subsequent Record of Decision (ROD) have selected the Hanford Site and the Nevada Test Site to be the DOE facilities responsible for the treatment, storage, and disposal of Low Level Waste (LLW) and MLLW originating from DOE facilities that lack these capabilities. The Hanford Site and Nevada Test Site could each receive all to none of these offsite wastes with the other receiving the remainder. The EIS should describe the range of possible scenarios involving the distribution of off-site wastes between the Hanford Site and the Nevada Test Site and the environmental consequences when describing the No Action Alternative.

12 Disparity between WAC and 10 CFR 61

Note that the radionuclide concentrations permitted by the WAC exceed those permitted under 10 CFR 61 for the commercially-licensed low level radioactive waste disposal site on the Hanford Reservation. The EIS should address the inconsistency between these two disposal circumstances. What specific technical provisions make such waste [e.g., Transuranic waste (TRU) exceeding 100 nCi/g] unacceptable at the commercial site, yet acceptable at the neighboring DOE site?

13 The EIS should incorporate a section specifically comparing future alternatives to existing disposals, their requirements (including waste acceptance criteria), and risks. Alternatives should be considered which provide additional isolation for wastes exceeding 10 CFR 61 criteria for shallow disposal. For example, the “greater confinement disposal” approach at the Nevada Test Site for similar wastes should be considered.

14 Consistent analyses: Intruder risks

Intruder risks are evaluated at Section 5.11.4, but only out to 500 years. Commercial sites complying with 10 CFR 61 can limit evaluation of intruder risks to 500 years because of the limits placed on concentration by 10 CFR 61 (i.e., greater than “Class C” waste is not permitted for disposal). Since the DOE WAC allows for disposal of greater than “Class C” waste, and since some of this waste (e.g., TRU waste) has long half-lives, the EIS should evaluate intruder risks beyond 500 years. Specifically, the EIS should evaluate intruder risks for a period of time consistent with other pathway evaluations in the EIS (e.g., the 10,000 year period evaluated for groundwater).

15 Groundwater analyses: Technical comments

For groundwater impacts, the location of concern is not the location selected “1-km along the Columbia.” Groundwater impacts apply anywhere in the aquifer, and in that context the well 1-km from the waste site provides a more appropriate evaluation of impacts.

16 The evaluations of radionuclide in groundwater do not properly characterize their impacts in the context of drinking water standards. Radionuclide MCLs are additive. The criteria apply using a “sum of fractions” approach so that if one radionuclide is at 0.6 of its MCL and another is at 0.5,

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the sum of fractions is 1.1 and the radionuclide MCL requirements have been exceeded. When this is taken into account, the predicted MCL exceedences at the location 1-km from the waste site (counting all radionuclides) are even greater than indicated. In evaluating alternatives with regard to groundwater impacts from radionuclides, the MCL sum of fractions for the radionuclide contaminants should be the primary basis for comparison.

Purpose and need statement

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The purpose and need statement should be stated more clearly. The scope of the purpose and need statement appears to be limited to the treatment, storage, and disposal of current and anticipated volumes of wastes solely of Hanford origin and to not include similar activities for imported, off-site wastes. This should be clarified. In addition, the use of the word "enhance" or "enhanced" in the context of the purpose and need statement, as well as when describing the wider trenches, seems subjective and pre-determined, and thus inappropriate. The EIS should use less subjective words in the EIS and let the reader and the decision-maker decide the appropriate mechanism (including the no action alternative) to enhance or improve solid waste disposal at Hanford.

The purpose and need statement should be rewritten to clearly articulate the primary need for this EIS in relation to Hanford's current waste inventory, its impact on Hanford cleanup, and the secondary need as the treatment and disposal of certain off-site wastes.

Public participation

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As a general observation, it is not clear that the comments received during scoping were not considered in the draft EIS. For example, page A.4 contains a scoping comment received by DOE that managing wastes using primarily cost considerations has been largely responsible for the magnitude of DOE's existing complex-wide clean-up problem. EPA believes that this comment was not adequately addressed in the draft EIS. The EIS should demonstrate more clearly that scoping comments (and subsequently comments made on the draft EIS) were used to identify significant issues [40 CFR 1500.4(g)].

In addition, the EIS states that the public meetings held during the scoping period extended through January 30, 1998. The EIS should state how DOE ensured that significant issues did not arise in the 4 year interim between the last scoping meeting and the issuance of this draft EIS.

Other general comments

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The body of the EIS tends to repeat information in many places. EPA suggests that the document be reviewed for redundancies and that vital information from each appendix be summarized in the body of the EIS to allow the reader to understand what is being analyzed and the impacts are.

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We commend DOE for using side-bar definitions which assist the non-technical reader of the EIS.

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The HSW EIS needs to be updated to ensure consistency with the Hanford Management Plan.

22 | Referencing the “Hanford Site Solid Waste Acceptance Criteria” (WAC) so extensively will
make those criteria harder to change, from a performance assessment, impact assessment, and
NEPA standpoint. Instead, the EIS should state what the WAC criteria are.

23 | The EIS lacks sufficient detail to understand what types of treatment would occur in either the
T-plant or the proposed M-91 facility under Alternatives 1 and 2, respectively.

Specific Comments

24 | 1) Summary – EPA is pleased that DOE views the Hanford Solid Waste EIS as a vehicle to
update previous documents and to provide evaluations for activities that may be
implemented as a result of DOE decisions on the Waste Management Programmatic EIS.
EPA believes that additional documentation to complement the brief analysis and
description of Hanford included in the *Waste Management Programmatic* EIS is needed.
The EIS should include this brief analysis in its entirety, as well as the Record of Decision
from the *Waste Management Programmatic* EIS, since this documentation is seen as
providing the need for this project.

25 | 2) Page S.4, Waste Types Analyzed, page S.5, sidebar – The definition of TRU differentiates
it from high-level radioactive waste, and identifies the lower radionuclide and half-life
limits. EPA recommends that this definition be expanded to explain how TRU differs from
high-level wastes and identify upper radionuclide and half-life limits, if these limits exist.

26 | 3) Page S.4, Waste Types Analyzed, page S.5 states that beginning in 1987, treatment of
MLLW (generally immobilization, removal, or destruction of the hazardous component)
was required before it could be sent to a Resource Conservation and Recovery Act (RCRA)
permitted land disposal facility. MLLW is defined as waste that contains both
radionuclides and hazardous components. The EIS should describe how, if the hazardous
component is dealt with, RCRA-permitted land disposal facilities address the remaining
radionuclide component subject to the Atomic Energy Act.

27 | 4) Section S.04, Waste Types, page S.6 – Since this EIS is supposed to bound conditions, it is
not clear why an estimate of pre-1970 TRU was not provided. The EIS should provide this
explanation. In addition, the explanation of “suspect” TRU waste is confusing and the
statement that DOE has not determined whether to retrieve and process “suspect” TRU
waste as TRU waste or leave it buried in Low Level Burial Grounds (LLBGs) is
concerning. Do future references to TRU in the document allude only to TRU or do they
28 | also include “suspect” TRU wastes? Why was the decision concerning how to best deal
with “suspect” TRU not made prior to, or as part of, this EIS? It appears that the outcome
of this decision will have a bearing on the program design, either the quantity of waste
treated as TRU would increase or LLBGs would need design parameters sufficient to
contain unknown quantities of TRU in an environmentally sound manner. The EIS should
discuss “suspect” TRU, the environmental risks it poses, and how it influences the design
of action alternatives.

- 29 | 5) Sections S.6.1.1, S.6.1.2, S.6.2.1, and S.6.2.2 begin with the conditioning statement, "when needed." The EIS should state when waste needs to be inspected and verified.
- 30 | 6) Table S.1, Summary Comparison of Alternatives, page S.11 states that under Alternative 1, non-conforming wastes would be treated commercially. Are such facilities available? If not, when would they be made available?
- 31 | 7) Section S.8.5, Cumulative Impacts, page S.20 states that impacts for all resources considered in the HSW EIS are relatively small and would not be expected to contribute substantially to impacts of other activities at Hanford or in the surrounding region. EPA strongly believes environmental impacts from proposed action alternatives which exceed or contribute to exceedences of MCLs in the groundwater and vadose zone should not be trivialized by comparing them to the nationally significant impacts which have occurred at the Hanford Site over the last 56 years. Instead, impacts which exceed MCLs be viewed as adding to an already environmentally unsatisfactory situation requiring clean-up with the impacts from these actions.
- 32 | 8) Section S.8.6, Mitigation, page S.20 – Trust organizations should be added as a group that needs to agree on the appropriate mitigation measures and this section should include mitigation measures for groundwater and the vadose zone, since they would result in exceedences of MCLs.
- 33 | 9) Section 1.4.1, Scoping Process, page 1.5 – The EIS states that decommissioning, surveillance, and maintenance activities that occur after closure of the waste management facilities, are not included within the scope of the HSW EIS. The EIS should state why this is the case and when and how they will be considered.
- 34 | 10) Section 1.4.1, Waste Volumes, page 1.6 – The EIS states that within the alternatives for LLW and MLLW, a range of waste volumes was evaluated to reflect the uncertainties in future waste receipts at the Hanford Site. The EIS should include statistical analyses and tools to describe the level of uncertainty and then explain it in language understandable to the general public. Statistical tools that could be employed are the expected mean, confidence intervals, and standard error.
- 35 | 11) Section 1.5.12, Tri-Party Agreement, page 1.15 – The EIS should describe how successful Hanford has been at meeting past milestones established in the Tri-Party Agreement (TPA).
- 36 | 12) Section 1.5.1.2, RCRA Requirements, page 1.16 – This section states that DOE is currently characterizing sites in the 200 area. The EIS should state when this characterization is scheduled to be completed and if draft information from this incomplete characterization is, or should be, included in the EIS.

- 37 | 13) Section 1.5.2, EA for Trench Construction, page 1.18 – The EIS should explain why DOE analyzed the construction and operation of four LLW disposal trenches in the Hanford Site 200 East and West Areas in the 2001 Environmental Assessment rather than analyzing these activities in this EIS.
- 38 | 14) Section 1.5.3, Related NEPA Documents, page 1.18 – The EIS should identify related NEPA documents or other environmental processes which analyze methods to avoid and minimize the production of wastes which subsequently needs to be stored, treated and disposed.
- 39 | 15) Section 1.5.3, Tank Waste Remediation, page 1.21 – The EIS states that the tank waste remediation program is expected to be a major generator of LLW and MLLW sent to the solid waste program for disposal in the Hanford LLBGs. The EIS should explain this process in greater detail, estimate the significant waste volume potentially generated by the tank waste remediation program, state whether this waste stream is included in the waste volume estimates in the EIS, and if not, explain why not.
- 40 | 16) Section 1.5.3, Waste PEIS, page 1.22 states that DOE decided in its February 25, 2000 ROD for LLW and MLLW states that DOE sites that have existing capacity to treat or dispose of LLW and MLLW would do so and that Hanford and Nevada Test Site would receive these wastes from DOE sites that lack this capacity. The EIS should give readers and the decision-makers additional information about the amount of off-site waste Hanford would receive. For example, the EIS could describe how DOE would divide between the Hanford Site and Nevada Test Site, wastes that other DOE facilities lack the capacity to treat or dispose. In addition, the EIS could use historical information to describe how much waste Hanford has received in past years from these facilities.
- 41 | 17) Section 1.5.3, EA for disposition of surplus U, page 1.23 – The EIS should state whether the remaining uranium is included in the estimates of wastes bounded in the EIS. The 3rd paragraph of this section should clearly state that ERDF is constructed to meet all the requirements of a hazardous waste landfill.
- 42 | 18) Section 2.1.1, LLW Streams, page 2.3 – This section describes verification that on-and off-site waste meet WAC. The EIS should describe this in greater detail. For example, how often is a random sampling taken of wastes? How often do tested wastes fail to meet the WAC? Are verifiers at generators and Hanford independent of site operators?
- 43 | 19) Section 2.1.2, MLLW Streams, page 2.5 – The EIS should describe the success of contracts intended to serve as a technical demonstration for future commercial treatment of the majority of Hanford's MLLW. This information is relevant to evaluating action alternatives included in the draft EIS.
- 44 | 20) Section 2.1.3.6, TRU Waste-Newly Generated, page 2.10 – The EIS should state when the Waste Isolation Pilot Plant (WIPP) waste criteria or shipping system are expected to be in place and if draft guidance for the waste criteria or shipping system currently exist.

- 45 | 21) Section 2.1.3.7, TRU Waste-K Basin Sludge page 2.10 – The EIS should clearly state that the K-Basin sludge does not require treatment for PCBs.
- 46 | 22) Section 2.2.2.4, T-Plant Complex, page 2.18 – The EIS states that current plans are to use the water-filled basins for the K Basin sludge until a treatment facility for the sludge is available. The EIS should estimate when such a facility would be available. The EIS should state whether using the T-Plant for this activity would restrict proposed uses of this facility.
- 47 | 23) Sidebar New M-91 Facility, page 2.20 – The EIS only identifies potential treatment capabilities. The EIS should analyze appropriate technological capabilities to include in this plant or defer to another NEPA process.
- 48 | 24) Section 2.2.3.1, Existing LLW Trenches, page 2.24 – The EIS states that soil is placed over the waste so that surface is near the original grade. The EIS should state why soil is not mounded over the trenches to shed water and avoid precipitation from infiltrating into the wastes.
- 49 | 25) Sections 2.2.3.1 and 2.2.3.2, Sidebars of Current and Enhanced LLW, MLLW Trenches, pages 2.24 and 2.25 – The EIS should compare the two alternatives from an environmental as well as a cost/capacity basis.
- 50 | 26) Section 2.2.3.2, Existing MLLW Trenches, page 2.26 – The EIS should state to what extent evapotranspiration rate will prevent infiltration through the layers of the Modified RCRA Subtitle C Barrier. “HWS” should be “HSW.”
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- 52 | 27) Section 3.2.2, MLLW Alt. 2, page 3.4 – The EIS states that the new M-91 facility would use non-thermal technology to treat organic solids and debris. The EIS should state why thermal treatments are excluded.
- 53 | 28) Section 3.3.1, Post 1970 TRU Alt. 1, page 3.6 – The EIS states that for the purpose of analysis, this EIS assumes that WIPP would have the necessary administrative and permitting authority to accept these wastes. The EIS should state when DOE expects WIPP would have the necessary authorities to accept wastes and if significant obstacles to obtain those authorities appear to exist.
- 54 | 29) Section 3.5, Other Alternatives Considered, pages 3.9-3.12 – EPA assumes that this section describes alternatives eliminated from detailed study, although this is not explicitly stated. NEPA regulations at 40 CFR 1502.14 (a) states that the Alternatives chapter should briefly discuss the reasons for alternatives having been eliminated. In many cases, the brief discussion does not convincingly state why alternatives were eliminated from consideration. For example, the EIS eliminates many treatment options based on the premise that environmental impacts would be similar. We do not find this rationale to be

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sufficient to withhold them from consideration by the decision-maker, especially because formulation of action alternatives appear to be driven primarily by cost concerns. EPA disagrees with eliminating alternatives because these options are being addressed under Superfund. NEPA and Superfund actions are not necessarily mutually exclusive and, when possible, should complement each other. Finally, EPA has identified several reasonable alternatives that the EIS should have examined but did not, including ERDF-like mega trench, varying WAC, volumes imported from offsite, packaging, and capping, and limiting radionuclide concentrations.

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- 30) Section 3.5.2.5, Mobile Treatment, page 3.10 – Mobile treatment facilities may be practical for treating certain waste streams. The EIS should state whether not including this option in the EIS precludes its use later on.

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- 31) Section 3.5.3.1, ERDF, page 3.11 – The section states that ERDF was rejected as an option because none of the waste is generated by Superfund actions. As discussed at the C3T meeting in June, that may not be the case. The Tri-Party Agencies have the ability to use the Superfund process when appropriate for many waste streams at Hanford. EPA suggests that you include this option in the EIS.

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- 32) Table 3.5, Comparison of Impacts, page 3.13 – The EIS should explain why maximum nuclide concentrations for iodine-129 and technetium-99 are greatest in the No Action Alternative when less waste would be buried. Table 3.5 should also identify the time period after action alternatives are adopted that these maximum concentrations are predicted.

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- 33) Section 3.7, Costs of Alternatives, page 3.15 – Costs should include total life cycle costs such as cap replacements, institutional control requirements, etc. The EIS should not rely on net present value estimates. The EIS should also state how costs were predicted for the No Action Alternative. Were costs discounted based on when DOE predicts treatment and disposal of the majority of MLLW and difficult to treat TRU? Did the EIS employ consistent methodology for estimating the costs of all the alternatives?

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- 34) Section 3.8, DOE Preferred Alternative, page 3.16 states that Alternative 1 is the most cost effective and environmental preferable approach to waste management at Hanford. This section should provide more supporting detail. For example, it should state the overall cost savings as well as show how Alternative 1 was and was not environmental preferable to Alternative 2 and the No Action Alternative.

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- 35) Section 4.2.2, 200 Areas, page 4.7 states that the T-Plant Complex is storing 27 metric tons (30 tons) of spent reactor fuel (from Shippingport, Pennsylvania) and that this fuel will be dried out and moved out of the T-Plant canyon. The EIS should state how this waste is classified (e.g., TRU or Hi-Level Waste), when it will be moved, and its final destination.

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- 36) Section 4.2.2, 200 Areas, page 4.10 describes 11 miles of underground pipeline used for non-RCRA-permitted waste streams. The EIS should state if this pipeline exists to

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facilitate movement of the waste within the 90 day period allowed by RCRA. Paragraph three of the same page states that surface contamination is present in three of the older LLBGs. The EIS should state the source, type, and level of the contamination.

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37) Table 4.3, page 4.18 expresses probability in scientific notation. We believe the general readership would find probability expressed as fractions easier to understand. Likewise, we believe the general readership would more readily identify with English units rather than metric ones. It is recommended that English units are expressed first with metric equivalents being placed in parenthesis.

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38) Table 4.6 and 4.7 – These tables should include emissions from remedial actions to be complete. Also, the table should label the two columns under the labels, 200 Area and 300 Area.

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39) Section 4.4.1, Topography and Geomorphology, page 4.24 refers to sea level and mean sea level. The EIS should state what is the difference between the two. The EIS also describes Holocene eolian activity. We recommend that the EIS define eolian in the text or the glossary.

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40) Section 4.4.4, Seismicity, page 4.31 states that other earthquakes with Richter magnitudes $> \text{ or } = 5$ and or MMI of VI occurred around Lake Chelan. The EIS should date these earthquakes to make them consistent with the surrounding sentences.

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41) Section 4.5.14, Onsite Ponds, page 4.36 states that evaporation has also led to relatively high levels of uranium due to concentration of natural sources. The EIS should describe in greater detail natural sources of uranium found at the Hanford Site and the extent that naturally occurring uranium contributes to radionuclide effects.

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42) Page 4.37 – Chapter 4 appears to lack a section on surface water quality. The EIS should include such a section or explain why such a section is unnecessary.

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43) Page 4.51, Section Biological and Ecological Resources, pages 4.51 and 4.52 appear to contain contradictory statements. Page 4.51 states that nonnative vegetation species currently dominate the landscape and page 4.52 states that native perennial shrubs and bunchgrasses generally dominate plant communities on the site. The EIS should clarify these statements.

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44) Section 4.6.1, 200 Area Plants, page 4.59 – This section states that Russian thistle and gray rabbitbrush are deep rooted and have the potential to accumulate radionuclides and other buried contaminants, functioning as a pathway to other parts of the ecosystem. The EIS should identify these pathways including wildlife that consume these species and describe the impacts to these receptors.

- 70 | 45) Section 4.6.2, Wildlife, page 4.63 states that West Lake has shrunk and the remnant small isolated pools and mud flats do not support coots and other nesting waterfowl. The EIS should also discuss impacts on amphibians and other water-reliant wildlife, if applicable.
- 71 | 46) Section 4.7.1, Native American Cultural Resources, page 4.70 – The EIS should state whether tribes who signed treaties reserving their ability to hunt, fish, collect berries, etc., on the Hanford Reservation can do so. If not, the EIS should state how the Federal government has resolved this conflict with agreed upon treaty rights. The third paragraph states that well-watered areas inland from the river also show evidence of concentrated human activity. The EIS should define concentrated human activity (e.g., gatherings, communal living, agriculture).
- 72 | 47) Section 4.8.5, Local and Regional Transportation, page 4.86 describes Level of Service (LOS) without identifying the LOS for roads on the Hanford Reservation.
- 73 | 48) Section 4.8.9, Utilities, page 4.8.8 describes how water systems in the Tri-City area rely on groundwater. The EIS should state if groundwater contamination described earlier in the EIS affects these water supplies as well as their status under the Safe Drinking Water Act.
- 74 | 49) Section 5.2, Air Quality, page 5.6 – EPA supports the use of environmentally conservative modeling to compensate for errors inherent in modeling and to ensure that the full extent of impacts is understood and mitigated for.
- 75 | 50) Tables 5.15 - 5.28 – The incremental impacts of future offsite wastes should be separately tabulated based on the upper and lower bound cases presented.
- 76 | 51) Section 5.14 – Cumulative risks presented should include risks from transuranic disposals (not included in Table 5.61) and should show comparative risks over time (not just at the end of 2046 – see Table 5.61).
- 77 | 52) Section 5.18, Potential Mitigation Measures, page 5.112-114 – The EIS should identify potential mitigation measures for groundwater.
- 78 | 53) Section 5.3.2, Methods for Assessment of Long-term Impacts, page 5.13 – EPA recommends that the assessment include wastes streams resulting from clean-up actions.
- 79 | 54) Section 5.3.2, Methods for Assessment of Long-term Impacts, page 5.14 states that inventories of retrievably stored TRU waste in trenches and caissons located in the LLBGs were not considered because they will eventually be retrieved and sent to the WIPP for disposal. The EIS should estimate when these wastes will be sent to WIPP and if releases are likely to occur in the interim.

- 80 55) Section 5.3.3 – This section does not address the important technical consideration of plutonium mobile fractions. Recent evidence is that small but highly mobile fractions of plutonium wastes can have significant impacts over the short term as well as the 10,000 year groundwater timeframe considered in the EIS. In addition, plutonium is known to exist in a number of oxidation states each of which has unique mobility characteristics. Transuranic wastes should not be screened out of future groundwater evaluations without consideration of the complex nature of plutonium chemistry, facilitated transport, and mobility. The EIS should include a section discussing the potential for mobile plutonium fractions, possible impacts on risk estimates, and actions that could be taken to mitigate impacts.
- 81 56) Section 5.3.3, Long-term Impacts on Water Quality, pages 5.18-5.20 does not differentiate the long-term impacts between alternatives on water quality. The EIS should do so to make meaningful information available to the decisionmaker for comparing alternatives.
- 82 57) Section 5.5.1, LLBGs, page 5.22 states that any mitigation for plant and animal species of concern within the 200 Areas would follow DOE policy. The EIS should identify specific mitigation measures for plant and animal species of concerns and commitments to implement these mitigation measures made in the ROD. The EIS should also state or summarize the referenced DOE policy.
- 83 58) Section 5.5.1, LLBGs, page 5.22 describes how the LLBGs and Area C were denuded by the 2000 range fire. The EIS should state if the fire disturbed the area to the extent that native shrub steppe vegetation is unable to recover, if action alternatives would further undermine the reestablishment of native vegetation, and if additional mitigation measures are necessary.
- 84 59) Section 5.7.1, Alternative 1, page 5.33 states that there is a reasonable probability that archeological sites are located within Area C, that these sites are likely to be buried, and any discovery is likely to result in new knowledge. The EIS should, to the extent possible, identify specific methods to ensure protection of buried deposits and the ROD should commit to use these methods.
- 85 60) Section 5.8, Traffic and Transportation, page 5.34 – This section should provide a summary of impacts from shipping off-site wastes to Hanford.
- 86 61) Table 5.16, Hazardous Chemical Concentrations, page 5.37 – The four chemicals exceeding TEEL-2 guidelines should be bolded in the table.
- 87 62) Table 6.1, TPA Milestones, page 6.3 – The EIS should clearly state what the date of December 2049 for M-91-00 signifies.

88 | 63) Section G.2.1.3, MLLW, page G.49 – This section states that “No uranium or carbon-14 was estimated to reach the water table from MLLW in the 200 West Area within the period of analysis.” The same section also states that these contaminants “were found to be at their maximum level at the 1-km well just before and at 10,000 years.” These two statements appear to be inconsistent since for maximum to be reached at 10,000 years, some quantity must be present in the water table prior to that. The analysis period is 10,000 years and both carbon-14 and uranium can be relatively mobile. Additional explanation is needed to justify the concentration estimate for these radionuclides.

89 | Editorial Comments (No Response Needed)

89 | Section 1.5.2, Trench 33 and Widening Trench 36, page 1.17 – It appears that the word “Impact” is missing from the wording Environmental Statement (ERDA 1975). There was not a citation in the reference section to confirm or deny whether a word was missing.

90 | Section 1.5.3, WIPP, page 1.23 should replace the word “supplement” with “supplemental EIS.”

91 | Section 2.1.1.2, LLW-Category 3, page 2.3 and 2.4 – The EIS should replace “greater confinement” and “monolithic waste form” with easier to understand terms if available.

92 | Section 4.7.1, Native American Cultural Resources, page 4.71 should read “Reconnaissance of selected locations conducted through the mid-1980s, as well as systematic archeological surveys conducted from the middle 1980s through 1996 added to the recorded site inventories.”

93 | Section 4.8.1, Local Economy, page 4.74 – A space should be placed between “and” and “payrolls.”

94 | Section 5.5.1, LLBGs, page 5.22 should read, “Both of these species are relatively common on the 200 Area Plateau.”

**U.S. Environmental Protection Agency Rating System for
Draft Environmental Impact Statements
Definitions and Follow-Up Action***

Environmental Impact of the Action

LO – Lack of Objections

The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC – Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO – Environmental Objections

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU – Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 – Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 – Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 – Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

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- 1 The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. DOE does not believe that any offsite DOE wastes shipped to Hanford will be problematic, will complicate future remediations, or that they will divert resources or disposal capacity from other Hanford cleanup activities.

- 2 The first draft *Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement* (HWS EIS) used available data, computer modeling, assumptions, and related analytical methods to produce estimates of reasonably foreseeable environmental impacts. The analytical approach was consistently applied to each alternative, and it provided information that allowed objective parametric comparison of the alternatives. Additional alternatives have been evaluated and discussion of impacts has been substantially expanded in this HSW EIS (see Section 5.3 and Appendix G for groundwater impacts, Section 5.11 and Appendix F for human health effects, Section 5.14 and Appendix L for cumulative impacts, and Section 5.18 for potential mitigation measures in Volumes I and II of this EIS). Most of the action alternatives analyzed in this EIS do not exceed the maximum contaminant levels (MCLs) or applicable regulatory standards. By the time the waste constituents from this action are predicted to reach groundwater (100s of years), as projected and shown in the concentration-versus-time figures in Section 5.3, they will not exceed the concentration levels (or the dose limits), because the existing groundwater concentrations will have decreased by then. Therefore, the cumulative groundwater impacts from the proposed action would not exceed applicable regulatory standards (or the MCLs).

- 3 Additional alternatives have been evaluated in part to address public comments received on the first draft HSW EIS. These alternatives include disposal at the Environmental Restoration and Disposal Facility (ERDF) and disposal at ERDF-like mega-trenches at various locations. See Section 3 of the EIS for descriptions of all alternatives. This HSW EIS evaluates a slightly larger range of volumes—see Section 3.2 for discussion of the range of waste volumes evaluated.

- 4 The impacts of activities not within the scope of the proposed action are discussed as part of cumulative impacts. The evaluation of cumulative impacts has been substantially expanded (see Section 5.14 and Appendix L in Volumes I and II of this EIS). One of the purposes of evaluating a range of volumes, including Hanford Only waste, is to determine the incremental impacts of managing waste from other DOE generators.

- 5 Please see Responses 12 and 13.

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| 6 | The revised draft HSW EIS includes a revised purpose and need statement that was developed in consultation with U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) staff. The revised statement includes disposal of existing and anticipated quantities of Hanford waste streams and potential wastes from offsite sources. |
| 7 | Additional alternatives have been evaluated and discussion of impacts has been substantially expanded in this revised draft HSW EIS (see Section 5.3 and Appendix G for groundwater impacts, Section 5.11 and Appendix F for human health effects, and Section 5.14 and Appendix L for cumulative impacts in Volumes I and II of this EIS). Most action alternatives analyzed in this EIS do not exceed the MCLs or applicable regulatory standards. By the time the waste constituents from this action are predicted to reach groundwater (100s of years), as projected and shown in the concentration-versus-time figures in Section 5.3, they will not exceed the concentration levels (or the dose limits), because the existing groundwater concentrations will have decreased by then. Therefore, the cumulative groundwater impacts from the proposed action would not exceed applicable regulatory standards (or the MCLs). |
| 8 | Additional alternatives have been evaluated in this revised draft HSW EIS. The additional alternatives evaluated in this EIS include the use of lined and capped facilities similar to Resource Conservation and Recovery Act (RCRA) Subtitle C requirements. DOE evaluates the performance of each disposal facility in detail to ensure the facility meets the DOE Performance Assessment requirements. If groundwater contamination in excess of DOE limits were predicted by the Performance Assessment process, changes in the waste acceptance criteria would be made to limit disposal of the waste causing the groundwater contamination. The waste would require further treatment prior to disposal or would be stored until a method was found to treat or dispose of the waste. In no case would DOE knowingly dispose of waste in violation of legal requirements. |
| 9 | The alternatives evaluated in this HSW EIS were formulated based on the underlying purpose and need for agency action, and in consideration of the Waste Management Programmatic Environmental Impact Statement (WM PEIS) Record of Decision (ROD) for management of low-level waste (LLW) and mixed low-level waste (MLLW) (65 FR 10061). DOE also factored in public scoping comments. The EIS does provide a comparative analysis/discussion of the potential environmental impacts associated with the proposed action and alternatives (see Section 3.4). |
| 10 | The revised draft HSW EIS analyzes additional alternatives that include mitigation measures such as liners, leachate collection systems, a lined mega-trench, ranges of waste volumes, and capping. |

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DOE prepared this revised draft HSW EIS to accommodate disposal of ILAW, in addition to new waste management alternatives under consideration since the first draft was issued in April 2002. The HSW EIS includes additional alternatives for disposal of LLW, MLLW, immobilized low-activity waste (ILAW), and Waste Treatment Plant (WTP) melters in either independent or combined-use facilities that would comply with applicable RCRA and state standards for disposal of hazardous wastes. A number of locations for the facilities are considered, including at ERDF.

The revised draft HSW EIS also evaluates various forecast waste quantities that include only Hanford generated waste, in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste. The Hanford Site Solid Waste Acceptance Criteria (HSSWAC) and radionuclide inventories would be revised as needed, based on periodic performance assessment updates prepared during operations, to ensure that long-term impacts would not exceed established dose standards.

- 11 This HSW EIS includes additional discussion of the No Action Alternative. The No Action Alternative does evaluate Hanford Only waste volumes.

This HSW EIS also evaluates various forecast waste quantities that include Hanford Only generated waste in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste.

- 12 DOE's basis for regulation of DOE LLW is set out beginning at p. A-152 of Appendix A of the "Implementation Guide for use with DOE M 435.1-1." Appendix A can be accessed at URL: <http://www.directives.doe.gov/>. Appendix A states that:

"The regulation of low-level waste at DOE facilities, as developed in DOE Order 435.1, differs from the more generic but prescriptive approach taken by the NRC in developing requirements for commercial facilities in 10 CFR Part 61 and other rules. 10 CFR Part 61 was developed with several known conditions that are specific to commercial waste and are not necessarily appropriate for DOE low-level waste. These differences include (1) NRC has a formal licensing process while DOE uses the Directives process; (2) NRC requirements are for generic but unknown facilities and locations; (3) commercial waste streams are well defined; (4) DOE processed spent fuel for spent nuclear material; (5) DOE disposes of low-level waste onsite, where practical, at facilities which have been operating for many years; (6) land use controls for DOE low-level waste disposal facilities are likely to extend into the distant future; and (7) the management structure for

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DOE complex-wide low-level waste management is well established. These factors lead to differences in waste management regulation and practices for DOE and NRC low-level waste disposal; however, the required level of health protection is essentially identical.

One specific result of the differences in the process used by DOE to regulate low-level waste is the approach to waste classification. The NRC developed a generic waste classification system for application to all facilities and all locations, which was based on a well-developed understanding of the characteristics of commercial low-level waste. The waste classification limits were developed from a performance assessment of generic low-level waste disposal facilities in various locations that was included in the Environmental Impact Statement for 10 CFR Part 61. The DOE approach places greater emphasis on site-specific decisions for site-specific conditions, and requires a site-specific performance assessment to develop limits, on the basis of criteria for radiation protection (dose limits) that are similar to the NRC. This approach recognizes that the locations for the disposal of wastes are well known, but the waste characteristics are not as well understood. DOE Manual 435.1-1 requires the development of waste acceptance criteria for each waste management facility to ensure justified limitations are placed on wastes to be disposed of. Sites may establish waste classifications as needed for operation of specific facilities, but they must establish waste acceptance criteria. This approach leads to the development of site-specific systems which take into account the environmental characteristics of the site and the characteristics of the wastes being disposed of, such as the Category 1 and 3 designations at Hanford, which are similar to the NRC classes A and C.”

The HSW EIS proposed action and alternatives do not include disposal of TRU waste at Hanford. TRU waste stored in the Low Level Burial Grounds (LLBGs) will be shipped to WIPP.

13

DOE interprets the comment to be asking for information comparing current use of unlined disposal trenches to potential future use of lined and capped disposal facilities. The revised draft HSW EIS includes such comparisons.

The HSSWAC would be revised as needed, based on periodic performance assessment updates prepared during operations, to ensure that long-term impacts would not exceed established dose standards. The HSSWAC also incorporate requirements for greater confinement of higher-activity LLW and MLLW through disposal in high-integrity containers, or by grouting the waste in place in the disposal facility. (Please see Response 12.)

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- 14 TRU waste will not be disposed of at Hanford. It will have been shipped to WIPP before closure, and thus does not require modeling. Other longer lived wastes were modeled but were found to not contribute significantly to doses after about 500 years. Therefore, the intruder scenario considered doses from 100 to 500 years.
- 15 Impacts 1 km down-gradient from waste sites and near the Columbia River were analyzed in the HSW EIS (see Section 5.3). The points of analyses used in the HSW EIS comparative assessment were located along lines approximately 1 kilometer downgradient from aggregate Hanford solid waste disposal facilities within the 200 East, 200 West, and the ERDF areas and near the Columbia River located down gradient from all disposal facilities. These points of analysis down gradient from the overall waste disposal facilities in each area are not meant to represent points of compliance but rather common locations to facilitate a more complete comparison of long term impacts from various waste management configurations and locations defined for each alternative.
- 16 The human health impacts from exposure to groundwater, which evaluate all constituents at the selected points of analysis, provide the best basis for the comparing Alternatives. The tables presented in Section 5.3 are meant to provide the reader with a summary of those constituents and waste categories that were closest to the benchmark maximum contaminant levels. Detailed tables of results are provided in Appendix G and show the relation of the estimated concentration of all constituents benchmark maximum contaminant levels.
- 17 This revised draft HSW EIS includes a revised purpose and need statement that was developed in consultation with EPA and Ecology staff. The statement includes disposal of existing and anticipated quantities of Hanford waste streams and potential wastes from offsite sources.
- 18 As required by the National Environmental Policy Act (NEPA) all comments received during the scoping period were considered in developing this HSW EIS. Appendix A in this HSW EIS provides a discussion on the disposition of the scoping comments.
- The alternatives considered in both the first and revised draft HSW EIS include activities that encompass a range of projected costs and environmental impacts. The revised draft HSW EIS also incorporates new alternatives suggested by commenters as well as recent proposals for waste management at Hanford that have been under discussion since the first draft was issued in April 2002.
- A number of events during the 4 years between public scoping and issuance of the first draft HSW EIS did affect the alternatives and document structure. For example, DOE incorporated evolving plans for nation-wide waste management by addressing the WM PEIS records of decision as they were issued, and as they related to solid waste

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management operations at Hanford. DOE also evaluated recent Hanford Site and nation-wide waste forecasts to determine whether the HSW EIS analyses needed to be updated to accommodate new waste volume projections. However, the basic scope of the document in terms of the types of actions evaluated, analyses performed, and impacts considered did not change sufficiently that additional scoping input was required. Comments received on the first draft HSW EIS and the scoping comments on the proposed ILAW SEIS were considered in the development of this revised draft HSW EIS.

- 19 In both drafts of the HSW EIS, DOE summarized all analyses in the body of the EIS and reserved more technical detail for the appendixes.
- 20 Thank you.
- 21 The HSW EIS alternatives incorporate elements of some initiatives considered as part of the Performance Management Plan for the Accelerated Cleanup of the Hanford Site (HPMP, DOE/RL 2002). In some cases, detailed evaluation of proposals may be deferred to future NEPA documents because they are not ready for decision at this time.
- 22 Like the disposal requirements contained in the RCRA, waste acceptance criteria applicable to disposal of DOE wastes are referenced in this HSW EIS, as appropriate.
- 23 Treatment technologies are identified in the text boxes in Section 2. The same technologies would be used in either a modified T Plant or a new waste processing facility. General technologies have also been identified for each of the waste streams in Section 2.1
Final selection of specific technologies will need to wait until detailed design of the facilities.
- 24 The revised draft HSW EIS has been revised extensively in response to comments. Summary information on the WM PEIS and its RODs is included in Section 1.0 and in Appendix B of this CRD. Appropriate references are made to the WM PEIS throughout this HSW EIS.
- 25 High-level waste has been added to the definitions of waste types in Section 1.0. Definitions for all waste types are included in the glossary.

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| 26 | Mixed waste management is discussed in some additional detail in Sections 2.1.2, 6.3, and 6.4 of this HSW EIS. This HSW EIS provides additional information on RCRA waste management practices for MLLW, including liners, groundwater monitoring, and permit requirements. The radiological components are regulated in the same way whether they are in MLLW or LLW. |
| 27 | Wastes not evaluated as part of the proposed action and alternatives in this HSW EIS are analyzed as part of cumulative impacts (see Section 5.14 and Appendix L in Volumes I and II of this EIS). |
| 28 | The definitions of TRU waste and suspect TRU waste are clarified in the revised discussion in Section 2.1.3 in this HSW EIS. As part of the Hanford Defense Waste (HDW) EIS, DOE decided to retrieve TRU waste stored in the LLBGs. For the purposes of analysis in this HSW EIS, it was assumed that 50% of the suspect TRU waste in the LLBGs is actually TRU waste. The TRU waste fraction was assumed to be packaged and shipped to WIPP. |
| 29 | Appendix B in Volume II of the HSW EIS contains assumptions for verification by waste type and alternative and are generally presented in Tables B.4 through B.12. For example, for Category 1 LLW, a 5% fraction of the contact-handled (CH) Category (Cat) 1 LLW in drums and boxes will be selected for verification at WRAP. A 5% fraction of the CH Cat 3 LLW in drums and boxes will be selected for verification at WRAP. A 10% fraction of the CH MLLW currently stored or received in a form suitable for disposal will be sent to WRAP for verification. For CH inorganic solids and debris, 10% of the waste will be verified at WRAP. |
| 30 | Commercial non-thermal treatment capacity, like macroencapsulation, is currently available and DOE uses it to some extent. Commercial thermal treatment capacity is limited at this time. This EIS evaluates alternatives for both onsite and offsite treatment of these wastes. |
| 31 | Additional alternatives have been evaluated and discussion of impacts has been substantially expanded in this revised draft HSW EIS (see Section 5.3 and Appendix G for groundwater impacts, Section 5.11 and Appendix F for human health effects, and Section 5.14 and Appendix L for cumulative impacts in Volumes I and II of this EIS). Most action alternatives analyzed in this EIS do not exceed the MCLs or applicable regulatory standards. By the time the waste constituents from this action are predicted to reach groundwater (100s of years), as projected and shown in the concentration-versus-time figures in Section 5.3, they will not exceed the concentration levels (or the dose limits), because the existing groundwater concentrations will have decreased by then. Therefore, the cumulative groundwater impacts from the proposed action would not exceed applicable regulatory standards (or the MCLs). |

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| 32 | DOE welcomes comments from all parties on this HSW EIS. |
| 33 | Additional discussion of conceptual decontamination and decommissioning activities and long-term stewardship are included in this HSW EIS. Final resolution of the waste facilities (which would include the surveillance and maintenance activities) will be addressed as part of the overall Hanford 200 Area environmental cleanup, closure, and stewardship programs (see Section 2.6 in Volume I of this HSW EIS). |
| 34 | In this HSW EIS, DOE addressed the uncertainty in waste volumes by addressing a range of potential waste quantities that could be managed at Hanford. This range encompasses quantities representing waste from Hanford and offsite generators. (Refer to waste volume discussion in Section 3.0 of Volume I in this HSW EIS. Other uncertainties are discussed in Section 3.5 of the same Volume.) |
| 35 | As of February 1, 2003, DOE had met 99% of its TPA milestones on or ahead of schedule. However, this type of information is not needed in the body of this EIS for the purposes of evaluating the proposed action and alternatives. DOE has made information on cleanup at Hanford available electronically at http://www.hanford.gov/doe/progress/progress.htm . This web site includes information on meeting TPA milestones. Further information on the TPA is available at URL: http://www.hanford.gov/tpa/tpahome.htm . |
| 36 | The cumulative impacts analysis addresses initial results of the System Assessment Capability (SAC) analyses, which were based on available data and assumptions about waste inventories in various waste sites at Hanford. Various disposal records, process information, and groundwater/vadose zone monitoring data were used to estimate the inventories at these waste sites. (See Section 5.14 and Appendix L in Volumes I and II of this HSW EIS.) |
| 37 | These trenches are analyzed in the HSW EIS as part of Alternative Group B. The draft 2001 Environmental Assessment was mentioned because it would provide interim action coverage for construction of additional LLW disposal trenches within existing LLBGs to provide timely disposal capacity before completion of this HSW EIS. This was determined to be an allowable interim action during preparation of the HSW EIS consistent with 40 CFR 1506.1. |
| 38 | Pollution prevention and waste minimization are discussed in Sections 2.5 and 5.18 in this HSW EIS. NEPA documents related to this HWS EIS are discussed in Section 1.5. The WM PEIS and other NEPA documents identified in this HSW EIS evaluate alternatives for managing various DOE waste streams. DOE uses waste minimization methods where practicable to minimize waste management costs and to comply with RCRA waste minimization requirements. |

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- 39 Waste from the tank waste remediation program addressed in the HSW EIS includes ILAW, melters, ancillary equipment, and LLW and MLLW generated during operations of the tank farms and the WTP (as described in Sections 2.0 and 3.0 of the HSW EIS).
- 40 This HSW EIS evaluates various forecast waste quantities that include Hanford Only generated waste, in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste. (Please see Response 11.)
- 41 The remaining uranium is included in the estimates bounded in this HSW EIS.
- See Section 2.2.3.4 in Volume I of this HSW EIS for a description of ERDF. This description includes a statement that the design of ERDF meets RCRA technical standards for a hazardous waste landfill.
- 42 The publication addressing the HSSWAC is the “Hanford Site Solid Waste Acceptance Criteria” (available at <http://www.hanford.gov/wastemgt/wac/docs/hnf-ep-0063/hnf-ep-0063-7.pdf>). In general, the verification frequency for onsite generators can be as low as 5% for LLW, TRU, mixed and TRU-mixed waste. Ten percent is the minimum for offsite generators. Appendix G of the HSSWAC document specifically deals with TRU waste certification requirements. Wastes that do not meet HSSWAC are treated at Hanford at the expense of the generators or they are sent back to the generators at their expense for treatment. When problems are found, the Performance Evaluation System is used to identify and implement corrective actions. More detailed information on waste acceptance can be found in Appendix G of the HSSWAC document.
- Verifiers at generators and Hanford are independent of site operators. The customer provides information concerning each waste stream on a waste profile sheet. The waste stream information is reviewed against the HSSWAC and the applicable waste specification record. If the waste stream information is sufficient and meets the applicable acceptance criteria, the waste stream is approved.
- New customers are required to submit a copy of their waste certification plan (or equivalent document) with the first waste profile sheet. In some cases, a site visit will be required for approval of this initial waste stream. On completion, the customer submits the waste profile sheet to their waste management representative. The waste management representative will coordinate all required reviews and return the approved waste profile sheet to the customer. After all required reviews are completed, the waste management representative will return the approved waste profile sheet package back to the customer. Customers must revise their waste profile sheet whenever the waste

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| | stream or generating process changes. In addition, waste profile sheets must be recertified annually. |
| 43 | Text has been added to Section 2.2.2.2 in Volume I of this HSW EIS to describe progress on the commercial demonstrations. |
| 44 | Information has been added to Section 2.1.3 in Volume I of this HSW EIS to discuss plans for receipt of RH wastes at the Waste Isolation Pilot Plant (WIPP). |
| 45 | WIPP has applied for changes to its permit to allow it to receive waste containing polychlorinated biphenyls (PCBs). EPA has indicated acceptance, but it is not final yet. Based on the assumption that the changes will be accepted, the sludge would not require treatment of PCBs. |
| 46 | For this HSW EIS it was assumed that T Plant would begin processing wastes in 2016. See Table B.11 in Volume II of this HSW EIS for waste stream 12. Only some of the K Basin sludge might be stored in a water-filled pool in T Plant. Storage of K Basin sludge would not restrict the use of T Plant. |
| 47 | Please see Response 23. |
| 48 | DOE has recognized the advantages of this approach and is starting to implement this practice. A discussion of these advantages has been added to this HSW EIS (see Sections 2.2.3.1 and 5.18 in Volume I). |
| 49 | The environmental analysis and comparisons for all alternatives are presented in Section 5 and summarized in Table 3.5. Costs comparisons are presented in Section 3.0. |
| 50 | Additional information on barriers has been added to Sections 2.2.3.6, 3.1.6.2, and Appendix D. Assumptions used about infiltration rates used for the groundwater analysis are contained in Appendix G, Section G.1.1.1. |
| 51 | Correction made. |
| 52 | Alternative Group B includes a new waste processing facility and was developed specifically to address a non-thermal treatment option. Other options, including the preferred alternative, incorporate thermal treatment. |
| 53 | WIPP currently is accepting CH wastes. DOE has added information regarding WIPP plans for acceptance of remote-handled (RH) wastes in Section 2.1.3. TRU waste containing PCBs is discussed in Response 45. |

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| 54 | This revised draft HSW EIS discusses several of these options, including an ERDF-style mega-trench, various cap designs, and a range of volumes of imported wastes. The EIS also includes an expanded discussion of alternatives considered but not addressed in detail (see Section 3.0). |
| 55 | The revised draft HSW EIS now considers the use of mobile facilities for the processing and certification of TRU waste. See Section 3.1.4.3. |
| 56 | The HSW EIS now includes alternatives for disposal at ERDF. See Sections 3.0. |
| 57 | The impacts are greatest in the No Action Alternative because no closure cap is placed over the facilities. See Section 3.0 for a description of the No Action Alternative. The time of peak concentrations for action alternatives are shown in figures in Sections 3.4.3 and 5.3. |
| 58 | Cost estimates are for life-cycle activities and are in constant 2001 dollars. No costs are discounted. Details of the cost estimates are contained in Appendix C of the Technical Information Document (FH 2002). Costs include post-closure activities, such as monitoring during the institutional control period. The HSW EIS analysis did not assume that caps are replaced. |
| 59 | The preferred alternative has changed as a result of new information added to the revised draft HSW EIS. Information supporting selection of the preferred alternative is included in Sections 3.4 and 3.5 immediately preceding the preferred alternative discussion. |
| 60 | The text was modified for clarification (see Section 4.2.2). |
| 61 | The Treated Effluent Disposal Facility (TEDF) takes treated waste from the Effluent Treatment Facility (ETF). The text in Section 4.2.2 has been modified to clarify this. Additional information on contamination in the burial grounds also has been added to Section 4.2.2. |
| 62 | See the Reader's Guide (in Volume I of this HSW EIS) for explanations of how and why scientific or exponential notation is used. Both metric and English units are provided in the text to assist readers. |
| 63 | The purpose of this section is to provide a current description of the environment that might be affected by the alternatives discussed in Section 3. The results of analyses performed to assess potential environmental consequences, or impacts, of implementing any of the alternatives are presented in Section 5. Cumulative impacts from other Hanford Site activities are summarized in Section 5.14 of this HSW EIS. |

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| 64 | Mean sea level and sea level were intended to mean the same thing. The text has been revised to avoid confusion. Eolian is defined in the glossary (see the Reader's Guide in Volume I of this HSW EIS). |
| 65 | The text has been revised to date these earthquakes to achieve consistency in the text. |
| 66 | Details regarding background uranium in the terrestrial environment are documented in the Hanford Site Environmental Report 2001 (Poston et al. 2002). In addition, information on background radiation is provided in <i>Ionizing Radiation Exposure of the Population of the United States</i> (NCRP 1987). |
| 67 | Section 4.5.1.4 contains details on surface water quality. Additional information is in the Hanford Site Environmental Report 2001 (Poston et al. 2002) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). |
| 68 | The text has been modified to clarify the intended meaning. |
| 69 | The Hanford Biological Control Program controls the growth of deep-rooted vegetation over contaminated and potentially contaminated waste sites by conducting herbicide spraying and cleanup activities. The effectiveness of the program is directly related to the timeliness of herbicide application and removal of tumbleweeds, rabbitbrush, and sagebrush. |
| 70 | Neitzel (2002) reports no amphibians or water-reliant wildlife at West Lake. Applicable environmental impacts are discussed in Section 5.5 of the HSW EIS. |
| 71 | <p>In response to the issues raised by this comment, refer to the Final Hanford Comprehensive Land-Use Plan EIS. The concept of agreeing to disagree on issues such as Tribal members' treaty rights allowed DOE and representatives of other governments and agencies to set aside differences and work together on the land-use planning process. Tribal governments and DOE agreed that the Tribal members' treaty-reserved right to take fish at all "usual and accustomed" places applies to the Hanford Reach of the Columbia River where it passes through the Hanford Site. However, they disagreed about the applicability of Tribal members' treaty-reserved rights to hunt, gather plants, and pasture livestock on the Hanford Site. Instead of delaying the completion and implementation of a comprehensive land-use plan for the Hanford Site, DOE and the Tribes have proceeded with the planning process while reserving the right to assert their respective positions regarding treaty rights. Neither the existence of the Comprehensive Land-Use Plan EIS, this HSW EIS, nor any portion of their contents is intended to have any influence on the resolution of the treaty rights dispute.</p> <p>The nature of concentrated human activities are described in Section 4.7.1.</p> |

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| 72 | <p>Level of service for onsite roads is not expected to be reduced</p> <p><i>The Impact of the Waste Treatment Plant Project on the Hanford Communities</i> (Perteet 2001) contains a detailed description of the ratings. (TWRS Section 5.10, Table 5.10.1)</p> |
| 73 | <p>Hanford's groundwater contamination has not been shown to affect the drinking water supplies of the Tri-Cities. The Washington State Department of Health and the Cities of Richland, Pasco, and Kennewick monitor these water supplies, which all meet the applicable standards under the Safe Drinking Water Act.</p> |
| 74 | <p>Thank you.</p> |
| 75 | <p>The Hanford Only waste volume has been added to provide a better comparison with the impacts of adding offsite waste. The incremental impacts of offsite waste are the difference between the Upper Bound and Hanford Only impacts for a given alternative and between the Lower Bound and Hanford Only impacts for a given alternative.</p> |
| 76 | <p>The impacts of activities not within the scope of the proposed action are discussed as part of cumulative impacts. The evaluation of cumulative impacts has been substantially expanded (see Section 5.14 and Appendix L in Volumes I and II of this HSW EIS).</p> |
| 77 | <p>Section 5.18.1 in this HSW EIS includes a discussion about potential groundwater mitigation measures. Specific discussion of the use of soil mounds over trenches as an interim measure to shed water has been included.</p> |
| 78 | <p>Assessment of waste streams resulting from cleanup actions are factored into the cumulative impacts analysis and in some cases are directly considered as part of the alternatives evaluated in this HSW EIS. For example, TRU waste from cleanup of the 618-10 and 618-11 Burial Grounds is part of the projected TRU waste volumes analyzed in all alternative groups. (For waste volumes and cumulative impacts, see Appendixes B and C, and Section 5.14 and Appendix L, respectively, in Volumes I and II of this HSW EIS.)</p> |
| 79 | <p>Retrieval of TRU waste from the LLBGs has already started. Shipment of TRU waste to WIPP has also started. Over one third of the TRU waste in the LLBGs is scheduled to be retrieved by 2006 (HPMP DOE 2002). No substantial releases are expected to occur before the waste is retrieved.</p> |
| 80 | <p>The basis for screening out plutonium (Pu) and other constituents in this analysis is described in detail in Appendix G, Section G.1.3.1. This assessment relied on estimates made by recently completed performance assessments and other analyses. Specific estimates of distribution coefficients for plutonium were taken from estimates described</p> |

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in the composite analysis (Kincaid et al. 1998). These estimates ranged from 80 to greater than 1980 mL/g, with a best estimate value of 200 mL/g. In this analysis, all plutonium isotopes were conservatively grouped in with other constituents that were categorized as strongly sorbed in Mobility Class 5 where the distribution coefficients were assumed to 40 mL/g or greater. As a part of the screening analysis, estimated travel times of contaminants within groups (3 ($K_d = 1$), 4, ($K_d = 10$), and 5 ($K_d = 40$) categories) through the thick vadose zone to the unconfined aquifer beneath the LLBGs were calculated to well beyond the 10,000-yr period of analysis.

Cantrell and Serne (2002) summarize available K_d information on plutonium and note the quantity and quality of Pu adsorption studies conducted with Hanford sediment are much less than those available for many other contaminants of interest at the Hanford Site. Delegard and Barney (1983) conducted a series of Pu adsorption experiments on Hanford sediment at high base concentrations and variable concentrations of chelating agents. From their results, it was demonstrated that even at high base concentrations Pu adsorption was moderately high. Combination of high base concentration and high ethylenediaminetetraacetic acid concentration reduced Pu adsorption the most; however, even under these conditions significant adsorption occurred. Hajek and Knoll (1966) conducted Pu adsorption experiments on Hanford sediment from high salt acid waste consistent with some tank waste environment but not geochemical conditions expected for LLW or MLLW. Under these conditions, the K_d values for Pu were determined to be less than 1. In another study conducted by Rhodes (1952, 1957), K_d values for Pu were measured on Hanford sediment at different solution to solid ratios, variable initial Pu concentrations, and a range of pH values from 0.5 to 14. In general, these results indicate high Pu adsorption, except at very low pH. The results of Rhodes at low and high pH are not consistent with the previous results discussed. It is possible that the high K_d values determined by Rhodes resulted from precipitation as a result of the high initial Pu [stated to be Pu (IV)] concentrations used in the experiments.

Based on the data available for Pu, it appears that Pu will be fairly immobile except at very low pH values or high ethylenediaminetetraacetic acid concentrations.

- 81 An expanded discussion of the long-term impacts between alternatives is presented in Section 5.3 and Appendix G in Volumes I and II of this HSW EIS.
- 82 Potential mitigation measures for addressing ecological impacts are described in the Biological Resources Management Plan (BRMaP) and the Biological Resources Mitigation Strategy (BRMiS), which are discussed in Section 5.18 of this HSW EIS.

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| 83 | <p>The LLBGs were not affected by the 24 Command Fire.</p> <p>See Section 5.5.1 of this HSW EIS for a discussion of Area C, the 24 Command Fire, and the expected recovery of natural vegetation. Future fires may periodically occur and could impact natural vegetation. See Section 5.18 for a discussion of potential mitigation measures.</p> |
| 84 | <p>Methods for management of cultural resources that may be found during construction are discussed in Section 5.7 and potential mitigation measures are described in Section 5.18 of this HSW EIS.</p> |
| 85 | <p>The discussion of transportation has been added in Section 2.2.4, Section 5.8, and Appendix H in volumes I and II of this HSW EIS. The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included.</p> |
| 86 | <p>Commented noted; text revised.</p> |
| 87 | <p>This was the exact title of the milestone. However the EIS no longer addresses this information in this format.</p> |
| 88 | <p>These two statements refer to the 200 East and 200 West contaminant sources separately. However, because of the potential confusion, the revised EIS addresses this subject in a different format. (See Appendix G, Section G.2 in Volume II of this HSW EIS.)</p> |
| 89 | <p>The wording “environmental statement” is correct in both the text and reference. The environmental statement was prepared prior to the issuance of the Council on Environmental Quality (CEQ) guidance that introduced the term “environmental impact statement.” This was consistent with the then-current practice of following the nomenclature in NEPA.</p> |
| 90 | <p>Change made.</p> |
| 91 | <p>These terms are standard and regularly used in the program. Changing them would likely cause other confusion.</p> |

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| 92 | The change has been incorporated. |
| 93 | The text has been modified. |
| 94 | In Section 5.5.1 of this HSW EIS has been changed to clarify the intended meaning. There are now two separate paragraphs: one each for crouching milkvetch and stalked-pod milkvetch. Each paragraph includes the statement... “Because...milkvetch is relatively common on the 200 Area Plateau,...” |