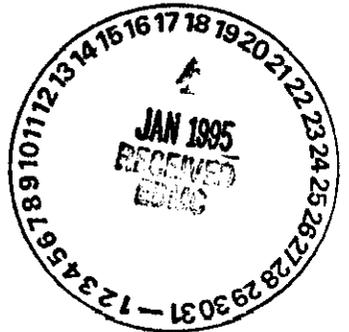


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APPENDIX A

**DECLARATION OF THE RECORD OF DECISION
RESPONSIVENESS SUMMARY**



USDOE HANFORD ENVIRONMENTAL RESTORATION DISPOSAL FACILITY

RESPONSIVENESS SUMMARY

The U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the State of Washington Department of Ecology (Ecology) (the agencies) held a public comment period from October 17, 1994 through November 30, 1994 for interested parties to comment on the Environmental Restoration Disposal Facility (ERDF) Proposed Plan. The Plan presents the preferred alternative for waste management of Hanford remedial waste. The primary supporting document is the Remedial Investigation/Feasibility Study for the Environmental Restoration Disposal Facility (Rev. 1).

Public meetings were held in Hood River, Oregon on November 14; in Seattle, Washington on November 15; in Richland, Washington on November 16; and in Portland, Oregon on November 30 to describe the waste disposal technologies that were evaluated and to present the agencies' preferred alternative for the ERDF.

A responsiveness summary is required by the *Comprehensive Environmental Restoration, Compensation, and Liability Act* (CERCLA) for the purpose of providing the agencies and the public with a summary of citizens comments and concerns about the site, as raised during the public comment period, and the agencies' response to those comments and concerns.

I. RESPONSIVENESS SUMMARY OVERVIEW. This section briefly describes the background of the Hanford Site and the ERDF and outlines the preferred alternatives for the ERDF.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS. This section provides a brief history of community interest and concerns regarding the ERDF.

III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND THE AGENCIES' RESPONSES TO THOSE COMMENTS. This section summarizes both oral and written comments submitted to the agencies at the public meeting and the public comment period, and provides the agencies' responses to those comments.

IV. REMAINING CONCERNS. This section discusses community concerns that the agencies should be aware of as they prepare to undertake remedial design and remedial action for the ERDF.

I. RESPONSIVENESS SUMMARY OVERVIEW

SITE BACKGROUND

In 1988, the Hanford Site was scored using EPA's Hazard Ranking System. As a result of the scoring, the Hanford Site was added to the National Priority Listing (NPL) in July 1989 as four sites (the 1100 Area, the 200 Area, the 300 Area, and the 100 Area). Each of these areas was further divided into operable units (a grouping of individual waste units based primarily on geographic area and common waste sources). These operable units contain contamination in the form of hazardous waste, radioactive/hazardous mixed waste, and other CERCLA hazardous substances.

- The ERDF will serve as a management unit for the majority of waste (primarily soil) excavated during remediation of waste management sites on the Hanford Facility. The scope of the ERDF Record of Decision (ROD) is focused on the location and configuration of the landfill (also referred to as the trench), the liner, and the surface cover. Summary information on the supporting facilities, including the transportation system, waste handling equipment and procedures, decontamination, and leachate treatment system, is also presented. They will be fully addressed during remedial design.

SUMMARY OF ERDF PREFERRED ALTERNATIVE

On the basis of consideration of the requirements of CERCLA, the detailed analysis of alternatives using the nine CERCLA criteria, the substantive evaluation criteria of NEPA, and public comments, DOE, EPA, and Ecology have determined that Alternative 4 (Resource Conservation and Recovery Act {RCRA} double composite liner and the RCRA-compliant cover) is the most appropriate remedial action for the ERDF for the Hanford Site.

This alternative consists of a deep single trench approximately 20 m (70 ft) deep and 300 m (1,000 ft) across at the ERDF location with a double-composite liner and, at minimum, a RCRA-compliant cover. The cover prevents direct exposure to the waste and includes a vegetated surface layer to uptake water and fine-grained soils to retain moisture and encourage evaporation, thereby minimizing the quantity of water able to reach the waste. Evaluation of alternative covers will be continued. The minimum cover design normally includes an admixture of silt and gravels in the top 50 cm (20 in). ~~This layer is intended to both reduce infiltration through the cover and to enhance the resistance of the cover to burrowing animals and long-term wind erosion.~~ In the double liner system the first liner collects leachate, water which passes through the waste and is contaminated. This leachate is then pumped from the trench and treated. A second liner below the first collects any leachate that has leaked from the first liner.

The alternative includes written instructions, deed restrictions, dust control, surface water management, decontamination facilities, waste offloading and transportation, buildings, , equipment for internal and external communications, , personnel protection and mitigation measures to reduce ecological harm.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

A public scoping period was held January 10 through February 8, 1994 to solicit input on the proposal to build a facility to receive cleanup wastes. Individual scoping meetings were held in Pasco on January 25 and Seattle on February 1. The Focus Sheet and Expanded Public Notice/Washington State Notice of Intent for Corrective Action Management Unit - Hanford Environmental Restoration Disposal Facility were provided during the onset of the scoping period to provide available preliminary information to the public. These documents were made available in both the Administrative Record and the Information Repositories.

Additional presentations were made to the Hanford Advisory Board, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes and Bands of the Yakama Indians, and the Hanford Natural Resource Trustee Council. Many of the concerns expressed by these groups were addressed within the RI/FS and Proposed Plan for the ERDF.

The major concerns expressed during the scoping period for the ERDF focused on minimizing the amount of land used for waste management activities. Commentors requested that previously contaminated areas be considered for siting the ERDF. Several commentors requested that the agencies consider areas that would minimize the impact to mature shrub-steppe habitat.

The agencies responded to these concerns by down-sizing the land requirements for the ERDF through the engineering design of a deep area-fill trench. This reduced the land requirements from 6 mi² to 1.6 mi². Additionally, the approved trench will be sized to handle remediation requirements for the next 6 years and will be expanded only as needed, thereby minimizing the impact on shrub-steppe habitat. The agencies also conducted an independent siting study considering a contaminated area for the ERDF. Due to safety, timing and cost considerations, the site was not evaluated further.

III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND THE AGENCIES' RESPONSES TO THOSE COMMENTS

Written and oral comments received during the public comment are presented in this section. The person and group affiliation providing the comment is also identified. Responses follow each comment or a series of comments. The comment responses often reference the *Remedial Investigation and Feasibility Study for the Environmental Restoration Disposal Facility*, Rev. 1.

Transcripts of the Fall 1994 public meetings are available for viewing in the Administrative Record.

A. GENERAL

Comment 1. A member of the general public noted that while the Washington DOE, USEPA, and USDOE presented a plan for storage and further cleanup, it appears that they are very slow in constructing and getting into operation that vital plant/storage facility. (name)

Response: While it may seem as though the initial planning and public involvement phases of the ERDF were time consuming, these are vital steps in the process. The ERDF will be ready to accept cleanup waste in September 1996, the projected date for the start of continuous and substantial cleanup of the Hanford Site. A RCRA-permitted facility is available at Hanford for smaller quantities of cleanup waste generated prior to time.

Comment 2. A member of the general public commented that they strongly agree that mixed, hazardous, and radioactive waste should be buried in the same place. This simplifies the disposal process.

Response: Thank you for the comment.

Comment 3. A member of the general public commented that The idea of disposing Hanford wastes at landfills outside Hanford is ludicrous. The ERDF should be the choice if all precautions at the site and monitoring are in place from day one and a law is in place that states only Hanford site past-practice wastes go into this landfill.

Response: The ERDF is authorized under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). By law, only waste generated during CERCLA cleanup actions at the Hanford site can be placed in this facility. Additionally, all applicable requirements will be followed for environmental monitoring of the facility.

Comment 4. Larry Penberthy of Penberthy Electromelt International, Inc. stated that The proposal to landfill hazardous (chemical), low-level radioactive, and mixed wastes is a bad idea, landfills for hazwaste have gone out of style. If this project is carried out, the net result will be another Superfund site, hugely expensive to clean up. The far superior way to handle these wastes is to use a Penberthy "Pyro-Converter" furnace which includes a pool of molten glass kept hot electrically.

Response: It is not feasible to glassify large volumes of Hanford waste. However, treatment options such as vitrification are and will continue to be evaluated during the feasibility studies for individual cleanup actions. It is expected that significant quantities of cleanup wastes will require a disposal facility if waste sites adjacent to the Columbia River are to be restored.

Comment 5. Columbia River United commented: We understand that the ERDF is definitely an onsite facility, but I'll play the devil's advocate and ask how could we get around that? We could get around it by having a closure of one of the cells, say in 10 years, and then they could go out for a permit again, do an EIS or EA on it, and possibly if the public didn't really care, or if the whole way to do business changed, we were back into the closed-door policy, which I don't think will ever happen, they could possibly bring in outside waste. So one thing we want to make sure from the public's concern is, this is a dump for Hanford, it is for cleaning up the site.

Response: Under the current regulatory framework, the use of the ERDF would be limited to CERCLA cleanup wastes from the Hanford Site. Any significant changes or future decisions will require public input.

Comment 6. The Coho Coalition commented: "I think, first of all, something really unfair has happened to the public, and that is that we are not really talking about cleanup. The DOE is not talking about cleanup; it's talking about a more effective way to treat and store wastes for the country and possibly from other parts of the world. We don't know yet. I know they said that this was only Hanford waste; but that was only for the disposal facility. We have to keep that in mind. And I think that it is really unfair that they haven't made that very clear to the public.

But I am totally against tearing down the buildings. Our group is not so sure that we think that we should be worried about the soil, tearing up the soil and bringing it to another area. The Hanford Site has been used for all kinds of dumping for years. The river has been dumped in for years. We shouldn't be surprised the figures that we are seeing now. I imagine that they were much higher many years ago. I think we should not try and put anything dangerous near the river that we know that there are underground streams that are going to carry it into the river. We need to be concerned about that. Maybe that is why we need the disposal facility to keep some of this stuff away from the river, but I am very much against removing the soil that is already there, spending the time and the money to do that to put it into this facility. I think that a lot of the buildings we are talking about are not in the 100-Areas but in other areas of tearing down and removing. We could consider using those buildings for storing drums, other kinds of materials. I don't think because they are contaminated we should be tearing them down."

Response: Each building is evaluated for potential uses, including waste storage, before demolition. However, the majority of buildings have been there for many years and, in most cases, have outlived their usefulness. Removal of contaminated soil is only recommended after an evaluation is made of the risk posed by leaving it in place. Only after the risk is shown to be unacceptable and public comment on the remedy sought, will a cleanup decision be made.

Comment 7. "The Yakama ERWM Program is not convinced that this ERDF proposal adequately protects the health and safety of all people. The lack of protection of human and health safety over an extended period of time is very disturbing to us. Present ERDF planning and structure has the effect of putting real hazard management responsibilities on future generations. This responsibility is made more difficult through the below ground disposal option exercise for the facility. Now in addition to finding adequate management techniques our children and their children must also disinter the wastes that they wish to treat."

Response: The Tri-Parties recognize the problem of long term management of waste. The decision to establish a central disposal facility stems from the idea that the current condition, i.e., numerous uncontrolled waste sites along the Columbia River, is much less desirable. Consolidation of waste into a central facility that is well marked and obviously incongruent to the surrounding environment will help deter inadvertent intrusion. The physical act of disintering the waste material is technically feasible even by today's standards and, hopefully, will only improve. The primary obstacle to a more suitable option than land disposal is the development of a practical treatment alternative for the type of waste projected. An above ground storage/disposal facility does not appear practical considering safety, technology, and cost implications. The disinterment process would not be significantly different for an above or below ground facility.

Comment 8. A member of the general public commented: "Well, I've been out there a long time and she's talked about a place to bury stuff. At East and West there's two big tunnels, concrete cover on them, you could bury a lot of stuff. Cover taken off and they got about 4 ft of soil on top of them. Up at Gable Mountain, the Indians had Gable Mountain filled back in again, and up there we have

holes 400 ft deep and one hole 1,000 ft deep and equipment to drop the capsules in there and release them. I know it would take a lot of years, I don't know of any reason why that can't be used to take and put dry waste, a lot of dry waste down there. They were down 400 feet and that was a big hole. So there's another place a lot of stuff could be put."

Response: Proposals have been made with regard to using various onsite facilities for disposal of waste; thus far, no place has had the necessary capacity (even when combined) to accommodate the waste volume expected.

Comment 9. A Hanford Watch Representative commented: "We support wholeheartedly Oregon Department of Energy Representative Dirk Dunning's comments tonight that we see that there is a crucial need for the ERDF landfill, but we feel that Dirk has hit upon some really important elements that this hasn't been done in the most efficient and most conscientious manner and that we would like this whole thing relooked at in an as expedient way as possible. Our group is interested in the wastes at Hanford having a home there. We are really supportive of not having other wastes brought into that landfill. We're going to have enough of those issues to face in this nation with the spent fuel and other things like that. I also would like to say that we support wholeheartedly that in the redeciding or redesigning or relooking at ERDF we too support the trustees must be made a part of the decision in the planning and construction of this. That is paramount otherwise the trust continues to erode between us and the Department of Energy and the agencies involved."

Response: The Tri-Parties will not consider resiting of ERDF. We feel that resiting will have unacceptable delays and would pose an unacceptable threat to the environment. The ERDF would dispose of wastes generated from cleanup on the Hanford Site. The Tri-Parties will coordinate mitigation actions with the trustees.

Comment 10. A Hanford Watch Representative commented: "If we say yes, we want this landfill, the one with the double-lined trench and the cap, is there going to be money for it or is this once again been a pipe dream?"

Response: Current funding levels support the construction of the double-lined landfill.

Comment 11. The Oregon Department of Energy commented: "In touring the site on Monday, one of the things that was impressive about the old-growth sage and the road that had been cut through was the very large piles of tumbleweed that had built up along it even though there's been no traffic on that road yet. And one of the concerns I have is particularly associated with ERDF, since it's a larger perimeter area that's going to be involved is it poses a fairly large jeopardy for fire to this very pristine habitat. And I think that's something both for ERDF and for the road and any other areas bordering those facilities needs to be very carefully considered and preventive measures be put in place to ensure that doesn't happen."

Response: The Hanford Site has a tumbleweed control program to remove and dispose of tumbleweeds that accumulate along fencelines and other barriers. The facility operator will be responsible for fire prevention activities within the fenced portion of the ERDF site. Additionally, water service for fire control is being extended to the ERDF site as a precautionary measure.

Comment 12. A member of the general public commented: "I want to address the issue of limiting this to Hanford waste only. I think that the whole thing that is happening at Hanford has to be looked at as a whole, not just in some little narrow areas here and there. Because what's happening there is

like some person digging a ditch in one side and they're shoveling the dirt out while at the same time somebody's behind them shoveling dirt right back into it again. So it never really gets anywhere because this program you're talking about here tonight is not operating in a vacuum or hermetically sealed box where it's just happening all by itself separately. I don't really see how you can keep talking about environmental restoration without addressing the continued additions of great volumes of various radioactive materials such as the Trojan Power Plant remains, medical science waste and foreign wastes, etc., that will be coming in the future. In reality when you think about it, what is going to happen in the future? Hanford is the only place to put a lot of this stuff. You either have to leave it where it is or put it some place and where else is stuff going to go, radioactive stuff. There's just no where else basically because either the other areas don't want it or don't have any ability to take care of it except Hanford. I really think that you need to plan for this and not just figure it out as it comes up. Each episode at a time."

Response: The purpose of the ERDF project is to make available a disposal facility to accept cleanup wastes from the Hanford Site. Other programs within the DOE are exploring disposal alternatives for other radioactive wastes.

B. ALTERNATIVES

~~Comment 1:~~ One member of the general public commented that alternative plan 4 should be adopted at the ERDF site at Hanford.

Response: Thank you for the comment.

~~Comment 2:~~ One member of the general public commented that they agree that the ERDF should be constructed, and that the proposed alternative, use of a double RCRA liner, is the best choice.

Response: Thank you for the comment.

C. REGULATORY PROCESS

~~Comment 1:~~ A member of the general public commented that they strongly agree that only the requirement of CERCLA should be used for this project. By not trying to apply RCRA or the State Environmental Policy Act (SEPA), resources can be spent on facility construction (versus) paperwork.

Response: Thank you for the comment.

D. SITING OF THE ERDF

~~Comment 1:~~ A member of the general public commented that they agree with the proposed size and location of the ERDF.

Response: Thank you for the comment.

~~Comment 2:~~ The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) commented that the siting of the ERDF was a decision that DOE made internally, without consulting with affected Indian tribes or natural resource trustees, and without public involvement. This was simply improper.

Virtually all ERDF impact decisions derive from the choice of site. DOE has made the most important decision behind closed doors and then allows everybody else to argue about how it will be implemented. This is a sham of tribal consultation or public involvement.

DOE has no excuse for excluding tribes, trustees and the public from the siting decision. If the RI/FS were an EIS, it would have to include alternative sites.

We agree that for practical reasons it is pointless for DOE to try to go back and undo the harm this time. They have forced the tribes, trustees, and public into the position that if we protest this violation of our rights, we force delay in the remediation of the Columbia River area. That result is even more intolerable than being barred from the ERDF siting decision. Nevertheless, DOE should not conclude that it is acceptable practice to play these sorts of political games with consulting governments. DOE failed to perform proper process and to consult with the CTUIR regarding siting. We ask that DOE admit as much in its response to comments.

We also ask that DOE commit in writing to work closely with the CTUIR and other tribes and trustees to plan the location and impact of future projects in the Central Plateau before making effectively irreversible decisions. This need is particularly critical in the 200 Areas, where siting decisions about a variety of facilities are essentially being made in an uncoordinated manner within DOE, and without consultation with tribes and other trustees.

We urge DOE to begin, with the full participation of tribes and trustees, a comprehensive planning process for the location of future DOE facilities at Hanford. These decisions directly affect the CTUIR's treaty rights and the potential liability of DOE to the natural resource trustees. As the ERDF and the 240 Road Access Extension decisions demonstrate, DOE is currently making these decisions with essentially no consideration of the impacts of these decisions to natural resources or treaty rights. This is an unacceptable practice, and should be reformed immediately.

Response: It seemed most effective to rely on the ERDF siting evaluation report to describe siting alternatives rather than reproducing the document in the RI/FS, which is already rather voluminous. Based on comments received from the public during the scoping process, the proposed site was down-sized from 6 mi² to 1.6 mi² and moved north into an area that the State of Washington had leased from DOE for industrial and waste management purposes. In this way the ERDF is entirely encompassed within the waste management area identified by the Hanford Future Sites Uses Working Group (HFSUWG).

It is true that when the initial siting evaluation was performed, the Indian tribes were not directly consulted. However, site selection was considered and commented on during scoping. Based on scoping, another site was considered. An evaluation for this site was completed but the site was not chosen. We recognize that the ERDF siting process was not acceptable to the concerned parties.

DOE recognizes that the tribes and natural resource trustees have a role to play in future siting decisions. There are efforts underway to open the Hanford site evaluation process to include affected Indian tribes and other interested parties. To that end, DOE is developing a comprehensive land and facility policy that provides a basis for ecosystem-based land-use plan accomplished with tribal and trustee involvement. The end goal of land management policies at Hanford is to avoid impacts to natural resources and to evaluate mitigation options for those impacts that are unavoidable.

Comment 3. CTUIR commented that under typical National Environmental Policy Act analysis, the scope of alternatives is based upon the purpose and need for the proposed action. In the case of ERDF, the purpose and need statement is found at section 1.2 of the RI/FS and is reprinted in the NEPA Roadmap. The purpose of the ERDF is "to support the . . . removal of contaminants from portions of the Hanford Site in a timely manner" The need is "to support the disposition of contaminants during restoration activities on the Hanford Site." This is a well-drafted purpose and need statement, reflecting the true priorities for the ERDF. Nothing in this purpose and need statement, however, places any practical limit on the location of the ERDF site. This purpose and this need cannot be used as a basis for limiting the proposed action and alternatives to only one site.

Response: It is true that the purpose and need statement does not limit the location of the facility (other than an implicit assumption that it not be located near the Columbia River). The criteria to be most protective of human health and the environment and to keep the facility on the central plateau within the squared-off boundaries of the 200 Areas significantly limits siting options. The Tri-Parties believe that the site chosen is most favorable for long-term protectiveness, consolidating waste management activities, and to support environmental remediation activities.

Comment 4. CTUIR commented: We also could find no analysis in the RI/FS that identifies why the rail spur is being constructed where it is. The map at 9F-1 (in the RI/FS) indicates that there are much shorter routes that might well avoid destroying as many natural resources as the proposed route does. Why is not the rail line going to be attached to one of the nearby spurs in the 200 West Area?

Response: It should be noted that the project has been modified to exclude construction of the rail at this time. Instead, waste will be delivered to the facility in tractor-trailers over the Hanford road system. The rail spur was not attached to one of the nearby spurs in the 200 West Area because:

- The alignment of the rail through 200 West Area would adversely affect existing area operations, would require rail crossings at Beloit Avenue, 23rd Street, and 27th Street, which would create unacceptable train-vehicle safety hazards.
- Much of the acreage located inside the 200 West Area would be fragmented by the rail line and unavailable for waste management activities (thus requiring location elsewhere on the Hanford Site).

Any future rail proposal would require a NEPA analysis and decision.

Comment 5. CTUIR, Oregon Department of Energy, and U.S. Department of Interior - U.S. Fish and Wildlife commented that the ERDF facility is proposed to be sited in the middle of the last of the high-quality shrub-steppe habitat at Hanford. This habitat is home to at least 11 species of special concern. Washington State identified this habitat of particular importance for preservation.

We were not formally notified and consulted in their Trustee roles for the planned activities as required by the Comprehensive Environmental Response, Compensation and Liability Act. When we learned of the Tri-Parties' plans, we requested the Tri-Parties present their plans to and consult with us. The presentation by the Tri-Parties raised even more serious questions about the siting process.

When we suggested it might be necessary for the Tri-Parties to reopen the siting process, the Tri-Parties responded that reopening the siting process would delay opening of ERDF and cleanup of the 100 Areas by 2 years, and could possibly jeopardize funding of Hanford cleanup by Congress.

This placed us in a completely unacceptable position. If we actively object to and oppose the siting process, we will be blamed for delaying and jeopardizing the whole cleanup. If we do not object, by omission we allow the destruction of a large area of rare habitat needed by the Loggerhead Shrike, the Sage Sparrow, the Whiptail Snake, and eight other species of concern.

In our role as Natural Resource Trustees, we cannot endorse the Tri-Parties plans. At the same time, we cannot reasonably oppose the ERDF facility without placing other habitat and human health in further jeopardy.

It is absolutely vital that the U.S. Department of Energy, Washington State Department of Ecology, and the U.S. Environmental Protection Agency not allow a repeat of this error. The Trustees must be made an active part of all planning that could result in impacts to the ecosystems and species at Hanford.

Response: The siting process has obviously been less than satisfactory to the concerned parties. The Tri-Parties have, however, attempted to incorporate into the siting decision the multitude of values expressed over the course of the environmental restoration process. The Tri-Parties recognize that the natural resource trustees are concerned about siting decisions that have major land use implications. To that end, DOE is developing a plan to involve all Natural Resource Trustees and affected Tribes in siting decisions.

Comment 6. CTUIR, Oregon Department of Energy, and U.S. Department of Interior - U.S. Fish and Wildlife commented that the process used to site the ERDF is unacceptable. The following are several specific areas where the RI/FS and the Siting Evaluation Report (SER) for the Environmental Restoration Disposal Facility fall short.

The SER is based on an early design assumption of a 6-mi² site. Only areas with a contiguous 6 mi² were evaluated in the SER. The ERDF as currently proposed will occupy an area of up to 1.6 mi². The dramatic de-sizing of the facility has not resulted in a re-evaluation of potential sites. This issue is only superficially addressed in the RI/FS's Fig. 1-3. The figure is limited to the Hanford Future Site Uses Working Group (HFSUWG) "exclusive" zone and assumes large tracts of land are unusable. The figure has no accompanying explanation or references.

The SER does not allow for consideration of areas placed in reserve for other purposes. The Tank Waste Remediation System (TWRS) plans place off-limits three large areas. Only one of these will be needed for TWRS. The siting of facilities must be coordinated, but should not be limited in this way.

The northwest corner of the 200 West Area was not considered because it was placed in reserve for a potential National low-level and mixed waste repository. This is completely unacceptable. Hanford uses must be given first priority over uses from offsite. It is particularly unacceptable that ERDF be sited in an area of such important habitat when another similar disposal facility is reserving space in an area of lower habitat value which is entirely within the fence line of the 200 West area.

The HFSUWG placed a high priority on limiting waste management activities to within the fence line of the 200 Areas, and only expanding into the area between the 200 Areas if there was not enough

room inside the fence-line. In the opinion of the Trustees, siting of a national repository on the Hanford site should not be considered until siting for all Hanford needs is done.

The SER uses as one of its central assumptions the HFSUWG recommendation to "Use the Central Plateau wisely for waste management." However, the SER does not address another recommendation of the HFSUWG, to "Do no harm during cleanup or with new development." Included in that finding is a statement that "habitat should be protected as cleanup and future development proceeds."

Response: As is evident from the comments, the issue of siting is complex and controversial. The siting evaluation was re-visited when the facility land requirements were down-sized from 6 mi² to 1.6 mi². It was determined that unless down-sizing was far more significant (less than 1 mi²), there was only one additional site readily available on the Central Plateau within the area defined by the Hanford Future Sites Uses Working Group for waste management. A siting evaluation was performed for this additional site (the BC Control Area). This additional site was not chosen because of its current contaminated condition and other difficulties.

In considering future land use requirements of projects such as the new tank farms, it is DOE's position that it would be irresponsible not to consider the acreage requirements of these proposed projects. In an effort to be responsive to the desires expressed by numerous parties to expedite Hanford cleanup in a safe and cost effective manner, the siting process may have been less than perfect.

Comment 7. Columbia River United commented: The other question came up that in the selection of the site, there were four proposed areas, and the one in between 200 West and 200 East Areas was chosen. But after doing some investigation, we found that the northwest corner of the 200 Area was basically not even being considered. And we wondered why. We found that there's a possible proposed national low-level mixed waste disposal facility that's going in there potentially. It's proposed, and I don't know if this is something that's outdated.

Response: The 200 West Area was considered both early and late in the siting process and was eliminated as a candidate site for reasons other than those stated in the comment. The overriding consideration has centered around the ability to expand the facility as needed. The volumes of waste are very imprecisely estimated because they rely on knowledge that is not currently available, for example: the extent of contamination of the numerous waste units; the final land-use designation which will determine the extent of removal actions needed; the practical application of waste reduction technologies. All these factors contribute to the ultimate size of the ERDF and make it imperative that the site chosen be cost effective and avoid having to re-site and move the facility at each expansion.

Comment 8. The U.S. Department of the Interior commented that: Habitat was only summarily considered in the SER's Site Selection section. The SER lays out seven criteria derived from USDOE orders. Habitat is discussed briefly in the Site Acceptability and Potential Consequences section, and the currently proposed site is found to be the least desirable. Within the site evaluation, sites are only qualitatively compared. No attempt is made to rank or weigh the seven criteria. While habitat quality varies greatly between the sites, other criteria such as Topography and Geology do not significantly differ. In future site evaluations, habitat quality should be carefully considered, and the criteria should be addressed in proportion to their potential significance.

Response: In earlier revisions of the Siting Evaluation Report the ranking criteria were weighted. Comments from internal and external reviewers took exception to weighting and felt it was not justified, and the evaluation was subsequently redone.

At three of the four candidate sites, habitat quality does not differ significantly, particularly since the ERDF has been moved as far north as possible to avoid native habitat. On the other candidate site with less valuable habitat, topographic as well as geologic considerations (e.g., depth to groundwater, general stratigraphy) contributed significantly to a lower preference for that site. Topography, geology, and geohydrology are most favorable at the preferred ERDF site. For the future, DOE is developing an ecosystem-based land-use plan.

Comment 9. The Yakama Nation ERWM Program recognizes the reevaluation which has reduced the proposed site from the original 6 mi² to the current 1.6 mi².

Response: Thank you for the comment.

Comment 10. The Yakama Indian Nation commented: In addition to human and health and safety issues, we're disturbed that there appears to be a limited commitment to the mandate to not cause additional disturbance during remediation activities. The ERDF represents a nearly 2-mi² disturbance to the environment. If the area currently targeted for the ERDF is covered with old growth sagebrush, this is a unique shrub-steppe community that is quite sensitive to perturbation. Old growth sage represents the habitat for a number of both mammalian and avian species. We feel that natural resources are at risk if the Hanford mission has indeed shifted to environmental considerations then activities should not pose a greater risk to sensitive resource areas.

Response: The proposed ERDF site is composed of a mix of habitat types, ranging from mature shrub-steppe habitat at the eastern end, to previously disturbed areas, such as the REDOX lay-down yard, at the western end. DOE intends to limit disturbance during environmental remediation as much as possible, but we must expect difficult trade-offs between competing priorities in the future. Because of the long-lived nature of the radiological contaminants, DOE must take a long-term view of the situation when weighing the positive and negative aspects. There will be disturbance of existing habitat at the ERDF site. However, DOE intends to minimize that disturbance to the extent possible, and to mitigate for those losses that cannot be avoided.

E. MITIGATION

Comment 1. The Lower Columbia Basin Audubon Society representative commented: We're very concerned that the restoration and mitigation is not going to happen. We've got the north slope as our example of how it's done. I don't want to just stand here and criticize the Department of Energy, the Corps of Engineers. What we want is the north slope to be restored and we want the ERDF area to be, the minimal amount of habitat to be disturbed. Keep it at the very minimum and then after the job is done, get in there and restore it. Now you just told us that we're only going to be disturbing 165 acres over the next 5 years. I think right now, we need to start mitigating for the entire 1.6 mi² so that these species have a place to migrate to. I don't think it's of any value to go in there and just rip up all this habitat and then a couple of years later go over a mile and try to start reestablishing. It takes time for these native grasses and shrub steppe, sagebrush to mature. So we need to get in and do it as early as possible. We're off to a bad start. I hope we can turn that around. Thank you.

Comment 2: CTUIR commented: We simply wish to emphasize that, for decisions to be made in a cooperative and trusting environment, DOE must be willing to disclose information, consult fully, and make real commitments -- even, sometimes, commitments that go beyond the bare minimum that the law requires. Is DOE willing to make such commitments? In the case of mitigation for impacts from the construction of ERDF, DOE has made no commitments, only promises to examine the issue further. The CTUIR can put little faith in such nice-sounding but non-binding words.

As steward of Hanford's natural resources, as the agency that manages the CTUIR's trust resources at Hanford, and as a natural resource trustee for Hanford, DOE has a duty to manage Hanford's natural resources wisely and to conserve those resources. If DOE is going to irreversibly commit natural resources at Hanford, it should also commit to fully mitigate those impacts. That commitment should be made in concrete terms by which DOE's performance of its commitment can be measured. That commitment should also be made in good faith consultation with the tribes and the other natural resource trustees. We request that DOE, in compliance with its own NEPA mitigation policy, begin discussion with the tribes and other trustees of concrete mitigation plans for impacts associated with the ERDF project. We further urge that DOE commit to fully mitigate for ERDF impacts, and that the goal of these discussions be concrete, measurable, enforceable commitments by DOE that are designed to fully mitigate these impacts.

Response: DOE commits to minimizing habitat loss to the extent possible. This project was downsized in part to minimize habitat disturbance. We recognize that the shrub-steppe vegetation community plays an increasingly important role within the Columbia Basin, because this habitat is rapidly shrinking elsewhere in the region. In addition to minimization, DOE intends to evaluate mitigation options for the loss of habitat on the ERDF site.

Comment 3. The Trustees commented that mitigation for impacts to natural resources is required under several statutes. ERDF is part of a series of CERCLA hazardous substance response actions, and as such, restoration of natural resources injured by the construction and operation of ERDF is required under CERCLA Natural Resource Damage Assessment (NRDA) provisions. NEPA requires agencies preparing EISs to address appropriate mitigation measures (40 CFR 1502.14f, 1502.16h, 1505.2d, and 1508.25b). USDOE regulations also require a mitigation plan to be developed (10 CFR part 1021.331). Finally, USDOE, as a federal land manager, has stewardship responsibilities for natural resources.

Mitigation under both CERCLA and NEPA includes, in order of preference:

- a) Avoiding the impact altogether by not taking a certain action or parts of an action
- b) Minimizing impacts by limiting the degree of magnitude of the action and its implementations
- c) Rectifying the impact by repairing, rehabilitating, or restoring the affected natural resources
- d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of action
- e) Compensating for the impact by replacing or providing substitute resources.

The ERDF siting process did not consider impacts to habitat, and those impacts were not avoided or minimized. Compensatory mitigation for habitat destruction must be provided.

The RI/FS identifies development of a mitigation evaluation (page 9-31) but contains no commitment to actually perform mitigation for habitat destroyed by the proposed project. USDOE must fully commit to mitigating for habitat destruction in both the RI/FS and in the Record of Decision (ROD) to ensure funding will be appropriate and guaranteed for implementation of the mitigation actions. The NRTC also recommends preparation and submission of a mitigation evaluation and implementation plan be identified as an enforceable interim Tri-Party Agreement (TPA) milestone.

The RI/FS identifies habitat removal as an irreversible and irretrievable commitment of resources. The Natural Resource Trustee Council (NRTC) strongly recommends that any onsite natural resources that are identified as irreversible and irretrievable commitments should be fully mitigated for. The habitat impacts associated with the McGee Ranch "borrow" site are not well documented in the RI/FS. Because a "borrow" site for basalt has not yet been identified, these habitat impacts cannot be documented. This lack of information will be an impediment to creating an adequate mitigation evaluation.

The mitigation evaluation should be developed concurrently with this environmental planning process and comprise an integral part of it. The benefits of mitigation planning early in the planning process include a more efficient and cost effective cleanup. The NRTC is concerned that delaying development of the mitigation evaluation until after the ROD is signed may result in an ineffective plan which is not supported by adequate funding, staffing or support.

The ERDF RI/FS mentions the Hanford sitewide mitigation plan, but does not clarify whether mitigation for natural resources impacts will occur as part of the sitewide plan or as a project specific plan. The sitewide mitigation plan is in an early draft stage. The NRTC supports the sitewide mitigation plan as the most effective method to protect, preserve, and enhance habitat and other natural resource values, and supports ensuring ERDF mitigation measures are consistent with the sitewide plan. However, if the sitewide plan does not go forward, the ERDF mitigation plan must compensate for natural resource impacts as an independent plan.

If USDOE chooses to address ERDF mitigation under the sitewide plan before the sitewide plan has received official sanction, a legally binding commitment between USDOE and the Trustees will be required prior to issuance of the ROD to ensure ERDF mitigation. Even though a sitewide mitigation plan for the Hanford site is being developed, this does not remove the need to conduct site-specific analysis to determine mitigation needs and requirements for individual projects. The October 26 draft of the plan states that it is not intended to provide specifications and procedures on conducting habitat improvements or protection for specific projects.

Mitigation for adversely impacted resources must be based not only on the amount of habitat lost, but also on habitat quality and value. For example, linear disturbances such as the proposed rail line will fragment blocks of habitat. Figure 9-1 shows that two substantial blocks of habitat will be fragmented by the rail line: between the north border of the proposed ERDF site and route 3, and between the north border of the 200 West Area and route 11A. Linear fragmentation of shrub-steppe habitat allows the spread of noxious weeds into relatively pristine or intact habitats. Other more subtle impacts may also occur.

Similarly, the value of McGee Ranch as a habitat corridor between Hanford and the Yakima Training Center, two large areas of relatively undisturbed shrub-steppe habitat, must be assessed and mitigated for. As the borrow site for basalt barrier material has not yet been identified, it is not clear what additional habitat values may need to be considered.

Mitigation for habitat loss requires long-term planning. The NRTC makes the following recommendations:

1. Native seeds and nursery stock are very limited. There will be competition for available stocks from other Hanford and non-Hanford projects. To make this volume of material available in a timely manner, planning and propagation should start as soon as possible.
2. USDOE should begin immediately to develop the needed nurseries and seed stocks to allow this habitat restoration/improvement to occur as soon as possible. We suggest USDOE develop a long-term contract for the construction and management of a native species nursery to provide revegetation material on a sitewide basis.
3. Ensuring revegetation success is crucial to the successful mitigation of habitat values. Monitoring of the mitigation site for a minimum of 10 years is recommended, and funding should be identified to support this effort.

Response: DOE intends to prepare a Mitigation Action Plan for evaluation of mitigation options to address issues raised in this and similar comments.

Comment 4. The Oregon Department of Energy commented: In particular, a number of things in the ERDF gave us a lot of concern. One of them has to do with the point that has already been mentioned a little bit about the NRDA provisions under the Superfund law. There are provisions within that are going to be problematic in the future because the costs associated with this facility are not just the costs of today. There are also the costs associated with the damage done to the habitat where this facility is going to be placed.

Response: Thank you for the comment.

Comment 5. The Coho Coalition commented: I would like to comment on restoring the area for environmental beautification. A lot of this is a waste of time. This area is never going to be considered an area where people can come and where it is going to be clean. This area is being cleaned up for treatment and storage of wastes. The money that we spend to try and clean something up, to beautify it for the public, is a waste.

Response: It is accurate to note that the area cannot be restored to the exact condition it was in before it was used for nuclear fuel production and fabrication. However, great strides can be made to restore and enhance the area for general use by future generations.

F. WASTE ACCEPTANCE CRITERIA FOR THE ERDF

Comment 1. Columbia River United commented that the waste selection criteria must be designed to limit the total amount of waste. Emphasis must be put on waste reduction/compaction and recycling. The goal must be to limit the overall size of ERDF.

Columbia River United also questioned "Is cleanup going to be digging up the whole site, just take a backhoe, dig it up, put it in a truck and dump it in the ground and put a big mound out there, who knows how big and how long and how high, and that's cleanup? or is cleanup really going to be finding the best available technologies, reducing the actual waste that we're burying and do the best available job with the best minds out there... So in the waste criteria selection we want to make sure

that they utilize the best available technologies to limit the amount of waste they have and also to recycle or reuse anything that can be used out there and we have to be involved with that process to make sure that they do it."

Response: New and innovative technology identification is a key element to the remediation selection process. Treatability studies are being carried out to explore waste minimization possibilities. These technologies will be evaluated, if applicable, in the Focused Feasibility Studies for each operable unit cleanup. Remedy selection will be made in the Record of Decision for the individual operable unit cleanups. ERDF will accept the waste if it is identified in these RODs for disposal at ERDF.

Comment 2. The Trustees commented that the radioactive and hazardous wastes from the 100 Area cleanup will continue to pose a threat to people and the ecosystem for so long as they remain dangerous. Many of the radioactive materials released in the 100 Areas have extremely long half-lives. Many of the hazardous materials are extremely persistent.

Closure of ERDF must protect the Tribal Treaty rights of the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation and the Nez Perce Tribe.

ERDF will be closed with, at a minimum, a RCRA-compliant cover. This cover is protective of human health and the environment and will allow some, yet limited uses of the site following closure.

Comment 3. A member of the general public commented that "Mixed waste generated in the state of Washington should be allowed to be buried in this landfill. There currently is no other way to dispose of this waste, and the quantity (volume) from onsite and offsite generators would be orders of magnitude smaller than that generated during Hanford cleanup activities. It would not be cost effective to build another pit in the state to dispose of these wastes. A new pit would probably be located on the reservation anyway, adding millions of dollars of new permitting and administrative costs. These mixed wastes, just like the Hanford wastes, would have to meet RCRA requirements, such as treatment standards."

Response: Under the current regulatory framework, the use of the ERDF would be limited to ~~wastes generated from cleanup under CERCLA on the Hanford Facility. Public comments to date have expressed a strong desire that ERDF be limited to accept only wastes generated from Hanford cleanup efforts.~~

Comment 4. Columbia River United commented that "The regulators need to tell the public what they propose to do with the soil that does not meet the current Curie [radioactive] content of ERDF. CRU feels that this is one factor that has not been discussed and is a critical part of the entire site remediation. Are the regulators proposing to build another site that will store this HOT soil until further remediation can be done?"

Response: High-level wastes, transuranic wastes, and wastes exceeding the Class C (Greater Than Class C, or GTCC) limit as defined in 10 CFR 61.55 will not be disposed of in the ERDF, as they are not acceptable for near-surface disposal. If encountered, these wastes would be treated and/or stored until such time that an appropriate disposal facility becomes available. There is likely to be little or no soils that exceed an activity level that would necessitate disposal

elsewhere. Low level wastes classified as Class A or Class C, using criteria defined in 10 CFR 61.55, are acceptable for disposal in the ERDF.

Comment 5. Columbia River United commented: "For the environmental restoration disposal facility, as I stated earlier, the public must be involved in the waste criteria selection set for this site. We hope this will limit the size and materials buried in this landfill and assure waste reduction, and we want to make sure all possible available technologies assured the lowest amount of waste and that recycling of any items out there that we can use for something else be looked at and actually be done."

Comment 6. Heart of America Northwest commented: We want to ensure that strict acceptance criteria are in place. We also want to have some public input into that process. We feel it is important enough for the public to be able to work with you on that and give you input on it.

Response: Waste acceptance criteria are fundamentally dictated by state and federal regulations as well as DOE Orders. The regulations limit ERDF waste acceptability primarily in the areas of chemical concentration, radioactivity level, treatment standards, and waste form. The generation of the waste at remediation sites must be where the decisions concerning waste reduction, innovative technologies, recycling, etc., are made. Public input into those decisions will be sought during public involvement periods for the operable units.

Comment 7. Heart of America Northwest commented: "I know that there is also a possibility that there will be a Resource Conservation and Recovery Act permit applied for by this facility, which may not be limited to only Hanford waste at some future date. I just want to put on record that we are very concerned about offsite waste. I am also concerned about what I have understood is the potential for proposal for a new disposal facility for offsite waste in the north corner of the 200 West Area. That is a serious concern, especially since stakeholders have said repeatedly that they do not want offsite waste. I realize it is DOE's plan to start playing a shell game with DOE's waste from INEL and Rocky Flats, etc. But we don't accept the premise that just because we are large we should take all of their stuff."

Response: Under the current regulatory framework, the use of the ERDF would be limited to wastes that are generated from cleanup under CERCLA on the Hanford Facility. There are currently no plans to permit the facility under RCRA.

Comment 8. A member of the general public commented: "I want to say that I am glad that you have made a commitment not to accept waste from outside of the Hanford Site; everybody agrees that would be a bad idea. Obviously you have to make some commitments to that in writing that you are going to stick to."

Response: Thank you for the comment.

Comment 9. Heart of America Northwest on ERDF. We are concerned that the waste acceptance criteria very explicitly include Washington State's management priorities as treatment standards. Washington state has in its law a set of waste management priorities that say you don't landfill unless you can treat and have attempted to treat, and this is very important that we insist that these be followed. Now, a second concern that rises from that is the fact that you said in the presentation either Norm or Pam that ERDF would follow Washington State laws, but and that you would not accept any extremely hazardous wastes which is a Washington State term for a certain level of toxicity. And you wouldn't accept transuranic waste, etc. I am concerned that apparently there is an

effort to place a low-level waste dump at Hanford or expand the current site to include both Hanford and non-Hanford low-level wastes. What is very disturbing to us is that the Westinghouse Hanford Company has been using our tax dollars to lobby for an end to the regulation that creates the extremely hazardous waste category in Washington State law. They have been lobbying to lower to 10% of the current standard what is a dangerous waste. That would mean that 90% of the wastes that are now expected to be dug up to go into ERDF because of their toxicity levels would suddenly be reclassified as low-level wastes only and they'd be free to go from a RCRA-compliant double-lined trench. We are glad that you are choosing that option and now they'd be going instead to simple "random" disposal in unlined trenches with no leachate collection system, no monitoring requirements, and no regulator oversight by Ecology or EPA. And we are very concerned about that and we would like a response on the record as to why Westinghouse Hanford Company has been allowed to lobby for those two changes on our federal tax dollar, which we understand is illegal. Secondly, we would like responses to what the impacts would be of eliminating EHW as a category and lower the toxicity level to 10% of what it is currently is for dangerous waste in terms of protection of human health and the environment as we cleanup Hanford and dig up soils that we need to dig up and remove."

Response: The ERDF will be a landfill that is regulated by the CERCLA, and as such, it is subject to applicable or relevant and appropriate requirements (ARARs). The Resource Conservation and Recovery Act (RCRA) and Washington State's Dangerous Waste Regulations (WAC 173-303) will be the primary regulations under which the ERDF will be operated. WAC 173-303 contains the management priorities to which you allude. The applicability of these standards will be evaluated and determined in the feasibility studies, proposed plans and RODs for the OUs.

The Low-level Burial Grounds (LLBG) on the Hanford Site is a RCRA landfill that has interim status. The LLBG dispose of low-level waste from other DOE sites and defueled submarine reactor compartments. As a CERCLA landfill, the ERDF cannot accept waste from outside the Hanford Facility. The Hanford Facility is defined in the Hanford Facility RCRA Permit.

The assertion that "...90% of the wastes that are now expected to be dug up to go into ERDF because of their toxicity levels would suddenly be reclassified as low level wastes only..." appears to assume that 100% of the wastes to be generated by ER remedial actions would be otherwise classified as EHW; in fact little of the remedial waste to be generated by remedial actions is anticipated to be EHW. Instead, the majority of the waste is expected to be Category A or Class 1 LLW, which will be excavated, transported, and disposed of in bulk form in the ERDF. Given that little of the remedial waste is anticipated to be classified as EHW, the impact on the ERDF of redefinition of the EHW levels as noted in the comment would be negligible; very little remedial waste would be impacted.

Comment 10. The Yakama Indian Nation commented: "Waste acceptance criteria are being formulated. We would support criteria that meet the nuclear waste policy act 500-year past closure requirements. We're opposed to the long-term reliance on institutional controls for safety and health assurance. Aside from a lower long-term effectiveness, such policy is against the nuclear waste policy act, which calls for unrestricted use of a site after 500 years past closure."

Response: It is assumed that institutional controls (such as, deed restrictions, fences, etc) will prevent intrusion into the waste for at least 100 years and that passive controls (such as, markers, barrier, etc) will prevent intrusion for 500 years. Furthermore, it is assumed that because the waste is covered with at least 4.6 m (15 ft) of cover materials, inadvertent intrusion

into the waste due to excavation is minimized. Since none of the evaluated barriers can prevent penetration by a drilling rig, however, it is reasonable to assume that someone might inadvertently drill through the waste sometime after 500 years. The likelihood that someone will drill through the waste is not addressed.

Comment 11. A member of the general public commented: "I also must admit that I am a little bit skeptical when I hear some assurances that all of this business is going to be for Hanford waste only. This particular project might be. But next year when the nuclear waste policy act is opened up, there may be a lot of political pressures that change the whole scene and everyone I think has to be very vigilant and take on all kinds of possibilities that might happen. I think the public is a little bit skeptical when we see so many problems coming from what we had thought was being handled before by smart scientists and planners in the government. We would like to see comprehensive coordinated plan."

Response: Thank you for your comment. DOE at Hanford is integrating the Tank Waste program tasks and the Environmental Restoration Program. Hanford is one of 26 sites that will be further evaluated for a possible mixed waste disposal facility for the disposal of treatment residues. No decisions have been made at this time and public participation will be solicited.

G. FACILITY DESIGN

Comment 1. A Hanford Watch Representative commented: "We still have the question of the mis-definition of low-level and high-level in this country. You say high-level and transuranic waste will not go into this landfill, only low-level waste. Some low-level waste is much more toxic, much more radioactive, and much more long-lived than some of the high-level and transuranic wastes. I have a concern about that because this waste will be in that landfill beyond its operational time, beyond the 30 years. And I know that there are enough life forces going on in this planet right now that there's going to be some leakage, so that's a real concern for me."

Response: The liner and leachate collection system for a landfill trench is only expected to function for the operating life and the postclosure care period. The postclosure monitoring will end when it is demonstrated that no leachate is being generated. The cover placed over the landfill at the time of closure is designed to prevent water from entering the landfill and generating leachate. The long-term prevention of leakage is based upon the cover preventing water from entering the landfill such that there will be no liquid to leak.

Comment 2. One member of the general public commented that "They don't agree that the decision for the type of protective cap needs to be decided before construction or use of the pit begins. It will take several years to build and load some waste into the pit. By then, studies should be complete and the best cap for the pit can be chosen."

Response: The RCRA-compliant cover is currently considered the minimum required to be protective of human health and the environment. Additional options will be evaluated prior to construction of the cap.

Comment 3. Heart of America Northwest commented: "I want to ensure that there is plenty of monitoring around this facility, that there is air monitoring and other monitoring to make sure that nothing goes offsite that you are all now thinking will not go off the site."

Comment 4. A member of the general public commented: "I am concerned about how you are going to do monitoring at the site. I was asking somebody about monitoring and nobody seemed to know about that. Monitoring is obviously been a serious problem (the high-level waste tanks). I think that we need to learn from that example and make this a safe facility."

Columbia River United commented: The only way that you can assure worker and public safety is to monitor with Continuous Air Monitors (CAMs). These monitors must be installed at all remediation sites and ERDF. To do anything less is putting the workers and the public at risk. We must keep in mind that worker safety is a number one priority.

Response: Continuous Air Monitors will be installed and operated as a part of the site's operational safety procedures. Currently existing groundwater monitoring system will document conditions prior to accepting waste at the facility and continue to monitor groundwater during operation.

A member of the general public had the following written facility design comments:

Comment 5. The clay liner is shown in plans as only 3 ft thick. Clay liners built for regular solid waste (household garbage) landfills are usually 5 ft thick. I think the ERDF liner should be thicker for this massive landfill.

With the clay content of the liner being only 9% with a total thickness of 36 in., this means that if the compacted clay were separated as a pure layer (separated from 91% sand) it would be about 4-1/4 in. thick. The remaining sand would be 31.75 in. thick. This amounts to being a very thin skim coating of a clay layer to contain 70 ft of waste materials, and;

A thicker liner with a higher clay content would provide for more chemisorption capacity. I think that 4-1/4 in. of clay will not have enough chemisorption capacity for 70 ft. of overlaying waste materials should failure of the plastic liners occur. Moreover, I would like to see a clay subliner installed which is adequate to contain through sorption, the fullest capacity (or ability to sorb) as much of the radionuclides and chemical contaminants present in the completed landfill as possible. Because of even the slight chance that the pump and treat leachate collection could terminate in the future of the landfill should be designed to take care of its self in the absence of human caretakers, and itself prevent dispersion of radionuclides and dangerous chemicals into the environment (or biosphere), rather than reliance upon indefinitely being pumped out.

Sodium bentonite is used as a sealing liner for landfills because it swells up greatly in size (or volume) with the absorption of pure water. Sodium bentonite mined from certain deposits will swell up to 20 x (time) the original dry size after saturation with pure water.

Response: The liner system is not intended to provide long-term containment of waste. It is only intended to collect leachate during the period when waste is being emplaced and for the first few years after closure. After this time, the permanent closure cover will limit infiltration of surface water to the waste. As required by EPA regulations (RCRA Subtitle C), the closure cover will have a permeability less than or equal to that of the liner. Thus, the long-term performance of the ERDF will be controlled by the cover, not the liner system. Likewise, long-term performance of the ERDF does not rely upon ongoing leachate pumping.

The compacted admix layer is 3 ft thick in accordance with EPA RCRA Subtitle C and Washington Department of Ecology requirements for hazardous waste landfills. The ERDF has

a double-liner system with a lower composite liner. Based on the analytical work underlying the EPA requirements as well as experience at other hazardous waste landfills, this liner system is expected to contain leachate with a high degree of reliability. It is true that some municipal waste landfills have clay liners that are thicker than 5 ft; these are often located in areas underlain by natural clay deposits. On the other hand, many municipal waste landfills have clay liners thinner than 3 ft, and often do not have two geomembrane liners as does the ERDF. Comparison of ERDF and municipal waste landfills should consider all liner system components.

Comment 6. As shown in plan drawings for the ERDF, the terms "compacted clay liner" are used. However, the completed liner will actually consist of 91% sand and 9% sodium bentonite clay mineral (by wt.). The term clay as used by geologist, mineralogist, and soil scientist is applied to geologic materials composed of at least 51% clay content. Therefore, the term clay cannot be properly applied to describe the liner as shown in plan drawings. The proper term should be sand liner, or sand-clay liner.

Response: The term "compacted admix" is now being used on the ERDF drawings.

Comment 7. Sodium bentonite clay used in the liner may be chemically altered over time with resulting degradation of its sealing performance.

Response: As noted above, long-term performance of the ERDF will be controlled by the cover, not the liner system.

Comment 8. Sodium bentonite is used in all the liners and containment barriers at Hanford. Sodium bentonite is also named Na montmorillonite, Wyoming bentonite, high yield bentonite, and Western bentonite. Sodium bentonite is a member of the smectite group of minerals. The other montmorillonite clay minerals being calcium bentonite (Ca montmorillonite, non-swelling bentonite, southern bentonite, and fullers earth), magnesium montmorillonite (saponite, armargosite), potassium montmorillonite (metabentonite), and lithium montmorillonite (hectorite). The structure of these clay minerals are extremely microscopically small aluminum silicate sheets with sodium, calcium, magnesium, iron, potassium, lithium, and other elements may be present. The particular montmorillonite mineral being named for the element which is dominant over the others as the principal exchangeable cation. The chemical and physical properties are determined by the cations present. The chemical and physical properties have a great variation between group members. The montmorillonites (or bentonites) are the best clays to use for sealing or liner applications because they are the least permeable to water. Also, these clays have a strong property of chemisorption, which is the ability to bond substances to the surface and between the silicate sheets of the clay minerals crystals. The sorption property will attract certain atoms, molecules, and even small particles like a magnet by electrostatic and other atomic forces and coat the clay crystals with a layer called the Stern layer. The sorption property will extract (or filter) certain dangerous chemicals and radionuclides as they very slowly percolate through the sand-clay liner in solution with water. The other clay minerals kaolinite and illite are much more permeable to water, and have weak to very weak sorption properties.

Response: When performance of the ERDF was analyzed, no credit was taken for permanent adsorption of contaminants by the clays in the admix, only for a slight retardation. Therefore, the geochemical properties of the admix are not relied upon for performance of the ERDF.

Comment 9. The swelling of the clay effectively seals pores in the sand-clay liner, and forms a very tight low permeability material. The sand in the liner is to provide physical stability and

densification. The sand-clay mixture will compact easily whereas a purer clay is difficult to compact into a dense layer (or liner). The sand stabilized against extrusion (flow or displacement) from the weight of the overlying waste and landfill liner cap. If pure clay were used for the liner, it will become plastic due to its rheological properties with the addition of enough water, and could flow or be displaced. A compacted dense sand-clay mixture of less than 10% sodium bentonite will not flow under pressure. Pure sodium bentonite saturated with pure water behaves rheologically as a watery gel, with strong lubricating properties. Also, hydration pressures in montmorillonites may reach 2000 psi., because of these reasons the clay content for sodium bentonite - sand liners cannot exceed 10% or so.

Response: Thank you for the comment.

Comment 10. Sodium bentonite does not swell (or expand) to the same volume in solutions of chemicals such as acids, alkalies, and saline solutions. The swell may be greatly reduced. Sodium bentonite does not swell in organics (such as oil), unless it is specially treated, as organoclay (organic clad clay). Bentonite clays are also subject to ionic exchange. The principal exchangeable cations can be removed and replaced by other cations present in solution, when the clay is placed into the solution.

Response: Thank you for the comment.

Comment 11. I read in Hanford literature regarding a previously completed sodium bentonite liner that it would take "50 years for the waste water to pass through the liner". The liner was constructed (or built) to the same thickness (3 ft.) and permeability (1×10^{-7} cm/sec) specifications as the proposed ERDF landfill. Therefore, the liners are somewhat permeable, albeit slowly.

My point is that should something happen to human caretakers of the ERDF, so that the pump-and-treat leachate collection system would become abandoned, then chemicals in the waste will be passing through the liner. In a long time period the leakage will be significant. The chemicals and alkaline metals in the waste will interact with the sodium bentonite. The chemicals will cause shrinking to occur in the bentonite by reducing its swelling or expansion, and that will cause an increase in permeability. Moreover, the actual clay mineral will likely be altered chemically into another montmorillonite clay mineral by cationic exchange with cations present in solution from the overlying waste. Sodium cations may be leached by acidic or alkaline solutions and replaced by other metal cations, this too will cause an increase in permeability, because sodium bentonite has the highest swell volume of the montmorillonites, and when altered to another montmorillonite it may be a low or non-swelling type (it may become a none-swelling clay).

Response: The admix for ERDF will contain a nominal 12% bentonite by dry weight. This same mixture was used at a smaller landfill on the Hanford Site and had excellent strength and constructability characteristics. It also had a permeability of 1×10^{-8} cm/sec with pure water, 10 times lower than the RCRA requirement of 1×10^{-7} cm/sec. Because of the same concerns raised by the reviewer, this admix was also tested using a synthetic leachate containing the chemical compounds expected at the landfill, which will have a waste stream similar to ERDF. For this testing, the admix was also irradiated to check the effects of radionuclides. Even under these conditions, the permeability of the admix remained under 1×10^{-7} cm/sec. The protective cap is relied on for long-term prevention of leachate.

Comment 13. If I may make a suggestion, I would like to see a non-swelling bentonite used in the liner. Non-swelling bentonite such a calcium bentonite, and nontronite (iron aluminum silicate) have

chemical and physical properties that may be better in a liner application. The iron content helps bonding of certain radionuclides to the clay crystals. Calcium bentonites from certain deposits also have a high iron content. The impermeability of calcium bentonite will not be adversely affected by acidic and saline solutions as will sodium bentonite. Acidic solutions will remove some of the calcium cations, however, in doing so the edges of the sheet structure will be expanded around the edges and cause a slight swelling to occur. The slight swelling will tighten up the sand-clay mix resulting in decreased permeability. Saline solutions will further disperse any calcium bentonite clay aggregates to smaller particles which will cause a slight swelling, to seal up the liner. Note that this is the opposite effect as compared to sodium bentonite, which becomes more permeable when exposed to the same chemicals. Calcium bentonite or nontronite would have to be added in higher percentages to the sand to achieve the same impermeability (up to 30%). The greater amount of clay would provide for more sorption capacity. Calcium bentonite bonds the sand together more strongly than sodium bentonite in the moist state. Much more calcium bentonite may be added to the sand and still be stable against flow or extrusion. The clay is also less sensitive to the amount of water needed for compaction during the building (construction process).

Calcium bentonite liners (or sorptive barrier technology liners) are used at chemical plants in Texas, Mississippi, Florida, South Carolina, and elsewhere. A hazardous waste landfill in South Carolina uses such a liner and cap, and not only to contain the waste but for backfilling around the waste containers in order to provide a sorptive medium for dangerous chemicals.

Sodium bentonite has been a standard at Hanford for years. I think that the ERDF is moving ahead too fast for construction under the "lets get the cleanup going" attitude. This is one area where more time should be taken to test the liner materials performance over time before completing the main landfill at Hanford, its too big to not have as good as possible.

Response: As part of the liner design for the completed, smaller landfill project at Hanford, a calcium bentonite from a commercial source in the Ephrata, Washington, area was tested. An admixture containing 10% Ephrata bentonite had a permeability of about 5×10^{-5} cm/sec, well outside of the minimum requirements. It was decided that even if sufficiently low permeability could be achieved with this material, a very large percentage of bentonite would be required. Due to potential problems with strength, workability, and higher costs resulting from use of a higher percentage of bentonite, the Ephrata bentonite was considered an unattractive alternative. See information noted above.

Comment 14. Finally, if I may, I would like to outline a recent incident regarding plastic pipes in analogy to liners. I saw a report on CBS news about plastic water pipes. The pipe has become brittle due to exposure to chlorine in city water supplies. The pipe was in service for about 15 years, and then the pipes began to crack or split open. Water damage was estimated to be 800 million dollars in homes and buildings all over the U.S. The plastic in the pipes was made by major chemical manufacturers who have been in business for a long time.

Response: Thank you for the comment.

H. DUST MITIGATION

Comment 1. Columbia River United commented that "One of the things that we will have to be shown to agree that the ARARs are being met are that adequate controls are being made to control the spread of contaminated dirt. And the issue of continuous air monitors was mentioned. I believe

those will not be CAMs, but will instead be air samplers. CAMs do have an instantaneous response. If you set up air samplers, though, generally those results are not back for a week or so, basically after the fact.

Dust mitigation as we mentioned before is another concern. We hope that the workers aren't out there working in high-wind conditions breathing in the dust that's contaminated. We want to make sure that they use the best available technologies for remediation and burial and dust mitigation. The question tonight was about continuous air monitors. Now we know that they're actually proposing not to use continuous air monitors and we're going to request that they do use continuous air monitors at the burial site.

Response: Continuous Air Monitors (CAMs) will be installed to monitor air emissions for worker and public safety. Because of the large area to be cleared and the generally dry and windy climate, DOE recognizes the particular importance of dust control at the ERDF site. Specific dust mitigation options such as water sprays, binders, and uncontaminated operational covers on emplaced wastes will be employed during construction and operation of the ERDF to prevent spread of contamination and to protect worker safety. Please refer to the responses below for more information.

Comment 2. Columbia River United commented that dust mitigation must be done with the best available technology. The Hanford Site is extremely dry and is noted to have very high winds. The Dust Mitigation Study (DSM) has some erroneous assumptions about the threshold velocities for ERDF. The threshold wind speeds of 36 mph for untreated ERDF soil and 42 to 53 mph for treated ERDF soil does not even come close to protecting the workers. It is amazing to find out that when Wal-Mart was under construction, the stop worker order was in place at winds much lower. The DSM gives no recommendation as far as work stoppage in relation to wind speeds. The DSM does not take into consideration all the different contaminated sites across the Hanford complex that will be excavated. There is no mention of how we will protect the workers and public from these excavations. More work needs to be done on a comprehensive Dust Mitigation Strategy to assure worker and public strategy.

Response: There may be some misunderstanding about the report. The report shows (on fig. 5-1) that the threshold velocity for untreated soil varies from 11 mph to 36 mph depending on the soil type and conditions and that the threshold velocity for treated soil varies from 42 mph to 53 mph depending on soil type. Dust emissions can vary greatly depending on the moisture of the soil, particle size, silt content, presence of binding agents, and initial suspension by outside forces other than wind (such as machinery). Consequently, comparisons of observed dust emissions at the Wal Mart construction may not be comparable to some of the cases evaluated in the report. The Wal Mart site was a shallow excavation using heavy equipment that stirred up the eolian deposits of fine sand. The eolian soil at the Wal Mart site is anticipated to be quite different from the coarse gravelly soils that would be more typical of the waste coming to the ERDF. It would be reasonable to expect that the eolian soil of the Wal Mart site would be associated with dust emissions at relatively low wind speeds (such as the 11 mph from fig. 5-1), whereas coarse, clean gravels would not emit dust even up to 36 mph. Some of the computations shown in the report are for undisturbed conditions (fig. 5-2, Open Area Wind Erosion), while others are for situations where heavy equipment would initially suspend dust particles (fig. 5-4, Particle Emissions from Dumping Operations, and fig. 5-5, Particulate Emissions from Dozer Operations). The threshold values shown for fig. 5-1 and probably for the range indicated by your comment (42-53 mph) are for undisturbed conditions that are not

- comparable to the Wal Mart conditions with its heavy equipment operation. Better comparisons to the Wal Mart conditions would be made from fig. 5-4 and fig. 5-5.

Because of the large area to be cleared and the generally dry and windy climate, DOE recognizes the particular importance of dust control at the ERDF site. Specific dust mitigation options such as maintaining moist conditions (sprinkler irrigation), adding binding agents to form larger particles (that are too heavy to be suspended/carried far), and covering the waste as it is placed (with stabilizing chemicals or clean soil) are being evaluated for their usefulness during construction and operation of the ERDF. The ultimate method or combination of methods for controlling dust will consider the range of soils and conditions (undisturbed and heavy equipment operations) that will be present at the facility. Once the methodology of controlling dust is decided upon, then operational safety limits tailored for that specific method will be developed.

Comment 3. Columbia River United commented: We also were looking at it (siting) in the Hanford Advisory Board. We learned from one of the people out there that his preference was the northern site because the northern site didn't have as much light sand and soft silty stuff that would fly around when you start cleaning it up, start digging the hole, and start burying it, and that brought up the question about what are we going to do for dust mitigation. The winds blow from anywhere (between) 5 mph to 50-60 mph out there; what are we going to do for mitigation to protect the workers, protect the people offsite.

Response: Upon completion of excavation and construction of the drainage layers, the facility will be covered with an operational layer of native soils, which will be treated with a soil binder for purposes of dust control. When the facility is operational, wastes will be covered with clean soils as they are emplaced, and dust control measures will be employed to limit generation of airborne dust. For these reasons the nature of soils on the ERDF site are of concern primarily during the construction phase and become less of a concern when the facility is completed and operational. For a more complete discussion of the dust control measures to be employed, please refer to the comment responses above.

I. CONSULTATION WITH THE CTUIR

The CTUIR had the following comments:

Comment 1. The ERDF staff are to be commended for promptly consulting with the CTUIR early in the scoping process for the ERDF. Moreover, the ERDF staff provided us with all drafts of ERDF-related documents at the same time they were sent to the regulators. Despite the CTUIR's committed involvement in Hanford matters, DOE still fails to send us many documents -- particularly documents concerning the 100 Areas -- in anything approaching a timely manner. The ERDF staff have shown that timely consultation with tribes is not some sort of indecipherable mystery. We appreciate their professionalism.

Response: Thank you for the comment.

Comment 2. Nevertheless, we are aware that many natural resource trustees were not consulted in a timely manner. We assume that the ERDF staff's consultation with the CTUIR was based more on DOE's duty to consult with affected Indian tribes (under the federal trust responsibility to tribes) than on the CTUIR's status as a natural resource trustee. Of course, this does not explain the fact that the

- Nez Perce were not consulted at the same time the CTUIR was. Nevertheless, in the wake of various trustees' (valid) criticism of DOE's failure to involve them in a timely manner, we did not want to lose sight of the fact that the ERDF staff did at least meet with CTUIR staff early in the process and get documents to us at the appropriate time.

Response: Thank you for the comment.

Comment 3. As for consultation over the siting of the ERDF, we agree with the other trustees that we all should have been consulted about alternative sites, and that alternative sites should have been analyzed in the RI/FS.

Response: It seemed most effective to rely on the ERDF siting evaluation report rather than reproducing the document in the RI/FS, which is already rather voluminous. Alternate sites were analyzed in the Siting Evaluation Report (WHC-SD-EN-EV-009, Rev. 2), which is cited in the ERDF RI/FS.

J. INTEGRATION OF NEPA EIS COMPONENTS INTO THE ERDF CERCLA RI/FS

Comment 1. The CTUIR commented that generally speaking, DOE has done a good job of integrating all of the components of an EIS into the ERDF RI/FS. Unfortunately, the *content* of those components is sometimes sorely lacking. We address the key failings of the planning process for ERDF later in this letter. Nevertheless, as far as fulfilling the Tri-Parties' goal of producing an RI/FS that was embellished to include most EIS *components*, DOE has succeeded in doing that.

Response: Thank you. We appreciate your effort to provide supportive as well as critical comments.

Comment 2. The Oregon Department of Energy commented: There were comments within the Remedial Investigation Feasibility Study document, which is the basic work document for this, that indicate that there's Natural Resources being committed and that therefore it's just assumed there will be mitigation, but that mitigation will be included in some sort of a sitewide restoration plan. The way that this entire document came about we definitely feel does not cause it to be equivalent to what's required in the National Environmental Policy Act for the performance of an environmental impact statement. This remedial investigation/feasibility study is not a good substitute, the process is not equivalent, and the damages caused by it are damages that will have to be mitigated and compensated for at some time in the future.

Response: Thank you. We appreciate your effort to provide supportive as well as critical comments. The intent of the regulatory package for the ERDF was to provide an integration of NEPA values within CERCLA documentation.

Comment 3. Heart of America Northwest commented: Let me just say that (NEPA/ CERCLA integration) was something that the State Advisory Council and the Oregon Waste Board and citizen groups encouraged integration of the two. I am not sure that it has worked perfectly. I mean the biggest difficulty is that under NEPA, the number one value is to produce the readable document and I am not sure we met that, quite honestly, in terms of value.

Response: Thank you for the comment. The RI/FS is admittedly technically oriented and voluminous.

Comment 4. Heart of America Northwest commented: NEPA requires that you address the cumulative impacts and the impacts of related actions in the one document for the action you're proposing this landfill. Since the lead agency is the Department of Energy taking the action, which apparently has plans or is considering other actions that are related that would bring similar wastes from all over the country, perhaps the world, to landfills at Hanford including, we've just learned, defense low-level wastes to be brought to the region including wastes under the federal facility compliance act from other nuclear weapons sites. Therefore, whether or not these wastes are off limits to ERDF, you must fully disclose what those wastes are, where they are going, what the cumulative risks and impacts are. This is what would be required under the NEPA. I know that EPA and Ecology may have trouble obtaining this information as it has been closely held. I would suggest that you must force the Department of Energy to fully disclose this information otherwise we cannot meet the promise that everything that would be covered under NEPA would be covered under the ERDF CERCLA documents; and it is imperative that the public see what the Department of Energy is considering to bring into another landfill at Hanford.

Response: The cumulative impacts section of the RI/FS (9.4.10) included a discussion of potential impacts from the Low-Level Burial Grounds, located in 200 East and 200 West Areas. These Burial Grounds accept low-level waste from other DOE sites and defueled submarine reactor compartments. Hanford is one of 26 sites that will be further evaluated for a possible mixed waste disposal facility for the disposal of treatment residues. No decisions have been made at this time and public participation will be solicited.

K. "NEPA ROADMAP"

Comment 1. The CTUIR commented that the NEPA Roadmap is a remarkable document. It contains a generally forthright and comprehensible discussion of the EIS and RI/FS processes, their similarities and differences, and an index for finding EIS components within the RI/FS. DOE has attempted the index idea before, most notably in the RI/FS for the 1100-EM-1 Operable Unit (OU) and the LFI/FFS for the other three 1100 OUs. The NEPA index to these documents was a dismal failure, precisely because those CERCLA documents had not been enhanced to contain NEPA elements. By comparison, the ERDF Roadmap is very well done. DOE deserves credit for this accomplishment.

Response: Thank you. We appreciate your effort to provide supportive as well as critical comments.

L. JUDICIAL REVIEW

The CTUIR had the following comments:

Comment 1. CTUIR staff have some extremely serious concerns, nonetheless, about DOE's (and EPA's) intention to completely discard formal compliance with NEPA on CERCLA projects. As we said, DOE has done a fine job on the ERDF "NEPA Roadmap," and on integrating most NEPA components into the RI/FS. Nevertheless, the ERDF is a high-profile project. As this is the "pilot project" for the concept of subsuming the NEPA process into CERCLA, DOE could be expected to do a good job on the integration of NEPA and CERCLA this time. We are concerned, however, that in future, less high-profile projects, DOE will not integrate EIS components into RI/FSs with as much attention to detail as DOE has shown this time. In the past, when DOE/RL has written run-of-the-mill NEPA documents (such as the EA for the 240 Road Access Extension), the CTUIR has often found them to be poorly crafted and legally inadequate. Considering DOE/RL's general poor track

record on NEPA documents, CTUIR staff are concerned that in future projects the standard for the "integrated" NEPA/CERCLA process will be much lower.

Response: DOE intends to substantially comply with NEPA. In other words, DOE will meet all significant requirements of a non-administrative nature. In the future, DOE hopes to continue to produce high quality documents.

Comment 2. Moreover, since DOE has done a generally good job, this time, of integrating NEPA and CERCLA elements in one document, we are left wondering why DOE has parted from its prior policy of producing a single document and calling it an "EIS - RI/FS" (See DOE Order 5400.4 § 7(d)). It appears that the only thing DOE gains from not calling the ERDF planning document an "EIS - RI/FS" is that DOE avoids any threat of judicial review under NEPA. This is an improper motivation for DOE. Judicial review is an extremely valuable process that protects those who would otherwise be improperly ignored. It protects entities with less power and forces discipline upon agencies that might otherwise show contempt for the law or for tribes and the public. Does DOE believe that accountability for its actions is a bad thing? If not, then why is DOE trying to avoid accountability?

Response: In June 1994, the Secretarial Policy for NEPA was issued, which commits the DOE to rely on the CERCLA process for review of actions to be taken under CERCLA. Under this policy, we will continue to incorporate NEPA values such as analysis of cumulative, offsite, ecological, and socioeconomic impacts, to the extent practicable. This is consistent with guidance from the Council on Environmental Quality (CEQ) (40 CFR 1502.25). This policy resulted from negotiations between EPA, CEQ, DOE, the U.S. Department of Justice, and others. The EPA expressed concerns about separate implementation of NEPA for CERCLA actions because of apparent unnecessary duplication of analyses and potential delay of project implementation, such as might be caused by judicial review. Congress has clearly expressed the intent in the CERCLA statute that cleanup not be delayed due to litigation prior to cleanup.

Comment 3. The usual complaint (raised by DOE and DOJ in recent litigation) about judicial review is that it can cause delay. Delay is, sometimes, the price of justice. Yet we can see in the example of ERDF that entities do not always seek judicial review even when they have cause to. Any citizen of the U.S. could file suit against DOE under NEPA for DOE's failure to perform an EIS for the ERDF. Citizens may also be able to sue claiming that DOE has not complied with legal requirements concerning the siting and licensing of a low level nuclear waste disposal facility. Tribes could sue DOE under the federal trust responsibility to Indian tribes for DOE's failure to consult with them about siting. The natural resource trustees could file suit against DOE for its failure to consult with them before making the siting decision. Yet no one has filed any suits to delay the ERDF on any of these grounds, precisely because everybody recognizes that in this case, delay is unacceptable. Does DOE have so little respect for tribes, states, and the public that it expects them to file reckless suits?

Response: DOE, EPA and Ecology appreciate the cooperative attitudes that have been evidenced by all of the interested parties who have participated in the reviews and discussions of the ERDF Proposed Plan and related documentation. DOE, EPA and Ecology feel that the decision reached in the ROD is supported by the record, and hope that any remaining concerns can be resolved through continued discussions, without the need for litigation. With regard to any issues that cannot be so resolved, judicial review will be available. Congress did not preclude judicial review of issues under CERCLA, it merely required that such review be postponed until implementation of the selected remedy. The CERCLA statutory bar on pre-enforcement review of cleanup actions has been uniformly upheld by the courts.

Comment 4. Moreover, judicial review is not a process that is outside of reasonable control. Every decision in a judicial review case is made by a federal judge. Judges have enormous discretion to dismiss cases that they feel are frivolous or unjustified. Indeed, the usual response to a complaint calling for judicial review, is for the defending agency to seek dismissal of the claim. This process is designed to filter out the merely delaying or "political" lawsuit very early in the process, before the suit can cause significant delays. Defendants can even file their own motions, seeking to impose *financial penalties* against those who file frivolous lawsuits. Judicial review is not a process that takes place irrationally or on "autopilot." So why does DOE fear this process? Does DOE distrust the judgment of federal judges? Or does DOE itself believe that its actions are often illegal or inadequate? Isn't DOE seeking to avoid judicial review precisely because it knows its actions often fail to live up to the minimum standards of the law, and because it wants to avoid being accountable when it breaks the law?

Response: DOE and EPA agree that judgements of the federal judiciary should be accorded respect and deference. Federal courts have uniformly held that judicial review of issues under CERCLA must await implementation of the remedy. Courts have held that the legislative history of CERCLA is clear, and that in balancing the right to review a potentially inadequate or flawed response plan with the interest in implementing prompt cleanup of hazardous waste sites, Congress gave priority to prompt cleanup. In making this decision, Congress apparently intended both to facilitate prompt cleanup action and to give some deference to the judgement of EPA, which it created to protect the public interest in enforcing federal environmental laws. In reaching the decision that is reflected in the ERDF ROD, EPA, DOE and Ecology are not turning a deaf ear to the needs and desires of interested parties and the public: significant considerations have been incorporated into the final decision based on input from these parties. For example, the location selected was consistent with criteria developed by the Future Site uses Working Group, the size of the facility was reduced to minimize the area disturbed, construction will commence on an extremely expedited schedule to assure that surface disturbance activities occur outside of sensitive nesting time periods.

Comment 5. Another concern that is sometimes raised about performing both NEPA and CERCLA is that doing so creates redundant paperwork and process. Yet the ERDF project shows this need not be the case. Moreover, DOE has produced EIS -- RI/FSs in the past under its former policy, with apparently little difficulty. DOE even has a headquarters-based NEPA office that provided guidance for the production of these documents. We cannot see how DOE achieves any significant reduction in paperwork or process by discarding NEPA.

Response: DOE has not discard NEPA. Instead DOE has incorporated the substantive evaluation of NEPA elements into the CERCLA documentation. This approach is consistent with the DOE NEPA policy, streamlines the procedural aspects, reduces redundant analyses, saves paper, and allows for a single, integrated decision.

Comment 6. The history of DOE's interaction with the people it is supposed to serve is a history of DOE erecting walls to accountability. One by one, those walls have been pulled down by the states, tribes and the public, only to have DOE erect new ones in their place. CTUIR staff are concerned that DOE's attempt to escape from judicial review is simply a repeat of this familiar theme. There may be some compelling procedural reasons for preferring the CERCLA RI/FS process over the NEPA EIS process. The NEPA Roadmap describes some of these. But as long as the CERCLA

process leaves DOE essentially unaccountable for its actions, we cannot support a wholesale abandonment of NEPA.¹

Response: In CERCLA remediations, DOE analyzes alternatives and suggests a remedy, but the regulatory agencies are responsible for choosing the remedial action to be implemented. Neither DOE nor the regulatory agencies are left unaccountable for their actions by the CERCLA process. It is true under the CERCLA statute, Congress has determined that citizen suits must await implementation of the selected remedy, however, the tribes and the public has significant opportunity for meaningful impacts on this remedy selection process.

M. ECOLOGICAL IMPACTS OF CONNECTED ACTIONS AT QUARRY SITES

Comment 1. The CTUIR commented that the RI/FS places no limit on where basalt quarry sites might be. Use of existing quarries or development of new quarries are connected actions to the ERDF project. Yet the RI/FS makes no attempt to describe the ecological impacts of those quarries. Further, the RI/FS makes no attempt to describe the transportation corridors or the ecological impacts of that transportation. From a NEPA standpoint, this is inadequate as a disclosure of affected environment and as a description of impacts to that environment. DOE should fully evaluate these issues in the RI/FS, and the CTUIR should be consulted about these decisions.

Response: The requirements for the surface cover have not yet been developed in detail. At this time, a RCRA-compliant cover is proposed for the closure of the ERDF, which does not include the use of basalt. To the extent practical, materials excavated from the ERDF site during construction will be used to construct the ERDF cover.

N. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Comment 1. The CTUIR commented: Because the tribes and trustees were not allowed to participate in the single most important decision concerning the site -- its location -- we can hardly be bound by DOE's decision to commit the resources at the ERDF site, "borrow" sites, and transportation corridors. This is the most glaringly obvious in the case of the basalt quarry site, the location of which, if a quarry is even required, is nevertheless undisclosed.

Response: Because the ERDF cover design does not specify a basalt biointrusion layer, or any other basalt layer, there is no need at this time to develop a source of basalt, or a basalt quarry, to support construction or closure of the ERDF. For this reason, no location for potential borrow sites are identified or proposed. Tribal and public participation will be invited at the time that a need for borrow sites is identified.

Comment 2. The CTUIR commented: CERCLA § 107(f) exempts a PRP from natural resource damages if the damages are identified as an irreversible and irretrievable commitment of resources in an EIS or comparable planning document and if various other conditions are met. This provision assumes that the EIS (or comparable environmental analysis) was performed properly. As the single

¹Judicial review under the citizen suit provision of CERCLA is essentially a chimera, since § 113(h) bars review until after the remedial action is complete -- far too late for a plaintiff to have any meaningful impact on the remediation.

most important decision concerning the ERDF was made without our participation, we must conclude that the commitment of resources was performed improperly. If it is true that the RI/FS process typically handles such decisions less rigorously than the EIS does, that only indicates that the RI/FS is not a comparable environmental analysis to an EIS.

Response: Evaluation of alternative sites has been an ongoing process in response to facility redesign and comments received from the public scoping meetings and from Hanford Site trustees. As noted in your previous comments, the analysis of issues in the RI/FS substantially complies with the requirements of NEPA. We therefore believe that the ERDF RI/FS is an environmental analysis comparable to an EIS for the purposes of irreversible and irretrievable commitments of resources and that identification of such commitment was proper and appropriate.

The Oregon Department of Energy had the following comment:

Comment 3: In Section 9.3.17 the RI/FS makes a sweeping claim for irreversible and irretrievable commitment of resources. This claim abrogates USDOE's duties as a Trustee and as a land and resource Steward. Additionally, this claim may be invalid because:

1. The siting process for ERDF failed to consider reasonable alternatives. The original facility size was predicated on a simple shallow burial. This did not comply with USDOE orders, or with prior guidance from the Future Site Use Working Group. When public demands caused the Tri-Parties to change the design of the facility and reduced its area from six square miles to 1.6 square miles, siting was not reconsidered.
2. The siting process relies on treating ERDF as a CERCLA facility. It is not clear this is allowable. The wastes intended to be placed in this facility are from remote sites in the 100 Areas. Based on guidance in CERCLA, it appears ERDF should have been sited using a full NEPA process rather than the CERCLA RI/FS process, including licensing under the Atomic Energy Act.

The CERCLA RI/FS process used for ERDF is significantly different from the NEPA process. The public involvement process was inadequate and judicial review is not allowed.

4. USDOE is required under CERCLA and DOE orders to mitigate for ecological damage. The irreversible and irretrievable claim is very broad. The mitigation measures identified in the RI/FS are all future actions with no detail provided and no detailed plans provided.

USDOE should at a minimum commit to:

1. Minimize the ecological harm done at ERDF, at the borrow material sources and along the transport routes to each of these locations.
2. Replace the destroyed habitat with sufficient new or upgraded existing habitat adjoining the remaining high shrub-steppe habitat to offset the harm done.
3. Work closely with Trustees from the earliest moment on future projects to avoid these problems and to protect and preserve the remaining habitat.
4. A comprehensive process to protect species of concern and habitat at Hanford.

Since the Tribes and Trustees were not allowed to participate in the important siting decisions for ERDF, we cannot be bound by USDOE's decision to commit the resources at ERDF, the borrow sites or the transportation corridors.

Response: Following the CERCLA process for documenting the irreversible and irretrievable commitment of resources does not abrogate DOE's duties as a trustee and as a land and resource steward. The siting evaluation report evaluated multiple sites. When the facility was down-sized the siting evaluation was reconsidered. Because this is an on-site facility, licensing is not required. The CERCLA RI/FS process substantially complies with NEPA. DOE intends to perform mitigation as required and to minimize ecological harm. Methods for mitigation will be analyzed and the tribes will have an opportunity to participate.

The U.S. Department of the Interior - U.S. Fish and Wildlife Service had the following comment:

Comment 4. The RI/FS claims irreversible and irretrievable commitment of habitat and other natural resources for areas which have either not been identified (basalt borrow site), or for areas which have not been specifically identified and habitat value has not been assessed (McGee Ranch borrow site). The Service strongly objects to these actions and considers the claims to be inappropriate and unethical. This claim abrogates USDOE's duties as a Trustee and as a land and resource Steward.

It is not clear whether alternative borrow sites for fine material were considered. The Service strongly recommends that this be done. McGee Ranch may be in a critical location to provide a wildlife corridor between Hanford and the Yakima Training Center. Thus, while the habitat quality at McGee Ranch may not particularly high, its location value to wildlife and populations of plants and animals may be very high, and the impacts created by a borrow site may be essentially unmitigatable.

Response: The discussion about use of borrow sites is preliminary. At the time that a need for a borrow site is identified, all required evaluations will be performed in consultation with appropriate entities.

O. MINES, BASALT, AND GABLE MOUNTAIN

The CTUIR had the following comments:

Comment 1. We sincerely request that the Tri-Parties refrain from referring to mines and quarries as "borrow" sites. Does DOE have any intention to return this material to these sites some day? Of course not. This material is not being borrowed, it is being taken -- taken with often extreme ecological impacts. Stone, once quarried, cannot be made whole again.

Response: The use of the term "borrow sites" in relation to mines and quarries is legitimate, and its use is not in any way intended to imply that any given source area, once mined, will be somehow reconstructed.

Comment 2. Also, please do not respond that this euphemism is somehow "customary" in the mining industry. The fact that others lie does not change the lie. Calling these mines "borrow" sites is deceptive and dishonest. Such jargon and euphemism needlessly defeats the tribes' and the public's need for clear, frank, honest discussion of issues and impacts.

Response: In using the term "borrow pits," DOE did not mean to be deceptive or dishonest. The term is clearly defined in Webster's Ninth New Collegiate Dictionary as "an excavated area where material has been dug for use as fill at another location."

Comment 3. In our scoping meeting with ERDF project staff, we repeatedly emphasized the importance of protecting Gable Mountain and other basalt outcrops (such as Gable Butte) on the Hanford site. Gable Mountain is of great religious importance to CTUIR members. The CTUIR can be expected to zealously oppose any impact to Gable Mountain. Other basalt outcrops are also of religious importance.

Response: DOE understands the importance of basalt outcrops to the CTUIR and other tribes. This is one reason that the preferred action (which requires no basalt) was chosen.

Comment 4. In addition, rock outcrops are a habitat feature that provides unique services to a variety of species. Once these geomorphic features are destroyed, they cannot be restored artificially.

Response: Thank you for the comment. Current design does not include the use of rock outcrops.

Comment 5. For these reasons, we urge that the protective cap for the ERDF be constructed without basalt. Either the modified Hanford barrier should be used, or stone should be derived from the process described below.

Response: Current design does not include the use of basalt.

Comment 6. The Hanford site is composed mostly of stone. The ERDF area is no exception. It is underlaid by many feet of Pleistocene flood deposits. Much of the material removed in the construction of the trench will be stone. If a crushed stone layer is needed for a biotic intrusion barrier in the ERDF cap, then this stone should be used. Simply sieve the appropriate-sized stone from the soil, crush it, and use it in place of the "crushed basalt" layer. Properly processed, this local stone should perform well as a biotic barrier.

Response: In fact, locally excavated materials will be utilized to the extent feasible in the construction of the ERDF cover layer. And, as noted above, closure of the ERDF site is planned to be accomplished using a RCRA-compliant cover, which will not require the use of basalt riprap.

Comment 7. This process should be less expensive than quarrying, involve no transportation costs and quarrying costs, and wholly avoid ecological impacts at yet-to-be-proposed quarry sites and along transportation routes. It should also render a crushed stone material that is adequate for the engineering needs of the cap. Please respond specifically to this proposal.

Response: Please note the comment response above.

P. DOE PROMISES TO THE CTUIR CONCERNING GABLE MOUNTAIN

The CTUIR had the following comments:

- *Comment 1.* On at least two separate occasions, at the July NRTC meeting with ERDF staff (on the day of the NRTC tour of ERDF sites), and at the September ERDF meeting between the NRTC and the Tri-Parties, ERDF project staff made oral promises to CTUIR staff that Gable Mountain would not be used as a quarry site for ERDF basalt. We took a good measure of relief from these promises, and publicly stated our gratitude and pleasure at this result. As this is an issue of great importance to the CTUIR, we expected this oral promise to be reflected in writing in the RI/FS. Unfortunately, no such promise is made in the RI/FS. Indeed, the RI/FS leaves open any possibility concerning quarry sites for basalt. So now we must ask, is DOE going to keep its commitment to the CTUIR, that Gable Mountain will not be used as a quarry site for basalt? Please respond in writing.

Response: ~~The current design does not include the use of basalt, which encompasses Gable Mountain.~~

Comment 2. DOE often says to tribes and the public "Trust us." Consider the discussion, above, concerning judicial review. Of course, based on past actions, tribes and the public have little reason to trust DOE. Yet, that does not stop DOE from coming back time and time again demanding our trust. This Gable Mountain basalt issue is but the smallest of examples of why DOE cannot be trusted. Despite our repeated statements to DOE about the importance of Gable Mountain, and despite promises by DOE that it would protect Gable, DOE has failed to put the least assurance about the future of Gable Mountain in this document.

Response: Comment noted. When evaluating remedial alternatives, DOE has a responsibility to evaluate reasonable alternatives and to justify the exclusion of certain alternatives from further consideration.

Q. ERDF ECOLOGICAL RISK ASSESSMENT EVALUATION

The Trustees had the following comments:

Comment 1. The goal of the ERDF baseline risk assessment is to evaluate the likelihood that adverse ecological effects may occur if organisms are exposed to contaminants that may be disposed in the facility. The goal of baseline risk assessment per 40 CFR 300.43 (e) (2) (i) (G) is to characterize current and likely future ecological risk attributable to releases of contaminants, especially when sensitive habitats and critical habitats of species protected under ESA may be impacted. The Hanford Site Natural Resource Trustees have evaluated the ERDF ecological risk assessment and, as such, have the following comments:

General Response:

EPA, Ecology, and DOE share the Tribes concerns regarding potential ecological effects and have made a conscientious effort to evaluate and mitigate these effects to the extent possible given the scope of this effort and the desire to remediate areas along the Columbia River. The relatively simple ecological risk assessment provided in Chapter 6 demonstrates that unacceptable ecological risk would result if the wastes to be received at the ERDF *were released to the environment*. This conclusion would not be altered if a more complex risk assessment were conducted. Based on the conclusions of the risk assessment, *the proposed remedial alternative is designed to prevent release of waste to the environment*, thereby eliminating ecological risk associated with the waste. Furthermore, the report acknowledges that physical ecological impacts (i.e., stressors) will occur at the ERDF site due to construction. These

impacts have been explicitly evaluated as part of the short-term effectiveness criteria (see Section 9.2) and significant design modification have been implemented to minimize the size of the facility and the magnitude of the impacts. For example, the trench design has been deepened to minimize the impacted surface area. As stated in Section 9.4.2, habitat value will be assessed before the start of construction, and impacts will be mitigated based on the ecological value of the habitat disturbed.

Comment 1.a. In general, the ERDF risk assessment should have been conducted consistent with the Hanford Site Risk Assessment Methodology (HSRAM). In the case of ERDF, it appears that portions of the Risk Assessment (RA) are not complete.

Response: The reviewer is correct that the ERDF risk assessment is not entirely consistent with the HSRAM methodology, primarily because the HSRAM methodology was not intended for the unique situation at the ERDF. Whereas the HSRAM provides guidance for evaluating existing environmental contaminants (primarily to determine if cleanup action is warranted), the ERDF risk assessment (Chapter 6) was conducted to determine the need for a engineered barrier over a *proposed* landfill. The results of the risk assessment demonstrated that unacceptable risks to human and ecological receptors would occur if exposure to materials intended for ERDF was not prevented (i.e., by an adequate barrier). This conclusion is already adequately documented in existing operable unit remedial investigation reports.

Comment 1.b. Problem formulation should examine the nature of the contamination for potentially impacted habitats and/or ecosystems. ERDF RA indicated that this assessment does not evaluate impacts to populations or the ecosystem, rather, it assesses one ecological receptor, the Great Basin pocket mouse. For this type of risk assessment, it may be more appropriate to assess 2 or 3 receptors at the trophic level. Further, the RI/FS states that it does not use the pocket mouse as a surrogate for any other receptor.

Response: Chapter 6 provides adequate evidence that unacceptable ecological risks would occur if exposure to ERDF wastes were to occur. As a result, the remedial alternatives are designed to prevent such exposure. Expanding the risk assessment to include higher trophic levels would not change this conclusion or the barrier designs.

Comment 1.c. Problem formulation should examine the stressors, not only chemical, and radionuclide, but also physical, which would examine changes to natural conditions, such as habitat alteration. This risk assessment does not attempt to assess the physical conditions.

Response: The report acknowledges that physical ecological impacts (i.e., stressors) will occur at the ERDF site due to construction. However, it is beyond the scope of this report to compare the impact of leaving contaminants in their current locations (the no action alternative) with the impact of physical stressors associated with ERDF construction. In addition, each of the alternatives (except the no-action alternative) are sufficiently similar that an evaluation of physical stressors could not be used to rank the alternatives.

Comment 1.d. Problem formulation should examine indirect as well as direct effects associated with the release of contaminants. ERDF RA does not attempt to address the indirect effects associated with the contaminant release.

Response: A conclusion of Chapter 6 is that the remedial alternatives need to be designed to prevent exposure to contaminants intended for disposal in ERDF. Increasing the scope of the risk assessment is unnecessary because it will not change this conclusion.

Comment 1.e. Problem formulation should identify ecosystems potentially at risk, including critical and sensitive habitats located on, adjacent to, or near the hazardous substance release site of interest. ERDF RA does not acknowledge that mature shrub is a priority habitat for several candidate species that could potentially be impacted either directly or indirectly.

Response: Mature shrub habitat is identified as a priority habitat at and near the ERDF in the RI/FS Sections 2.8.1.1, 2.8.2, and 9.4.2. Impacts on this habitat are a primary concern for this project and have been explicitly addressed as a decision criteria for the remedial alternatives. The issue of mitigation of these impacts has been fully acknowledged in Section 9.4.11.

Comment 1.f. Endpoint selection may not be adequate. Given there are candidate species to be considered, a second type of indicator species should have been assessed.

Response: The agencies believe that the endpoint selection is adequate for the purposes to evaluating the impact of contaminants (see response to comment 1b). Similarly, it is unnecessary to expand the scope of the risk assessment to evaluate the impact of physical stressors (see response to comment 1c).

Comment 1.g. The Risk Summary is not clear. This should pull the components of the assessment together into a meaningful discussion of ecological significance, including the nature and magnitude of the effects, spatial and temporal patterns of the effects, and potential recovery. It's not clear what the magnitude of effects are, but there is an indication that there would be significant risk to the environment (should be more clear) based primarily on heavy metal concentrations and a potential hazard to wildlife receptors (should be more specific) due to ingestion. It does not discuss potential recovery due to the impacts.

Response: The reviewer is correct that "there is an indication that there would be significant risk to the environment" if ecological receptors were allowed to be exposed to ERDF wastes. As a result of this conclusion, remedial alternative barriers are designed to prevent exposure. Refinement of the risk assessment is unnecessary because it will not alter the barrier designs.

Comment 2. The Yakama Indian Nation commented: Intrusion scenarios in the ERDF plan are optimistic at best. At no point is the potential for inadvertent intrusion as to the drilling of a well considered. Since the current proposal does call for the placement of a layer of top soil over the facility, it is reasonable to assume that at some point past closure, the land would be utilized due to the obviously arid nature of this region utilization of the land would presumably require a water source such as a well. Some intrusion scenario based on this assumption is logical. That is what would happen if some future resident wishes to drill a well on top of what is currently known as the environmental restoration disposal facility. We see a very real need for consideration of such a potential and we do recognize the difficulty in identifying a solution for this scenario.

Response: Section 6.3 of the RI/FS extends the risk assessment for current exposure to soils to determine the risks associated with the 500-year drilling scenario. This scenario is considered a reasonable soil exposure scenario for all the remedial alternatives (except no action). The alternatives evaluated include active institutional controls (e.g., fences, signs, patrols), passive controls (e.g., markers and offsite records), and a surface barrier that is at least 4.6 m (15 ft)

thick. It is assumed that institutional controls prevent intrusion into the waste for at least 100 years and that passive controls prevent intrusion for 500 years. Furthermore, it is assumed that because the waste is covered with at least 4.6 m (15 ft) of cover materials, intrusion into the waste due to excavation is precluded. Since none of the evaluated barriers can prevent penetration by a drilling rig, however, someone might inadvertently drill through the waste sometime after 500 years. The likelihood that someone will drill through the waste is not addressed.

The U.S. Department of Interior - Fish and Wildlife Service (the Service) had the following comments:

Comment 3. The RI/FS considers the human health risk assessment in much greater detail than the ecological risk assessment. This discrepancy in effort is inappropriate. Likely future scenarios suggest very little use of the site by humans, while buffer zones, mitigation banking, and other land uses are likely to retain high quality habitat around the 200 Area, resulting in a much greater potential for exposure of nonhuman organisms. Ecological risk assessment should be given at least as much, if not more, consideration than human health risk assessment.

Response: EPA, Ecology, and DOE share these concerns regarding potential ecological effects and have made a conscientious effort to evaluate and mitigate these effects to the extent possible given the scope of this effort and the desire to remediate areas along the Columbia River. Furthermore, it is acknowledged that the ecological risk assessment is based on oversimplified assumptions regarding the receptor species and exposure scenario. However, this approach utilized in the RI/FS is appropriate considering the goals of the risk assessment; that is, to determine the need for an engineered barrier to eliminate biointrusion and/or waste release to the surface. The relatively simple ecological risk assessment provided in Chapter 6 demonstrates that unacceptable ecological risk would result if the wastes to be received at the ERDF *were released to the environment*. This conclusion would not be altered if a more complex risk assessment were conducted. Based on the conclusions of the risk assessment, *the proposed remedial alternative is designed to prevent biointrusion and release of waste to the environment*, thereby eliminating ecological risk associated with the waste. Although a more detailed ecological risk assessment may be more accurate, it would not alter the conclusions of this report or the proposed landfill design.

Comment 4. The Service considers the ecological risk assessment to be inappropriate and incomplete for the following reasons:

Comment 4a Risk to aquatic organisms when potentially contaminated groundwater discharges into the Columbia River was not assessed.

Response: An unstated assumption is that protection of human health from exposure via a hypothetical residential drinking water well at the ERDF edge will result in adequate protection of all receptors at the Columbia River. Qualitatively, dilution, decay, and degradation would occur, and support the assumption of adequate protection at the Columbia River. It is worth noting that the ERDF concept supports the TPA goal of removal of contaminants from portions of the Hanford Site, especially near the Columbia River, as a means of reducing the likelihood of exposure.

Comment 4b. Risk to terrestrial organisms during the several decades of the active phase of the landfill when contaminated materials would be exposed and fugitive dust would be likely was not assessed.

Response: As summarized in Section 9.4.7 of the ERDF RI/FS, potential risks to workers associated with releases during operations are expected to be low and within acceptable limits. These risks are expected to be low even with relatively conservative assumptions regarding the concentration of airborne particulates. In practice, stringent dust control measures will be implemented to minimize dust releases far below the conservative assumptions in the analysis. Given that any ecological receptors will receive much less exposure than workers, ecological risk assessment is not warranted. Exposure to contaminants by ecological receptors during active phases of the ERDF could occur, but this exposure is not expected to result in unacceptable risks.

Comment 4c. Use of the human health screening process to determine contaminants of potential concern for ecological risk assessment (page 5-1, paragraph 4 and pages 6-25, paragraph 6) is not appropriate; exposure scenarios and contaminant sensitivities between humans and wildlife are substantially different.

Response: The document, as well as other remedial investigation reports, provide adequate evidence that unacceptable ecological risks would exist if exposure were allowed to occur. As a result, an ERDF barrier would be designed to prevent such exposure. Expanding the scope of the risk assessment would not change this conclusion.

Comment 4d. Potential impacts based on cumulative exposure to several contaminants was not assessed.

Response: See above responses.

Comment 4e. Ecological risk assessment based on individuals of a single species is not appropriate. If just a single species is used, the RI/FS should be appropriately characterize the information presented as the "Great Basin Pocket Mouse Risk Assessment", and not as an "Ecological Risk Assessment".

Response: See above responses. (specifically 1b.)

Comment 5. The Service considers the risk assessment using the Great Basin pocket mouse to be flawed and based on faulty assumptions. It is stated on page 5-1, paragraph 4 that animal studies are expected to be generally applicable to the pocket mouse. This statement is misleading. The pocket mouse is fairly unique among mammals in having an extremely efficient metabolism, require no drinking water and excreting highly concentrated urine. The pocket mouse also spends a significant portion of time hibernating or estivating. Thus, uptake, eliminations, and exposure rates are likely to be different from laboratory animals which are provided continually with water and live at a constant temperature, and different from standard man (page 6-29, paragraph 2). The unique aspects of pocket mouse life history should be discussed, and should be taken into account when creating exposure models such as those on pages 6-28 and 6-29.

Response: As discussed above, it is acknowledged that the ecological risk assessment is based on oversimplified assumptions regarding the receptor species and exposure scenario. However, this approach utilized in the RI/FS is appropriate considering the goals of the risk assessment; that is, to determine the need for an engineered barrier to eliminate biointrusion and/or waste release to the surface.

Comment 6. The exposure scenario of the pocket mouse, which limited the exposure to dietary exposure from seeds, is not appropriate. Additional factors should be included in the exposure scenario. Because the pocket mouse is a burrowing animal, soil exposure will make up a substantial portion of total exposure, including increased dermal exposure from living underground, increased ingestion exposure from grooming, and increased inhalation exposure from dust associated with digging. Although soil exposure from radionuclides was assessed, it was not clear which of the above factors were included. Also, regarding plant uptake of contaminants, it is not clear why plant uptake by deposition was not considered (page 6-27, paragraph 5); this statement should be justified.

Response: See response to comments 1 and 5 above.

Comment 7. Throughout the Ecological Risk Assessment section, lack of specific information upon which to base risk assessment assumptions is frequently mentioned. The Hanford cleanup is a long term project. The Service strongly recommends that the necessary studies be conducted to obtain ecological and contaminant exposure and sensitivity information on the Great Basin pocket mouse and several other key species so that ecological risk can be adequately assessed in the future.

Response: See above responses.

R. CONTAMINANT FATE AND TRANSPORT

Comment 1. The Trustees commented: Section 4.1.1 describes the conceptual model used. The description notes that the mechanisms: controlling contaminant fate and transport in the vadose zone are highly coupled, unsteady, and non-linear. Furthermore, the hydrogeologic strata are heterogeneous and anisotropic.

It then describes the conceptual model as assuming "the media are homogeneous and isotropic", "the flow is plug flow in both the vadose zone and saturated zone", and "constituent release form ERDF is controlled by either solubility or partitioning between the waste and pore water."

It is clear the conceptual model bears little or no relation to the actual conditions. There is no data provided to justify the model selected as being in any way representative of the actual conditions. There is no analysis or data provided to show that bounding conditions exist which would allow the use of such a simplified model.

Response: See general and specific responses noted below.

The CTUIR had the following comments:

Comment 2. By DOE's own admission, quoted above, the design of the model bears little relation to the reality of the site. As a result, CTUIR technical staff view the extensive results and additional assumptions outlined in Appendix A to be a house of cards.

Response: See general and specific responses noted below.

Comment 3. Simplistic and unrealistic assumptions about homogeneous hydrogeologic conditions, vertical-only flow paths, and the physical and chemical behavior of only single contaminants make it highly doubtful that:

- 1) a complete range of contaminants of concern has been identified,
- 2) identified infiltration characterization and subsurface behavior are representative,
- 3) interactive effects of contaminants or critical conditions such as Ph, discontinuous caliche layers, or bedding have been adequately accommodated,
- 4) contaminant mixing or transport processes are as simplistic as portrayed, and
- 5) calculated travel times are anything but meaningless when they are assumed to vary only in proportion to vadose zone thickness.

Response: See general and specific responses noted below.

Comment 4. We find additional reason to doubt the accuracy of the model and assumptions when we review the summary tabulation of potential groundwater contaminants identified through this modeling (Table 4-11). This table indicates *identical* travel times for such physically and chemically diverse constituents as radionuclides, heavy metals, and selected anions. Such an implausible result is highly suspect, and would, by itself, call the model into question.

Response: See general and specific responses noted below.

Comment 5. These deficiencies indicate to CTUIR staff that the adopted modeling approach, combined, as it is, with too many unrealistic assumptions, fails to serve its stated goal of "identify[ing] groundwater contaminants, perform[ing] contaminant screening, and evaluat[ing] alternative ERDF designs" (Section 4.1).

Moreover, despite the foregoing quote, Section 4.1 does not apply the results of the modeling to "evaluat[ion of] alternative ERDF designs."

Given these deficiencies, CTUIR technical staff conclude that the model used for evaluating the ERDF proposal -- and the data generated by that model -- is of little value.

Response: See general and specific responses noted below.

Comment 6. The CTUIR staff request that before further steps on the design of the ERDF are completed, a more representative model should be developed that represents field conditions more realistically and that is designed specifically to evaluate barrier and subsurface characteristics and develop appropriate engineering design criteria. The results of the new modeling will be essential for informed decision making concerning engineering and design of the ERDF, including but not limited to the Remedial Design portion of the project.

General Response

The predictive fate and transport model for the site is based on a parametric approach that utilizes empirically-based parameters that are relatively easy to measure instead of a mechanistic approach that would rely on physically-based parameters that are highly variable and difficult to measure. Although relatively simple, the parametric approach has experimental analogs (such as lysimeter observations, laboratory column testing, and field measurements of plume migration) that demonstrate a good comparison between the conceptual model and actual

conditions. In contrast with the reviewer's comments, the simple parametric approach utilized for this analysis is solidly based on direct field and laboratory observations. The primary parameters (including infiltration rate, moisture content, and soil/water partitioning coefficient) are relatively easy to measure and have a relatively low degree of variability.

The reviewer appears to be recommending a mechanistic approach that relies on physically-based parameters such as unsaturated hydraulic conductivity (which can vary over many orders of magnitude with very small changes in moisture content or soil texture). Such an approach is not possible given the current state-of-the-art. Although we know that unsaturated fate and transport is complex, the scientific community has not yet developed the conceptual understanding, tools, and data to simulate this complex process.

Understanding the physical mechanisms of unsaturated flow and transport is important in terms of furthering our understanding of contaminant fate and transport; DOE and others have supported such research for many years. As a result, a review of the literature will provide many examples of physically-based models for simulating unsaturated fate and transport. Careful review of these models will reveal that they are not useful for practical application for a variety of reasons, including one or more of the following:

- 1) the model focuses on specific segments of the process and does not address the entire system;
- 2) the model requires extensive data that are not possible to collect for a field application;
- 3) the model requires vast computing resources and thus is not feasible for field applications that include large variable model domains, multiple constituents, and long time frames.

Specific Responses:

Re: Contaminants of Concern. The analysis considered every constituent that has been identified as a potential constituent of concern at the Hanford Site. Risk associated with the ERDF will be driven by constituents that are mobile, long-lived, and toxic. Furthermore, constituents that are found in groundwater beneath the waste units are likely to be potential contaminants of concern. The modeling results were compared with a qualitative evaluation of these factors to ensure that no potential contaminants of concern were overlooked. Therefore, given the limits of our knowledge and experience at Hanford and other sites, we can state with confidence that the list of potential constituents of concern is complete.

Re: Infiltration characterization and subsurface behavior. Due to lysimeter studies and observation of existing contaminant plumes, the Hanford Site has many field analogs for infiltration and subsurface fate and transport. The modeling parameters relied on these data to the extent possible and the results are consistent with these observations.

Re: Geochemical interaction and stratigraphic conditions. The complex geochemical interactions and other chemistry factors cited by the reviewer have been identified as potentially important factors under certain conditions. In particular, low-pH or high-organic contents found in some of the waste streams in the 200 Area can significantly increase the migration rate of some radionuclides and metals. However, chemical conditions in the waste and below the ERDF are expected to be characteristic of the 100 and 300 Areas, which are neutral pH and low organic content. Based on observations of plume migration in the 100 and 300 Areas, the

geochemical interactions and chemistry factors cited by the reviewer are second-order considerations that would not significantly impact the results.

Re: Stratigraphic layering and mixing. Stratigraphic layering can impact groundwater migration by inducing horizontal migration and impacting vertical migration and mixing. These effects are more important in cases where the modelled facility received liquid effluent and infiltration rates were quite high. Given the low rates of infiltration (i.e., similar or less than background) these effects were considered relatively unimportant and were incorporated into the model using a parametric approach.

Re: Travel times. The comment suggests that travel times were only a function of vadose zone thickness and that all the constituents have identical travel times. As described in Appendix A, travel times were a function of vadose zone thickness, infiltration rate, and retardation (as well as other minor parameters). Furthermore, although *some* of the constituents have identical travel times, in general they are divided into a range of travel times ranging from completely mobile (the same migration rate as water transport) to highly immobile (up to 100,000 times slower than water transport).

Re: Evaluation of alternative ERDF designs. Alternative ERDF designs are not evaluated in Section 4. They are evaluated in Section A.4 and the results are summarized in Section 9.5.

IV. REMAINING CONCERNS

Issues and concerns that the Tri-Parties were unable to address in detail during remedial planning activities include the following:

- **Mitigation** - A mitigation action plan will be prepared to address mitigation requirements for the ERDF. The Hanford Natural Resource Trustees will be consulted in development of this plan.
- **Waste Acceptance Criteria** - Several public interest groups requested that the public have an opportunity to provide input into the development of waste acceptance criteria. EPA is committed to providing interested parties a copy of the draft waste acceptance criteria for the ERDF when it becomes available.
- **Tribal Cultural Resource Review** - The CTUIR and Yakama Indian Nation requested the opportunity to perform a cultural resource review of the ERDF site prior to construction. DOE is in consultation with the Tribes concerning this issue.

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