



Environmental Assessment

**Transuranic Waste Retrieval from the 218-W-4B and
218-W-4C Low-Level Burial Grounds, Hanford Site,
Richland, Washington**

U.S. Department of Energy
Washington, D.C.

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PREFACE

This environmental assessment was prepared to assess potential environmental impacts associated with the proposed action for retrieval of covered, suspect-transuranic containers (primarily drums) from the 218-W-4B and 218-W-4C Low-Level Burial Grounds in the 200 West Area. Information contained herein will be used by the Manager, U.S. Department of Energy, Richland Operations Office, to determine if the Proposed Action is a major federal action significantly affecting the quality of the human environment. If the Proposed Action is determined to be major and with significant impact, an environmental impact statement will be prepared. If the Proposed Action is determined not to be major and with significant impact, a Finding of No Significant Impact will be issued and the action may proceed. Criteria used to evaluate significance are found in Title 40, Code of Federal Regulations 1508.27.

This environmental assessment is prepared in compliance with the *National Environmental Policy Act of 1969*, as amended, the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the *National Environmental Policy Act* (Title 40, Code of Federal Regulations 1500-1508), and the U.S. Department of Energy Implementing Procedures for the *National Environmental Policy Act of 1969* (Title 10, Code of Federal Regulations 1021).

The following is a description of each section of this environmental assessment.

- 1.0 Purpose and Need for Action.** This section provides a brief statement concerning the problem or opportunity the U.S. Department of Energy, Richland Operations Office, is addressing with the Proposed Action. Background information is provided.
- 2.0 Description of the Proposed Action.** This section provides a description of the Proposed Action with sufficient detail to identify potential environmental impacts.
- 3.0 Alternatives to the Proposed Action.** This section describes reasonable alternative actions to the Proposed Action, which addresses the Purpose and Need. A No Action Alternative, as required by Title 10, Code of Federal Regulations 1021, also is described.
- 4.0 Affected Environment.** This section provides a brief description of the locale in which the Proposed Action would take place.
- 5.0 Environmental Impacts.** This section describes the range of environmental impacts, beneficial and adverse, of the Proposed Action. Impacts of alternatives briefly are discussed.
- 6.0 Permits and Regulatory Requirements.** This section provides a brief description of permits and regulatory requirements for the Proposed Action.
- 7.0 Organizations Consulted.** This section lists any outside groups, agencies, or individuals contacted as part of the environmental assessment preparation and/or review.
- 8.0 References.** This section provides a list of documents used to contribute information or data in preparation of this environmental assessment.

Appendices. Additional information necessary to support an understanding of the Proposed Action, alternatives, and potential impacts is provided.

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GLOSSARY

AEC	U.S. Atomic Energy Commission
ALARA	as low as reasonably achievable
CAM	continuous air monitor
CEDE	committed effective dose equivalent
CERCLA	<i>Comprehensive Environmental Response, Compensation and Liability Act of 1980</i>
CFR	<i>Code of Federal Regulations</i>
CH	contact handled
CH-TRU	contact-handled transuranic (waste)
Ci	curie (unit of radioactivity)
CWC	Central Waste Complex
CY	calendar year
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
EA	environmental assessment
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ERPGs	emergency response planning guidelines
ESA	<i>Endangered Species Act of 1973</i>
FH	Fluor Hanford
FONSI	finding of no significant impact
ft ³	cubic foot
FY	fiscal year
g	gram
HazOp	hazards and operability analysis
HCRC	Hanford Cultural Resources Review
HCRL	Hanford Cultural Resources Laboratory
HEPA	high-efficiency particulate air (filter)
HSW-EIS	draft Hanford Site Solid (Radioactive and Hazardous) Waste Program-EIS
kg	kilogram
LLBG	Low-Level Burial Grounds
LLW	low-level waste
m ³	cubic meters
mg/m ³	milligrams per cubic meter
mrem	millirem per hour

GLOSSARY (cont)

NDA	nondestructive analysis (assay method)
NEPA	<i>National Environmental Policy Act of 1969</i>
NOC	notice of construction (for air permit)
PCB	polychlorinated biphenyl
PNNL	Pacific Northwest National Laboratory
Pu	Plutonium
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RH	remote handled
RH-TRU	remote-handled transuranic (waste)
rem	common unit of radiological dose equivalent
ROD	Record of Decision (under NEPA process or CERCLA process)
SWITS	Solid Waste Information and Tracking System
TEDE	total effective dose equivalent
TEELs	temporary emergency exposure limits
Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
TRU	transuranic (waste)
TSCA	<i>Toxic Substance Control Act of 1976</i>
TSD	treatment, storage and/or disposal (unit)
U	uranium
USC	<i>United States Code</i>
WAC	<i>Washington Administrative Code</i>
WDOH	Washington State Department of Health
WHC	Westinghouse Hanford Company

SCIENTIFIC NOTATION CONVERSION CHART

Equivalent Values		
10^{-1}	1 E-01	0.1
10^{-2}	1 E-02	.01
10^{-3}	1 E-03	.001
10^{-4}	1 E-04	.0001
10^{-5}	1 E-05	.00001
10^{-6}	1 E-06	.000001
10^{-7}	1 E-07	.0000001
10^{-8}	1 E-08	.00000001

METRIC CONVERSION CHART

Into metric units

Out of metric units

If you know	Multiply by	To get	If you know	Multiply by	To get
Length			Length		
inches	25.40	millimeters	millimeters	0.03937	inches
inches	2.54	centimeters	centimeters	0.393701	inches
feet	0.3048	Meters	meters	3.28084	feet
yards	0.9144	Meters	meters	1.0936	yards
miles (statute)	1.60934	kilometers	kilometers	0.62137	miles (statute)
Area			Area		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.09290304	Square meters	square meters	10.7639	square feet
square yards	0.8361274	Square meters	square meters	1.19599	square yards
square miles	2.59	square kilometers	square kilometers	0.386102	square miles
acres	0.404687	hectares	hectares	2.47104	acres
Mass (weight)			Mass (weight)		
ounces (avoir)	28.34952	Grams	grams	0.035274	ounces (avoir)
pounds	0.45359237	kilograms	kilograms	2.204623	pounds (avoir)
tons (short)	0.9071847	tons (metric)	tons (metric)	1.1023	tons (short)
Volume			Volume		
ounces (U.S., liquid)	29.57353	milliliters	milliliters	0.033814	ounces (U.S., liquid)
quarts (U.S., liquid)	0.9463529	Liters	liters	1.0567	quarts (U.S., liquid)
gallons (U.S., liquid)	3.7854	Liters	liters	0.26417	gallons (U.S., liquid)
cubic feet	0.02831685	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.7645549	cubic meters	cubic meters	1.308	cubic yards
Temperature			Temperature		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Energy			Energy		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.94782	British thermal unit per second	British thermal unit per second	1.055	kilowatt
Force/Pressure			Force/Pressure		
pounds (force) per square inch	6.894757	kilopascals	kilopascals	0.14504	pounds per square inch

06/2001

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Third Ed., 1990, Professional Publications, Inc., Belmont, California.

DEFINITION OF TERMS

Contact-handled (CH) waste containers produce radiation dose rates less than or equal to 200 millirem (mrem) per hour at the container surface. CH containers can be handled safely by direct contact with appropriate health and safety measures.

Low-level waste (LLW) is radioactive waste, including accelerator-produced waste, that is not high-level waste, spent nuclear fuel, transuranic waste, or byproduct material [as defined in Section 11e.(2) of the *Atomic Energy Act of 1954*].

Remote-handled (RH) waste containers produce greater than 200 mrem per hour dose rates at the container surface. RH waste contains a high proportion of radionuclides that produce highly penetrating radiation. Thus, RH containers require special handling and/or shielding during operations.

Transuranic (TRU) waste is waste that contains alpha particle-emitting radionuclides with atomic numbers greater than that of uranium (92), half-lives greater than 20 years, and concentrations greater than 100 nanocuries per gram of waste. TRU waste is not high-level waste. Some TRU waste also has hazardous components and sometimes is referred to as TRU mixed waste.

Temporary Emergency Exposure Limits (TEELs) are established by the U.S. Department of Energy, Subcommittee on Consequence Assessment and Protective Actions (WSMS-SAE-99-0001 2000). The limits for uranium oxide are the same or more conservative than for metal. The U.S. Department of Energy, Emergency Management Guide (DOE-G-151.1-1) calls for the use of TEELs when Emergency Response Planning Guidelines (ERPGs) are not available. Although ERPGs are the standard community exposure limits approved by the American Industrial Hygiene Association, less than 100 chemicals have been assigned ERPGs, and none of these include compounds of uranium. The definition of the TEEL limits use uranium oxide as the most conservative and bounding chemical for threshold limits as follows.

- TEEL-0: The threshold concentration below which most people will experience no appreciable risk of health effects. The TEEL-0 is 0.05 milligram per cubic meter (mg/m^3).
- TEEL-1: The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing other than mild transient health effects or perceiving a clearly defined objectionable odor. The TEEL-1 is $0.6 \text{ mg}/\text{m}^3$.
- TEEL-2: The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action. The TEEL-2 is $1.0 \text{ mg}/\text{m}^3$.
- TEEL-3: The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing or developing life-threatening health effects. The TEEL-3 is $10 \text{ mg}/\text{m}^3$.

1.0 PURPOSE AND NEED FOR ACTION

The following sections describe the purpose and need and provide background information for this environmental assessment (EA).

1.1 PURPOSE AND NEED

The U.S. Department of Energy, Richland Operations Office (DOE-RL) needs to improve management of post-1970, contact-handled (CH) suspect transuranic (TRU) waste containers (primarily drums) that are stacked in modules and covered with soil in the Low-Level Burial Grounds (LLBG).

1.2 BACKGROUND

In 1970, the U.S. Atomic Energy Commission (AEC) defined TRU waste as a separate waste category and declared that TRU waste must be retrievably stored. In 1973, the AEC determined (AEC Order 0511) that waste containing plutonium might be associated with increased hazards and should be disposed of in facilities that provide a greater level of containment than the type of shallow land burial typically used for LLW. Beginning at that point, suspect-TRU waste (identified at that time as waste likely to contain greater than 10 nanocuries per gram of transuranic radionuclides) was separated from other LLW and retrievably stored in designated areas in the 200 Areas burial ground facilities. The definition of TRU waste was changed in 1984 to specify only waste containing greater than 100 nanocuries per gram of transuranics; therefore, some of the suspect TRU waste initially placed in storage would now be LLW. The proposed action would occur in the 200 West Area of the Hanford Site (Figure 1) in the 218-W-4B and 218-W-4C LLBG (Figure 2).

The 218-W-4B LLBG (Figure 3) in the 200 West Area became active in 1967, and was last used in 1990. The 218-W-4B LLBG received packaged waste materials from 200 West Area operations, other onsite areas, and from offsite. Suspect TRU waste first went into a concrete 'V' trench (Figure 4) in 1972. This trench was designated Trench V7. Since then, V7 has become a section or part of Trench 7. However, the asphalt slab (Figure 5 and 6) trench concept was adapted and first used in this burial ground later in 1972.

The 218-W-4C LLBG (Figure 7), also in the 200 West Area, first received waste in March 1978, and is still active. This LLBG received packaged waste materials from 200 West Area operations, other onsite areas, and from offsite.

During 1995, *Environmental Assessment Solid Waste Retrieval Complex, Enhanced Radioactive and Mixed Waste Storage Facility, Infrastructure Upgrades, and Central Waste Support Complex, Hanford Site, Richland, Washington*, DOE/EA-0981, was prepared to support retrieval of some soil covered TRU containers. However, this retrieval activity was never implemented.

Retrieval of covered drums is a continuation of retrieval activities for uncovered drums in the same trenches. Relocation of TRU waste drums from the LLBG to other TSD facilities in support of uncovered retrieval activities commenced in 1996. The retrieval and assay of uncovered drums, beginning in 1999, has resulted in over 700 suspect-TRU waste drums being redesignated as TRU waste or LLW. These activities were considered to be responsive to existing NEPA Documentation that evaluated retrieval of TRU waste (DOE/EIS-0113). Approximately 1100 waste containers from the uncovered portion of these LLBG have been relocated to other TSD units since uncovered retrieval activities began in the 1990's.

A number of uncovered drums remain in the 218-W-4C LLBG. Of these drums, some have been assayed and designated as TRU or LLW, and some have not been assayed. Plans are to assay and designate the remaining uncovered drums and transfer the remaining TRU waste designated drums to the Central Waste Complex (CWC) in the 200 West Area or another TSD unit for storage by the end of summer 2002.

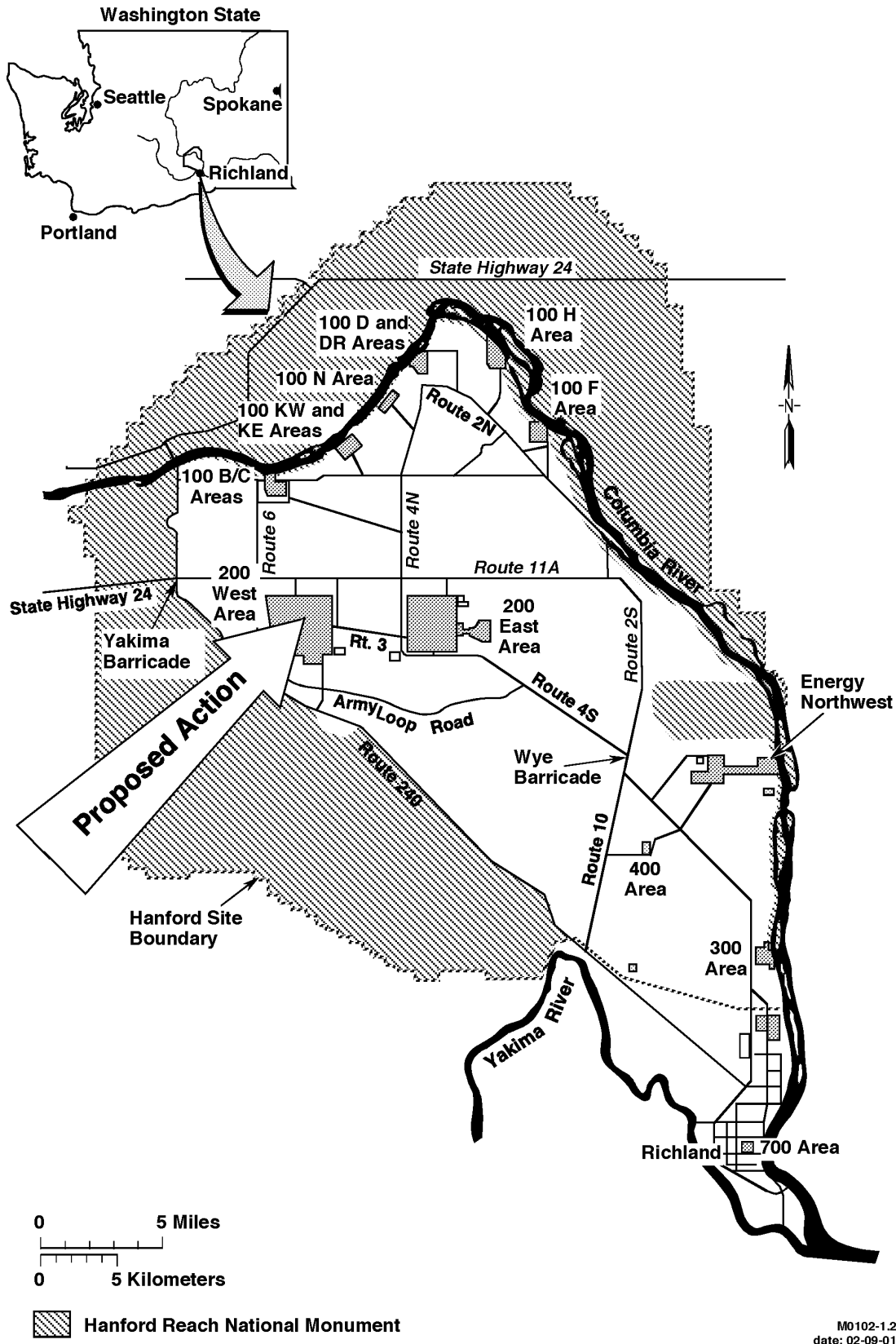


Figure 1. Hanford Site.

Figure available upon request.

Figure 2. 200 West Area.

Figure available upon request.

Figure 3. Location of Trench 7 and V7 in 218-W-4B Low-Level Burial Grounds.



Figure 4. TRU Retrievable Storage – V7 in 218-W-4B Low-Level Burial Grounds (Circa 1970's).

Figure available upon request.

Figure 5. Typical Post-1970 TRU Interim Storage (Cross-Section).



Figure 6. TRU Retrievable Storage (Typical Configuration)
in 218-W-4B and 218-W-4C Low-Level Burial Grounds.

Figure available upon request.

Figure 7. 218-W-4C Low-Level Burial Grounds.

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2.0 DESCRIPTION OF THE PROPOSED ACTION

The proposed action would retrieve up to 15,200 buried 208-liter (55-gallon) drums of post-1970, suspect CH-TRU waste from the 218-W-4B LLBG (Figure 3) and the 218-W-4C LLBG (Figure 7), over about a five year period. Retrieval might include a small quantity of containers other than 208-liter (55-gallon) drums, such as 38-liter (10-gallon) drums, 416-liter (110-gallon) overpack drums, and wood or fiberglass-reinforced boxes. The drums would be designated in the LLBG as containing TRU waste or LLW. Any drums that are determined to be LLW, estimated to be about half the drum total, would remain disposed of in the LLBG. Any unvented CH-TRU waste drums would be vented before leaving the LLBG. Those 208-liter (55-gallon) drums determined to be CH-TRU waste, and some of the other TRU waste containers would be transferred to CWC or another permitted TSD unit for storage, in accordance with the TSD unit waste acceptance criteria. All other TRU waste containers (e.g., boxes, RH-TRU) would be staged within the LLBG for later disposition.

The containers in all the trenches except Section V7 in Trench 7 of the 218-W-4B LLBG are stored in modules. A module is normally 3 or 4 layers of horizontally stacked drums. The number of containers in a module could vary, as some modules contain boxes in place of drums. Drums in V7 are placed on their side in a different configuration.

The proposed TRU waste retrieval flow diagram is described in Figure 8 and provides the following:

- Review record information on modules identified for retrieval
- Excavate overburden, place soil in spoil piles, and stabilize side slopes
- Remove metal cover from Section V7 in Trench 7
- Remove plastic module cover or tarp and remove plywood from drum tops
- Inspect drums for container integrity and container markings (overpack as necessary)
- Remove drums from stack
- Handle retrieved containers per LLBG operating procedures
- Stage suspect-TRU containers for assay and/or venting
- Perform assay to determine if TRU waste (100 nCi/g of transuranic isotopes) or LLW
- LLW remains in LLBG (continued disposal)
- Vent TRU waste drums if needed for transfer and storage
- TRU waste drums transferred to CWC or another TSD unit
- Most TRU waste boxes and RH-TRU waste are staged in the LLBG for future action
- Continue with additional modules
- Excavated spoil piles would be used to support typical LLBG operation activities.

The retrieval of buried post-1970, suspect CH-TRU waste is proposed to begin in 2002, and retrieve approximately 1,200 drums in the first year of operation. The peak retrieval plan between now and about 2006 would be to retrieve up to 5,000 drums in a 12-month period. After a records review is complete, TRU retrieval equipment would be mobilized in the LLBG. Various methods for excavating the covered drums and boxes might be employed. A mechanical scrapper might be used to remove the overburden followed by use of a soil guzzler, soil vacuum, or hand excavation to remove the remaining soil surrounding the drums. Exposed drums would be inspected for integrity, marked, labeled, and vented, if needed. Drums would be removed from the module and staged within the LLBG. Drums requiring nondestructive analysis (NDA) would be sent through a TRU waste drum assay mobile trailer (Figure 9 and 10), or similar assay equipment. TRU waste drums without vents would be placed in an area in the LLBG designated for venting drums with an appropriate venting device (Figure 11). Drums with suspect integrity would be overpacked. TRU waste drums would be bar code labeled and transferred to CWC or another TSD unit for storage. LLW would remain disposed of in the LLBG.

2.1 PROPOSED RECORDS REVIEW, LLBG MODIFICATIONS, AND STAGING OF EQUIPMENT

The following describes the waste records review, potential modifications to the two LLBG, and possible equipment staging activities that are expected to occur before retrieval of waste containers from the LLBG. During final set up, decisions to determine specific preparations and staging locations for equipment would be made. Operations would designate where the project support equipment would be located. No new permanent facilities are planned and all equipment/facilities would be located within the LLBG and only for the duration of the proposed action. Any of the potential modifications to the LLBG would be temporary in support of the proposed action.

Before physical retrieval of the waste, a review of existing waste records would be conducted. The reviewer would search available records such as the Solid Waste Information and Tracking System (SWITS) database, burial records, location maps, and supplemental generator records. A large portion of these data has been collected and included in published reports such as physical descriptions (WHC-EP-0225), radiological descriptions (WHC-SD-W113-PSE-001, WHC-SD-W221-DP-001, and WHC-SD-WM-TI-517), and hazardous constituents (WHC-SD-WM-TI-517) of the stored material. The reports indicate that the waste consists primarily of contaminated material enclosed in one or more layers of plastic wrapping, placed in an outer structure of a drum, box, or other container. The majority of the drums are 208-liter (55-gallon) drums. The boxes are a variety of sizes and materials. The data for the reports are derived from solid waste storage/burial records prepared at the time of storage, process histories, and interviews with personnel from the generating facilities. Because of waste management requirements and practices from before the mid-1980's, it is anticipated that storage/burial records for some containers might be incomplete or missing.

Before actual TRU waste retrieval activities, the work site in LLBG would be configured to facilitate operational efficiency. The designation of radiation zones, staging areas, barricades, necessary utilities, container movement paths, locations of the TRU waste drum assay mobile trailer (NDA), TRU waste drum venting locations, transportation loading, etc., would be made and the LLBG would be modified as necessary. Not all the equipment would be used continuously during the project, so mobilization would take place as the equipment was needed. The placement of equipment would depend on considerations of the space required for retrieval activities, radiological control, the space available in the trench, staging, and transportation needs. An effective placement strategy would minimize the required movement distances for the retrieval of drums while allowing for the efficient repositioning within the LLBG of those drums that are designated as LLW.

Potential LLBG modifications might include a temporary utility drop from a power pole or use of a portable generator(s). Other examples include drum storage shelters, office and change facility trailers, equipment laydown yards within the LLBG in portions of unused trenches, connex boxes or vans for storage, fencing, and temporary lighting.

2.2 PROPOSED RETRIEVAL ACTIVITIES

The excavation of soils and removal of plywood and tarp material from around the waste containers, container inspections, and other waste container retrieval activities as currently planned are detailed in the following paragraphs.

The most efficient methodology of removing the overburden from the drums would include the maximum use of heavy earthmoving equipment. When the quantity of soil removed with heavy equipment has reached close to the top of the drum modules, hand tools or vacuum systems (e.g. guzzler vacuum excavation system) might be used to complete the soil removal operations. The tarps and plywood sheets that separate the layers of waste containers might have deteriorated, while some might be reuseable. Operations would determine the disposition of these materials. Uncovered TRU waste containers would be inspected for signs of corrosion and degradation. Dust suppression would be employed as needed. The integrity of the trenches would be maintained to allow for long-term operations. In addition, there is no liquid effluent generated by normal retrieval operations.

The uncovering of waste containers in Section V7 in Trench 7 of the 218-W-4B LLBG (Figure 4) would vary from the methodology for excavation and removal from modules of all the other trenches of the proposed action as described previously. Section V7 was the first engineered storage location for drummed TRU waste. This section of the trench was constructed as a 90-degree V-shaped concrete slab. When filled with drums, the section was enclosed with a galvanized steel roof and covered with about 1 meter (4 feet) of earth and gravel. In this design, the drums were separated from the soil and moisture to reduce possible corrosion during storage. The overburden from the entire area of Section V7 would be removed to access the metal fabricated cover. After the overburden is removed, the cover can be removed either in its entirety or cut up into smaller pieces. All other aspects of retrieval remain unchanged.

If contaminated soil is encountered during retrieval, the personal protective equipment that personnel might be wearing would be adjusted as required. Small amounts of incidental contaminated soil might be placed in drums or boxes, and the packages would be staged as appropriate according to LLBG procedures, while the work planning required for final waste disposition is completed. Larger areas of contamination might be fixed and the area posted as required by the radiological control organization, but will not be remediated under the proposed action. Bulk transfer of contaminated soil for disposal in another trench in the LLBG also might occur. Clean soil from retrieval activities would be moved to/from other areas within the LLBG. Overpacking potential breached waste containers is a routine LLBG operation.

2.3 PROPOSED WASTE CONTAINER DISPOSITION

Waste container disposition, including waste designation, venting, staging activities, and TRU waste disposition are described in the following.

Initial container inspection would commence once the earth overburden, plywood, and protective tarps were removed, and the soil adjacent to the exposed containers was stabilized. The initial inspection would be a visual subjective determination of the container integrity and vent status.

Removal of the drums from the stacked module would use drum-retrieval lifting and moving equipment. An inspection area that facilitates a final visual inspection might be designated. Any container requiring final inspection might be relocated from the module to an inspection area.

Retrieval would be required from modules where the drums are stacked right next to each other. It is most likely that retrieval would be conducted from the open end of the row, but it is possible the initial drum retrieval might come from the center of the module if boxes bound both ends of the row. Retrieval of containers could be conducted with heavy equipment, cranes, large forklifts, etc., that might be located within the trench or between the trenches.

All retrieved containers would be inspected. The container inspection would consist of a visual examination to determine if there is significant corrosion, holes, dents, or other visual deformity. Primarily, the container integrity would be assessed. All containers might be moved, turned, or otherwise relocated within the LLBG to facilitate an adequate visual inspection. Containers of questionable integrity can be safely retrieved, provided precautions and possible repackaging are performed. Operations would determine if containers with questionable integrity could provide secure containment for container contents while being removed from the stack. LLBG operating procedures would be established to safely deal with these containers.

TRU waste container inspection and retrieval might encounter containers with higher than CH dose rate limits. These containers would be placed in a safe and segregated location while maintaining safety for personnel using as low as reasonably achievable (ALARA) principles. Temporary shielding such as lead blankets may be used to lower dose rates for any of the containers.

After a drum is inspected visually and structural integrity is established, the drum may be staged for either NDA (with the use of assay equipment) or venting. LLBG operations would designate the location of the staging area that provides for the efficient movement of drums. It is projected that the drum retrieval rate would exceed the assay rate. The NDA staging area within the LLBG would be sized accordingly to ensure adequate space is available for the expected backlog of drums waiting to be assayed. The placement of drums in the staging area would conform to the applicable safety requirements, and would be subject to the routine inspections required of all uncovered TRU waste drums.

The NDA process would include all necessary equipment, TRU drum assay mobile trailer (Figure 9) and assay equipment (Figure 10), utilities, and personnel required to monitor and perform the analysis. LLBG personnel would perform drum handling activities, including placement and removal of the drums from the assay system. The drums to be assayed would be moved to the TRU drum assay mobile trailer drum in-feed area using the appropriate handling equipment. The drums would be assayed and moved out of the unit. The assaying process would include the required quality assurance/quality control verification of accuracy of the analysis. Following assay, the drums would be segregated according to waste type (TRU or LLW).

The drums segregated as LLW according to the NDA results or alternative designated methodology would be kept in the LLBG.

TRU waste drums that do not have a venting device upon initial retrieval would have an approved venting device installed via a proven process that ensures personnel and environmental protection. The installation of a venting device would require penetrating the drum and inserting a high-efficiency particulate air (HEPA) filtered venting device (Figure 11). Following venting, the drums would be moved to the staging area with the other TRU waste drums awaiting transfer to CWC or another TSD unit, or to the NDA staging area for assay. The sequence of assaying drums or inserting a venting device might be done in any order. There are minimal fugitive dust emission releases anticipated from the proposed action.

Following NDA (and drum venting if required), those drums determined to be TRU waste drums would be staged for transport. It is projected that the drum retrieval rate occasionally would exceed the transportation rate out of the LLBG. The transportation staging area within the LLBG would be sized to ensure adequate space was available for the expected backlog of drums awaiting transportation and would provide adequate spacing between drums to allow for labeling, inspection, and final preparations for transfer.

The necessary paperwork for all transfers of TRU waste containers meeting the waste acceptance criteria at CWC or another Hanford Site TSD unit would be checked and verified. The TRU waste

containers would be transported to CWC or another TSD unit. On arrival, the paperwork and TRU waste containers would be inspected, off-loaded, and placed into storage within the TSD unit.

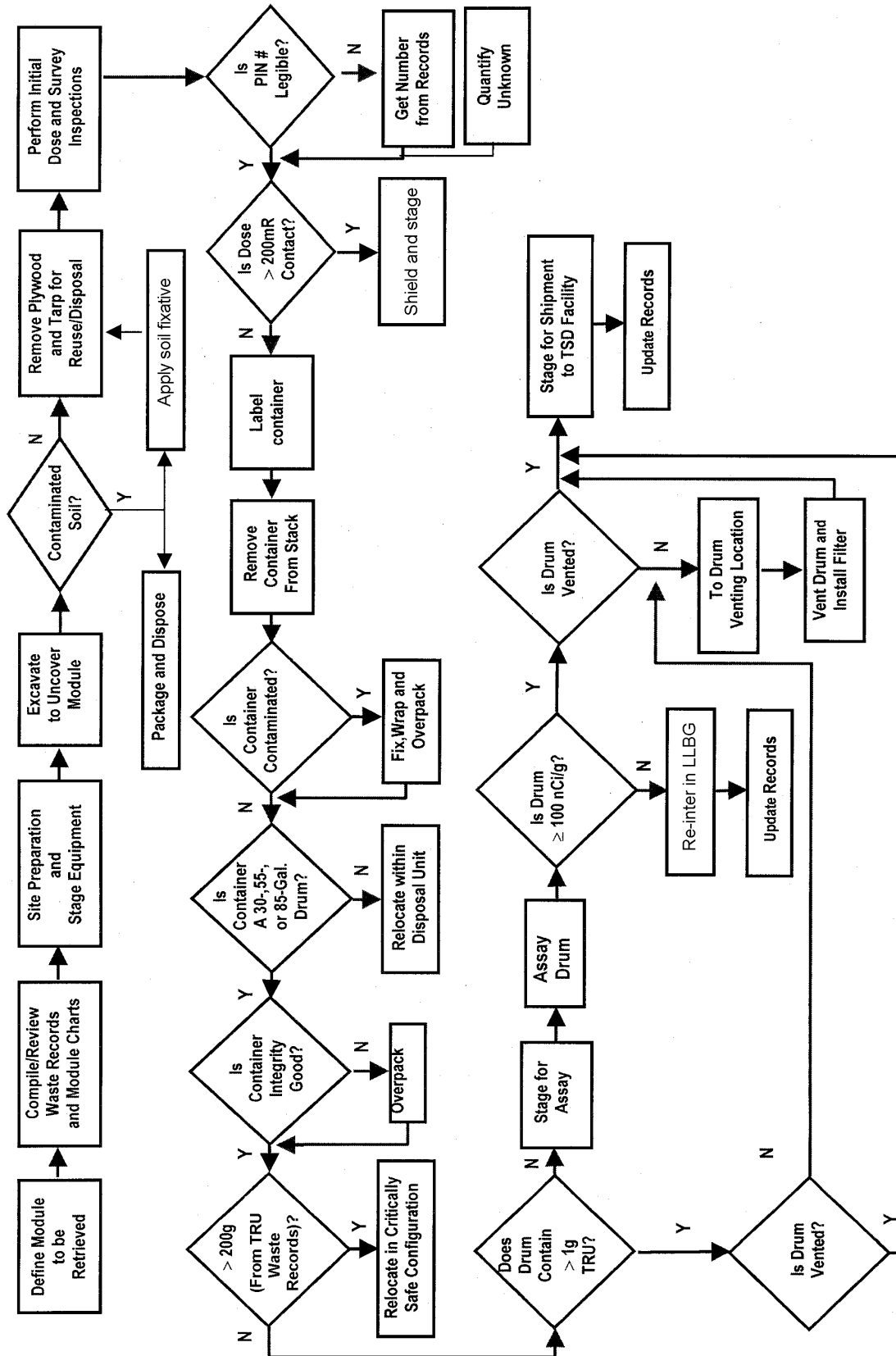


Figure 8. TRU Waste Retrieval Flow Diagram.
(The order or steps may change depending on operational conditions)



Figure 9. TRU Waste Drum Assay Mobile Trailer (Example).



Figure 10. TRU Waste Drum Assay Equipment (Example).

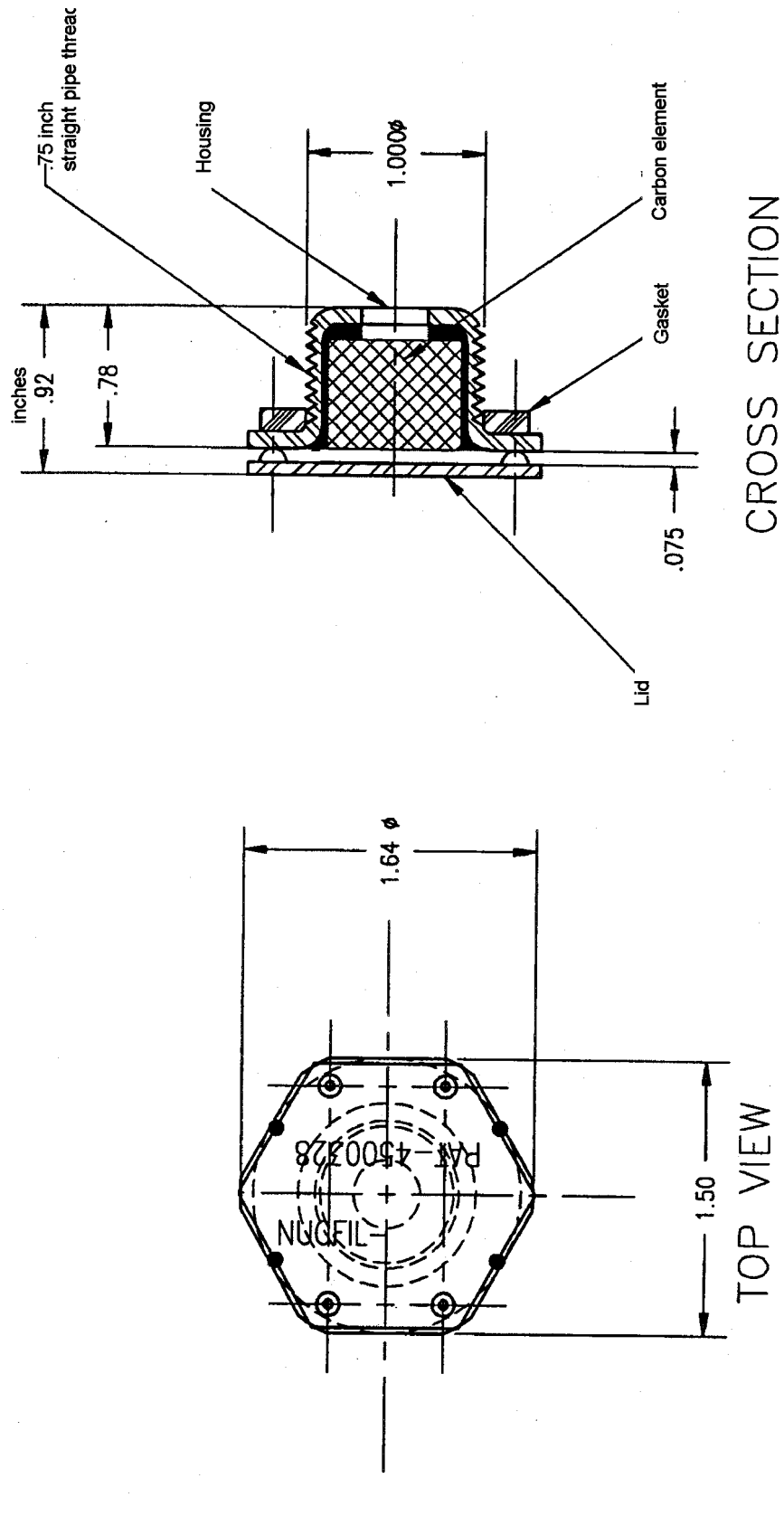


Figure 11. HEPA Filtered Venting Device for Drums (Example).

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3.0 ALTERNATIVES TO THE PROPOSED ACTION

Alternatives to the proposed action are discussed, but not fully analyzed, in the following sections.

3.1 NO ACTION ALTERNATIVE

The No Action Alternative to the proposed action would not retrieve any buried TRU waste at this time. This alternative would leave all buried TRU waste containers in place in the current configuration. The LLBG would not be modified and CWC or any other TSD unit would not receive and store the currently buried TRU waste drums.

3.2 ALTERNATIVE TO RETRIEVE ALL POST-1970 TRU WASTE FROM LLBG 218-W-4B AND 218-W-4C

This alternative would retrieve all post-1970 TRU waste from LLBG 218-W-4B AND 218-W-4C, including the boxes, casks, and other large containers and the remote handled (RH) containers that are not included for retrieval in the proposed action. These large and RH containers would be shipped to a storage facility where they would await processing in a RH and large container TRU waste processing facility that would be constructed or modified as part of future activities.

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4.0 AFFECTED ENVIRONMENT

The following sections provide a discussion of the existing environment that would be affected by the proposed action and alternatives.

4.1 GENERAL HANFORD SITE ENVIRONMENT

The Hanford Site, about 1,517 square kilometers (586 square miles) is located in southeastern Washington State, in a semiarid region with rolling topography. Two topographical features dominate the landscape: Rattlesnake Mountain located on the southwest boundary and Gable Mountain located on the northern portion. The Columbia River flows through the northern part and forms part of the eastern boundary of the Hanford Site. Areas adjacent to the Hanford Site primarily are agricultural lands. The 200 East Area and 200 West Area have been used heavily as waste processing and waste management areas.

Designations for land use on the Hanford Site for the next 50 years have been established in the *Final Comprehensive Land-use Plan Environmental Impact Statement* (DOE/EIS-0222-F). These designations on the Hanford Site include preservation, conservation, industrial, and research and development. On June 9, 2000, the Hanford Reach National Monument was established (65 FR 37253) covering approximately 78,900 hectares (195,000 acres) under the preservation land use category. The Hanford Reach National Monument incorporates a portion of the Columbia River corridor, the Fitzner-Eberhardt Arid Lands Ecology Reserve to the south and west, portions of the Hanford Site north of the Columbia River, and recognizes the unique character and biological diversity of the area, as well as its geological, paleontological, historic, and archaeological importance.

The Hanford Site has a mild climate with 15 to 18 centimeters (6 to 7 inches) of annual precipitation, with most of the precipitation taking place during the winter months. Temperature ranges of daily maximum temperatures vary from normal maxima of 2°C (36°F) in early January to 35°C (95°F) in late July. Monthly average wind speeds are lowest during the winter months, averaging 10 to 11 kilometers (6 to 7 miles) per hour, and highest during the summer, averaging 14 to 16 kilometers (8 to 10 miles) per hour (PNNL-6415). Tornadoes are rare in the region surrounding the Hanford Site.

During 2000, the Hanford Site air emissions remained below all established limits set for regulated air pollutants (PNNL-13487). Atmospheric dispersion conditions of the area vary between summer and winter months. The summer months generally have good air mixing characteristics. If the prevailing winds from the northwest are light, less favorable dispersion conditions might occur. Occasional periods of poor dispersion conditions occur during the winter months.

On June 27, 2000, a fire known as the 24 Command Fire, spread rapidly and eventually consumed 66,322 hectares (163,884 acres) of federal, state, and private lands. A total of 24,384 hectares (60,254 acres) within the Hanford Site burned, including lands within the Hanford Reach National Monument, most of the Fitzner-Eberhardt Arid Lands Ecology Reserve, and areas near former production sites. Fire suppression impacts included construction of 66 kilometers (41 miles) of bulldozed fire lines, widened dirt roads, and cut fences (DOI 2000). Impacts to the land should not be permanent because of rehabilitation measures, including revegetation and fence repair.

The vegetation on the Hanford Site is a shrub-steppe community of sagebrush and rabbitbrush with an understory consisting primarily of cheatgrass and Sandberg's bluegrass. The typical insects, small birds, mammals, and reptiles common to the Hanford Site can be found on the 200 Areas Plateau (PNNL-6415).

Relatively undisturbed areas of the mature shrub-steppe vegetation are high quality habitat for many plants and animals and have been designated as "priority habitat" by Washington State.

Most mammal species known to inhabit the Hanford Site are small, nocturnal creatures, primarily pocket mice and jackrabbits. Large mammals found on the Hanford Site are deer and elk, although the elk exist almost entirely on the Fitzner-Eberhardt Arid Lands Ecology Reserve. Coyotes and raptors are the primary predators. Several species of small birds nest in the steppe vegetation. Semiannual peaks in avian variety and abundance occur during migration seasons. Additional information concerning the Hanford Site can be found in PNNL-6415.

DOE-RL and its contractors dominate the local employment picture with almost one-quarter of the total nonagricultural jobs in Benton and Franklin counties. Ninety-three percent of Hanford Site personnel reside in the Benton and Franklin county areas. Therefore, work activities on the Hanford Site play an important role in the socioeconomics of the Tri-Cities (Richland, Pasco, and Kennewick) and other parts of Benton and Franklin counties (PNNL-6415). Other counties are less affected by changes in Hanford Site employment.

4.2 SPECIFIC SITE ENVIRONMENT

The proposed TRU waste drum retrieval would occur in a previously disturbed area within the 218-W-4B and 218-W-4C (Figure 2) LLBG in the 200 West Area on the Hanford Site. The 200 West Area LLBG contain generally shallow trenches of about 6 meters (20 feet) deep, around 30 meters (100 feet) wide, and up to 220 meters (720 feet) in length. The two LLBG provide for disposal of LLW and the retrievable storage of TRU waste.

The CWC, also in the 200 West Area, stores mixed LLW, TRU waste, and a small amount of LLW awaiting treatment and final disposal. The storage areas include 12 small mixed waste storage buildings, seven large storage buildings, and the 2420-W Building (used for cask storage). There is adequate storage space available in CWC to accommodate the proposed action. The waste is generally packaged in 208-liter (55-gallon) drums unless alternate packages are dictated by size, shape, or other form of waste. Each drum is handled individually using a hand truck, fork lift, or crane. Drums are placed on wooden pallets with a maximum of four drums handled together; the pallets can be stacked three-high, or 12 drums per stack. The storage buildings or pads have physical features that provide for segregated storage areas to maintain appropriate separation between groups of incompatible waste.

Both the LLBG and CWC are approximately 9.2 kilometers (5.7 miles) southwest of the Columbia River. The 200 West Area is not located in a 100-year or 500-year floodplain, nor located within a wetlands area (PNNL-6415). The elevations for the 200 Areas average about 218 meters (715 feet) above mean sea level. The 200 West Area does not contain any prime farmland, state or national parks, forests, conservation areas, or other areas of recreational, scenic, or aesthetic concern. The proposed action is consistent with the land use designation of industrial exclusive use for such activities as described in DOE/EIS-0222-F. The city of Richland (population approximately 38,000), located about 40 kilometers (25 miles) from the 200 Areas in Benton County, adjoins the southernmost portion of the Hanford Site boundary and is the nearest population center.

4.2.1 Soil and Subsurface

The soil in the 200 Areas is predominately a sand and gravel mixture. All areas within the proposed action have been disturbed previously and scraped clean of any vegetation. The geologic strata under the

surface layer, in descending order, are Holocene eolian deposits, Hanford formation, Ringold Formation, and the Columbia River Basalt Group. The eolian sands are fine- to coarse-grained, and relatively quartz- and feldspar-rich. Deposits of the Hanford formation underlie the eolian deposits. Hanford formation strata generally are dominated by deposits typical of the gravel-dominated facies consisting of uncemented granule to cobble gravels and minor coarse-grained sand. This is underlain by the top of the Ringold Formation. Basalt flows of the Columbia River Basalt Group and intercalated sediments of the Ellensburg Formation underlie the Ringold Formation. The region is categorized as one of low to moderate seismicity (PNNL-6415).

4.2.2 Hydrology

The water table in the 200 Areas is approximately 75 meters (240 feet) to 90 meters (290 feet) below the surface (PNNL-6415).

4.2.3 Air Resources

Air emissions from the proposed action would come from diffuse and fugitive sources, such as soil disruption during excavation as well as releases from vented containers. The activity would require submittal of a Notice of Construction (NOC) per WAC 246-247-110(9), *Radiation Air Emissions*, to WDOH and be subject to approval conditions and limitations. The activity would use all appropriate emission control measures to minimize impact to ambient air. Excavation might involve the use of the specially designed and regulated soil guzzler vacuum excavation system. All drum venting would be through a HEPA filtered venting device.

4.2.4 Biological Resources

A Hanford Biological Review ECR #2001-200-064 (Appendix A) was conducted for the proposed action. The 218-W-4B and 218-W-4C LLBG are highly disturbed. No plant or animal species protected under the *Endangered Species Act (ESA) of 1973*, on the federal list of "Endangered and Threatened Wildlife and Plants" (50 CFR 17), or on the Washington State list of threatened or endangered species has been found in the area of the proposed action.

4.2.5 Cultural Resources

A Hanford Cultural Resources Review #2001-200-064 (Appendix B) was conducted for the proposed action. The review concluded that, "It is the finding of HCRL that no historic properties are affected by this undertaking". Personnel must be directed to watch for cultural materials (e.g., bones, artifacts) during all work activities. If any are encountered, work in the vicinity of the discovery must stop until an appropriately qualified archaeologist has been notified.

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5.0 ENVIRONMENTAL IMPACTS

The following sections describe potential impacts from the proposed action.

5.1 MODIFICATION AND OPERATION IMPACTS

Impacts from the modification and operation activities are described in the following sections.

5.1.1 Soil or Subsurface Disturbance

All soil disturbances would occur on previously disturbed soil within the 218-W-4B and 218-W-4C LLBG. All soil and subsurface activities would be temporary. Therefore, the anticipated impacts to the environment are not expected to be consequential.

5.1.2 Liquid Discharges to the Groundwater or Surface Waters

TRU waste retrieval activities might include application of clean water or fixatives for fugitive dust control. However, because the water table is more than 75 meters (240 feet) below the surface, this activity would have little effect on groundwater or surface waters. Standard LLBG operational run-on/run-off controls would be used.

5.1.3 Gaseous, Particulate, or Thermal Discharges to the Air

Small quantities of gaseous and particulate discharges might occur from typical excavation activities in the LLBG. Other than some vehicle or crane exhausts, thermal discharges would not be expected. Sources could include the disturbance of contaminated soil, releases from the unearthing of contaminated or breached containers, installation of HEPA filtered venting devices, and very minor releases from the vented containers through the HEPA filtered devices.

Under the proposed action, all air effluents would be diffuse and fugitive. Monitoring for diffuse and fugitive emissions is conducted through the Near-Facility Environmental Monitoring Program.

Only very minor radiological and hazardous substance releases are expected during excavation, venting operations, and from the vented containers. Any unexpected releases would come from breached drums. The number of breached drums is expected to be very low. Under conditions that would be in effect, no substantial increases in overall emissions are envisioned from the proposed action.

5.1.4 Radiation Exposure

Any retrieval work in the LLBG would be performed in compliance with as low as reasonably achievable (ALARA) principles, applicable federal and state regulations, and DOE Orders and guidelines. The LLBG are monitored routinely for radiation levels, and radiation work permits would specify the radiological condition and any entry requirements. Personnel would be required to have appropriate training, wear appropriate personal protective equipment, adhere to ALARA principles, and follow established administrative controls. Localized areas of potential radionuclide contamination would be

cleaned up, packaged, and disposed of, however the proposed action would not remediate large areas of the LLBG. Radionuclide contamination releases, if any, are expected to be extremely small. Because potential internal deposition would be expected to be extremely small, inhalation doses were not included or calculated in the dose estimates.

Personnel radiation protection during both LLBG modifications and retrieval activities would be provided through the use of procedural controls and engineering controls as appropriate. Potential radiological exposure received by personnel during the proposed action would be similar to exposures that occur during current routine LLBG operation activities. Radiation exposures would be controlled administratively below DOE limits established in 10 CFR 835, "Occupational Radiation Protection" and the *Project Hanford Radiological Control Manual* (HNF-5173).

Based on existing information contained in WHC-EP-0225, *Contact-Handled Transuranic Waste Characterization Based On Existing Records*, a dose estimate was calculated for the proposed action. Since the time the documents were released some of the waste containers have been moved between trenches or moved from the LLBG to another TSD unit, but no additional TRU waste has been moved into those trenches. Based on existing information, bounding dose conditions have been calculated. This information was used for the bounding inventory values in the safety analysis.

The inventory presented above was consolidated and grouped into distinct dose rate categories (Table 1) based on information contained in WHC-EP-0225. Once the inventory was grouped into the dose rate categories, a statistical analysis was performed to determine the percentage of packages in each category. A dose rate was estimated and assigned for each category. The following assumptions and information were used in order to estimate the total dose to an individual worker and cumulative dose that would be expected.

Based on the number of years (approximately thirty years) that have elapsed since the start of placement of TRU waste and considering the isotopic distribution and the dose rate information stated in WHC-EP-0225, it was assumed that the dose rates would be half the reported value because of radioactive decay. In addition, it was assumed that the exposure would be received at a distance of 2 feet from the source term (a factor of 4 reduction in the contact exposure rate). These data were applied to the life cycle of the retrieval project (currently 5 years).

To estimate the dose received during the project, occupancy factors were applied to the amount of time personnel would be in the dose rate categories listed in Table 1. The amount of time an individual would be in the estimated dose rates was 40% of an occupational year (i.e., 2000 hours per year with a 40% occupancy rate indicates that the annual exposure time in the referenced dose rate would be 800 hours per year or 4000 hours for the project). To determine the cumulative dose shown in Table 1, three workers were assumed to be involved in the retrieval activities and receive exposure from the source term at the calculated rate over the life of the proposed action.

Table 1. Potential Radiological Doses per Dose Rate Category.

Dose rate category (mrem/hr)	Percentage of packages in category	Dose Rate during retrieval operations (mrem/hr)	Individual estimated total dose received (mrem)	Cumulative dose (person-mrem)
< 5	91.4	0.1	366	1,097
5 to 10	5.1	0.9	182	546
10 to 20	1.0	1.9	75	226
20 to 50	1.0	4.5	179	538
50 to 100	0.6	9.5	220	661
100 to 150	0.2	15.8	141	422
150 to 250	0.3	22	259	776
Greater than 250	0.4	31.3	557	1,671

mrem/hr = millirem per hour

Based on these estimates, the projected total cumulative dose for the TRU retrieval project has been calculated to be approximately 5.9 person-rem over the 5 year period for the proposed action.

Because the proposed action would involve only extremely small radionuclide releases and low direct radiation exposure during LLBG modifications and retrieval activities, these impacts to the environment would be expected to be small.

5.1.5 Nonhazardous Solid Waste Generated

It is expected that only small amounts of nonhazardous solid waste would be generated during the proposed action. The addition of nonhazardous waste from the proposed action into an onsite landfill would be small compared to the expected overall waste disposal capacity on the Hanford Site. In addition, other facilities would be expected to have adequate capacity to accept all other waste volumes from the proposed action. All nonhazardous waste would be disposed of in accordance with applicable requirements. Therefore, these impacts to the environment would be expected to be small.

5.1.6 Hazardous, Dangerous, or Radioactive Waste Generated

Small amounts of potential hazardous/dangerous/radioactive waste might be generated during operation. This waste, if generated, would be managed and disposed of in accordance with applicable federal and state regulations. Waste that might be generated from the proposed action would be expected to be minimal compared to annual Hanford Site waste generation. Therefore, these impacts to the environment would not be expected to be consequential.

5.1.7 Hazardous Substances Present

Table 2 presents the possible hazardous substances present in a small number of the drums to be retrieved under the proposed action.

Table 2. Potential Hazardous
Substances in Small Number of Drums.

Ammonia
Beryllium
Cadmium
Cyclohexane
Dioxane
Hydrogen Peroxide
Indole-2-C-14 picrate
Manganese
Mercury
Naphthylamine tritium
Nitric Acid
Phosphoric acid
Propane
Sodium
Sodium Hydroxide
Sodium hypochlorite
Sodium oxalate
Styrene
Tetrahydrofuran
Uranyl nitrate hexahydrate
Vinyl ester/ acetate resins
Vinyl chloride/ resins
Zirconium

During normal retrieval operations, personnel would not be expected to be exposed to these hazardous substances.

5.1.8 Disturbance to Previously Undeveloped Areas

All areas within the proposed action are previously disturbed areas.

5.1.9 Consumption or Commitment of Nonrenewable Resources

Consumption of nonrenewable resources (e.g., fuel, wiring, venting devices) would occur. None of the materials to be used are in short supply. The amount of consumption would be minimal and managed through established procedures.

5.1.10 Effects on Federal or State Listed, Proposed or Candidate, Threatened or Endangered Species

No federal or state-listed, proposed, candidate, threatened, or endangered species are expected to be affected, because the proposed action would occur within the previously disturbed LLBG and the biological review, ECR #2001-200-064 (Appendix A) did not identify any affected species.

5.1.11 Effects on Cultural Resources

A Hanford Cultural Resources Review, HCRC #2001-200-064 (Appendix B), was conducted for the proposed action. The review concluded that: "No historic properties are affected by this undertaking". In addition, the State archaeologist concurred "...that no cultural resources are in the identified area of potential effect" (Appendix B). Workers would be directed to watch for cultural materials (e.g., bones, artifacts) during all work activities. If any are encountered, work in the vicinity of the discovery would stop until an archaeologist has made an assessment. Therefore, no adverse impacts under the *National Historic Preservation Act of 1966* are expected.

5.1.12 Effects on any Floodplain or Wetland

The retrieval activities would not occur in a 100- or 500-year floodplain, nor within any area designated as a wetland.

5.1.13 Effects on any Wild and Scenic River, State or Federal Wildlife Refuge, or Specially Designated Area

The proposed action is outside any Wild and Scenic River corridor, state or federal wildlife refuge, or specially-designated area.

5.1.14 Reasonably Foreseeable Accidents Considered and the Potential Effects

The term 'reasonably foreseeable accident' does not imply that the accident is likely to occur. It does suggest that the accident has a frequency of occurrence of greater than one in a million.

Modifications Phase

The reasonably foreseeable accidents during the minor LLBG modifications would be typical construction accidents. Nonradiological risks to personnel from occupational illness or injury were based on statistics for DOE and DOE contractor experience (DOE 2000). The lost work-day rate is 63 per 200,000 hours of construction work. The fatality rate is close to zero per 200,000 hours of work. About 1 lost work day and no fatalities would be expected during the retrieval phase. All LLBG modification personnel would follow approved LLBG safety procedures for modification activities. There have been no lost workdays in the LLBG over the last 2 years. Public health and safety would not be affected because the area is closed to the general public. Typical construction hazards would exist during the LLBG modifications; however, the risk of severe accidents would be small.

Retrieval Phase

During retrieval of waste containers under the proposed action, operations would be similar to the current uncovered TRU waste drum removal activities in the LLBG, which are conducted under a DOE-approved LLBG safety authorization basis and in conformance with recognized safety codes, regulations, and approved procedures. Administrative controls would be used to reduce the chance of accidents.

The preliminary hazard evaluation for the retrieval of TRU from the LLBG has been performed. A fire and explosion involving retrieved containers was postulated as the bounding accident scenario because of potential mixing of incompatible materials, unvented hydrogen buildup, or the ignition of propane from discarded cylinders. Hazardous materials might be present in waste to be retrieved. Among the waste contents were incompatible materials that could interact, discarded propane cylinders, and materials causing the potential for hydrogen buildup. These conditions could lead to the explosion of a container. The frequency of the event was judged to be in the extremely unlikely ($<10^{-4}$ $>10^{-6}$) event frequency category.

A handling accident resulting in an explosion would be initiated in the same manner as a mechanical release. A drum picker (modified forklift) could puncture drums while attempting to grab a drum, or could cause drums to fall from elevated positions through unintended contact, through a rapid stop, or through a rapid start. A number of the drums removed from the modules might not be vented; unvented drums could have hydrogen-oxygen mixes that might ignite on dropping of the drum, if the impact caused an internal spark. If incompatible materials were present (initially in separate containers, probably 1-liter plastic jars but possibly glass) in a drum that was punctured or dropped, breaking or spilling the separate containers could occur from the damage induced by the accident, mixing of incompatible materials or ignition of hydrogen gas could occur, and an explosion could result. A puncture of a drum by equipment would rupture the drum and could damage multiple containers or a propane cylinder. The piercing by the drum picker also could provide the spark to ignite the propane or hydrogen gas.

The scenario for the bounding accident not only involved the drum that exploded, but also postulated that 29 other containers could be involved in the accident. It was postulated that the fire resulting from the exploded drum ignited the exposed material from the other containers. The source term for the drums involved in an explosion accident would involve a drum containing 494 grams TRU, and the subsequent rupture and burning release of the contents of 29 containers with 200 grams of TRU each.

The dropping of a container resulting in an explosion in one drum and a fire in other drums could occur because of either a mechanical failure or an operator error. The risk associated with the accident was determined by comparing the consequences and frequency of the event to the risk evaluation guidelines based on SEN-35-91, *DOE Nuclear Safety Policy*. Comparison of the event consequences to the evaluation guidelines is documented in Table 3. The unmitigated onsite and offsite dose consequences for a multiple TRU container explosion accident were less than the evaluation criterion. The doses also were below the emergency preparedness action guide of 1 rem offsite (conservatively taken to be the river boundary).

Table 3. Comparison of Maximum Exposed Individual Doses to Risk Guidelines.

Receptor location	Projected dose (rem)	Guideline (rem)
Nearest facility	84	100.0
Closest river shore	0.53	1.0
Site boundary	0.42	1 to 25.0

To provide perspective on the anticipated health effects associated with projected accident doses of the magnitude presented in Table 3 above, the occupational dose risk factor of 4×10^{-4} fatal cancers per person-rem and the public dose risk factor of 5×10^{-4} fatal cancers per person-rem are used to project potential effects. Maximally exposed individuals, if they actually received doses of the magnitude shown in Table 3, would have an estimated 3.4 % increase in probability of radiation-induced cancer for a worker

at the nearest facility not involved in the accident, an estimated 0.026% increase in probability of radiation-induced cancer for a member of the public located on the nearest river shore, or an estimated 0.021% increase in probability of radiation-induced cancer for a member of the public located at the site boundary. It is most likely that there would be no incidents of fatal cancer attributable to projected accident exposures of the magnitude shown in the table.

Any of the accident sequences analyzed have the potential to release toxic material as well as radioactive material. The toxic consequences of a release from a drum in a fire were compared to the temporary emergency exposure limits (TEELs) as established by the U.S. Department of Energy, Subcommittee on Consequence Assessment and Protective Actions (WSMS-SAE-99-0001 2000), as this scenario has a potential high release fraction.

The potential hazardous chemical concentrations are shown in Table 4 for the worst case inventories. A comparison of chemical concentrations to TEELs for the bounding accident is shown. TEEL-1 is the maximum concentration in the air below which it is believed nearly all individuals could be exposed without experiencing other than mild transient health effects or perceiving a clearly defined objectionable odor. TEEL-2 is the maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action. It is unreasonable to assume that the maximum concentrations for several different chemicals are in the same drum, per WHC-EP-0225.

Table 4. Comparison of Chemical Concentrations to Temporary Emergency Exposure Limits for Bounding Accident.

Chemical	Maximum amount in a drum (kg)	Concentration at Nearest Facility (mg/m ³)	TEEL 2 (mg/m ³)	Ratio of Concentration at the Near Facility To TEEL 2	Concentration at site boundary (mg/m ³)	TEEL 1 (mg/m ³)	Ratio of Concentration at the Near River To TEEL 1
Ammonia	0.45	3.45 E-04	140	2.47 E-06	6.21 E-07	18	3.45 E-08
Beryllium	7	5.37 E-03	0.025	2.15 E-01	9.66 E-06	0.005	1.93 E-03
Cadmium	89.99	6.90 E-02	4	1.73 E-02	1.24 E-04	0.03	4.14 E-03
Cyclohexane	3.75	2.88 E-03	4,500	6.39 E-07	5.18 E-06	3,100	1.67 E-09
Dioxane	25.22	1.93 E-02	450	4.30 E-05	3.48 E-05	270	1.29 E-07
Hydrogen peroxide	0.49	3.83 E-04	70	5.48 E-06	6.90 E-07	14	4.93 E-08
Indole-2-c24 picrate	0.0001	7.67 E-08	0.5	1.53 E-07	1.38 E-10	0.3	4.60 E-10
Manganese	0.06	4.60 E-05	5	9.21 E-06	8.28 E-08	3	2.76 E-08
Mercury	43.55	3.34 E-02	0.1	3.34 E-01	6.01 E-05	0.1	6.01 E-04
Naphthylamine tritium	102.06	7.83 E-02	260	3.01 E-04	1.41 E-04	35	4.03 E-06
Nitric acid	34.99	2.68 E-02	13	2.07 E-03	4.83 E-05	2.6	1.86 E-05
Phosphoric acid	49.98	3.83 E-02	5	7.67 E-03	6.90 E-04	3	2.30 E-05
Propane	0.89	6.90 E-04	3,800	1.82 E-07	1.24 E-06	3,800	3.27 E-10
Sodium	2.56	1.96 E-03	500	3.93 E-06	3.53 E-06	150	2.36 E-08
Sodium hydroxide	37.19	2.85 E-02	5	5.71 E-03	5.13 E-05	0.5	1.03 E-04
Sodium hypochlorite	0.0075	5.75 E-06	500	1.15 E-08	1.04 E-08	75	1.38 E-10
Sodium oxalate	48.26	3.70 E-02	50	7.40 E-04	6.66 E-05	30	2.22 E-06
Styrene	2.75	2.11 E-03	1,100	1.92 E-06	3.80 E-06	210	1.81 E-08
Tetrahydrofuran	1.35	1.04 E-03	3,000	3.45 E-07	1.86 E-06	740	2.52 E-09
Uranyl nitrate hexahydride	6.11	4.69 E-03	0.6	7.81 E-03	8.44 E-06	0.6	1.41 E-05
Vinyl ester/acetate	2.75	2.11 E-03	500	4.22 E-06	3.80 E-06	100	3.80 E-08
Vinyl chloride	4.09	3.14 E-03	13	2.42 E-04	5.65 E-05	13	4.35 E-07
Zirconium	0.86	6.60 E-04	10	6.60 E-05	1.19 E-06	10	1.19 E-07

kg = kilogram

mg/m³ = milligram per cubic meter.

Table 4 shows that even under worst-case inventories for potential hazardous materials in drums under the bounding accident scenario, that TEEL limits would not be exceeded.

5.2 SOCIOECONOMIC IMPACTS

A temporary contractor most likely would be hired to run the assay and venting equipment/operations. However, most of the proposed TRU waste retrieval activities would involve existing operating personnel at LLBG, so no long-term additional personnel would be needed. In a local population of over 165,000 persons with a workforce in excess of 8,000 persons on the Hanford Site, the socioeconomic impacts of this proposed action would be expected to be small. There would be no discernible impact to employment levels within Benton and Franklin counties. The proposed action would use existing operating and some construction personnel to perform LLBG modifications on the Hanford Site; therefore, the proposed action would have little, if any, socioeconomic impacts.

5.3 ENVIRONMENTAL JUSTICE IMPACTS

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", requires that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or socioeconomic effects of their programs and activities on minority and low-income populations. Minority populations and low income populations are present near the Hanford Site (PNNL-6415). The analysis of the impacts in this EA indicates that there would be minimal impacts to both the offsite population and potential workforce by implementing the proposed action. The offsite health impacts from the proposed action analyzed in this EA are expected to be minimal. Therefore, it is not expected that there would be any disproportionately high and adverse impacts to any minority or low-income portion of the community.

5.4 CUMULATIVE IMPACTS

In analyzing the impacts of the proposed action, increased radioactive dose, potential toxicological exposures, and potential accident scenarios to personnel would occur temporarily during the retrieval of TRU waste containers. The proposed action is sited in LLBG designed to contain radioactively contaminated materials and conduct remote handling operations. Potential air releases from insertion of HEPA filtered venting devices would be very minor and temporary. Once vented, all TRU waste drum emissions would be captured by the HEPA filter, or a similar device. The potential unabated air releases from the proposed action as described in the NOC is 0.063 mrem, which would be less than the total Hanford Site releases to the air of 0.095 mrem reported in 2000 (DOE/RL-2001-32).

All nonhazardous solid waste and hazardous or dangerous waste would be generated in small quantities, easily handled by existing storage or disposal methods on the Hanford Site.

Because the proposed action would involve existing operations and construction personnel and a small crew of temporary assay and venting personnel, little or no change is expected in the overall workforce on the Hanford Site or within Benton and Franklin counties. Operations within the LLBG would be modified slightly, but change little because of the proposed action. There would be no adverse socioeconomic

impacts or any disproportionately high and adverse impacts to any minority or low-income portion of the community.

Because there are no substantial, foreseeable adverse impacts from this proposed action, there would be no substantial addition to Hanford Site cumulative impacts.

5.5 IMPACTS FROM ALTERNATIVES

Alternatives and the No Action Alternative are discussed in the following sections.

5.5.1 Impacts of the No Action Alternative

The No Action Alternative would involve leaving the TRU waste in the LLBG in its current state, for now. This would result in little to no change in existing short-term conditions within the LLBG. The potential long-term impacts of the No Action Alternative for this EA is the same as the potential impacts of the No Action Alternative as analyzed in Section 5.5.4 of DOE/EIS-0113, and the long-term analysis is not repeated here.

5.5.2 Impacts of Alternative to Retrieve Post-1970, Suspect CH-TRU Waste from the 218-W-4B and 218-W-4C LLBG

The alternative to retrieve all post-1970 suspect CH-TRU waste from the 218-W-4B AND 218-W-4C LLBG, including the boxes, casks, and other large containers and RH containers was not analyzed in detail. The impacts of this alternative would be a higher potential for personnel exposure due to more movements of waste containers. The impacts would include substantially greater cost due to the need to develop a storage facility capable of storing the large and RH waste containers until they can be processed in the future. This alternative may be considered at a future time, when it aligns with treatment and processing capacity for the large and RH waste.

6.0 PERMITS AND REGULATORY REQUIREMENTS

It is the policy of the DOE to carry out its operations in compliance with all federal, state, and local laws and regulations; Presidential Executive Orders; DOE Orders; and DOE-RL Directives. The proposed action would follow pollution prevention requirements under *Executive Order 12856: Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements*. The *Radioactive Air Emissions Notice of Construction for the Transuranic Waste Retrieval Project* (DOE/RL-2001-57), an air permit NOC per WAC 246-247-110(9), *Radiation – Air Emissions*, was approved by WDOH on January 7, 2002. The U.S. Environmental Protection Agency (EPA) approved the NOC on February 14, 2002. Environmental regulatory authority over the Hanford Site is vested in federal and state agencies.

The Hanford Site is subject to the emission limits of WAC 173-400-040, *General Standards for Maximum Emissions* and WAC 173-460, *Controls for New Sources of Toxic Air Pollutants*, which are designed to protect existing air quality. While New Source Review in accordance with WAC 173-400-110 has been determined to be applicable, the potential emissions have been determined to be below the Small Quantity Emission Rates and Acceptable Source Impact Levels. Therefore, a NOC application under WAC 173-400 or WAC 173-460 would not be required.

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7.0 ORGANIZATIONS CONSULTED

Before approval of this EA, a draft version was sent for a 30 day review to the following:

- Nez Perce Tribe
- Confederated Tribes of the Umatilla Indian Reservation
- Yakama Nation
- Confederated Tribes of the Colville Reservation
- Wanapum People
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Washington State Departments of Ecology, Fish & Wildlife, and Health
- Oregon Office of Energy
- Benton County
- Franklin County
- City of Pasco
- City of Richland
- City of West Richland
- Hanford Advisory Board
- Heart of America
- Physicians for Social Responsibility.

A draft version of this EA was made available in the DOE reading room (Consolidated Information Center at Washington State University Tri-Cities), and a notice of availability was placed in the Tri-City Herald.

Comments were received from the Nez Perce Tribe and the Washington State Department of Ecology. These comments were considered in the preparation of the final EA. Copies of the comments and DOE responses are located in Appendix C.

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8.0 REFERENCES

- 10 CFR 835, DOE "Occupational Radiation Protection".
- 10 CFR 1021, DOE "National Environmental Policy Act Implementing Procedures".
- 40 CFR 1500-1508, Council on Environmental Quality "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act".
- 50 CFR 17, "Endangered and Threatened Wildlife and Plants".
- 65 FR 37253, June 9, 2000, *Proclamation 7319 of June 9, 2000, Establishment of the Hanford Reach National Monument*, Presidential Documents, June 13, 2000.
- AEC Order 0511, 1973, *Atomic Energy Commission Order 0511*, Atomic Energy Commission-Headquarters, Washington, D.C.
- DOE, 2000, *DOE Computerized Accident/Incident Reporting System (CAIRS), including Occupational Injury and Property Damage Summary*, January-March 2000, U.S. Department of Energy, Washington, D.C.
- DOE/EA-0981, *Environmental Assessment Solid Waste Retrieval Complex, Enhanced Radioactive and Mixed Waste Storage Facility, Infrastructure Upgrades, and Central Waste Support Complex, Hanford Site, Richland, Washington*.
- DOE/EIS-0113, *Final Environmental Impact Statement Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes*, December 1987, U.S. Department of Energy, Richland, Washington
- DOE/EIS-0222-F, *Final Comprehensive Land-Use Plan Environmental Impact Statement, Richland, Washington*, September 1999, U.S. Department of Energy, Richland, Washington
- DOE-G-151.1-1, *Introduction to the Emergency Management Guide, Volume I*, U.S. Department of Energy, Washington D.C.
- DOE/RL-2001-32, *Radionuclide Air Emissions Report for the Hanford Site, Calendar Year 2000*, June 2001, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-2001-57, Rev. 1, *Radioactive Air Emissions Notice of Construction for the Transuranic Waste Retrieval Project*, December 2001, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOI 2000, *24 Command Fire, Burned Area Emergency Rehabilitation(BAER) Plan*, July 7, 2000, U.S. Department of Interior, Northern States Burned Area Emergency Rehabilitation Team, Hanford, Washington.
- Endangered Species Act of 1973*, 16 U.S.C. 1531 et seq.
- Executive Order 12856, *Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements*.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*.

HNF-5173, *Project Hanford Site Radiological Control Manual*, Rev. 0, November 1999, Fluor Hanford, Richland, Washington.

Migratory Bird Treaty Act, 16 U.S.C. 1431 - 1543, et seq.

National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq.

National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq.

PNNL-6415, *Hanford Site National Environmental Policy Act (NEPA) Characterization*, Rev. 13, September 2001, Pacific Northwest National Laboratory, Richland, Washington.

PNNL-13487, *Hanford Site Environmental Report for Calendar Year 2000*, September 2001, Pacific Northwest National Laboratory, Richland, Washington.

SEN-35-91, *DOE Nuclear Safety Policy*.

WAC 173-400, *General Regulations for Air Pollution Sources*.

WAC 173-460, *Controls for New Sources of Toxic Air Pollutants*.

WAC 246-247, *Radiation Protection – Air Emissions*.

WHC-EP-0225, *Contact Handled Transuranic Waste Characterization Based on Existing Records*, Rev. 1, September 1991, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-W113-PSE-001, *Solid Waste Retrieval Phase 1 Preliminary Safety Evaluation (PSE)*, 1991, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-W211-DP-001, *Phase 2 Solid Waste Retrieval Trench Characterization*, 1994, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-WM-TI-517, *Radioisotopic Characterization of Retrievably Stored Transuranic Waste Containers at the Hanford Site*, Rev. 1, 1996, Westinghouse Hanford Company, Richland, Washington.

WSMS-SAE-99-0001, 2000, *ERPGs and TEELs for Chemicals of Concern: Rev.16 Abbreviated (January 2000)*, Westinghouse Safety Management Solutions, Aiken, South Carolina.

APPENDIX A

BIOLOGICAL RESOURCES REVIEW

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Pacific Northwest National Laboratory

Operated by Battelle for the
U.S. Department of Energy

June 27, 2001

Mr. Daniel G. Saueressig
Fluor Daniel Hanford /Waste Management
P. O. Box 1000, MSIN T4-04
Richland, WA 99352

Dear Mr. Saueressig:

BIOLOGICAL REVIEW OF THE TRU RETRIEVAL PROJECT, 200W Area, ECR #2001-200-064.

Project Description:

- Waste currently buried in several trenches within the 218-W-4C and -4B burial grounds will be retrieved. Work will consist of scraping off the existing soil cap and removing the drums or other containers. Cap material will be stored in spoil piles over adjacent trenches, within other parts of the trenches, or used as cover for other waste containers.

Survey Objectives:

- To determine the occurrence in the project area of plant and animal species protected under the Endangered Species Act (ESA), candidates for such protection, and species listed as threatened, endangered, candidate, sensitive, or monitor by the state of Washington, and species protected under the Migratory Bird Treaty Act,
- To evaluate and quantify the potential impacts of disturbance on priority habitats and protected plant and animal species identified in the survey.

Survey Methods:

- Pedestrian and ocular reconnaissance of the proposed project site were performed by C. A. Duberstein and M. R. Sackschewsky on 23 April 2001. The percent cover of dominant vegetation was visually estimated,
- Priority habitats and species of concern are documented as such in the following: Washington Department of Fish and Wildlife (1994, 1996), Washington State Department of Natural Resources (1997), and for migratory birds, U.S. Fish and Wildlife Service (1985). Lists of animal and plant species considered Endangered, Threatened, Proposed, or Candidate by the USFWS are maintained at 50 CFR 17.11 and 50 CFR 17.12.

Survey Results:

- The proposed project sites are mostly highly disturbed, with sparse cover of Russian thistle (*Salsola kali*), cheatgrass (*Bromus tectorum*), and crested wheatgrass (*Agropyron*)

902 Battelle Boulevard • P.O. Box 999 • Richland, WA 99352

Telephone (509) 376-2554 E-mail: michael.sackschewsky@pnl.gov FAX: (509) 372-3515

Mr. D. G. Saueressig
2001-200-064
Page 2 of 2

cristatum). Native species such as Sandberg's bluegrass (*Poa sandbergii*), gray rabbitbrush (*Chrysothamnus nauseosus*) and Indian ricegrass (*Oryzopsis hymenoides*) are present but are sparsely distributed.

- No migratory bird species were observed nesting in the vicinity of the proposed site, however several species could nest in the vicinity, including killdeer and nighthawks, both of which favor barren gravel areas as nest sites.

Considerations and Recommendations:

- No plant or animal species protected under the ESA, candidates for such protection, or species listed by the Washington state government as threatened or endangered were observed in the vicinity of the proposed site.
- It is recommended that scraping of areas that have not been recently disturbed be performed during the non-nesting season (i.e. between August 1 and April 1) to avoid destruction of migratory bird nests. If such disturbance between April and August is required, please contact the ECAP staff for further site-specific review.
- No adverse impacts to species, habitats, or other biological resources are expected to result from the proposed actions.
- This Ecological Compliance Review is valid until 15 April 2002.

Sincerely,



Michael R. Sackschewsky
Project Manager
Ecological Compliance Assessment Project

REFERENCES

- U. S. Fish and Wildlife Service. 1985. Revised List of Migratory Birds; Final Rule. 50 FR 13708 (April 5, 1985).
- Washington Department of Fish and Wildlife. 1994. Species of Special Concern in Washington.
- Washington Department of Fish and Wildlife. 1996. Priority Habitats and Species List.
- Washington Department of Natural Resources. 1997. Endangered, Threatened & Sensitive Vascular Plants of Washington.

APPENDIX B

CULTURAL RESOURCES REVIEW

Appendix available upon request.

APPENDIX C

PUBLIC COMMENTS/RESPONSES

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Nez Perce

ENVIRONMENTAL RESTORATION & WASTE MANAGEMENT
P.O. BOX 365 • LAPWAI, IDAHO 83540-0365 • (208) 843-7375 / FAX: 843-7378

December 4, 2001

Paul G.X. Dunigan, Jr.
NEPA Compliance Officer
Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

Re: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR TRANSURANIC WASTE RETRIEVAL IN THE 218-W-4B AND 218-W-4C LOW-LEVEL BURIAL GROUNDS, HANFORD SITE, RICHLAND, WASHINGTON (DOE/EA-1405)

Dear Mr. Dunigan:

The Nez Perce Tribe's Environmental Restoration and Waste Management Program (ERWM) has reviewed the draft version of the *Draft Environmental Assessment (EA) for Transuranic Waste Retrieval in the 218-W-4B and 218-W-4C Low-Level Burial Grounds, Hanford Site, Richland, Washington (DOE/EA-1405)*. This letter contains, for your consideration, ERWM's comments and suggestions on this document.

The Nez Perce Tribe retains reserved treaty rights in the Mid-Columbia under the 1855 and 1863 treaties with United States government. These rights have been recognized and affirmed in subsequent federal and state actions. These actions protect Nez Perce rights to utilize their usual and accustomed resources and resource areas in the Hanford Reach of the Columbia River and elsewhere. Accordingly, ERWM has support from the U.S. Department of Energy (DOE) to participate in and monitor relevant DOE activities.

We have reviewed the document with careful consideration, and our comments follow.

- ✓ As listed in Section 2-1 PROPOSED RECORDS REVIEW, LLBG UPGRADES, AND STAGING OF EQUIPMENT in the **third paragraph** (and in Figure 10, the flow chart), review of the record information is vital to identification of the contents of the containers in the pits. However, the

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following final sentence of **paragraph two** warns that records may be compromised. "Because of waste management requirements and practices from before the mid-1980's, it is anticipated that storage/burial records for some containers might be incomplete or missing." The Tribe suggests that responsible record keeping of the contents of the assayed containers during this proposed action is a critical element of the action, and that a module **addressing responsible current record keeping** be added to end of the flow diagram to prevent incomplete or missing records in the future.

It is unclear whether methods and routes to the CWC or other TSDs are to be covered in this proposed action. The EA indicates there is adequate storage at the CWC, but that other TSDs might also be used. If so, what potential impacts to the environment might transport of wastes to these locations have?

- ✓ **Section 2.2** PROPOSED RETRIEVAL ACTIVITIES – **Paragraph two** begins, "The most efficient methodology of removing the overburden from the drums would include the maximum use of heavy earthmoving equipment." This overburden is about one meter in thickness. The integrity of the tarps and plywood covering the containers of waste is not known at this point. Therefore, the Tribe expresses concern that using heavy equipment to remove soil cover of the trenches puts the waste containers at high risk for puncture or other destruction.

In addition, we did not notice any reference to checking the integrity of the storage trenches, such as the asphalt bottoms to the pits. As it is intended that the pits remain in use for LLW long-term storage, it would seem prudent to check the pits as well as the containers at this time.

- ✓ **Section 1.2** BACKGROUND - Within **paragraph four** (in italics) it is stated that some retrieval of soil covered TRU was to have been handled by the proposed action DOE/EA-098 in 1995, but that activity was never implemented. What assurance is there that the currently proposed action will be implemented?

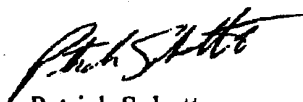
Editorial suggestions for further clarification are listed below

We suggest that the EA would read more clearly if:

- a.) When describing preliminary work in the LLBG area prior to retrieval, either upgrades or modifications be used, but not both; and,
- b.) That the **third sentence** in **Section 2.0** DESCRIPTION OF THE PROPOSED ACTION read as follows: "*The drums would be assayed in the LLBG and designated as containing TRU waste or LLW.*"

The Nez Perce Tribe ERWM appreciates the opportunity to provide comments on the *Draft Environmental Assessment (EA) for Transuranic Waste Retrieval in the 218-W-4B and 218-W-4C Low-Level Burial Grounds, Hanford Site, Richland, Washington (DOE/EA-1405)*. If you wish to further discuss Nez Perce ERWM's comments, please contact Sandra Lilligren at (208) 843-7375, (208) 843-7378 (fax), or sandra@nexperce.org (email).

Sincerely,



Patrick Sobotta
ERWM Director

Cc: Kevin Clarke (DOE)



Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

FEB 25 2002

02-WMD-088

Mr. Patrick Sobotta, Director
Environmental Restoration/
Waste Management Program
Nez Perce Tribe
P.O. Box 365
Lapwai, Idaho 83540

Dear Mr. Sobotta:

RESPONSES TO COMMENTS PROVIDED FOR THE DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR TRANSURANIC DRUM RETRIEVAL IN THE 218-W-4B AND 218-W-4C LOW-LEVEL BURIAL GROUNDS, HANFORD SITE, RICHLAND, WASHINGTON (DOE/EA-1405)

The U.S. Department of Energy, Richland Operations Office (RL), has reviewed the comments you provided on the draft EA for Transuranic Drum Retrieval in the 218-W-4B and 218-W-4C Low-Level Burial Grounds, Hanford Site, Richland (DOE/EA-1405). Attached are responses to your comments. The comments were considered in the development of the final EA and a number of changes were made based on your comments. RL appreciates you taking the time to provide the comments.

Please direct any questions about these responses to Todd Shrader, Waste Management Division, on (509) 376-2725. Questions regarding the NEPA process may be directed to me on (509) 376-6667.

Sincerely,

A handwritten signature in black ink that reads "Paul F. X. Dunigan, Jr.".

Paul F. X. Dunigan, Jr.
NEPA Compliance Officer

WMD:TAS

Attachment

cc w/attach:
C. M. Borgstrom, EH-42
K. (Kim) R. Welsch, FHI
Admin Record, H6-08

02-WMD-088

Attachment

**Nez Perce Tribe Comments
and U. S. Department of Energy Responses**

Consisting of 4 pages
including coversheet

02-WMD-088

Comment:

As listed in **Section 2-1 PROPOSED RECORDS REVIEW, LLBG UPGRADES, AND STAGING OF EQUIPMENT** in the **third paragraph** (and in Figure 10, the flow chart), review of the record information is vital to identification of the contents in the pits. However, the following final sentence of **paragraph two** warns that records may be compromised. "Because of waste management requirements and practices from before the mid-1980's, it is anticipated that storage/burial records for some containers might be incomplete or missing." The Tribe suggests that responsible record keeping of the contents of the assayed containers during this proposed action is a critical element of the action, and that a module **addressing current record keeping** be added to end of the flow diagram to prevent incomplete or missing records in the future.

Response:

Transuranic waste removed from the 218-W-4B and 218-W-4C burial grounds will be subjected to the same rigorous record keeping requirements and acceptance review as similar wastes generated elsewhere on the Site and placed into storage at Hanford Site TSD units. Records that will be retained for removed containers include: contents inventory records, waste acceptance checklist, designation worksheets, analytical data, radiological calculations, verification documentation, and any documentation associated with specialty reviews. To indicate this, a box labeled "Update Records" has been added after the step "Stage for Shipment to TSD Facility" in Figure 10.

Comment:

It is unclear whether methods and routes to the CWC or other TSDs are to be covered in this proposed action. The EA indicates there is adequate storage at the CWC, but that other TSDs might also be used. If so, what potential impacts to the environment might transport of wastes to these locations have?

Response:

Specific transportation routes were not described within this EA and the transportation of TRU waste to and from Hanford TSDs is a routine operation. It is anticipated that all of the transportation routes will lie exclusively within the 200 West Area. The primary 'other' TSDs that might be used for storage are the Waste Receiving and Processing Facility (WRAP) and T Plant, which are also in the 200 West Area. WRAP is contiguous with the Central Waste Complex (CWC) and the distance to T Plant is about one additional mile compared to transporting to CWC. The additional impacts are minimal.

02-WMD-088

Comment:

Section 2.2 PROPOSED RETRIEVAL ACTIVITIES – Paragraph two begins, “The most efficient methodology of removing the overburden from the drums would include the maximum use of heavy earthmoving equipment.” This overburden is about one meter in thickness. The integrity of the tarps and plywood covering the containers of waste is not known at this point. Therefore, the Tribe expresses concern that using heavy equipment to remove soil cover of the trenches puts the waste containers at high risk for puncture or other destruction.

Response:

For planning purposes, it is assumed that the tarps and plywood will not provide any protection for the drums. A detailed plan for excavation will be implemented. Currently, the plan calls for mechanically removing the soil cover to within approximately one foot above and on the sides of the containers. The depth or distance to the containers will be measured frequently with push rods to ensure that the mechanical excavation does not disturb this last foot of soil cover over and around the containers. Heavy earthmoving equipment will not be utilized if there is a risk for damaging the containers. The last foot of soil around the containers will be removed manually using non-sparking hand shovels, or by using the Guzzler soil vacuum.

Comment:

In addition, we did not notice any reference to checking the integrity of the storage trenches, such as the asphalt bottoms to the pits. As it is intended that the pits remain in use for LLW long-term storage, it would seem prudent to check the pits as well as the containers at this time.

Response:

Routine weekly trench integrity inspections are required and performed per LLBG operating procedures. However, to clarify this point, the following sentence has been added near the end of the second paragraph of section 2.2. “The integrity of the trenches will be maintained to allow for long-term operations.” Eventually, after all or the TRU containers have been removed, the trenches might be converted to LLW disposal trenches and asphalt bottoms are not required for disposal trenches.

02-WMD-088

Comment:

Section 1.2 BACKGROUND – Within **paragraph four** (in italics) it is stated that some retrieval of soil covered TRU was to have been handled by the proposed action DOE/EA-0981 in 1995, but that activity was never implemented. What assurance is there that the currently proposed action will be implemented?

Response:

The initiation or completion of an action is not required based on NEPA documentation. The EA is a decision document utilized to determine if a proposed action has No Significant Impact or requires further analysis in an Environmental Impact Statement. Issuance of this EA does not assure the retrieval will take place. However, Fluor Hanford, Inc. is currently contractually incentivized to perform the retrieval operations described in this EA by September 30, 2006.

Comment:

We suggest that the EA would read more clearly if:

- a.) When describing preliminary work in the LLBG area prior to retrieval, either *upgrades* or *modifications* be used, but not both; and,

Response:

The EA has been changed to utilize the word “modifications” throughout.

Comment:

- b.) That the **third sentence in Section 2.0 DESCRIPTION OF THE PROPOSED ACTION** read as follows: “*The drums would be assayed in the LLBG and designated as containing TRU waste or LLW.*”

Response:

This change would not be accurate. Assay is but one of a number of possible designation methodologies that might be utilized.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

December 12, 2001

Mr. Paul F. X. Dunigan, Jr.
Dept of Energy
Richland Operations Office
PO Box 550
Richland WA 99352

Dear Mr. Dunigan:

Thank you for the opportunity to comment on the draft environmental assessment (EA) for the transuranic (TRU) waste retrieval in the 218-W-4B and 218-W-4C Low-level Burial Grounds (LLBG), Hanford Site, Richland, Washington (DOE/EA-1405). We have reviewed the draft EA and have the following comments.

General Comment: This EA needs to address in more detail the handling of hazardous, dangerous, or radioactive waste generated/discovered during retrieval operations. It is possible that while during retrieval operations discoveries will be made of hazardous, dangerous, or radioactive wastes that have been released to the vadose zone. Please develop and/or describe a contingency plan for such discoveries. As well, please clarify how Investigative Derived Waste (IDW) will be handled.

Page 2-4, Section 2.3, Proposed Waste Container Disposition: In the fifth paragraph beginning with "All retrieved containers would be inspected." The last sentence states: "LLBG operating procedures would be established to safely deal with these containers." Please explain the operating procedures that will be established with regards to safety for containers with questionable integrity.

The EA does not adequately evaluate "long-term" impacts of the No Action Alternative. Rather, the EA identifies a deferral of impact analysis to a "future NEPA review". In Section 5.5.1, the following is provided: "The No Action Alternative would involve leaving the TRU waste in the LLBG in its current state, for now. This would result in little to no change in existing short-term conditions within the LLBG. In the long-term, DOE has committed to TRU retrieval that will be addressed at a later time in future NEPA review." This does not provide sufficient information on the long-term effects of the No Action Alternative to support decision-making.

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DOE RL/CCC
A small recycling symbol consisting of three chasing arrows forming a triangle.

Paul F. X. Dunigan, Jr.
December 12, 2001
Page 2

If you have any questions, please contact Mr. Fred Jamison with our Nuclear Waste Program at (509) 736-3022.

Sincerely,



Rebecca J. Inman
Environmental Coordination Section

EA #01-7310

cc: Alisa Huckaby, Kennewick
Fred Jamison, Kennewick
Tracy Richards, Kennewick



Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

FEB 25 2002

02-WMD-089

Ms. Rebecca Inman
Environmental Coordination Section
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Ms. Inman:

RESPONSES TO COMMENTS PROVIDED FOR THE DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR TRANSURANIC DRUM RETRIEVAL IN THE 218-W-4B AND 218-W-4C LOW-LEVEL BURIAL GROUNDS, HANFORD SITE, RICHLAND, WASHINGTON (DOE/EA-1405)

The U.S. Department of Energy, Richland Operations Office (RL), has reviewed the comments you provided on the draft EA for Transuranic Drum Retrieval in the 218-W-4B and 218-W-4C Low-Level Burial Grounds, Hanford Site, Richland (DOE/EA-1405). Attached are responses to your comments. The comments were considered in the development of the final EA. RL appreciates you taking the time to provide the comments.

Please direct any questions about these responses to Todd Shrader, Waste Management Division, on (509) 376-2725. Questions regarding the NEPA process may be directed to me on (509) 376-6667.

Sincerely,

Paul F. X. Dunigan, Jr.
Paul F. X. Dunigan, Jr.
NEPA Compliance Officer

WMD:TAS

Attachment

cc w/attach:

C. M. Borgstrom, EH-42
K. (Kim) R. Welsch, FHI
Admin Record, H6-08
T. Richards, Ecology

02-WMD-089

Attachment

**State of Washington Department of Ecology Comments
and U.S. Department of Energy Responses**

Consisting of 3 pages
including coversheet

02-WMD-089

General Comment:

This EA needs to address in more detail the handling of hazardous, dangerous, or radioactive waste generated/discovered during retrieval operations. It is possible that during retrieval operations discoveries will be made of hazardous, dangerous, or radioactive wastes that have been released to the vadose zone. Please develop and/or describe a contingency plan for such discoveries. As well, please clarify how Investigative Derived Waste (IDW) will be handled.

Response:

The Low-Level Burial Ground (LLBG) currently has a contingency plan and emergency response procedures that meet the requirements of WAC 173-303-350 and WAC 173-303-360. All containers will be inspected to determine integrity. When breached containers are discovered, the operating organization has a spill response procedure that directs personnel to isolate the material and minimize contamination spread. For this project, when contamination is discovered in the soil, immediate actions will include performing radiological surveys to determine the extent of the contamination and stabilizing or covering the soil to prevent contamination spread. After these initial actions, soil will be cleaned up only to the extent that personnel safety is ensured. These actions will be governed by radiological control and waste packaging procedures (and will be performed in accordance with the Tri-Party Agreement Strategy for Management of Investigation Derived Waste, signed on July 26, 1995.) This project is not intended to remediate the LLBG, but only to retrieve TRU drums. Cleanup of extensive soil contamination is outside of the scope of this project. Evaluation of the vadose zone will be performed as part of the ongoing evaluation of the entire Hanford Site groundwater/vadose zone.

Comment:

Page 2-4, Section 2.3, Proposed Waste Container Disposition: In the fifth paragraph, beginning with "All retrieved containers would be inspected" the last sentence states: "LLBG operating procedures would be established to safely deal with these containers." Please explain the operating procedures that will be established with regards to safety for containers with questionable integrity.

Response:

The LLBG operating organization uses a procedure for overpacking breached containers or containers with questionable integrity. Personnel safety and environmental protection considerations are paramount when performing this type of operation. Personnel protective equipment is selected based on radiological and chemical constituents present as known through radiological surveys and container records. Detailed instructions for packaging are provided by procedure and a job hazard analysis is performed to identify all necessary controls. Overpack container preparation is performed in an area away from exposure to contaminants to keep exposure As Low as Reasonably Achievable. In addition, all hoisting and lifting equipment attachments are inspected to ensure that they can be safely utilized. The overpack process involves ensuring container/waste compatibility, radiological surveys, and contamination control on the breached or questionable container (e.g., wrap in plastic). An integral part of the overpack process is record keeping, with detailed instructions provided to ensure that the information for the contents of the container is transferred to the new overpack drum barcode number and cross referenced with the original barcode number.

02-WMD-089

Comment:

This EA does not adequately evaluate “long-term” impacts of the No Action Alternative. Rather, the EA identifies a deferral of impact analysis to a “future NEPA review”. In Section 5.5.1, the following is provided: “The No Action Alternative would involve leaving the TRU waste in the LLBG in its current state, for now. This would result in little to no change in existing short-term conditions within the LLBG. In the long-term, DOE has committed to TRU retrieval that will be addressed at a later time in future NEPA review.” This does not provide sufficient information on the long-term effects of the No Action Alternative to support decision-making.

Response:

This Environmental Assessment is analyzing a short-term operation that implements a portion of the preferred alternative of the Hanford Defense Waste Environmental Impact Statement (HDW-EIS) (DOE/EIS-0113). The HDW-EIS analyzes the long-term impacts of the No Action Alternative for this EA and the analysis is not repeated here.