Tri-Party Agreement

12-HAB-0001

OCT 24 2011

Ms. S. L. Leckband, Chair
Hanford Advisory Board
Enviroissues Hanford Project Office
713 Jadwin, Suite 4
Richland, Washington 99352

Dear Ms. Leckband:

RESPONSE TO HANFORD ADVISORY BOARD (HAB) JUNE 3, 2011, CONSENSUS ADVICE #247, "PW-1/3/6 AND CW-5 OPERABLE UNITS"

The U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) would like to thank the Board for their advice on the Proposed Plan for the remediation of the 200-CW-5, 200-PW-1, 200-PW-3, and 200-PW-6 Operable Units.

A Record of Decision (ROD) for these operable units was signed by DOE and EPA on September 30, 2011. Ecology has concurred with this cleanup decision. Part III of the ROD is a Responsiveness Summary, which summarizes the public comments received on the Proposed Plan, including HAB advice #247, and provides agency responses to those comments. This Responsiveness Summary is provided as an enclosure.

The HAB's advice, as well as other comments received on the Proposed Plan, was considered before finalizing the cleanup decision identified in the ROD. The Tri-Parties thank you for your advice and look forward to hearing from the Board in the future.

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Richland Operations Office
U.S. Department of Energy

Dennis Faulk
Hanford Project Office
U.S. Environmental Protection Agency

Enclosure

cc: See Page 2

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PART III: RESPONSIVENESS SUMMARY

1.0 Introduction

This responsiveness summary was prepared in accordance with the requirements of Section 117(b) of CERCLA, as amended. The purpose of this responsiveness summary is to summarize and respond to significant public comments on the Proposed Plan for remediation of the 200-CW-5, 200-PW-1, 200-PW-3, and 200-PW-6 OUs on the Hanford Site.

2.0 Community Involvement

A formal public comment period on the Proposed Plan, originally scheduled to run from July 5 through August 5, 2011, was extended through September 6, 2011 in response to requests from stakeholders. Individuals sent written comments through the mail or electronically. Written comments were also collected at the four public meetings held in Richland, WA, Seattle, WA, Hood River, OR, and Portland, OR. The public meetings and comment period were publicized in the *Tri-City Herald, Seattle Weekly Hood River News,* and *Willamette Weekly.* A fact sheet was mailed to the Hanford mailing list and sent electronically on the Hanford Listserv.

3.0 Comments and Responses

318 comments were received from 122 individuals and groups covering a wide range of topics and varying perspectives. The public comments were separated out and aggregated into the following general categories:

- Excavate and Remove All Plutonium
- Remove All Cesium
- Dig Deeper Than Two Feet in the High-Salt Waste Sites
- Ship Plutonium Off-Site
- Plutonium Is Mobile
- Don't Rely On Barriers/Caps
- Government Is Not Long-term Stewardship
- Don't Rely On Institutional Controls
- Modeling for Seismic Activity, Floods, Climate Change
- Insufficient Scientific Data
- Support for Leaving Cesium in Place
- Public Involvement Process
- Other Comments on the Proposed Plan
- General Comments

Appendix A provides all the public comments received on the Proposed Plan, sorted by the categories listed above. A summary of significant public comments is provided below and agency responses are provided in the ***bold italicized text.***

EXCAVATE AND REMOVE ALL PLUTONIUM

Excavate and Removal All Plutonium Comment Summary

Some commenters identified issues with the long half-life of plutonium (24,000 years), carcinogenic risks from exposure to plutonium, long time frames that institutional controls would be required when plutonium is left in place, the potential for plutonium to reach groundwater and the Columbia River, and the level of protectiveness of the preferred alternative presented in the Proposed Plan.

Some commenters stated that budget limitations should not be the deciding factor on how much plutonium contamination is removed. Regarding cleanup, comments included the following: there is more risk reduction when more plutonium is removed; plutonium belongs in a deep geologic repository; partial removal of plutonium is not sufficient or at least 90% should be removed; and cleanup levels for plutonium should be as stringent as levels identified for other locations.

Some commenters discussed the need for surgical removal of plutonium at the Z-Ditches Waste Group instead of methods that would intentionally mix clean soil and contaminated soil during excavation. Other concerns were future dangers of someone attempting to retrieve plutonium from these waste sites and risks to individuals who may use the area for subsistence farming.

Response to comments:

The Tri-Party agencies recognize that plutonium is a dangerous contaminant that must be remediated carefully to protect human health and the environment and that institutional controls would be used, as part of the selected remedy, over long time frames where plutonium is left in place. Concern over plutonium reaching groundwater and the Columbia River is understandable. However, plutonium is not currently entering the Columbia River from the Hanford Site. Monitoring programs are in place to monitor if any contaminants from Hanford are entering the Columbia River and to identify any need for additional actions to protect human health and the environment from unacceptable risk.

The Tri-Party agencies also recognize that many members of the public would prefer to have all or nearly all of the plutonium contamination removed from the High-Salt Waste Group. DOE and EPA do not agree that all plutonium contamination should be sent to WIPP for disposal and have determined that the plutonium contamination that will remain in place after the selected remedy is implemented will not pose an unacceptable risk to human health and the environment. The selected remedy will remove approximately 90% of the plutonium contamination in the Low-Salt Waste Group and almost all of the plutonium contamination from the Z-Ditches and Settling Tanks Waste Groups. For the High-Salt Waste Group, soils located two feet below the bottom of the disposal structure, where the highest concentrations of plutonium are located, will be removed. After excavating to the specified depths in these waste sites, plutonium-239/240 levels will be assessed. DOE will consider removing additional plutonium-contaminated soil from these waste sites.

At waste sites in the Z-Ditches Waste Group, traditional excavation methods will be used to remove contaminated soils as part of the selected remedy. Clean overburden will be removed and stockpiled for backfilling. Subsequent excavation using traditional excavation methods will result in plutonium-contaminated soil being removed with some clean soil. This is not an intentional "blending" of clean and contaminated soil, but rather a result of the traditional excavation methods that are used for digging up soil. As contaminated soil is removed and packaged for disposal, waste in containers will be screened to determine if it meet ERDF waste acceptance criteria as low-level waste or if the waste has plutonium concentrations greater than 100 nCi/g. Since Hanford waste is a result of defense-related activities, waste containers that have plutonium concentrations greater than this value qualify as

transuranic waste and can be disposed in the approved geologic repository. Transuranic waste will be sent to WIPP for disposal.

The EPA and DOE did evaluate the removal of contaminated soils that pose an unacceptable risk at waste sites in the High-Salt and Low-Salt Waste Groups. This was evaluated under Removal, Treat (if necessary) and Dispose – Option E in the feasibility study. This cleanup alternative was evaluated along with the other alternatives that were identified through the CERCLA process. There are nine criteria that must be considered when evaluating cleanup alternatives under CERCLA. The first two criteria, known as "threshold criteria", are the overall protection of human health and the environment and compliance with (or qualification for a waiver from) Applicable or Relevant and Appropriate Requirements (ARARs). The next five criteria, known as "balancing criteria", allow for a comparison of the relative performance of each alternative against these criteria. These criteria are: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. The last two criteria, known as "modifying criteria", are State acceptance and community acceptance. The selected remedy meets the threshold criteria and provides the best balance of the CERCLA balancing criteria and modifying criteria considerations.

The land where the waste sites addressed in this Proposed Plan and ROD are located is considered an industrial-use area and will have the necessary land-use restrictions for land that has contamination in place that does not allow for unrestricted use and unlimited exposure.

It is important to note that cost is only one factor that is considered for deciding how much plutonium-contaminated soil to remove. While cost was a factor in selecting the remedy, budget limitations were not. A remedy must be protective of human health and the environment and comply with (or qualify for a waiver from) ARARs in order to be selected for implementation. After the plutonium-contaminated soil is removed in accordance with the selected remedy at the High-Salt and Low-Salt Waste Groups, the waste sites will be backfilled with clean soil and covered with an evapotranspiration barrier which will provide further isolation from humans and the environment.

The current and anticipated future land use for this area is industrial. The selected remedy and final cleanup level for plutonium were developed based on this anticipated industrial land use. Waste will remain in place that will not allow for unlimited use of the land (e.g., no residential or farming activities). Institutional controls will be used to prohibit activities that would disturb the soil at these waste sites to prevent potential human exposure to contamination and to protect the integrity of the remedy. DOE is ultimately responsible for maintaining institutional controls at the Hanford Site, even if the land is transferred to another owner.

The Tri-Party agencies understand that some members of the public are concerned about the possibility of someone trying to access the residual plutonium-contaminated soil in the future. Institutional controls will prohibit access to the plutonium-contaminated soil which, after implementation of the selected remedy, will be located deeper than 15 feet below the ground surface. Since contamination will remain in place that will not allow for unlimited land use, CERCLA requires that the selected remedy be reviewed no less often than every five years to ensure that human health and the environment are being protected by the remedial action. If, based on a five-year review, further action at the site is determined appropriate, such action will be taken. Please see the "Government Is Not Long-Term Stewardship" section for additional agency responses related to this concern. Please see the "Regulatory Standards" section for agency responses regarding cleanup levels for plutonium.

REMOVE ALL CESIUM

Remove All Cesium Comment Summary

Some commenters stated that they preferred the removal of cesium contaminated soil over a capping remedy for the following reasons: removal is more protective; contaminated soil is more secure when disposed of at ERDF; and capping is not effective.

Response to comments: The Tri-Party agencies recognize that some members of the public prefer to remove cesium-contaminated soil rather than leave it in place. When selecting a remedy, the Tri-Party agencies must select a remedy that meets the threshold criteria and provides the best balance of the CERCLA balancing criteria and modifying criteria considerations. The selected remedy for the Cesium-137 Waste Group to maintain/enhance the existing soil cover (MEESC) meets the threshold criteria and provides the best balance of the CERCLA balancing criteria and modifying criteria considerations. The 15 ft depth of the soil cover is effective in eliminating environmental pathways from biological activity, such as from plant roots or burrowing animals and from workers coming in direct contact with contamination.

DIG DEEPER THAN 2 FEET AT THE HIGH-SALT WASTE SITES

Dig Deeper Than 2 Feet Comment Summary

Comments received on dealing with digging deeper that 2 feet are specific to the High-Salt Waste Group. Multiple commenters stated that digging to 2 feet below the bottom of a waste site is not sufficient and that long-term protectiveness is not achievable for the High-Salt Waste Group if enough plutonium contamination remains in the soil. It was also stated that an observational approach should be used to determine how deep to dig at the High-Salt waste sites or that the same approach used at the Low-Salt Waste Group, which is to remove approximately 90% of the contaminated soils, be used. One commenter went on to state that the Proposed Plan did not provide sufficient data to support digging to 2 feet below the bottom of a waste site when the Feasibility Study states that plutonium is found to depths of 121 ft. This commenter continued by stating that cleanup should be based on contaminant concentration levels and not on the depth to contaminants.

Commenters expressed concern over plutonium-contaminated soils potentially being used to make nuclear bombs in the future and also the potential harm these soils pose to future generations.

Response to comments: The Tri-Party agencies acknowledge that the public generally prefers digging deeper than 2 ft below the bottom of a waste site for the High-Salt Waste Group and that there is concern over the protectiveness of leaving plutonium-contaminated soils in place.

Risk evaluations were conducted as part of the CERLCA process to identify the source of the risk and exposure pathways to humans and the environment. When these pathways are broken, the risk is eliminated. Pathways are identified by considering the current and reasonably anticipated future land use for the area, which is industrial use. Institutional controls will be used to prohibit activities that would disturb the soil at these waste sites to prevent potential human exposure to contamination and to protect the integrity of the remedy.

No complete exposure pathways or unacceptable risks will remain after implementation of the selected remedy. Regular workers, meaning Hanford Site workers not involved in digging activities, are not at risk since there are no complete pathways to contamination under an industrial scenario. A construction worker could potentially be at risk since they could come into contact with contaminated

soil when conducting digging activities. Exposure pathways for construction workers via contact with contaminated soil would be through ingestion, inhalation, dermal contact, and external radiation. However, the institutional controls of the selected remedy will break the pathways to construction workers and eliminate the unacceptable risk. Further removal of contamination at greater depths will not achieve additional protectiveness. Under the selected remedy, after the contaminated soil is removed, the waste sites will be backfilled with clean soil to a minimum depth of 15 feet which is effective in eliminating environmental pathways to contaminated soils from biological activity, such as from plant roots or burrowing animals.

The DOE and EPA have determined that the plutonium that will remain in place after the selected remedy is implemented will not pose an unacceptable risk to human health and the environment. The selected remedy for the High-Salt Waste Group, (removal of contaminated soil to a depth of 2 feet below the bottom of the disposal structures, construction of an evapotranspiration barrier, and use of institutional controls consistent with industrial land use) meets the threshold criteria and provides the best balance of the CERCLA balancing criteria and modifying criteria considerations. After excavating to the specified depths in these waste sites, plutonium-239/240 levels will be assessed. DOE will consider removing additional plutonium-contaminated soil from these waste sites.

Please see the "Use of the Observational Approach" and "Excavate and Remove All Plutonium" sections for additional agency responses.

SHIP PLUTONIUM OFF-SITE

Ship Plutonium Off-Site Comment Summary

Some commenters stated that more or even all plutonium contaminated soil should be disposed in a deep geologic repository, such as WIPP, regardless of the additional costs since they believe it provides a more permanent remedy. Commenters stated this is due to the long-half life of plutonium and the potential for plutonium-contaminated soils to migrate now or in the future. Commenters also stated that plutonium should be moved away from the Columbia River.

Response to comments: The Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico is where the US disposes of the nation's defense-related transuranic radioactive waste. Plutonium contaminated soils removed from the Hanford Site must qualify as "transuranic waste" in order to be accepted at WIPP. This means the contaminated soil and debris must have alpha-emitting TRU radionuclides possessing half-lives greater than 20 years and in concentrations greater than 100 nCi/g. Under the selected remedy, any contaminated soil and debris that are excavated and packaged for disposal that qualify as TRU waste will be sent to WIPP for disposal. Contaminated soil and debris that are excavated and packaged for disposal that do not qualify for disposal at WIPP will be disposed of at Hanford's Environmental Restoration and Disposal Facility (ERDF).

Some plutonium will remain in place as part of the selected remedy. The risks from the plutonium that remains were evaluated as documented in the Remedial Investigation and Feasibility Study (RI/FS)(DOE/RL-2007-27). Based on that information, DOE and EPA have determined that the plutonium that will remain in place after the selected remedy is implemented will not pose an unacceptable risk to human health and the environment and that the selected remedy will protect the Columbia River and its ecological resources from degradation and unacceptable impact associated with hazardous substances, pollutants or contaminants originating from these waste sites.

PLUTONIUM IS MOBILE

Plutonium Is Mobile Comment Summary

Some commenters stated that plutonium is mobile and that it can travel to groundwater and the Columbia River. Commenters also stated that there is no certainty that plutonium will remain immobile over the long-term. Some commenters stated that plutonium is currently reaching the Columbia River or will reach it in a relatively short period of time. Some commenters expressed concern over the potential for future unexpected exposures.

Response to comments: The Tri-Party agencies agree that the mobility of plutonium can be affected by certain environmental conditions. However, we do not agree that plutonium is mobile under the environmental conditions at these waste sites. The presence of plutonium at depths to approximately 110 feet at the High-Salt waste sites was due to the driving force of large amounts of highly acidic liquid discharges during active operations. Liquid disposal of highly acidic waste is no longer occurring at these waste sites and the average precipitation rate is low at 6.8 in/year. Based on its insolubility and strong sorption to sediments, and the pH of the soil at these waste sites, plutonium is highly immobile. Since the plutonium at these waste sites is highly immobile, it does not pose an unacceptable risk to groundwater or the Columbia River.

Some plutonium will remain in place under the selected remedy. The waste sites where plutonium will remain will be covered with an evapotranspiration barrier which will minimize water infiltration and also reduce the potential for contaminant migration with water flow. The risks from the plutonium that remains were evaluated as documented in the RI/FS (DOE/RL-2007-27). Based on that information, DOE and EPA have determined that the selected remedy meets the threshold criteria and provides the best balance of the CERCLA balancing criteria and modifying criteria considerations. The plutonium that will remain in place after the selected remedy is implemented will not pose an unacceptable risk to human health and the environment. The selected remedy will protect groundwater, the Columbia River and its ecological resources from degradation and unacceptable impact associated with hazardous substances, pollutants or contaminants originating from these waste sites.

Please see the "Excavate and Remove All Plutonium" section for responses regarding plutonium reaching the Columbia River and the "Do Not Rely on Institutional Controls" section for responses regarding future unexpected exposures.

DO NOT RELY ON BARRIERS/CAPS

Do Not Rely On Barriers/Caps Comment Summary

Some commenters stated that caps are not sufficient because they cannot be maintained in perpetuity and will deteriorate over time. Some commenters also stated that these waste sites are located too close to the Columbia River for caps to be considered. Some commenters stated lateral water movement is possible and trenched walls to stop water flow should be used. One commenter stated that surface barriers should not impede soil vapor extraction activities.

Response to comments: The Tri-Party agencies recognize that many members of the public generally prefer to remove contaminated soil rather than leave it in place. When selecting a remedy, DOE and EPA must select a remedy that is protective of human health and the environment, meets the other threshold criterion, and provides the best balance of the CERCLA balancing criteria and modifying criteria considerations. The selected remedy for the Cesium-137 Waste Group is to maintain or enhance the existing soil cover (MEESC). The selected remedy for the Cesium-137 Waste Group to maintain/enhance the existing soil cover (MEESC) meets the threshold criteria and provides the best balance of the CERCLA balancing criteria and modifying criteria considerations. The cesium-137

contamination is not mobile under existing or anticipated conditions and will not pose an unacceptable risk to groundwater or the Columbia River under the Selected Remedy. The 15 ft depth of the soil cover is effective in eliminating environmental pathways from biological activity, such as from plant roots or burrowing animals, and from workers coming in direct contact with contamination. Institutional controls will prohibit activities to prevent potential human exposure to contamination and to protect the integrity of the remedy. The soil cover will need to be maintained as long as there is unacceptable risk from these waste sites.

The selected remedy for the Low-Salt and High-Salt Waste Groups consist of constructing an evapotranspiration (ET) barrier after the excavated area is backfilled with clean soil. The ET barriers will be made from natural materials (i.e., nothing man-made) and covered with vegetation. ET barriers in semi-arid climates like that at the Hanford Site make use of high evaporation, high transpiration and native plants to maintain low soil moisture levels, which minimize water infiltration. Minimizing water infiltration also reduces the potential for contaminant migration with water flow. This barrier will keep workers from coming in direct contact with the remaining contamination and will also eliminate environmental pathways. The ET barriers will need to be maintained as long as there is unacceptable risk from these waste sites. Since the plutonium at these waste sites is highly immobile, it does not pose an unacceptable risk to groundwater or the Columbia River. Due to the low precipitation rate at the Hanford Site (6.8 in/yr), lateral water movement in the soil column will not be a significant transport mechanism for contamination located beneath the ET barriers. Soil vapor extraction (SVE) will be used to address carbon tetrachloride and methylene chloride contamination, the contaminants that were identified at threats to groundwater, at waste sites in the High-Salt Waste Group in conjunction with the other parts of the selected remedy. The ET barriers will not impede SVE activities.

DOE and EPA have determined that the selected remedy is protective of human health and the environment, complies with ARARs, and provides the best balance of the CERCLA balancing criteria and modifying criteria considerations. Since contamination will remain in place that will not allow for unlimited land use, CERCLA requires that the selected remedy be reviewed no less often than every five years to ensure that human health and the environment are being protected by the remedial action. If, based on a five-year review, further action at the site is determined appropriate, such action will be taken.

Please see the "Excavate and Remove All Plutonium" section for responses regarding plutonium reaching the Columbia River.

GOVERNMENT IS NOT LONG-TERM STEWARDSHIP

Government Is Not Long-Term Stewardship Comment Summary

Some commenters stated that the remedy cannot be dependent on the existence of government hundreds or thousands of years into the future. Some commenters stated this is because plutonium has a half-life of 24,000 years, making it impossible to guarantee protectiveness of a remedy that consists of maintaining institutional controls 240,000 years into the future.

Some commenters stated that a more conservative approach should be selected since long time frames have high levels of uncertainty and it would be cheaper to remove the contamination than to guard it in perpetuity.

Response to comments: The Tri-Party agencies understand there is some public concern over the ability to maintain control of the Hanford Site far into the future. We acknowledge that there is

uncertainty associated with the future of society beyond hundreds of years into the future. However, when cleanup decisions are made those decisions follow the CERLCA process which requires the appropriate amount of scientific data and analysis as well as the appropriate consideration of the nine CERCLA criteria.

Institutional controls are part of the selected remedy and will be maintained. The land where these waste sites are located is considered an industrial-use area and will have appropriate land-use restrictions for land that has contamination in place that does not allow for unlimited land use. DOE is ultimately responsible for maintaining institutional controls at the Hanford Site for as long as necessary, even if the land is transferred to another owner.

Since contamination will remain in place that will not allow for unlimited land use, CERCLA requires that the selected remedy be reviewed no less often than every five years to ensure that human health and the environment are being protected by the remedial action. If, at any time based on a five-year review, further action at the site is determined appropriate to ensure protectiveness , such action can be taken.

DO NOT RELY ON INSTITUTIONAL CONTROLS (ICs)

Do Not Rely On Institutional Controls Comment Summary

Some commenters stated that ICs should not be relied on due to the uncertainty in the ability to maintain ICs over 1,000 years into the future. Some commenters stated that it cannot be assumed that Hanford's Central Plateau will never be developed for residential use. Other commenters stated that Tribal nations may want to use the land in the future and questioned if there was an analysis of exposure from contamination originating from the 200 Area to Native American tribes exercising treaty rights or agricultural-related exposures to those using land beyond fenced portions of the 200 area.

Response to comments: Institutional controls will be used as part of the selected remedy to prevent or limit exposure to hazardous substances, pollutants, or contaminants in a manner that is protective of human health. Institutional controls are a necessary part of this remedy because contamination will remain in place that will not allow for unrestricted use of the land and unlimited exposure. CERCLA cleanup standards consider the reasonably anticipated future land use. The future reasonably anticipated land use for these waste sites is for industrial use. The DOE worked for several years with cooperating agencies to define land use goals for the Hanford Site. The cooperating agencies and stakeholders included: the National Park Service; Tribal Nations; the States of Washington and Oregon; local, county, and city governments; economic and business development interests; environmental groups; and agricultural interests. A 1992 report, The Future for Hanford: Uses and Cleanup: The Final Report of the Hanford Future Site Uses Working Group (Drummond, 1992) was an early product of these efforts to develop land use assumptions. The report recognized that portions of the Central Plateau would be used to some degree for waste management activities for the foreseeable future. This, in part, affected the 1999 Hanford Comprehensive Land-Use Plan Environmental Impact Statement (DOE/EIS-0222-F) and associated ROD where DOE designated the Central Plateau as an industrial land use area suitable and desirable for the treatment, storage, and disposal of hazardous, dangerous, radioactive, and nonradioactive wastes, as well as related activities.

Industrial cleanup standards are different from residential cleanup standards because industrial cleanup standards consider the amount of time people are in the area and the types of activities that occur under industrial use. Residential cleanup standards allow for unrestricted activities on the land after cleanup occurs. The feasibility studies for these waste sites analyzed a number of risk scenarios

to compare against the industrial scenario. This includes a Native American Exposure scenario which is located in Appendix F (DOE/RL-2004-24) for the Z-Ditches Waste Group and in Appendix G (DOE/RL-2007-27) for the other waste groups. The selected remedy includes using evapotranspiration (ET) barriers to minimize water infiltration which reduces contaminant migration and soil covers to break environmental pathways that could result in human contact with contamination. The ET barriers will also minimize contamination migration that could result in unacceptable exposures in areas beyond the waste sites. Also, institutional controls will be used to prohibit activities that would disturb the soil at these waste sites to prevent potential human exposure to contamination and to protect the integrity of the ET barrier and soil covers which are part of the selected remedy.

DOE and EPA recognize the public skepticism with maintaining ICs over many years into the future. ICs are required to be maintained as long as necessary for the selected remedy to be protective. However, since contamination will remain in place that will not allow for unlimited land use, CERCLA requires that the selected remedy be reviewed no less often than every five years to ensure that human health and the environment are being protected by the remedial action. If, based on a five-year review, further action at the site is determined necessary to be protective of human health and the environment, such action will be taken.

MODELING FOR SEISMIC ACTIVITY, FLOODS, AND CLIMATE CHANGE

Modeling For Seismic Activity, Floods, and Climate Change Comment Summary

Some commenters stated that seismic activity, flooding, and other natural disasters should be considered when developing and evaluating cleanup alternatives. Some commenters stated that events such as glacial flooding, earthquakes, and severe storms will occur on the Hanford Site and any remedy selected should address risks posed from those events.

***Response to comments:** The Tri-Party agencies understand public concern over the potential for natural disasters at the Hanford Site. The probability of these types of disasters occurring were considered. Large Columbia River floods have occurred in the past, but the likelihood of recurrence of large-scale flooding has been reduced by the construction of several (7) flood control/water-storage dams upstream of the Hanford Site. Major floods on the Columbia River are typically the result of rapid melting of the winter snowpack over a wide area augmented by above-normal precipitation. Evaluation of flood potential was conducted, in part, through the concept of the probable maximum flood.*

The probable maximum flood for the Columbia River downstream of Priest Rapids Dam has been calculated to be greater than a 500-year flood scenario. This flood would inundate parts of the Hanford Site adjacent to the Columbia River, but the central portion of the Hanford Site, where these operable units are located, would remain unaffected. Potential dam failures on the Columbia River have also been evaluated. The Army Corps of Engineers evaluated a number of scenarios on the effects of failures of Grand Coulee Dam. The remainder of the areas along the Columbia River and nearly all of Richland, WA would be flooded, but the central portion of the Hanford Site, where these operable units are located, would not be flooded.

The Tri-Party agencies acknowledge public concern over the consideration of seismic activity when selecting a remedy. There is an active program for seismic monitoring at Hanford, the Hanford Seismic Assessment Program (HASP), to maintain instrumentation (or other means) to detect and record the occurrence and severity of seismic events. The program provides interpretations of seismic events from the Hanford Site and vicinity, locates and identifies sources of seismic activity, monitors

changes in the historical pattern of seismic activity, and builds a "local" earthquake database that is permanently archived.

Once the waste sites are remediated, the potential effect of seismic events on the remediated waste sites will be minimal (e.g. structures will be removed, voids filled, soil covers and ET barriers can be repaired). Seismic events should have no effect on plutonium chemistry, and thus should have no direct effect on plutonium mobility. Potential seismic effects are considered in design and placement of evapotranspiration barriers over a remediated site, as necessary.

DOE and EPA have selected a remedy that is protective of human health and the environment, meets the other threshold criterion and provides the best balance of the CERCLA balancing criteria and modifying criteria. The probability of natural disasters occurring at the Hanford Site was evaluated and considered. Regarding events that may occur on a geologic time scale, such as glacial flooding, the Tri-Party agencies acknowledge that there is uncertainty associated with environmental conditions that far into the future. However, when cleanup decisions are made those decisions follow the CERLCA process which requires the appropriate amount of scientific data and analysis as well as the appropriate consideration of the CERCLA criteria. Since contamination will remain in place that will not allow for unlimited land use, CERCLA requires that the selected remedy be reviewed no less often than every five years to ensure that human health and the environment are being protected by the remedial action. If, based on a five-year review, further action at the site is determined appropriate, such action can be taken.

INSUFFICIENT SCIENTIFIC DATA

Insufficient Scientific Data Comment Summary

Some commenters stated that there is not sufficient characterization data to select a remedy for these waste sites, particularly for the Settling Tanks, Z-Ditches and High-Salt Waste Groups. One commenter stated that no data was presented on the values of contaminant concentrations at various depths or cost information for removing contaminated soil at various depths. Some commenters stated the data available for the waste sites were dated and that new data should be collected before proceeding. Other commenters stated that potential risks to groundwater were not evaluated and that a baseline risk assessment could not be fully conducted without additional information.

Response to comments: The Tri-Party agencies recognize public concern over the amount of scientific data that was used to determine risks and select an appropriate remedy for these waste sites. Following the CERCLA process, DOE conducted an assessment of the nature and extent of contamination and the associated health and environmental risks (in the Remedial Investigation) and developed and analyzed the range of potentially viable cleanup alternatives for these operable units (in the Feasibility Study). The scientific data included use of historical data such as process history. For the Settling tanks, historical data on the tank contents is one valid source of information since there have been no leaks from the tank to date and long-lived radionuclides remain. For the Z-Ditches and High-Salt Waste Groups, there have been no major contaminant transport mechanisms (such as large volumes of liquid discharges) since operations ceased to cause the contamination to migrate. The long-lived radionuclide contamination is still present, making process history a valuable source of information for characterizing these waste sites. DOE and EPA have determined that the existing data and information is sufficient to make this remedy decision.

The Tri-Party agencies acknowledge public concern with age and amount of data used to characterize the Settling-Tanks, Z-Ditches, and High-Salt Waste Group. Characterization information is available for each waste site, including information on contaminant concentrations, in their respective FS documents (Chapter 2 in DOE/RL-2004-24 and Chapter 2 in DOE/RL-2007-27). The information in the FS document is intended to provide a synopsis of all the available information on the waste sites. Typically, highly technical documents are used to write the FS, but are not included in their entirety. Appendix C of the FS (DOE/RL-2007-27) provides the cost estimates for the remedial alternatives identified for potential implementation. The cost estimates in the FS were developed in accordance with EPA guidance (EPA/540/R-00/002 A Guide to Developing and Documenting Cost Estimates During the Feasibility Study, OSWER 9355.0-75.) The cost estimates did not identify costs for remedial alternatives that were not identified during the RI/FS process. Appendix F of the FS (DOE/RL-2007-27) provides an evaluation of the amount of risk reduction achieved when removing soil to various depths under an unrestricted land use scenario at the High-Salt Waste Group, which was used to evaluate the remedial alternatives that were considered. Appendix E of the FS (DOE/RL-2007-27) provides an evaluation of groundwater protection from all potential contaminants of concern. The baseline risk assessment was conducted with sufficient data and information.

SUPPORT FOR LEAVING CESIUM IN PLACE

Support For Leaving Cesium In Place Comment Summary

Some commenters expressed support for the maintain or enhance soil cover (MEESC) remedy for the Cesium-137 Waste Group. Some commenters stated that they supported the MEESC alternative if it would allow for the removal of more plutonium contamination.

Response to comments: DOE and EPA agree and have selected the maintain/enhance the existing soil cover (MEESC) remedy as part of the selected remedy for the Cesium-137 Waste Group. The Tri-Party agencies acknowledge that the public generally prefers to have more plutonium contamination removed, but the plutonium waste sites were assessed independently of the Cesium-137 Waste Group.

PUBLIC INVOLVEMENT PROCESS

Public Involvement Process Comment Summary

Some commenters stated that information on the waste sites is not easily accessible and that it is difficult to find documents in the Administrative Record. Some commenters also stated that the information presented in the Proposed Plan and technical documents is complex and difficult to understand. Some commenters suggested increasing outreach efforts and advertising for meetings and providing 30 to 45 days of advance notice for upcoming meetings. One commenter stated that the Tri-Party Agencies failed to provide the minimum thirty days of public notice for public meetings as prescribed in the Hanford Community Relations Plan and that not all key documents were publically available. An additional comment was that the original notices simply identified the operable units to be addressed which did not make clear to the public that plutonium and cesium discharge sites were to be addressed.

Response to comments: Public involvement is important to the Tri-Party agencies. We strive to include our stakeholders and the public in the decision-making process at Hanford. The remedial investigation reports and feasibility studies developed as part of the CERCLA decision-making process present highly technical information. We agree that these technical documents need to be publically available during the public comment period on the Proposed Plan and allow at least 30 days for the public to

review these documents. The technical documents that support the basis for alternatives presented in the Proposed Plan are long and complex. This is particularly true for the waste sites located in these operable units due to the complexity of each waste site. The Proposed Plan and fact sheet are a high level summary of the technical documents and are meant for a general audience and are not intended to present highly technical information in detail. The Tri-Party agencies recognize the difficulty readers may have had with the Proposed Plan due to the complexity of and manner in which the information was presented.

The Hanford public involvement team engaged stakeholders and the public throughout the CERCLA process for selecting this remedy. For example, a stakeholder call was held on June 15, 2011 to measure interest in public meetings and to discuss meeting locations. The Tri-Party agencies strive to provide the public with early notification (30 to 45 days notice) of upcoming public comment periods and meetings whenever possible, as described in the Hanford Community Relations Plan. However, this is not a legal requirement. Situations occur when it is not possible to provide early notification. In those cases, notice is provided by the Tri-Party agencies as soon as definitive information is available. The public meetings for the Proposed Plan were advertised in advance in four regional newspapers (in a major circulation newspaper in each city where a meeting was to be held), on the www.hanford.gov ***website, and through the Hanford electronic listserv and mail list. A formal public comment period on the Proposed Plan, originally scheduled to run from July 5 through August 5, 2011, was extended through September 6, 2011 in response to requests from stakeholders. A fact sheet with a more reader-friendly title, "Reference Guide on the Remediation of Waste Sites in Hanford's Central Plateau", indicating the nature of the proposed cleanup was sent through the Hanford electronic listserv and mail list on July 5, 2011. The fact sheet also listed the date and location of public meetings on the Proposed Plan. A reminder was sent out on the Hanford electronic listserv on August 18, 2011 with information on how to access the Proposed Plan, related links to key technical documents, and a video of the public meeting held in Seattle, WA.***

The Tri-Party agencies encourage individuals to contact agency representatives with any concern or questions they have. During the public comment period, members of the public contacted DOE and EPA representatives by phone and email to discuss the Proposed Plan and to request additional information. These requests were met in a timely manner.

REGULATORY STANDARDS

Some commenters stated that the Resource Conservation and Recovery Act (RCRA) applies to waste sites in these OUs, particularly the Settling Tanks and Z-Ditches Waste Groups. One commenter questioned the integrity of the settling tanks and indicated that the tanks should be removed. Some commenters stated that Hanford should use the same plutonium cleanup values that have been used at other cleanup sites in the nation. A commenter stated that carbon tetrachloride originating from these waste sites is still contaminating groundwater. Other commenters expressed concern over whether the cleanup values identified in the Proposed Plan will provide groundwater protection. A commenter questioned why different risk considerations are used for nonradionuclide and radionuclide contaminants. One commenter stated that the State has more rigorous cleanup standards and that those should be used over the federal cleanup standards. Another commenter stated that this remedial action cannot proceed without the completion of the Tank Closure and Waste Management Environmental Impact Statement (EIS) and indicated that the proposed plan failed to consider the cumulative impact from all the waste sites in these units and related similar wastes sites on the Central Plateau.

Response to comments: The Tri-Party agencies recognize that some members of the public believe the Resource Conservation and Recovery Act (RCRA) applies to the Settling Tanks and Z-Ditches Waste

Groups. The Tri-Party agencies agree that the settling tanks present a substantial threat of release that requires action to protect human health and the environment and need to be remediated in a manner that complies with all substantive requirements for closure of a dangerous waste tank. As the settling tanks are remediated, the cleanup actions will comply with the substantive requirements of the State Hazardous Waste Management Act, Dangerous Waste Regulations for closure of a dangerous waste tank as applicable or relevant and appropriate requirements (ARARS.) The tanks would only be removed if necessary to comply with substantive closure requirements. Dangerous waste closure requirements have been included as an ARAR.

The Z-Ditches waste sites were used to dispose of cooling water from the Plutonium Finishing Plant. Unlike liquid discharges from plutonium processing activities, the cooling water did not come into direct contact with chemicals used during plutonium processing. The 216-Z-19 Trench and 216-Z-20 Trench operated after RCRA was enacted in 1976. However, there is no evidence that these Z-Ditches were used to dispose of dangerous waste.

The Tri-Party agencies also recognize that the public is concerned with the final cleanup level for plutonium. While many contaminants have standardized cleanup levels across the nation, there is no national cleanup level identified for plutonium. When cleanup of a site deals with plutonium contamination, the appropriate cleanup value is developed based on protecting human health and the environment, the specific conditions of that site, and the anticipated land use. This is why there are varying cleanup values for plutonium at different locations across the nation. The selected remedy and final cleanup level for plutonium were developed from EPA guidance and methodology based on Hanford Site conditions where these waste sites are located and the anticipated industrial land use. The respective FSs and Proposed Plan identified 2,900 pCi/g as the preliminary remediation goal for plutonium 239/240. However, for the final cleanup level in the selected remedy, DOE has agreed to use a more conservative value of 765 pCi/g.

The potential migration of hazardous substances, pollutants or contaminants to groundwater was evaluated for each waste site. This evaluation identified carbon tetrachloride and methylene chloride as the only contaminants that could potentially migrate through the soil from waste sites in the High-Salt Waste Group and impact groundwater at unacceptable risk levels. The cleanup levels for these contaminants are specified in the ROD. These values will provide for the protection of groundwater. The other contaminants of concern (COCs) were not identified as posing a threat to groundwater based on screening levels and fate and transport modeling. Soil vapor extraction is currently being conducted at High-Salt Waste Group and will be implemented as part of the selected remedy to continue to address unacceptable risk from carbon tetrachloride and methylene chloride. Although nitrate and technetium-99 were determined to not pose an unacceptable risk to groundwater, sampling will be conducted at Ecology's request to confirm that these contaminant levels do not pose an unacceptable risk to groundwater.

Risks are calculated differently for nonradionuclide and radionuclide contaminants. The target cancer risk range of $1x10^{-4}$ to $1x10^{-6}$ used to evaluate carcinogenic risks from radionuclides is based on the acceptable risk range identified under CERCLA. The target cancer risk level of $1x10^{-5}$ used to evaluate multiple non-radionuclide contaminants is stated in Washington Administrative Code (WAC 173-340), also referred to as the Model Toxics Control Act (MTCA). WAC regulations do not address cancer risks from radionuclides. Cleanup levels for all contaminants of concern in this ROD were established consistent with the CERCLA and MTCA.

As described in EPA's ROD guidance (EPA 540-R-98-031), this ROD presents an overall site cleanup plan including the relationship between CERCLA and other remediation activities at the site. In accordance with EPA's Framework for Cumulative Risk Assessment (EPA/630/P-

02/001F) the risk assessment evaluated the multiple contaminants, both chemical and radiological, that human or ecological receptors could be exposed to at these sites. The risk assessment combined the toxicities and risk from all chemicals and from all exposure routes (such as inhalation and ingestion) for a cumulative hazard to establish the basis for action, and to establish cleanup levels. Likewise for radionuclides, cumulative risk was evaluated for these sites. The Tri-Party agencies do not agree that this remedial action cannot proceed without completion of the Tank Closure and Waste Management EIS. The remedy was selected in accordance with CERCLA and the NCP. The EIS covers a specific scope including closure of Hanford's single-shell and double-shell tanks and on-going waste management activities. However, the EIS has no direct bearing on the evaluations conducted as part of this cleanup decision.

USE OF OBSERVATIONAL APPROACH

Use Of Observational Approach Comment Summary

Some commenters expressed support for use of the observational approach at waste sites in the High-Salt Waste Group. Some commenters stated that the observational approach would be ideal for dealing with the removal of plutonium-contaminated soil and that it is a more effective and efficient process for determining the appropriate depth of contaminated soil removal.

Response to comments: The Tri-Party agencies acknowledge that some members of the public support use of the observational approach when removing plutonium contaminated soil at waste sites in the High-Salt Waste Group. For the High-Salt Waste Group, soils that are located up to 2 ft below the bottom of the waste site (6.1 m (20 ft) bgs at the 216-Z-1A Tile Field, 7 m (23 ft) bgs at the 216-Z-9 Trench, and 6.1 m (20 ft) bgs at the 216-Z-18 Crib) will be removed. This area represents soil with the highest concentrations of plutonium. The DOE and EPA have determined that the plutonium that will remain in place after the selected remedy is implemented will not pose an unacceptable risk to human health and the environment. However, based on public comment, it has been determined that after excavating to the specified depths in these waste sites, plutonium-239/240 levels will be assessed. DOE will consider removing additional plutonium-contaminated soil from these waste sites.

OTHER COMMENTS ON THE PROPOSED PLAN

Other Comments On The Proposed Plan Comment Summary

Some commenters thanked the Tri-Party agencies for their efforts on this cleanup decision or for the opportunity to provide comment on the Proposed Plan. Some commenters expressed support of the remedies identified for the Z-Ditches and Low-Salt Waste Groups, pipelines, and the use of soil vapor extraction at the High-Salt Waste Group. Some commenters asked for clarification on the remedy for the Settling Tanks and cost tables presented in the Proposed Plan. Another commenter stated that WIPP disposal costs should not be included since these costs are not part of the Hanford DOE office budget.

Response to comments: The Tri-Party agencies would like to thank those who provided comment on the Proposed Plan and acknowledge those comments that expressed support of portions of the selected remedy. The selected remedy for the Settling Tanks Waste Group includes removal of the remaining contents (including any liquid and sludge) and grouting of the tanks for stabilization, and will satisfy substantive closure requirements for dangerous waste tanks. The cost tables presented in the Proposed

Plan show present worth calculations based on 350 years for the Cesium-137 Waste Group to 1,000 years for the Low-Salt and High-Salt Waste Groups and include estimated disposal costs at WIPP, where applicable. WIPP costs were included in the Proposed Plan in order to fully present the full range of life-cycle costs for each alternative. This was done in part in response to HAB advice #207 regarding Criteria for Development of the Proposed Plan for 200-PW-1,3,6 (available at http://www.hanford.gov/files.cfm/HABAdv_207.pdf***) which specifically requested life-cycle costs be provided.***

GENERAL COMMENTS

General Comments Summary

General comments that were not specific to a particular part of the Proposed Plan were also received. Some commenters expressed concern with the following: if the protectiveness of the remedy is limited to protection of workers; increases in cancer risks if groundwater from the central part of Hanford is used; threats to the Columbia River; and possibility of major nuclear accidents occurring at Hanford in the future. Some commenters also share personal stories regarding their experiences with people who were exposed to radiation and their concern that others may also suffer from future radiation exposure from Hanford. Some commenters stated vitrification technology should be used and one commenter asked for the meaning of the "ET" abbreviation.

Comments that were not directly related to this decision dealt with shipping of waste to the Hanford Site, ending nuclear power, and supporting alternative energy.

Response to comments: When determining how contaminated waste sites will be cleaned up, CERCLA requires that the selected remedy be protective of human health and the environment. The Tri-Party agencies have determined that the selected remedy is protective of human health and the environment, including, but not limited to, workers since industrial use is the current and reasonably expected future land use, the public living near Hanford and throughout the Pacific Northwest, groundwater on the Hanford Site, and the Columbia River and its ecological resources.

The groundwater located on the Hanford Site is contaminated and not suitable for use. Under other CERCLA RODs, remedies are being implemented to clean the contaminated water; however, restrictions on using the groundwater will continue to be in place until the water is safe for consumption. The Tri-Party agencies agree that the risks from using Hanford's groundwater are not acceptable and will be restricted from use until it reaches drinking water standards. The selected remedy will protect groundwater, the Columbia River and its ecological resources from degradation and unacceptable impact associated with hazardous substances, pollutants or contaminants originating from these waste sites.

The Tri-Party agencies agree that the Columbia River is vital to the Pacific Northwest region. One of the main priorities of the Tri-Party agencies is to protect the Columbia River from contamination originating from the Hanford Site. The main way contamination can potentially reach the river is from the migration of contaminated groundwater. Extensive groundwater monitoring is done on the Hanford Site to monitor for this migration. This information is located in the Hanford Site Annual Groundwater Monitoring and Performance Reports which are available at http://www.hanford.gov/page.cfm/SoilGroundwaterAnnualReports. ***If Hanford-related contamination from areas on Hanford not addressed by this ROD is moving towards or reaching the river at levels that would pose an unacceptable risk to human health or the environment, actions will be taken to***

address the contamination. For people who would like more information on the Columbia River in general, the State of the River Report for Toxics is a summary of contaminants in the Columbia River Basin. It describes all sources of contamination in the region, not just contamination from the Hanford Site. This report is available at http://yosemite.epa.gov/r10/ecocomm.nsf/Columbia/SoRR/.

The Tri-Party agencies understand public concern over the potential for major nuclear accidents at the Hanford Site. One key difference between Hanford and nuclear power plants is that there are no active Hanford Site nuclear power plants. The nine nuclear reactors that were part of Hanford plutonium-production activities have all been shut down and eight of the reactors have been cocooned (to allow radioactive materials to decay) and the surrounding structures removed. One nuclear reactor, B-Reactor, has not been cocooned since the radioactive materials have been removed and it is used as part of guided tours and is a national historic landmark.

There is a commercial low-level radioactive waste disposal facility, US Ecology, Inc., that leases land on the Hanford Site. DOE and EPA are not involved with the activities at US Ecology; however, the Washington State Department of Ecology and Washington State Department of Health are responsible for interacting with US Ecology. More information is available at US Ecology's website at http://www.americanecology.com/richland.htm ***or at Ecology's website at*** http://www.ecy.wa.gov/programs/nwp/llrw/llrw.htm. ***Energy Northwest operates the Columbia Generating Station, a commercial nuclear power plant, located north of Hanford's 300 Area. This commercial power plant is licensed through the Nuclear Regulatory Commission and is not part of Hanford cleanup activities. More information on the plant is available at Energy Northwest's website at*** http://www.energy-northwest.com/generation/cgs/.

The Tri-Party agencies would like to thank those commenters who shared their experiences of those who suffered from radiation exposure.

In-situ vitrification was considered as a possible remedial alternative to address contamination at the Z-Ditches, Low-Salt, and High-Salt Waste Groups. Vitrification was not suitable for implementation for these waste groups due to the distribution of contaminants. At the Z-Ditches and Low-Salt Waste Group, the contamination was relatively shallow; thus, the Tri-Party agencies determined it was better to remove the contamination instead of vitrifying it in place. At the High-Salt Waste Group, the contamination is relatively deep, which makes using vitrification technology difficult to implement. As a result, the Tri-Party agencies determined that vitrification was not as implementable as other technologies considered. After analyzing all the remedial alternatives using the CERCLA criteria, the Tri-Party Agencies determined that vitrification did meet threshold criteria but did not provide the best balance of the balancing and modifying criteria and it was thus not selected as the final remedy.

"ET" stands for evapotranspiration. This abbreviation was used to describe the evapotranspiration barrier that will be constructed over the waste sites that have plutonium contamination remaining in place. The purpose of using an ET barrier is to reduce the amount of water that will infiltrate through the soil column that could potentially cause contaminants to migrate with water flow.

The Tri-Party agencies understand the public's concern with the shipping of wastes to the Hanford Site. Currently, the Hanford Site is receiving no offsite waste except for what was decided in a court settlement agreement between the Department of Energy (DOE) and the State of Washington in 2006. This agreement is available at www.hanford.gov/orp/uploadfiles/settlement-agreement.pdf.

The Tri-Party agencies acknowledge public comments on ending nuclear power and supporting alternative energy. Thank you for your comments

ACRONYMS

ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BRA	baseline risk assessment
CCU	Cold Creek Unit
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
COC	contaminant of concern
COPC	contaminant of potential concern
CSM	conceptual site model
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CW	Cooling Water
DBBP	dibutyl butyl phosphate
DNAPL	dense, nonaqueous phase liquid
DOE	U.S. Department of Energy
DOE-RL	DOE Richland Operations Office, also known as RL
Ecology	Washington State Department of Ecology
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ESA	*Endangered Species Act of 1973*
ET	evapotranspiration
FS	feasibility study
HAB	Hanford Advisory Board
HCP EIS	Hanford Comprehensive Land Use Plan Environmental Impact Statement
HI	hazard index
HQ	hazard quotient

ICs	institutional controls
ISV	in situ vitrification
MCL	maximum contaminant level
MEESC	maintain and/or enhance existing soil cover
NCP	National Contingency Plan
NPH	normal paraffin hydrocarbon
NPL	National Priorities List
O&M	operations and maintenance
OSWER	Office of Solid Waste Emergency Response
OU	operable unit
PCB	polychlorinated biphenyl
PFP	Plutonium Finishing Plant
ppmv	parts per million by volume
PRF	Plutonium Reclamation Facility
PRG	preliminary remediation goal
PUREX	Plutonium Uranium Extraction
PW	Process Water
RAO	remedial action objective
RBC	risk based concentration
RCRA	*Resource Conservation and Recovery Act of 1976*
RECUPLEX	Recovery of Uranium and Plutonium by Extraction
RESRAD	RESidual RADioactivity (dose model)
RfD	reducing reference dose
RI	remedial investigation
RME	reasonable maximum exposure
ROD	record of decision
RTD	removal, treatment, and disposal
SLERA	screening level ecological risk assessment
SVE	soil vapor extraction
TBP	tributyl phosphate
TSD	treatment, storage, and disposal

UPR	unplanned response
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WAC	*Washington Administrative Code*
WIPP	Waste Isolation Pilot Plant

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