DOE/EA-0944

Environmental Assessment

222-S Radioactive Liquid Waste Line Replacement and 219-S Secondary Containment Upgrade, Hanford Site, Richland, Washington

U.S. Department of Energy
Richland, Washington

January 1995

This page intentionally left blank.

DISCLAIMER

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

EA/FONSI DISTRIBUTION LIST
DOE/EA-0944

Number of Copies	Receiving Organization	Receiving Organization's Address	Comments
6	EH-25	C. M. Borgstrom, Director Office of NEPA Oversight 1000 Independence Avenue S.W. Washington, D.C. 20585	Include a copy of the EA distribution list in the EA/FONSI package.
5	EM-20	R. S. Scott 1000 Independence Ave. S.W. Washington, D.C. 20585 Attention: EM-22	
5	EM-30	James Poppiti 12800 Middlebrook Road Germantown, MD 20874 Attention: EM-30	
1	RL	K. K. Randolph Communications MSIN: A7-75	
1	RL	C. D. Poynor Communications MSIN: A7-75	
1	RL	R. N. Warren MSIN: A5-18	
1	RL	P. F. X. Dunigan, Jr. NEPA Compliance Officer MSIN: A5-15	Include a copy of the EA distribution list in the EA/FONSI package.
10	RL	J. M. Hennig MSIN: S7-55	
1	RL	P. K. Clark MSIN: S7-55	
1	RL	A. D. Scrantz MSIN: S7-65	
5	RL	J. D. Wagoner Manager MSIN: A7-50	

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

For additional copies of this EA, please contact J. M. Hennig, RL, P.O. Box 550, Richland, Washington 99352 (509) 376-1366.

1	MACTEC	D. J. Guzzetta MACTEC MSIN: B1-42	
1	MACTEC	U. Subrahmanyam MACTEC MSIN: S6-81	
1	WHC	Environmental Resource Center MSIN: H6-07	
1	WHC	R. H. Engelmann, Manager NEPA Services organization MSIN: H6-26	Insert EA/FONSI package into the Organization's reference file.
1	WHC	B. F. Archer, Author NEPA Services organization MSIN: H6-26	
1	WHC	J. J. Beyer MSIN: R3-35	
1	WHC	D. I. Buckles MSIN: R3-35	
1	WHC	M. J. Hall MSIN: T6-14	
1	WHC	J. F. Williams Jr MSIN: H6-24	
1	WHC	S. A. Thompson MSIN: H6-24	
1	WHC	B. B. Sidhwaney MSIN: G3-17	
1	WHC	C. E. Sowa MSIN: H6-25	
1	PNL	D. D. Eggebratten MSIN: S2-55	
1	PNL	Hanford Technical Library 3760 Building 300 Area - MSIN: P8-55 Richland, Washington 99352	
1	Public	DOE Public Reading Room WSU Tri-Cities Branch MSIN: H2-53 Richland, Washington 99352	Please direct WHC Communications to publish an add in the local paper concerning approval of the EA/FONSI.

For additional copies of this EA, please contact J. M. Hennig, RL, P.O. Box 550, Richland, Washington 99352 (509) 376-1366.

1	Public	Eleanor Chase University of Washington Suzzallo Library Government Publications Room Mail Stop FM-25 Seattle, Washington 98195
1	Public	Joyce Cox Gonzaga University Foley Center E. 502 Boone Spokane, Washington 99258
1	Public	Michael Bowman Portland State University Branford Price Millar Library Science and Engineering Park Portland, Oregon 97207
1	Public	Ms. Judy McMakin, Head Librarian Richland Public Library 955 Northgate Drive Richland, Washington 99352
1	ODOE	Mr. Ken Niles Oregon Department of Energy 625 Marion Street NE Salem, Oregon 97310
1	ODOE	Mr. Dirk Dunning Oregon Department of Energy 625 Marion Street NE Salem, Oregon 97310
1	Ecology	Ms. Barbara J. Ritchie, NEPA Coordinator Environmental Review Section State of Washington Department of Ecology P.O. Box 47703 Olympia, Washington 98504-7703
1	Ecology	Mr. Tim Reierson State of Washington Department of Ecology P.O. Box 47703 Olympia, Washington 98504-7703

For additional copies of this EA, please contact J. M. Hennig, RL, P.O. Box 550, Richland, Washington 99352 (509) 376-1366.

1	Ecology	Mike Gordon State of Washington Department of Ecology 1315 West Fourth Kennewick, WA 99336
1	Ecology	Bob Cordts State of Washington Department of Ecology P.O. Box 47703 Olympia, Washington 98504-7703
1	Ecology	Tom Tebb State of Washington Department of Ecology 1315 West Fourth Kennewick, WA 99336
1	Ecology	Geoff Tallent State of Washington Department of Ecology P.O. Box 47703 Olympia, Washington 98504-7703
1	Ecology	Ms. Marilyn Smith State of Washington Department of Ecology Nuclear and Mixed Waste Library 300 Desmond Drive Lacey, Washington 98503
1	Nez Perce Tribe	Ms. D. Powaukee Nez Perce Tribe P.O. Box 365 Lapwai, Idaho 83540
1	Umatilla Tribe	Mr. J. R. Wilkinson Confederated Tribes of the Umatilla Reservation P.O. Box 638 Pendleton, Oregon 97801
1	Umatilla Tribe	Mr. William H. Burke, Chair Tribal Emergency Response Committee Treasurer, Board of Trustees Confederated Tribes of the Umatilla Indian Reservation P.O. Box 638 Pendleton, Oregon 97801

For additional copies of this EA, please contact J. M. Hennig, RL, P.O. Box 550, Richland, Washington 99352 (509) 376-1366.

1	Wanapum Indian Tribe	Mr. Richard Buck, Jr. Wanapum Indian Band P.O. Box 878 Ephrata, Washington 98823
1	Yakama Indian Nation	Mr. Russell Jim Yakama Indian Nation P.O. Box 151 Toppenish, Washington 98948

For additional copies of this EA, please contact J. M. Hennig, RL, P.O. Box 550, Richland, Washington 99352 (509) 376-1366.

Executive Summary

The U.S. Department of Energy (DOE) is proposing to: 1) replace the 222-S Laboratory (222-S) radioactive liquid waste drain lines to the 219-S Waste Handling Facility (219-S); 2) upgrade 219-S by replacing or upgrading the waste storage tanks and providing secondary containment and seismic restraints to the concrete cells which house the tanks; and 3) replace the transfer lines from 219-S to the 241-SY Tank Farm. This environmental assessment (EA) has been prepared in compliance with the *National Environmental Policy Act (NEPA) of 1969*, as amended, the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and the DOE Implementing Procedures for NEPA (10 CFR 1021).

222-S is used to perform analytical services on radioactive samples in support of the Tank Waste Remediation System and Hanford Site environmental restoration programs. Activities conducted at 222-S include decontamination of analytical processing and support equipment and disposal of nonarchived radioactive samples. These activities generate low-level liquid mixed waste. The liquid mixed waste is drained through pipelines in the 222-S service tunnels and underground concrete encasements, to two of three tanks in 219-S, where it is accumulated. Periodically, the liquid waste is transferred from the two tanks to a third tank, where it is sampled and treated. When the waste meets acceptance criteria, it is transferred to the tank farms. The annual volume of liquid mixed waste transferred is approximately 159,000 liters (42,000 gallons). This quantity could either increase or decrease in the future depending on analytical needs.

219-S is a treatment, storage, and/or disposal (TSD) unit, and is therefore required to meet Washington Administrative Code (WAC) 173-303, *Dangerous Waste Regulations*, and the associated requirements for secondary containment and leak detection. The waste drain and transfer lines must also meet these requirements. The purpose and need for agency

action is to bring the waste lines and 219-S into compliance with existing secondary containment and leak detection requirements in WAC 173-303, upgrade 219-S to meet seismic design standards, reduce risks to worker safety and environmental contamination, and reduce the risk of laboratory shutdown due to failure of the waste system.

The proposed action would replace the waste drain and transfer lines and upgrade 219-S. Most of the drain and transfer piping is approximately 40 years old and the aging pipes in the 222-S service tunnels have developed leaks that have increased contamination and radiation levels in the service tunnels. The service tunnels are periodically inspected by workers and decontaminated as necessary to maintain as low as reasonably achievable (ALARA) radiation levels. Although no contamination is reaching the environment from the service tunnels, the risk of worker exposure is present and could increase. 222-S is expected to remain in use for at least the next 30 years to serve the Hanford Site environmental cleanup mission.

The Radioactive Liquid Waste Line Replacement Project would replace the aging drain lines in the 222-S service tunnels, and would replace the single-wall pipes in the underground concrete-encased pipe trenches between the service tunnels and 219-S with double-contained lines. New routing would be provided for a double-contained waste transfer line from 219-S to the 244-S Double-Contained Receiver Tank south of the 241-SY Tank Farm. Spare lines would be installed in all these segments except for the 222-S service tunnels, where spare lines are not needed because of the easy accessibility for maintenance. The existing lines would be removed and disposed of as waste, or capped and left in place for eventual removal under future site cleanup actions.

The 219-S Secondary Containment Upgrade Project would replace or upgrade the three tanks and upgrade two underground concrete cells in 219-S to provide secondary containment and leak detection capability and meet seismic design requirements. This would be accomplished by reconditioning the existing tanks or, alternatively, replacing them, sealing and lining the cells, and installing alignment braces and seismic restraints.

Risk of environmental contamination and radiation exposure to operating personnel would be reduced by the proposed actions. The proposed actions would also end the current practice of transferring waste from 219-S via tanker truck to a tank farm in the 200 East Area. This type of transfer is being done because the existing line from 219-S to the 241-SY Tank Farm is not considered reliable. This trucking of the waste is currently being carried out under interim status under the Washington State Department of Ecology Dangerous Waste Permit, Part A, and is not a preferred long term method of operation.

This EA evaluates the proposed actions described above and other alternatives including No-Action Alternatives. The No-Action Alternatives would result in continued non-compliance and safety and environmental risks.

Two alternatives to the proposed action, shipping the liquid wastes by rail tank car and alternative treatment of wastes at 222-S, were considered. These alternatives were found to require extensive permitting and construction and were more complex and less cost effective than replacing the transfer pipelines.

No environmental impacts of concern have been identified for the proposed actions during construction. There would be no planned releases of gaseous or particulate radioactive emissions to the atmosphere, and no liquid discharges would be anticipated to the environment. No environmentally sensitive areas or cultural resources would be affected. Construction activities would be closely monitored to detect contamination, and appropriate action would be taken to prevent environmental consequences.

Solid waste generated by project activities would be disposed of in existing Hanford Site waste management units in compliance with all applicable regulations. An estimated maximum of 62 cubic meters (2,200 cubic feet) of low-level mixed waste requiring about 17 large containers would be generated by the proposed actions. An estimate has been made of the quantities of low-level mixed waste that could be generated by final decontamination and decommissioning and past-practice site remediation activities associated with the installation of replacement components. The total potential low-level mixed waste from the existing

waste transfer lines (which would be capped and left in place), the existing concrete emplacements, and the new transfer lines and secondary containment could be 297 cubic meters (10,500 cubic feet).

There would be potential for radiation exposure to workers during the construction activities. Exposure to workers would be maintained to ALARA principles. Insufficient information was available to calculate potential worker exposures, so an upper bound case was used based on the workers receiving a dose which corresponds to the administrative control level set by the Hanford Site construction contractor. Under this upper bound case, each worker would be expected to receive 0.5 roentgen equivalent man (rem) for a population dose of 72 person-rem, which is estimated to result in 0.029 latent cancer fatalities. The upper bound case was postulated using a very conservative exposure which could result if decontamination of the lines and encasements and other dose reduction methods prove unsuccessful. It was presented in this manner so that a conservative calculation of the cancer fatalities would be analyzed. It is believed that actual doses would be much smaller.

The estimated radiation dose to the maximally exposed offsite individual from continuing routine operation of the upgraded system would be less than 2.0×10^{-6} rem/year effective dose equivalent (EDE). The estimated probability that this individual would die from this radiation exposure is 1.0×10^{-9}. The only routine emissions from the system operation are from the tanks in 219-S which would be the same as or lower, than existing emissions.

The postulated upper bound accident for the waste system is the inadvertent rupture of the waste line that results in a spray release from the line between 219-S and the tank farm during a pressurized waste transfer due to accidentally striking the buried line with heavy equipment. This accident is estimated to result in a radiation dose of 2.5×10^{-3} rem to the maximally exposed onsite individual and 7.3×10^{-5} rem to the maximally exposed offsite individual. The estimated probability that the individuals would die as a result of this radiation exposure would be 1.0×10^{-6} and 3.7×10^{-8}, respectively. The duration and

quantity of the liquid discharge from the postulated accident would be limited and no migration into the groundwater would be expected. Cleanup of the spill would result in some exposure to cleanup workers. The dose to the cleanup workers would be lower than the dose from the spray release during the accident.

The estimated cost of Project W-087, 222-S Radioactive Liquid Waste Line Replacement, is $17 million and the estimated cost of Project W-178, 219-S Secondary Containment Upgrade, is $3 million.

Glossary

Acronyms and Initialisms

ALARA	As Low As Reasonably Achievable
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
DCRT	Double-contained Receiver Tank
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EDE	Effective Dose Equivalent
EPA	U.S. Environmental Protection Agency
HEPA	High-Efficiency Particulate Air
ICRP	International Commission on Radiological Protection
LCF	Latent Cancer Fatality
MEI	Maximally Exposed Individual
NEPA	*National Environmental Policy Act of 1969*
RCRA	*Resource Conservation and Recovery Act of 1976*
REDOX	Reduction-oxidation
rem	roentgen equivalent man
RI/FS	Remedial Investigation/Feasibility Study
Tri-Party Agreement	Hanford Federal Facility Agreement and Consent Order
TSD	Treatment, Storage, and/or Disposal
TWRS	Tank Waste Remediation System
WAC	*Washington Administrative Code*

Scientific Notation Conversion Chart

Multiplier	Equivalent
10^{-1}	0.1
10^{-2}	.01
10^{-3}	.001
10^{-4}	.0001
10^{-5}	.00001
10^{-6}	.000001
10^{-7}	.0000001
10^{-8}	.00000001
10^{-9}	.000000001
10^{-10}	.0000000001
10^{-11}	.00000000001
10^{-12}	.000000000001

Metric Conversion

If you know	Multiply by	To get
Length		
centimeters	0.394	inches
meters	3.2808	feet
kilometers	0.62	miles
Area		
square kilometers	0.39	square miles
Temperature		
Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Volume		
liters	0.26	Gallons
cubic meters	35.31	cubic feet

Source: *CRC Handbook of Chemistry and Physics,* Robert C. Weast, Ph.D., 70th Ed., 1989-1990, CRC Press, Inc., Boca Raton, Florida.

Table of Contents

List of Tables

Table of Contents (cont.)

List of Figures

Appendices

1.0 Purpose and Need for Agency Action

The U.S. Department of Energy (DOE) needs to take action to: (1) bring the 222-S Laboratory (222-S) radioactive liquid waste lines into compliance with existing secondary containment and leak detection requirements specified in Washington Administrative Code (WAC) 173-303, (2) reduce potential risks to the environment and to worker safety, and (3) reduce the risk of laboratory shutdown due to failure of the waste system.

There is also a need to upgrade the 219-S Waste Handling Facility (219-S), which is a treatment, storage, and/or disposal (TSD) unit, to meet the requirements of WAC 173-303 for secondary containment and leak detection and to meet seismic design standards required by DOE Order 6430.1A. A 1990 Tank System Integrity Assessment found that tanks within 219-S are not adequately restrained to resist lateral loading from a seismic event. The coating of the underground concrete Cells A and B in 219-S is no longer intact, pipe gaskets have exceeded the recommended damage threshold, and the tank alignment braces are near the end of design life and in need of replacement.

1.1 Background

222-S was built in 1951 to support the 202-S Reduction-Oxidation (REDOX) Plant and the 200 Area tank farms. The laboratory is now used to perform analytical services on radioactive samples in support of the Tank Waste Remediation System (TWRS) Program and Hanford Site environmental restoration programs. Activities conducted at 222-S include decontamination of analytical processing and support equipment and disposal of nonarchived radioactive samples. These activities generate low-level liquid mixed waste (waste which contains both radioactive and hazardous chemical constituents). The liquid mixed waste streams are drained through pipelines in the 222-S service tunnels and underground concrete encasements to two of three tanks in 219-S, where they are accumulated (Figure 1). The range of characteristics of the waste to the drainlines is summarized in Appendix A.

Periodically, the liquid waste in the two tanks is transferred to a third tank where it is sampled. If necessary, the hydroxide and nitrite concentrations are adjusted to meet tank farm acceptance criteria for tank corrosion control. When the liquid waste meets acceptance criteria, it is transferred to the tank farms. The annual volume of low-level mixed waste transferred is approximately 159,000 liters (42,000 gallons). This quantity could either increase or decrease in the future depending on analytical needs.

The waste historically was transferred from 219-S through a buried pipeline to the 241-SY Tank Farm in the 200 West Area for storage. However, the current practice is to transfer waste via tanker truck from 219-S to a tank farm in the 200 East Area because of concerns about the integrity of the existing line between 219-S and the 241-SY Tank Farm. The Washington State Department of Ecology (Ecology) is now allowing this to be done on an interim basis under a Part A dangerous waste permit.

222-S is expected to remain in use for at least the next 30 years to serve the Hanford Site environmental cleanup mission. Failure of the drain and transfer piping systems or any of the 219-S tanks would result in shut down of the laboratory.

Most of the waste-drain piping in the 222-S service tunnels and in the waste transfer system is approximately 40 years old, and does not meet secondary containment and leak detection regulatory requirements for hazardous waste piping. New piping would be needed to meet these requirements. In addition, the aging pipes in the 222-S service tunnels have developed leaks that have increased radiation levels in the service tunnels, resulting in safety risks to workers. The service tunnels require decontamination to reduce radiation exposure to construction, maintenance, and operations personnel. The existing transfer piping outside of the service tunnels is confined within concrete-encased trenches. It cannot be determined if this piping is leaking. However, because the pipes in the service tunnels have been found to leak, there is the possibility that the lines are also leaking in the trenches, potentially resulting in contamination to the soil and groundwater.

The existing underground concrete-encased line from 219-S to the 241-S-151 diversion box in the 241-SY Tank Farm goes through D-Cell in the 202-S REDOX Building. This line does not meet secondary containment and leak detection requirements. In addition, the line uses a connecting line which is located in D-Cell, and if this connecting line were to fail, the potential exists for exposure of maintenance personnel. This segment of the line is not now in use and replacement of the line is needed to eliminate the safety and environmental risks of transferring waste by tanker truck.

2.0 Description of the Proposed Action

The proposed action consists of two related projects: 1) replacement of pipelines that transfer liquid radioactive waste from 222-S to the 241-SY Tank Farm by way of 219-S, and 2) upgrading tanks within 219-S, which handle the 222-S radioactive liquid waste. The proposed replacement of the 222-S radioactive liquid waste lines would start in fiscal year 1995 and require a construction period of about 27 months and is estimated to cost $17 million. The proposed upgrading of 219-S tanks would begin in fiscal year 1996 and require about 16 months for completion and would cost as estimated $3 million. A phased construction approach would allow 222-S to continue operations with minimal interruption during the construction period. The periodic brief interruptions would be integrated with laboratory operation schedules.

Following completion of construction, the systems are projected to operate for at least 30 years. Management of the liquid wastes in the Hanford Tank Farms and the ultimate disposition of these wastes is the responsibility of the TWRS Program. The proposed action is a connected action to the overall TWRS Program. This action would not limit the choice of reasonable alternatives for the TWRS Environmental Impact Statement under preparation because the action covers only the replacement of an existing system for an existing waste stream that represents only a small part of the overall volume of waste managed by the TWRS Program. Therefore, this is an allowable interim action during the preparation of the TWRS EIS according to 40 Code of Federal Regulations (CFR) 1506.1.

2.1 Replacement Of Radioactive Liquid Waste Lines

The Radioactive Liquid Waste Line Replacement Project would replace drain piping in three 222-S service tunnels, the piping in the underground concrete-encased pipe trenches between the 222-S service tunnels and 219-S, and the waste transfer lines between 219-S and the receiving tank farm. All of the new piping would be double-walled to provide secondary containment. Leak detection and flow monitoring instrumentation would be installed at various locations. The existing lines between 222-S and 219-S would be removed as necessary and disposed of as waste. The lines which are not removed would be capped and left in place for eventual removal under future site cleanup actions. No new concrete encasement would be required. The individual elements of this project are described in more detail below.

The proposed action would install two sets of new double-walled drain lines which would extend from the 222-S service tunnels to 219-S. One set would consist of up to four new lines, while the other would consist of two lines. These two sets would cover distances of 52 meters (170 feet) and 21 meters (70 feet) respectively. Spare drain lines may be installed to provide a redundant system as necessary. Some excavation, which would occur within a previously disturbed area, may be required to complete the installation. If the existing concrete-encased trench is used to route the new pipeing, the existing pipe may be removed to provide adequate space for the new lines (the total length of pipe available for

removal is approximately 73 meters [240 feet]). The new lines would be equipped with leak detection capability in the outer pipe. Any leakage in the pipes would drain to the waste storage tanks in 219-S. The piping material, which may consist of either metallic or non-metallic piping, would be selected for compatibility with the waste stream. A simplified schematic of the proposed action is shown in Figure 1.

The 222-S service tunnels would be decontaminated to as low as reasonably achievable (ALARA) levels to reduce radiation exposure to construction and operating personnel. Decontamination techniques would depend upon the nature of contamination, but could include grinding, fixing, scrubbing, or wiping. The existing hot cell drain piping containing residues of radionuclides and chemicals would be removed and disposed of in conjunction with installation of the new drain piping. The old pipe and associated equipment in the service tunnels and in the concrete encasements to 219-S would be removed as necessary to make room for new piping. Removal and disposal of contaminated pipes and equipment, and associated wastes would be accomplished in accordance with all applicable federal and state requirements, DOE orders, and ALARA principles.

Procedures employed to control airborne emissions would include: (1) the use of greenhouse type enclosures to seal the exits of the service tunnels, (2) routing of air through the High-Efficiency Particulate Air (HEPA) filtered laboratory exhaust system during removal of old piping and equipment and the decontamination of the service tunnels, and (3) the use of greenhouse type enclosures as necessary during the accessing and replacement of pipe in the concrete encasements. Once the piping was replaced, the excavation would be backfilled using the soil originally removed.

Two new waste transfer lines would also be installed from 219-S to the 244-S Double-Contained Receiver Tank (DCRT) south of the 241-SY Tank Farm. One pipeline would be used to transfer the liquid waste while the other pipeline would be used as a spare. Both of these lines would be double-walled with leak detection capabilities. A new route would be chosen for the transfer piping to the tank farm, a distance of about 1,100 meters (3,650 feet) and would extend through an area which has been previously disturbed as a result of past Hanford Site activities. Trenching would be required for the new lines and some existing vegetation would have to be cleared. After the lines are installed, the trenches would be filled and the soil stabilized. Revegetation of the disturbed area would be accomplished using compatible plant types. Following the completion of construction, the new lines would be put in use, eliminating the need to truck waste from 219-S to the tank farm in 200 East.

The existing piping in the concrete encasement from 219-S to the 202-S REDOX facility, and the transfer piping from REDOX to the 241-S-151 diversion box (which would be bypassed), would be capped and left in place. The piping and concrete encasements would be included in work plans for the 200 West Area past-practice operable units, and disposed of as part of the environmental restoration program. The portion of the transfer piping within the REDOX Plant would eventually become subject to the decontamination and decommissioning (D&D) of the facility which may be subject to an additional *National Environmental Policy Act of 1969* (NEPA) review.

2.2 219-S Secondary Containment Upgrade

219-S contains three tanks (101, 102, and 103) used to receive and treat the liquid low-level mixed waste. Tanks 101 and 102 are 15,000 liter (4,000 gallon) tanks in Cell A. Cell A contains only one compartment. Tank 103 is a 5,700 liter (1,500 gallon) tank in Cell B, which contains two compartments. Piping in Cell A would be removed and disposed of at the Hanford Site. The tanks and the compartment would be decontaminated and inspected. If feasible, Tanks 101 and 102 would be reconditioned and re-installed. If it is determined that the tanks need to be replaced, the old tanks would be disposed of and new tanks and piping would be installed. Removal and disposal of the tanks, piping, and associated wastes would be accomplished in accordance with all applicable federal and state requirements, DOE orders, and ALARA principles. Tank 103 in Cell B would be isolated and removed from service because of its condition and structural access problems and a new 7200 liter (1900 gallon) tank (Tank 104) and connecting lines would be installed in the spare compartment in Cell B to replace Tank 103.

The cell compartments to be used would be repaired and re-coated with a chemically resistant sealer and lined with stainless steel to provide secondary containment and leak detection. New alignment braces and seismic restraints for the tanks would be installed. New transfer pumps, valves, instruments, and necessary piping would also be installed.

Following completion of the upgrades, operation of 219-S would resume with no change from its present operation.

2.3 Worker Safety

There would be potential for radiation exposure to workers during the construction activities. All activities including excavation, pipe and support equipment removal, decontamination, and new equipment installation would be controlled by approved radiological and industrial safety procedures and administrative controls that prevent or minimize worker exposure. Radiation monitoring of work areas, use of shielding or remote handling where necessary, use of protective clothing and respiratory protection, and administrative limitations on individual exposure time would be used to minimize worker exposure. Construction risks would be mitigated by job safety planning and by following approved radiological and industrial safety procedures for the Hanford Site.

2.4 Waste Generated by The Proposed Actions

An estimated maximum of 62 cubic meters (2,200 cubic feet) of low-level mixed waste requiring about 17 large containers would be generated. This volume includes the tanks in 219-S and any piping from 222-S and 219-S, if they are removed. Removed tanks and piping would be cut in sections, wrapped in plastic, and placed in the boxes. This waste estimate does not include the transfer piping and concrete encasements to be left in place for future cleanup or D&D activities.

The waste would be characterized for appropriate disposition according to regulatory requirements. Two steam lines in the 222-S service tunnels would be removed to gain access to the drain lines being replaced. These steam lines have asbestos insulation which would be removed and disposed of in accordance with regulatory requirements for asbestos. Any contaminated asbestos pipe insulation would be friable when disturbed and considered a dangerous waste under the WAC. It would be appropriately handled as low-level mixed waste. Decontamination of the 219-S tanks would require a triple rinse with about 15,000 liters (4,000 gallons) of water which would be shipped to the tank farms for disposal. Pollution prevention and waste minimization would be considerations in planning the work.

3.0 Alternatives to the Proposed Action

Alternatives evaluated for the liquid mixed waste line replacement and the 219-S upgrade were No-Action Alternatives for each of the related proposed actions, transferring wastes from 219-S to the tank farms via a rail car, and treatment options (such as evaporation to reduce the volume of waste or sugar denitration[1] to treat acidic wastes). The railcar and treatment option alternatives were conceptually evaluated and were found to be more complex and less cost effective than constructing the replacement pipelines.

Other alternatives, such as repairing the lines in the 222-S service tunnels on an as needed basis or replacing only portions of the waste transfer lines, were considered. However, they were dismissed as not meeting the purpose and need for the proposed action. Specifically, compliance with regulatory requirements for secondary containment and seismic standards would not be achieved, and the potential for environmental contamination would continue to exist as would the risk of radiation exposure to maintenance workers and the possibility of laboratory shutdown.

3.1 Radioactive Liquid Waste Lines

3.1.1 No-Action Alternative

Under this alternative, the drainage and transfer systems would not be replaced or upgraded. Drain line leakage in the service tunnels would continue and the probability of a large release to the service tunnels would increase. This alternative could result in increased radiation exposure to maintenance workers and extended laboratory downtime. The underground concrete-encased lines would continue to be out of compliance with DOE orders and state requirements and would continue to pose the risk of a substantial release to the environment. The existing underground line from 219-S to the 241-S-151 diversion box would also continue to be unsuitable for use because of the questionable integrity of the primary containment system and the lack of secondary containment at the diversion box.

The current interim practice of transferring waste from 219-S via tanker truck to a tank farm in the 200 East Area would continue under this alternative. This is not an acceptable long term method of operation although Ecology is allowing this activity as an interim measure under the Dangerous Waste Permit, Part A. In addition, the long term safety and radiation exposure risks of transferring and transporting the wastes by truck would not be consistent with DOE requirements to maintain ALARA principles.

3.1.2 Rail Transport to the Tank Farms

This alternative would require construction of a rail spur to 219-S and a regulatory compliant transfer system to load tank cars. This alternative was dismissed because of the

[1] Sugar denitration is a process which involves reacting nitric acid with sucrose which produces NO_x, carbon dioxide, and water vapors as well as a reduction in the nitric acid concentration.

cost and complexity of siting and constructing a rail spur and transfer system to handle the relatively small volume of liquid waste.

3.1.3 Treatment Options

Options for treating the wastes at 222-S or constructing an additional treatment facility were considered. An evaporator could be constructed to concentrate the wastes and reduce the volume. This reduced volume would then be trucked to the tank farm. Other options include constructing a facility which would use a sugar denitration process to treat the waste. These alternatives were dismissed for a variety of reasons. These reasons include increased complexity in the design and permitting of a new facility and product waste disposal. These alternatives would also entail a higher cost necessary for feasibility studies as well as construction of new treatment facilities. Continuing to transfer the wastes to the tank farms where further treatment of the wastes would be considered as part of the TWRS Program would be more environmentally sound and cost effective.

No other alternatives were identified that satisfied the purpose and need for action as stated in Section 1.0.

3.2 219-S Secondary Containment Upgrade

3.2.1 No-Action Alternative

Under this alternative, 219-S would not be upgraded and the regulatory requirements for secondary containment and leak detection would not be met. Without the addition of seismic restraints, the tanks in 219-S would be subject to toppling during a seismic event. The vertical and horizontal alignment braces and the flanges supporting the tanks would soon go beyond design life, and the tank cell chemical resistant coating would continue to deteriorate and would not protect the concrete. The No-Action Alternative would not replace the tanks in 219-S which, if found to be leaking, would severely disrupt or stop laboratory operations. This would adversely impact Hanford Site programs that rely on 222-S.

No other alternatives to the preferred alternative were identified for the 219-S Secondary Containment Upgrade that could satisfy the purpose and need for action stated in Section 1.0.

4.0 Affected Environment

The Hanford Site is a tract of 1,450 square kilometers (560 square miles) of flat to gently rolling mostly treeless desert, with some trees occurring along the Columbia River. Two topographical features dominate the landscape: Rattlesnake Mountain which is a treeless anticline, 1,066 meters (3,500 feet) high, on the southwestern edge of the site, and Gable Mountain, a small ridge 339 meters (1,112 feet) high, north of the 200 West Area. Figure 2 is a map of the Hanford Site with the proposed project location noted.

The Hanford Site has a mild dry climate, with 15 to 18 centimeters (6 to 7 inches) of annual precipitation, and occasional high winds up to 129 kilometers (80 miles) per hour. There has been no reported occurrence of a tornado on the site.

222-S and the waste lines are located in the 200 West Area of the Hanford Site approximately 48 kilometers (30 miles) northwest of the City of Richland, and 8 kilometers (5 miles) from the Columbia River. The 200 Areas Plateau is not located in the 100- or 500-year floodplain of the Columbia River. The proposed project site is not located within wetland areas. The groundwater table in the 200 West Area is approximately 61 meters (200 feet) below the ground surface.

The soils and underlying formations in the 200 West Area are composed of sedimentary materials consisting of silts, sands, and gravels underlain by basalt at a depth of several hundred feet. The central Columbia Plateau region is categorized as one of low to moderate seismicity. There are no known faults specifically identified with the 200 West Area but fault structures with potential for seismic activity have been identified along the southwest boundary of the Hanford Site and along Gable Mountain in the northern portion of the Facility (PNL 1994). The annual probability (frequency) of a seismic event occuring in excess of .09 gravity horizontal acceleration (the characteristic which dictates the design of the drain lines) has been estimated to be 2×10^{-3}/year.

The proposed action would be in a developed part of the 200 West Area within the fenced area. Trenching for the waste transfer lines could encounter some vegetation consisting mainly of rabbitbrush, cheatgrass, and mustard.

Some of the typical insects, small birds, mammals, and reptiles that inhabit the rest of the Hanford Site would be expected to be encountered here. More than 300 species of insects, 39 species of mammals, 187 species of birds, and 12 species of reptiles and amphibians have been identified on the Hanford Site. Grasshoppers and various species of beetles are the most conspicuous insects in the community. Several species of small birds nest in the steppe vegetation. During migration seasons the bird population increases in species variety. The most common snakes are gopher snakes, yellow-bellied racers, and rattlesnakes. Toads and frogs are found along the Columbia River. Pocket mice and jack rabbits are the primary small mammal species on the Site. Large mammals are deer and elk, although the elk are almost entirely on the Arid Lands Ecology Reserve located on Rattlesnake Mountain. Coyotes and raptors are the primary predators.

The federally- and state-registered bald eagle (threatened) is a regular winter visitor occurring principally along the Columbia River. The peregrine falcon (federal and state endangered) is a rare accidental visitor. The American white pelican (state endangered) is a transient summer visitor, but is not known to nest on the Hanford Site. The State of Washington lists the sandhill crane as endangered, and the ferruginous hawk as threatened. Cranes are casual migrants to the area, while the ferruginous hawk sometimes nests on area power poles. However, neither these nor other plant or animal species registered as rare, threatened, or endangered are known to depend on the habitats near or within the 200 West Area (PNL 1994). As a result, the proposed action would not be expected to affect any critical habitat of federally listed threatened or endangered species. An Ecological Survey (Appendix C), of the proposed sites determined that no plant or animal species of concern would be affected by these projects.

Ten cultural resource properties (including B Reactor) have been identified on the Hanford Site along the Columbia River and are listed in the *National Register of Historic Places*. The White Bluffs Road (which transects the 200 West Area) is proposed for listing as an Historic Place. Additional information about the Hanford Site can be found in PNL 1994.

A Cultural Resource Review (Appendix B) of the sites of the proposed activities concluded that there were no known cultural or historic properties that might be affected by these projects.

5.0 Environmental Impacts

5.1 Construction Impacts

There would be very limited releases of gaseous or particulate radioactive or hazardous emissions to the atmosphere due to construction activities because excavation, pipe removal, and decontamination activities would be controlled by procedures and administrative controls to prevent or minimize the escape of hazardous airborne emissions. Procedures employed to control unexpected airborne emissions would include the use of greenhouse type enclosures as necessary to seal the exits of the service tunnels, and routing of air through the HEPA filtered laboratory exhaust system during removal of old piping and equipment and the decontamination of the service tunnels. Radiation monitoring and use of greenhouse type enclosures with HEPA filters would be employed as necessary during the accessing and replacement of pipe in the concrete encasements.

The new pipe route from 219-S to the 241-SY Tank Farm would avoid known contaminated areas. Unexpected airborne emissions from construction activities, if any, would be very small in quantity and of brief duration in comparison to normal operations. Resulting impacts would be small and within the bounds of analyses for normal operation and accident scenarios, as described in Sections 5.2 and 5.3.

Because of ALARA concerns, specific data on expected radiation exposure to workers during all phases of construction would not be available until the work starts and actual measurement of radiation levels can be obtained. Preliminary job planning estimates indicate that there would be a total of about 144 workers involved in the demolition and construction activities with potential for radiation exposure. Duration of radiation work would be approximately 6 months. A conservative upper bound estimate of exposure may be made by assuming that the workers receive a dose which corresponds to the administrative control level set by the Hanford Site construction contractor (0.5 roentgen equivalent man [rem]). This administrative control level can be exceeded to a cumulative maximum of 2.0 rem per year only under certain situations and with the appropriate management approval. Such controls assure that, under normal operating conditions, workers will not be exposed to levels approaching the DOE limit of 5 rem per year as prescribed in 10 Code of Federal Regulations 835.

Assuming that each worker would receive a dose equal to the administrative control level (0.5 rem), the total dose to workers would be 72 person-rem from the construction. This exposure is estimated to result in 0.029 latent cancer fatalities (LCF) and the probability that one of the 144 workers would become a LCF as a result is about 1 in 5,000.

Most of this exposure would result from decontamination work, pipe removal, and installing new pipe in the service tunnels. DOE policy is to maintain exposures ALARA, therefore the actual exposure would probably be much lower. Radiation exposure would be limited to the immediate working areas and no dose calculation for other onsite workers or the offsite public is considered necessary for the construction work.

Some nonhazardous dust, exhaust gases, and heat from construction vehicles and equipment would be discharged to the air during the construction activities. However, dust control would be maintained by spraying with raw water as necessary, and vehicle exhaust would be minimal. Construction activities and equipment would also result in slightly elevated noise levels.

No liquid discharges to the environment would be anticipated during construction except for small quantities of clean water used for dust control. This water would be expected to evaporate and would not reach the groundwater. Pipelines being replaced would be flushed with raw water, drained, and the liquid would be contained in waste tanks according to appropriate waste handling procedures. Liquid wastes, including mixed-wastes, resulting from the pipe replacement and decontamination activities would be appropriately handled and disposed of in existing Hanford Site facilities and no new facilities or modification to existing facilities would be required. The estimated 15,000 liters (4,000 gallons) of water used to decontaminate the 219-S tanks would be sent to the high-level waste tank farms.

Removal of radioactively contaminated materials and equipment such as pipe, treatment tanks, valves, concrete, and soil, and removal of asbestos insulation materials around piping, would generate hazardous waste. Removal and disposal of this waste would be accomplished in accordance with applicable contractor procedures and standards, ALARA principles, all applicable federal and state regulations, and DOE orders and guidelines. All waste would be disposed of in existing Hanford Site waste management units, or approved permitted offsite facilities. An estimated maximum of 62 cubic meters (2,200 cubic feet) of low-level mixed waste requiring about 17 large boxes would be generated. A total of 447 cubic meters (15,800 cubic feet) of low-level mixed waste was generated at the Hanford Site during 1992. The mixed waste would be characterized and stored in a *Resource Conservation and Recovery Act of 1976* (RCRA) permitted storage facility in the Hanford Central Waste Complex in the 200 West Area of the Hanford Site, pending appropriate treatment and disposal in RCRA-permitted facilities.

Small quantities of nonradioactive and nonhazardous construction waste and debris would also result from construction activities. This waste would be disposed of in the Hanford Site Solid Waste Landfill, or in other appropriate disposal units in compliance with all applicable requirements. No new facilities or modification to existing waste management facilities would be required.

The existing line to be bypassed from 219-S, through the 202-S Building, and on through the 241-S-151 diversion box, would be capped, its location appropriately identified and left in place for future remediation. The 202-S Building would eventually undergo D&D. The buried pipe and equipment, and any associated soil contamination, along the old lines, would eventually be included in past-practice site work plans for the 200 West Area operable units, and eventually be disposed of as part of the remediation program. 219-S would be subject to closure under RCRA. The D&D and RCRA/*Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) activities would undergo appropriate NEPA review as necessary.

An estimate has been made of the quantities of low-level mixed waste that could be generated by eventual D&D and past-practice site remediation activities. Conservative waste compaction values were used. The existing waste transfer lines to be capped and left in place could result in approximately 8.5 cubic meters (300 cubic feet) of waste. The existing concrete emplacements could result in about 266 cubic meters (9,400 cubic feet) of potentially contaminated waste. About 22.6 cubic meters (800 cubic feet) of waste could result from the new transfer lines, secondary containment, and spare encasements to be installed. The total potential waste is estimated to be 297 cubic meters (10,500 cubic feet). An analysis of the impacts of removing, storing and/or disposing of this waste at a future date is outside the scope of this EA and would be addressed by future environmental review.

The current *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) recognizes that activities related to the cleanup of the Hanford Site will involve RCRA Closures, CERCLA Remedial Investigation/Feasibility Study activities, and D&D of structures. The generation and/or discharge of (Ecology/U.S. Environmental Protection Agency [EPA]) regulated substances or wastes is subject to the Tri-Party Agreement. Facility transition and D&D activities not subject to Ecology/EPA regulation that are critical to the cleanup of a past-practice aggregate area will be coordinated with Tri-Party Agreement actions with the goal of accomplishing regulated and non-regulated work in an orderly sequence.

A Cultural Resource Review (Appendix B) of the sites of the proposed activities concluded that there were no known cultural or historic properties that might be affected by these projects. An Ecological Survey (Appendix C) of the proposed sites determined that no plant or animal species of concern would be affected by these projects.

The socioeconomic impact of the proposed project on current employment and the local economy has not been quantified. There would be no change in the number of operating personnel required; however, the construction activities might require a small, temporary increase in construction workers.

5.2. Impacts From Normal Operations

A Preliminary Safety Evaluation Report (PSER) (WHC 1991) has been prepared to address safety considerations for the proposed project. The PSER contains an assessment of radioactive emissions from both normal system operation and from postulated accidents.

During current normal operations, very small quantities of radionuclides are released due to evaporation from the three tanks in 219-S. This is the only routine radionuclide release from operation of 219-S and the drain line and waste transfer system. 219-S is vented by an exhaust fan, through a de-entrainer and single-stage HEPA filter, to the atmosphere through the 296-S-16 stack. This release would be expected to continue at the same rate with no increase following the waste line replacement and the upgrading of 219-S and would represent no change from existing emissions.

An upper bound source term for this release was determined for radionuclides, and the filtered release of radionuclides was calculated to total 4.4×10^{-12} curies annually. The calculated concentration of radionuclides exiting the stack are considerably below the Derived Concentration Guides for members of the public measured at the point of release as defined in DOE Order 5400.5 (WHC 1991). The calculated dose to the maximally exposed offsite individual, determined for air permitting purposes by the method in 40 CFR 61 Appendix D, is less than 2.0×10^{-6} rem/year Effective Dose Equivalent (EDE). The probability of the maximally exposed offsite individual developing an LCF as a result of exposure to this radiation for one year is estimated to be 1 in 1 billion. A discussion of radiological doses and health effects is given in the following sections.

Completing the waste line replacement and 219-S upgrades would have the positive effect of bringing the facility into compliance, reducing radiation exposure to workers during normal operations, and minimizing the risk of accidental release of waste to the environment.

5.3 Accident Risk

A review of the waste system operation was also performed to select accidents that could happen during the lifetime of the waste transfer and treatment system. Two accidents were selected to be analyzed in the PSER; a rupture of the double-contained transfer line between 219-S and the 244-S DCRT during a pressurized waste transfer operation, and a failure of the HEPA filter for venting of the waste tanks in 219-S. The upper bound accident postulated in the PSER is the rupture of the double-contained transfer line during a pressurized waste transfer operation that would produce a spray release.

A rupture of the pipeline could occur either from a seismic event or from accidentally breaching the buried line with heavy equipment while liquid waste is being transferred. The Functional Design Criteria for the pipeline requires the line to be designed to withstand a 0.09g seismic event. The probability of an earthquake of sufficient magnitude (greater than 0.09g) breaching the line at the Hanford Site during a pressurized pumping operation from 219-S to 244-S is calculated in the PSER to be 2.2×10^{-6}/year, based on the probability of an earthquake greater than 0.09g, and the fraction of the year that the line is pressurized (it is estimated that the line would be pressurized for less than 30 minutes per month or 360 minutes per year). This is equivalent to one event in 450,000 years. Rupture of the buried pipeline during an earthquake would not likely result in an airborne discharge because of the overburden covering the line; therefore, there would likely be no adverse consequences to human health or the environment.

The inadvertent rupture of the pipeline due to unauthorized heavy equipment operation (such as cutting the line with a backhoe) while waste is being transferred is likewise an extremely unlikely event because of onsite work procedures and administrative controls, but is a credible accident, and the consequences would be greater due to the resultant spray release of the pipeline contents to the atmosphere. This is considered the upper bounding postulated accident. The probability of breaching the buried line with heavy equipment to produce a spray release was not calculated in the PSER because it was not felt that enough information was available to predict the probability of this event.

5.3.1 Radiological Doses

The Hanford Site standard dosimetry GENII Computer Code (PNL 1988) was used to determine the radiological doses from the postulated upper bounding accident, which is the rupture of the double-contained transfer line by heavy equipment during a pressurized waste transfer operation. Radiological dose consequences were calculated for the maximally exposed onsite and offsite individuals, the maximally exposed offsite population, and the average exposed offsite individual based on the postulated bounding accident. Calculated doses to the maximally exposed individuals and the offsite population using the GENII Computer Code are very conservative estimates assuming worst case conditions. The calculated doses are given in Table 1.

Table 1.

Summary of Accident Consequences
Spray Release Caused By Heavy Equipment Intrusion

Receptor	Dose	Population	Health Effect
Maximally Exposed Onsite Individual	0.0025 rem (EDE) (2.5×10^{-3} rem)	1	0.000001 LCF (1.0×10^{-6})
Maximally Exposed Offsite Individual	0.000073 rem (EDE) (7.3×10^{-5} rem)	1	0.000000037 LCF (3.7×10^{-8})
Maximally Exposed Offsite Population	0.053 person-rem (5.3×10^{-2} rem)	102,538	0.000026 LCF (2.6×10^{-5})
Average Potentially Exposed Offsite Individual	0.000000011 rem (EDE) (1.1×10^{-8} rem)	In a potentially exposed population of 375,860	0.000000000006 LCF (6.0×10^{-12})

LCF = Latent Cancer Fatalities

5.3.2 Health Effects

Estimates may be made for the health effects in the form of LCFs using the dose calculations from the GENII Computer Code model for the postulated accident and applying dose-to-risk conversion factors developed by the International Commission on Radiological Protection (ICRP). The ICRP has determined that the nominal cancer fatality dose-to-risk conversion factor for low dose, low dose-rate irradiation is approximately 4.0×10^{-4} LCF/person-rem EDE for a worker population, and for a population of all ages the dose-to-risk conversion factor is approximately 5.0×10^{-4} LCF/person-rem EDE (ICRP 1991). The

health effects are calculated by multiplying the calculated radiological dose by the ICRP coefficient.

The health effects estimated from the dose calculations and the ICRP dose-to-risk conversion factors are also summarized in Table 1. Because of the conservative dose estimates from the GENII Computer Code, the estimated health effects are also very conservative.

5.3.2.1 Onsite Effects

The calculated health effect of 1.0×10^{-6} LCF means that the probability that the radiation would produce a fatal cancer in the maximally exposed onsite individual as a result of the postulated accident is one in one million. This represents a conservative bounding case. To place this in perspective, the National Safety Council has estimated the total annual death rate from all types of cancer per 100,000 persons of all ages is 195.9 (NSC 1990).

Should the postulated accident occur, onsite personnel and leak detection instruments would limit the duration and quantity of the liquid discharge and the migration into the vadose zone would be very limited. It is not anticipated that the spill would reach the unconfined aquifer at a depth of 61 meters (200 feet). Cleanup of the spill following the accident would result in some exposure to radiation workers who would clean up the contaminated soil. The dose to the cleanup workers would be anticipated to be less than the dose received by the workers involved with the accident. The cleanup workers would be trained radiation workers, which may not be the case for those workers in the vicinity of the spill, and proper ALARA principles (i.e., administrative and engineering controls to limit worker exposure, the utilization of shielding as appropriate, the utilization of special tools and remote handling equipment whenever possible, etc.) would be utilized in the planning and execution of the cleanup.

5.3.2.2 Offsite Effects

The offsite population is assumed to extend from the Hanford Site boundary, to a circle having a 80 kilometer (50 mile) radius from the point of the accident. The maximally exposed offsite population is chosen to be the population in the compass sector which yields the highest population dose based on population distribution and meteorological conditions. This sector, out to 80 kilometers (50 miles) has a population of 102,538.

The calculated health effect of 2.6×10^{-5} LCF means that the chances of a LCF in the maximally exposed offsite population, given that the spray leak accident occurs is approximately three in 100,000. This represents a conservative bounding case. To place this in perspective, this exposed offsite population of 102,538 persons would normally be expected to have approximately 200 LCFs per year from causes other than the postulated accident (NSC 1990).

The calculated health effect of 3.7×10^{-8} LCF for the maximally exposed offsite individual means that the probability that radiation would induce a fatal cancer in that

individual as a result of the postulated accident is about four in 100 million. This represents a conservative bounding case.

Based on average meteorological conditions for the Hanford Site, a calculation was also made to project the health effects to the average potentially exposed individual in the total offsite population within 80 kilometers (50 miles) of the point of the accident. This calculated health effect is 6×10^{-12} LCF for the average potentially exposed offsite individual. This means that the probability of the average individual in the offsite population of 375,860 within an 80 kilometer (50 mile) radius developing a fatal cancer should the postulated accident occur is about 6 in 1 trillion.

The concept of the average potentially exposed offsite individual is based on the distribution of the offsite population and the weighted average of the meteorological conditions in all sectors during the year. The actual population health effect could be larger or smaller than this average depending on the prevailing atmospheric conditions should the accident occur, but could not exceed the health effect to the maximally exposed offsite individual in the conservative bounding case.

5.4 Hazardous Chemicals

Hazardous chemicals are constituents of the liquid waste along with radionuclides in the 222-S mixed waste effluent. The aqueous waste solutions from the laboratory may contain chloride, nitric acid, carbonate, hydroxide, fluoride, nitrite, phosphate, sodium, sulphate, and organic carbon compounds. The accident with the greatest risk would be a major leak from a pipeline, or tank rupture that for some reason is not contained by the tank secondary containment. This would be a low probability event that could result in potential adverse effects to immediately involved workers in the form of chemical burns and effects due to inhalation. Because the atmospheric emissions are anticipated to be small and of short duration, no adverse impacts to non-involved workers and offsite individuals are expected. In case of a major leak or the postulated upper bounding accident, onsite personnel and leak detection instruments would limit the duration and quantity and no migration through the vadose zone to the unconfined aquifer would be anticipated. Prompt remedial action would take place to mitigate the spill in accordance with applicable requirements. The operation of the upgraded systems would represent no change from the current operation other than eliminating the current practice of trucking the wastes. The risk of personnel contamination from leaks or spills would be reduced. The systems would be designed to avoid worker contact with the wastes.

5.5 Cumulative Impacts

Cumulative impacts from the proposed action to replace the 222-S liquid waste lines and upgrade 219-S would consist of adding approximately 62 cubic meters (2200 cubic feet) of

low-level mixed waste to the mixed wastes stored in the Hanford Central Waste Complex. In addition, approximately 22.6 cubic meters (800 cubic feet) of buried new pipe would be placed in service to eventually be remediated as part of the environmental restoration program. This could potentially increase the quantity of waste to be added to existing Hanford Site storage and disposal sites as discussed in Section 5.1. To put this total in perspective, 447 cubic meters (15,800 cubic feet) of low-level mixed waste was generated at the Hanford Site during 1992.

Because emissions from 222-S and 219-S would remain essentially the same, the proposed action would not result in an overall increase in Hanford Site radiological emissions. Consequently, there would be no detrimental effect to human health to either on- or offsite populations.

The proposed action would not change the size of the permanent workforce at the Hanford Site as the personnel needed to operate the facilities would consist of existing employees. However, during the construction phase of the proposed action, a small temporary increase in construction workers may be necessary. Even assuming this small increase, there would be no socioeconomic impacts to the City of Richland or nearby communities.

5.6 Environmental Justice

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 environmental effects of their programs and activities on minority and low-income populations. The analysis presented in this EA indicates that there would be minimal impacts to on- and offsite populations during both construction/replacement of the drain lines and the upgrades to 219-S. Additionally, the proposed action would not result in any increase in air emissions from these facilities which could impact on- or offsite populations. Therefore, it is not expected that there would be any disproportionate impacts to any minority or low-income populations.

6.0 Permits and Regulatory Requirements

The drain lines from 222-S to 219-S and the tank system in 219-S are included in the 222-S Laboratory Complex Dangerous Waste Permit Application, which has been submitted to Ecology. The waste transfer line from 219-S to the 241-SY Tank Farm is included in the Double-Shell Tank System Dangerous Waste Permit Application which also has been submitted to Ecology. Ecology would be notified of the changes in the drain system as they were made and the permit applications would be modified.

The upgraded drain and transfer line system would comply with the provisions of 40 CFR 265 and WAC 173-303.

Because of the potential for radionuclide and other contaminants to be released to the air during construction activities and the subsequent operation of 219-S, the drain line replacement and 219-S upgrades would have to comply with provisions of 40 CFR 61, Subpart H, National Emission Standards for Hazardous Air Pollutants (NESHAPS); WAC 246-247, Radioactive Air Emissions Program (RAEP); WAC 173-400, Prevention of Significant Deterioration (PSD); and WAC 173-460, Notice of Construction (NOC).

This page intentionally left blank.

7.0 Organizations Consulted

No outside agencies or persons were consulted for the preparation of this document. Prior to DOE approval of this EA, it was sent to the State of Washington and the affected indian tribes; the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Nez Perce Tribe, and the Wanapum for review.

Appendix D presents the comments received from the State of Washington and the Yakama Indian Nation, as well as responses to these comments.

This page intentionally left blank.

8.0 References

10 CFR 835, 1993, "Occupational Radiation Protection," *Code of Federal Regulations*, as amended.

ICRP, 1991, "*International Commission on Radiological Protection, Annals of the ICRP*," Publication 60, pp. 132-133.

NSC, 1990, "*Accident Facts - 1990 Edition*," National Safety Council, Chicago, Illinois, p. 6.

PNL, 1988, "*GENII - The Hanford Environmental Radiation Dosimetry Software System*," Pacific Northwest Laboratory, Richland, Washington, PNL-6584, Volume 1, UC-600.

PNL, 1994, "*Hanford Site National Environmental Policy Act (NEPA) Characterization*," (PNL 6415, Rev.6), Pacific Northwest Laboratory, Richland, Washington.

WHC, 1991, "*Preliminary Safety Evaluation Report for Project 93L-GFW-087, 222-S Radioactive Liquid Waste Lines Upgrade*," (WHC-SD-W087-PSE-001, Revision 0), Westinghouse Hanford Company, Richland, Washington.

This page intentionally left blank.

Figures

This page intentionally left blank.

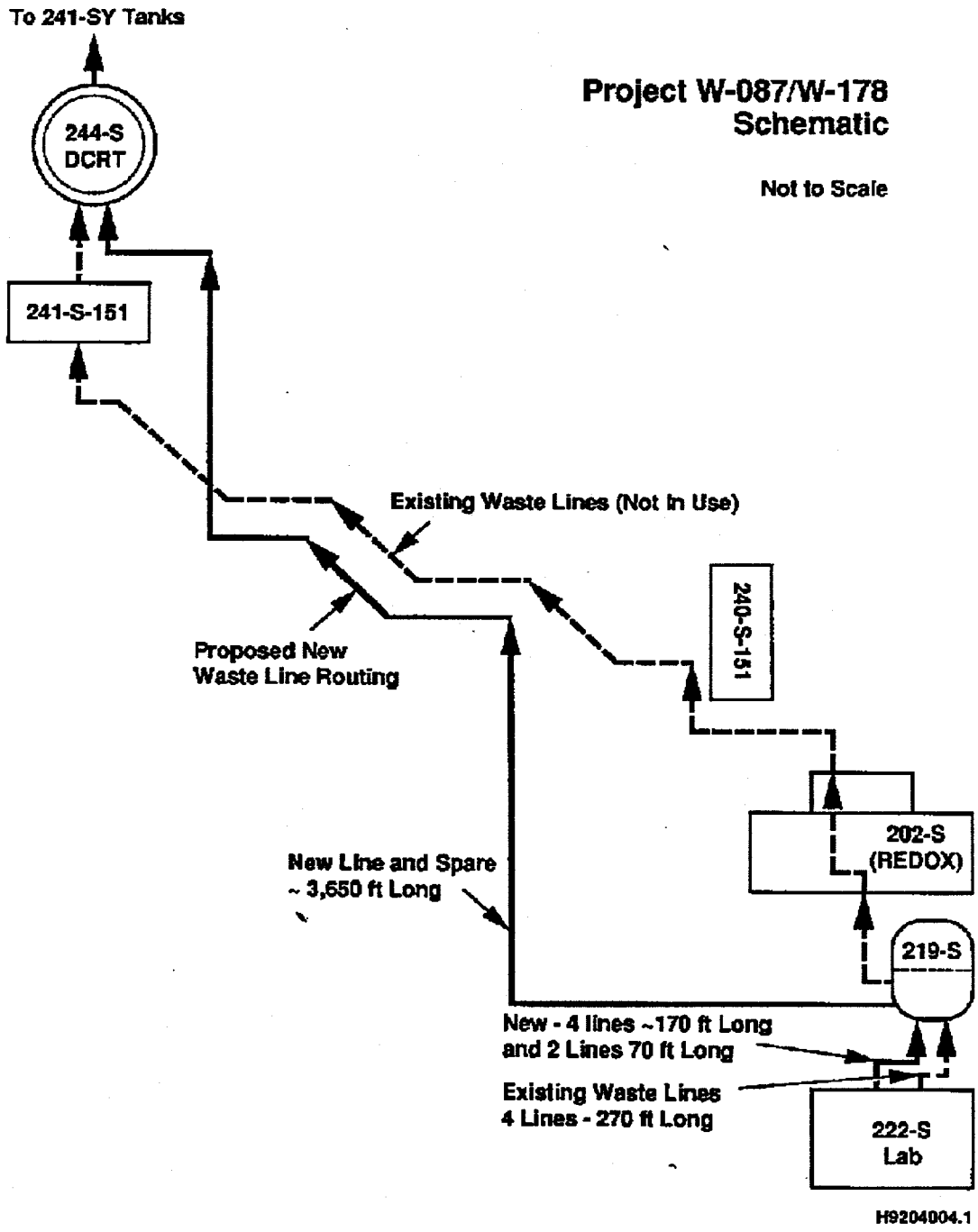

Figure 1. Schematic of the Proposed 222-S Waste Line Replacement

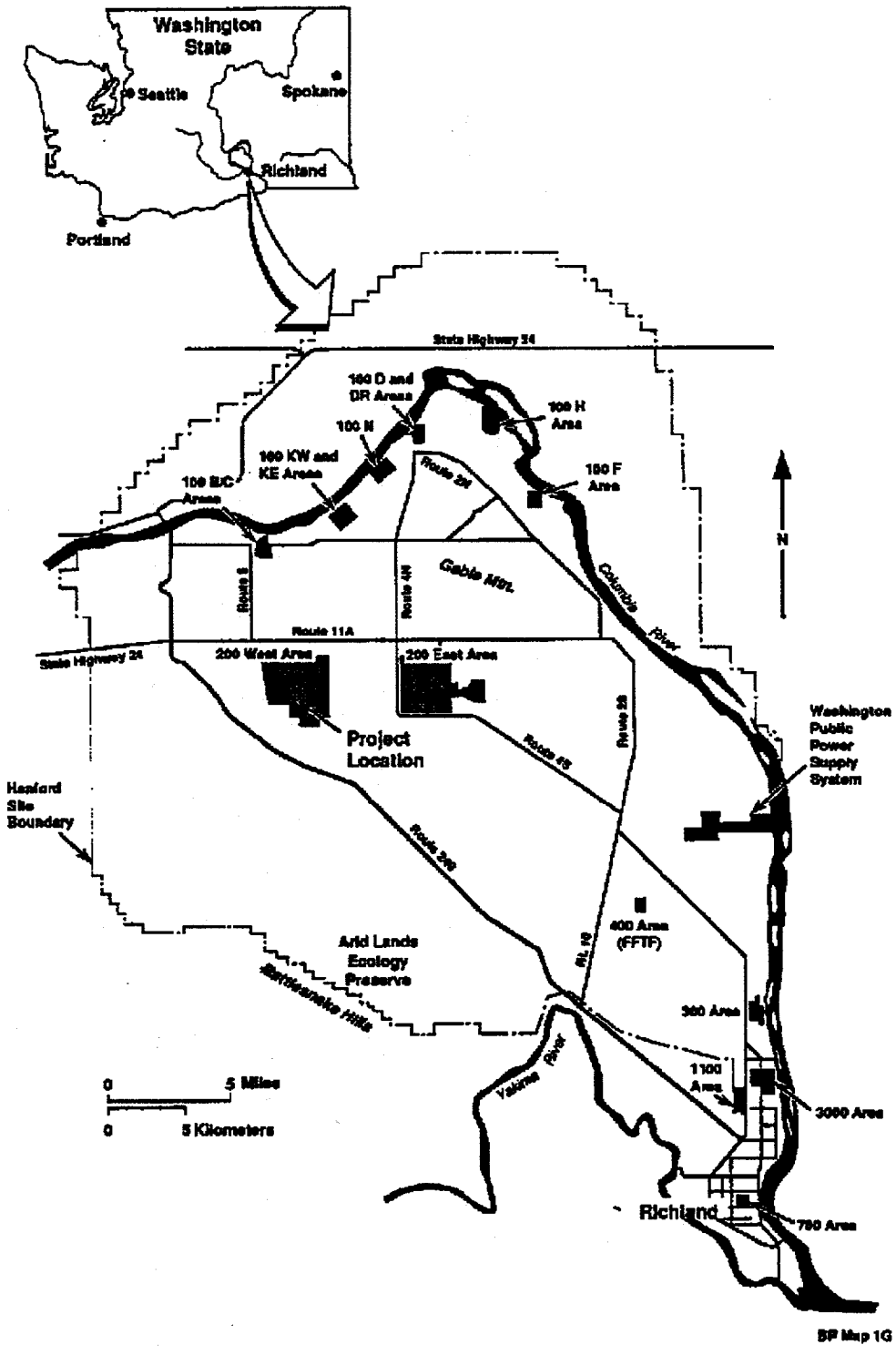

Figure 2. Hanford Site Map

Appendix A

Waste Characteristics

This page intentionally left blank.

APPENDIX A

TABLE A-1
RANGE OF OPERATION

Piping and all components in contact with waste solutions shall be designed to transfer liquid wastes with the following characteristics:

Fluid Properties:	
Density	1.0 - 1.4 g/cc
Viscosity	0.3 - 3.0 centipoise
Solids Content	0.0 - 2.0 vol. %
Radioactive Materials:	
Total Alpha	0.000005 Ci/l
Total Beta	0.0002 Ci/l
Strontium-89/90	0.00003 Ci/l
Cesium-137	0.00005 Ci/l
Uranium	0.01 g/l
Plutonium	0.00004 g/l
Chemicals in Aqueous Solution:	
Hydrochloric Acid	0 - 0.5 Molar
Nitric Acid	0 - 12.0 Molar
Carbonate	0 - 2.0 Molar
Hydroxide	0 - 10.0 Molar
Fluoride	0 - 0.5 Molar
Nitrite	0 - 0.025 Molar
Phosphate	0 - 0.5 Molar
Sodium	0 - 10.0 Molar
Sulfate	0 - 0.5 Molar
Total Organic Carbon	0 - 1.0 g/l

TABLE A-2
AVERAGE ANALYSIS OF 1993 SHIPMENTS FROM 219-S
COMPOSITION BEFORE TREATMENT

DETERM	WEIGHTED AVERAGE	UNITS
Total Beta	54.3	μCi/l
Alpha Total	0.706	μCi/l
Cl	0.0281	Molar
Total Inorganic Carbon	0.005333	Molar
Total Organic Carbon	0.347	g/l C
F	0.00298	Molar
Cs-137 (GEA)	45.7	μci/l
Co-60 (GEA)	0.185	μci/l
H+	0.0994	Molar
Hg	0.322	mg/l
As	230	ppb
Zr	6110	ppb
Sr	4740	ppb
Bi	1100	ppb
Sn	2710	ppb
Si	20100	ppb
Al	15200	ppb
Co	99.2	ppb
Cu	1160	ppb
Li	79.6	ppb
Zn	18000	ppb
Ni	4630	ppb
La	4630	ppb
Eu	38.6	ppb
Fe	33200	ppb

Ca	50500	ppb
Cr	7430	ppb
Ce	1670	ppb
Be	254	ppb
Ba	1750	ppb
Nd	480	ppb
P	39200	ppb
Se	2100	ppb
S	244000	ppb
Mg	9560	ppb
Na	803000	ppb
Mo	1300	ppb
Pb	41100	ppb
Ti	556	ppb
Cd	151	ppb
B	20200	ppb
K	243000	ppb
Mn	8540	ppb
Ag	42.4	ppb
I-129	0.0823	μCi/l
NO2	0.000273	Molar
NO3	0.104	Molar
pH	1.20	
Pm	3.59	μCi/l
PO4	0.0128	Molar
Pu-238	0.0290	μCi/l
Pu-239/40	0.249	μCi/l
Pu TOTAL	0.0473	g
Se	13.6	μG/l
SO4	0.00597	Molar
Sr-89/90	29.7	μCi/l
Tc-99	0.0275	μCi/l
U	0.0141	g/l

Am-241	0.136	μci/l
H-3	0.000367	μCi/ml
C-14	0.00000301	μCi/ml

Following treatment with sodium hydroxide at 219-S, the NO2 was 0.0178 Molar and the pH was 12.6.

Appendix B

Cultural Resources Review For Projects W-087 and W-178 (HCRL #93-0200-046)

This page intentionally left blank.

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509)

May 28, 1993

No Known Cultural Resources

Mr. John Beyer
Westinghouse Hanford Company
Effluent Treatment and Laboratory Projects
P.O. Box 1970/2752E/C104
Richland, WA 99352

CULTURAL RESOURCES REVIEW OF THE W-087 RADIOACTIVE LIQUID WASTE LINE REPLACEMENT AND W-178 219-S SECONDARY CONTAINMENT UPGRADE PROJECTS. HCRC #93-0200-046.

Dear John:

In response to your request received May 26, 1993, staff of the Hanford Cultural Resources Laboratory (HCRL) conducted a cultural resources review of the subject project, located in the 200 Area of the Hanford Site. According to the information that you supplied, the W-087 project entails replacing the waste transfer lines between the 222-S Laboratory and the 219-S Waste Handling Facility. It will also involve installing new transfer lines from the 219-S Facility to the 244-S Catch Basin adjacent to the SY Tank Farm. The W-178 project entails installing a stainless steel liner and leak detection system in the 219-S Waste Handling Facility.

Our literature and records review shows that the project area is located in highly disturbed ground. It is unlikely that any intact cultural materials would exist in such a disturbed area. Survey and monitoring by an archaeologist are not necessary.

It is the finding of the HCRL staff that there are no known cultural resources or historic properties within the project area. The workers, however, should be directed to watch for cultural materials (e.g., bones, artifacts) during excavations. If any are encountered, work in the vicinity of the discovery must stop until an HCRL archaeologist has been notified, assessed the significance of the find, and, if necessary, arranged for mitigation of the impacts to the find. This is a Class I case, defined as a project that involves maintenance of existing facilities in a disturbed, low-sensitivity area, and a Class III case, a project that involves new construction in a disturbed, low-sensitivity area. Please notify us if changes to the project location or dimensions are anticipated.

A copy of this letter has been sent to Charles Pasternak, DOE, Richland Operations Office, as official documentation. If you have any questions, I can be reached at 372-2225. Please use the HCRC# above for any future correspondence concerning this project.

Very truly yours,

M. E. Crist
Technician
Cultural Resources Project

Concurrence: M. K. Wright
M. K. Wright, Scientist
Cultural Resources Project

cc: C. R. Pasternak, RL (2)
File/LB

This page intentionally left blank.

Appendix C

Ecological Survey For W-087 Pipeline (#93-200-7)

This page intentionally left blank.

ECOLOGICAL SURVEY FORM

REPORT #: 93-200-7 **LOCATION:** T12N R26E S6

PROJECT: W-011H Waste Sampling and Characterization Facility Water Line
W-087 Radioactive Liquid Waste Transfer Line Replacement

PLANT SURVEY DATE: 05/24/93 **INVESTIGATOR:** M. R. Sackschewsky

ANIMAL SURVEY DATE: 05/24/93 **INVESTIGATOR:** D. S. Landeen

SPECIES OF SPECIAL CONCERN OBSERVED:

PLANTS: Stalked-pod milkvetch (*Astragalus sclerocarpus*)
WILDLIFE: None

IS THE AREA UNDER VEGETATION MANAGEMENT: No

DESCRIPTION OF AREA: The Waste Sampling and Characterization Facility Water line starts at T-Plant in 200 West and goes to the above mentioned facility. The area near T-Plant is composed of Siberian wheatgrass which was planted in the 1970's. This area is also dominated by cheatgrass and some sagebrush. The area proposed for the Radioactive Liquid Waste Transfer Line replacement near S-Plant in 200 West has been disturbed and is dominated by rabbitbrush, cheatgrass, and mustard sp. Some of the area has also been reseeded with Siberian wheatgrass.

PLANTS OBSERVED: *Astragalus sclerocarpus* which is classified as a state monitor three species was found at both sites. A monitor three species means that it is more abundant or less threatened than previously believed so relatively it is of minor importance and should not preclude the construction of either line. See the attached forms for a complete list of all plant species observed at both sites.

WILDLIFE OBSERVED: Bird species observed were the western meadow lark, starling, and magpie. Species of concern that were specifically looked for but not observed were loggerhead shrikes, sage sparrows, and burrowing owls.

SUMMARY AND CONCLUSIONS: The planned construction of both the water line and the radioactive waste transfer line will not impact any plant or wildlife species of concern. From an ecological perspective there is no reason not to proceed with the planned construction of these lines.

PLANT SPECIES SEEN PROJECT W-087 (S-PLANT TRANSFER LINE)		
SPECIES	FAMILY	COMMON NAME
Achillea millefolium	Asteraceae	Yarrow
Ambrosia acanthicarpa	Asteraceae	Bur ragweed
Chrysothamnus nauseosus	Asteraceae	Gray rabbitbrush
Machaeranthera canescens	Asteraceae	Hoary aster
Tragopogon dubius	Asteraceae	Salsify
Sisymbrium altissimum	Brassicaceae	Jim Hill Mustard
Holosteum umbellatum	Caryophyllaceae	Jagged Chickweed
Salsola kali	Chenopodiaceae	Russian thistle
Astragalus sclerocarpus	Fabaceae	Stalked-pod milkvetch
Calochortus macrocarpus	Liliaceae	Mariposa lily
Agropyron sibericum	Poaceae	Siberian wheatgrass
Bromus tectorum	Poaceae	Cheatgrass
Oryzopsis hymenoides	Poaceae	Indian ricegrass
Poa sandbergii	Poaceae	Sandberg's bluegrass
Stipa comata	Poaceae	Needle-and-thread
Penstemon acuminatus	Scrophulariaceae	Sand beardtongue

Appendix D

EA Comments and Responses

This page intentionally left blank.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600 • (206) 407-6000 • TDD Only (Hearing Impaired) (206) 407-6006

August 2, 1994

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

Dear Mr. Dunigan:

Thank you for the opportunity to comment on the environmental assessment for the 222-S Laboratory radioactive liquid waste line replacement and 219-S Treatment and Storage Facility secondary containment upgrade at the Hanford site. After reviewing the document we had the following comments. These comments are preliminary and subject to change based on discussions with U. S. Department of Energy and Ecology's staff.

(1) Any ground water withdrawals in excess of 5,000 gallons per day or for the irrigation of more than one-half acre of lawn or noncommercial garden, or any surface water diversions will require a water right permit from Ecology.

(2) A Notice of Construction (NOC) air permit may be needed for this proposal, even if the project results in lower overall air emissions.

(3) Please clarify whether the statement, "new drain pipelines would be double walled from where the piping enters the 222-S Laboratory service tunnels to the inside of the 219-S concrete confinement", means that secondary containment will be provided by concrete inside 219-S.

(4) It was suggested that piping which currently belongs to the double-shell tanks would be included in CERCLA work plans. Transitioning this ancillary equipment from the dangerous waste rules to CERCLA will require Ecology and Environmental Protection Agency approval.

(5) The document is unclear as to how the 219-S cell sumps operate following the planned upgrades. It should be clarified as to whether they connect to a common cell drain, or will they be pumped from each sump to a holding tank?

Mr. Paul F. X. Dunigan, Jr.
August 2, 1994
Page 2

(6) The pipe insulation may not be subject to the dangerous waste regulation if it contains only asbestos. Please refer to WAC 173-303-071(3)(m) and 40 CFR Part 61.

(7) Removed tanks and piping may be subject to the "Debris Rule" in 57 FR 37194, and the treatment standards in 40 CFR 268.45.

(8) The dangerous waste regulations do not specifically require triple rinsing for decontamination of tank systems. Please explain the technical and regulatory basis for rinsing.

(9) New underground piping will need to comply with the Hanford Facility Dangerous Waste Permit Condition II.U. for mapping.

(10) Ecology is not satisfied that the environmental effects of the pipes proposed to be capped and left in place (Page 2 of 21, paragraph 1) have been evaluated. An unknown effect on the environment, remediated in an unknown manner at some unknown date in the future is inappropriate. Regulation directs attention to this type of work within 180 days, WAC 173-303-610(4)(b).

(11) Westinghouse and Ecology are accustomed to thinking of Hanford as a huge project. This does not, however, diminish 2,200 cubic feet of mixed waste to insignificant proportions (Page 2 of 21, paragraph 5). The effect to the environment should be addressed when considering the final dispositions of those 17 large burial boxes generated by this activity. The proposed location of disposal for the removed tanks and piping should be included in this assessment.

(12) The document states that dust control would be accomplished by spraying with raw water. Water should not be sprayed on contaminated ground as there is a risk of driving contaminants into the groundwater.

Mr. Paul F. X. Dunigan, Jr.
August 2, 1994
Page 3

If you have any questions on Comment (1), please call Mr. Tim Reierson with our Water Resources Program at (509) 575-2384. Questions regarding Comments (2) through (9) should be directed to Mr. Mike Gordon with our Nuclear Waste Program at (206) 407-7143. For questions on Comments (10) through (12), please contact Mr. Bob Cordts, also with our Nuclear Waste Program at (206) 407-7142.

Sincerely,

Barbara J. Ritchie

Barbara J. Ritchie
Environmental Review Section

BJR:ri
94-5666

cc: Jeff Breckel, Nuclear Waste
Bob Cordts, Nuclear Waste
Mike Gordon, Nuclear Waste
Tim Reierson, CRO
Debbie Smith-Taylor, CRO

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352
DEC 14 1994

94-ASB-078

Ms. Barbara J. Ritchie
NEPA Coordinator
Environmental Review Section
State of Washington
Department of Ecology
Post Office Box 47703
Olympia, Washington 98504-7703

Dear Ms. Ritchie:

COMMENTS TO ENVIRONMENTAL ASSESSMENT FOR THE 222-S RADIOACTIVE LIQUID WASTE LINE REPLACEMENT AND 219-S SECONDARY CONTAINMENT UPGRADE

Thank you for your comments of August 2, 1994, on the subject draft Environmental Assessment (EA). Responses to the comments are detailed below, and changes to the EA are noted.

(1) **Any ground water withdrawals in excess of 5,000 gallons per day or for the irrigation of more than one-half acre of lawn or noncommercial garden, or any surface water diversions will require a water right permit from State of Washington, Department of Ecology (Ecology).**

No groundwater would be withdrawn in support of this action. The water required for dust control and hydrostatic testing would be withdrawn from the site water system.

(2) **A Notice of Construction (NOC) air permit may be needed for this proposal, even if the project results in lower overall air emissions.**

No Notice Of Construction (NOC) air permit would be required for Project W-087, "222-S Radioactive Liquid Waste Line Replacement." A NOC would be required for Project W-178, "219-S Secondary Containment Upgrade," and it will be processed nine months prior to the start of construction. No modification to the document is proposed pursuant to this comment.

(3) **Please clarify whether the statement, "new drain pipelines would be double walled from where the piping enters the 222-S Laboratory service tunnels to the inside of the 219-S concrete confinement", means that secondary containment will be provided by concrete inside 219-S.**

Secondary containment that meets the requirements of Washington Administrative Code (WAC) 173-303-640 would be provided for the complete system. The concept for the interface at the 219-S Vault is to have the doubled walled pipe penetrate through the wall and then terminate. Secondary containment inside the vault would be met through the use of a stainless steel liner system. This is provided as a clarification and no modification is proposed pursuant to this comment.

(4) **It was suggested that piping which currently belongs to the double-shell tanks would be included in CERCLA work plans. Transitioning this ancillary equipment from the dangerous waste rules to CERCLA will require Ecology and Environmental Protection Agency approval.**

The lines which would be installed under this proposed action fall under dangerous waste regulations. However, the decommissioning of these lines will be a part of an integrated action that has yet to be defined. The document will be revised to reflect this condition more accurately.

(5) **The document is unclear as to how the 219-S cell sumps operate following the planned upgrades. It should be clarified as to whether they connect to a common cell drain, or will they be pumped from each sump to a holding tank?**

There is a common sump for each of the two cells in 219-S. These sumps would be designed to meet the dangerous waste regulations for leak detection. No modification to the document is proposed pursuant to this comment.

(6) **The pipe insulation may not be subject to the dangerous waste regulation if it contains only asbestos. Please refer to WAC 173-303-071(3)(m) and 40 CFR Part 61.**

The pipe insulation has been considered to be subject to the dangerous waste regulations due to the high potential for it to be contaminated. This was considered in this manner to be conservative regarding potential impacts. No modification to the document is proposed pursuant to this comment.

(7) **Removed tanks and piping may be subject to the "Debris Rule" in 57 FR 37194, and the treatment standards in 40 CFR 268.45.**

It is agreed that they may be subject to the "Debris Rule." Applicable requirements of this rule would be satisfied. No modification to the document is proposed pursuant to this comment.

(8) **The dangerous waste regulations do not specifically require triple rinsing for decontamination of tank systems. Please explain the technical and regulatory basis for rinsing.**

Triple rinsing is an operational procedure that would be used to lower radiation levels in the 219-S facility prior to construction. This rinsing would contribute to lowering personnel exposure during construction. No modification to the document is proposed pursuant to this comment.

(9) **New underground piping will need to comply with the Hanford Facility Dangerous Waste Permit Condition II.U. for mapping.**

New underground piping would comply with the mapping requirements. No modification to the document is proposed pursuant to this comment.

(10) **Ecology is not satisfied that the environmental effects of the pipes proposed to be capped and left in place (Page 2 of 21, paragraph 1) have been evaluated. An unknown effect on the environment, remediated in an unknown manner at some unknown date in the future is inappropriate. Regulation directs attention to this type of work within 180 days, WAC 173-303-610(4)(b).**

The transfer lines in question (i.e., those lines between 222-S Analytical Laboratory and the 219-S Waste Handling Facility) would be flushed to remove dangerous waste to the extent practicable prior to being capped. Therefore, the risk of future releases from these transfer lines would be minimal. The proposed action is considered a replacement of components (i.e., ancillary equipment) rather than closure of the tank system in question. Additionally, the 180-day closure requirement must be accomplished only after the unit in question has received the final volume of waste as specified per WAC 173-303-610(4)(b). Because the tank system has not received the final volume of waste and because the activity in question is a component replacement activity, RL does not believe that closure activities have been triggered. Finally, the lines in question would be closed in accordance with an Ecology approved closure plan at the time the unit in question received the final volume of dangerous waste. All closure activities would be documented in that plan and would ensure protection of human health and the environment.

(11) **Westinghouse Hanford Company (WHC) and Ecology are accustomed to thinking of Hanford as a huge project. This does not, however, diminish 2,200 cubic feet of mixed waste to insignificant proportions (Page 2 of 21, paragraph 5). The effect to the environment should be addressed when considering the final dispositions of those 17 large burial boxes generated by this activity. The proposed location of disposal for the removed tanks and piping should be included in this assessment.**

Barbara Ritchie -4- DEC 14 1994
94-ASB-078

The following information will be added to the document to identify more specifically the disposal scenario for the mixed waste. The mixed waste would be characterized and stored in RCRA permitted storage facility in the Hanford Central Waste Complex in the 200 West area of the Hanford site, pending appropriate treatment and disposal in a RCRA permitted facility.

(12) The document states that dust control would be accomplished by spraying with raw water. Water should not be sprayed on contaminated ground as there is a risk of driving contaminants into the groundwater.

Water would be used for control of dust in non contaminated areas. In addition, relatively small amounts of water would be used and evaporation is expected to prevent any penetration deep into the soil. No modification to the document is proposed pursuant to this comment.

If you have any questions, please call me on (509) 376-6667.

Sincerely,

Paul F. X. Dunigan, Jr.

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

WPD:PKC

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

94-ASB-077

DEC 14 1994

Mr. Russell Jim
Program Manager
Environmental Restoration and Waste
Management Program
Yakama Indian Nation
Post Office 151
Toppenish, Washington 98948

Dear Mr. Jim:

ENVIRONMENTAL ASSESSMENT FOR THE 222-S LABORATORY RADIOACTIVE LIQUID WASTE LINE REPLACEMENT AND 219-S TREATMENT AND STORAGE FACILITY SECONDARY CONTAINMENT UPGRADE AT THE HANFORD SITE

On August 1, 1994, I forwarded the subject draft Environmental Assessment (EA) to you. In late August 1994, the Department of Energy Richland Operations Office (RL) Waste Programs Division was advised by phone call from Mr. F. Robert Cook of your staff that the Yakama Indian Nation (YIN) had comments. The attached written listing of issues was provided to RL on September 20, 1994. A meeting was held on Thursday, October 6, 1994, to discuss and resolve these concerns.

Discussion from the meeting is summarized below. Specific YIN issues are grouped as they were addressed in the meeting, followed by responses to the issues. Changes to the EA are also noted. The meeting participants agreed that the intent of the EA is to provide sufficient information to the decision maker to determine whether the proposed action has no significant impact on the environment or to evaluate the action and alternatives further in an Environmental Impact Statement.

ISSUE: "2. Impacts associated with the disposition scenarios associated with the D&D of new and old pipeline and other waste materials."

RESPONSE: Although removal of the existing and new lines will be performed under future decommissioning and integrated Resource Conservation and Recovery Act (RCRA) closure actions, Project W-087 has considered the disposition scenarios in the following manner: (1) the existing lines will be secured as required by this project, (2) the design considered final disposition when evaluating the pipe material selection. Waste minimization principles contributed in the decision to install fiberglass piping in lieu of steel. In addition to the ease of waste segregation and compaction, selecting fiberglass eliminated the need for a cathodic protection system that would have required disposition in the future, (3) Project W-178 evaluated the integrity of the existing tanks in the 219-S facility and found them suitable for continued use which saved the waste volume and costs associated with their disposition.

Russell Jim -2- DEC 14 1994
94-ASB-077

INFORMATION ADDED TO THE EA TO BE CONSIDERED IN THE FINAL DECISION:

- Executive Summary, page ES-3, 5th paragraph - "An estimate has been made of the quantities of low-level mixed waste that could be generated by eventual decontamination and decommissioning and past-practice site remediation activities associated with the installation of replacement components. The total potential waste from the existing waste transfer lines (which would be capped and left in place), the existing concrete emplacements, and the new transfer lines with secondary containment could be 297 cubic meters (10,500 cubic feet)."

- Section 2.0, Description of the Proposed Action, second paragraph - "The proposed action is a connected action to the overall TWRS Program. This action would not limit the choice of reasonable alternatives for the TWRS Environmental Impact Statement under preparation because the action covers only the replacement of an existing system for an existing waste stream that represents a small part of the overall volume of waste managed by the TWRS Program. Therefore, this is an allowable interim action during the preparation of the TWRS EIS per 40 CFR 1506.1."

- Last paragraph on page 5-2, start of page 5-3 in Section 5.1, Construction Impacts, - "An estimate has been made of the quantities of low-level mixed waste that could be generated by final D&D and past-practice site remediation activities. Conservative waste compaction values were used. The existing waste transfer lines to be capped and left in place are estimated to result in approximately 8.5 cubic meters (300 cubic feet) of waste. The existing concrete emplacements are estimated to result in about 266 cubic meters (9,400 cubic feet) of potentially contaminated waste. A total of about 22.6 cubic meters (800 cubic feet) of waste would be expected to result from the new transfer lines and secondary containment to be installed. The total potential waste is estimated to be 297 cubic meters (10,500 cubic feet). An analysis of the impacts of removing, storing and/or disposing of this waste at a future date is outside the scope of this EA and would be addressed by future environmental review.

  The current Tri-Party Agreement recognizes that activities related to the cleanup of the Hanford Site will involve RCRA Closures, CERCLA RI/FS activities, and D&D of structures. The generation and/or discharge of Ecology/EPA regulated substances or wastes is subject to the Tri-Party Agreement. Facility transition and D&D activities not subject to Ecology/EPA regulation that are critical to the cleanup of a past-practice aggregate area will be coordinated with Tri-Party Agreement actions with a goal of accomplishing regulated and non-regulated work in an orderly sequence."

ISSUE: Were all options considered? "1. Alternatives to new pipeline involving surface transportation and comparison of impacts with other alternatives." "3. Alternatives for solidification of waste liquids and storage in an interim dry condition until an acceptable disposal facility is identified."

RESPONSE: A consideration of alternatives to the proposed action was conducted in July 1993. The means of waste transfer was brainstormed and a multitude of concepts were conceptually considered. The field of concepts to be studied in detail was then narrowed.

The current transportation method is by tanker truck. This method does not meet the regulatory requirements in its current state, as noted in the No-Action Alternative. The concept of transportation by tanker truck was evaluated as an alternative to the transfer lines, however the concept was eliminated from consideration for the following reasons: (1) the risk of a spill to the environment is considerably higher than the transfer line option, (2) with the high-level of operator involvement with the transfer, it is labor and exposure intensive, and not consistent with ALARA principles, (3) neither the tanker or load-out station meet RCRA/WAC requirements, (4) due to the modifications required per item 3 to meet current standards and the increased operational cost associated with item 2, this alternative was not considered cost effective.

Use of a railcar for transportation was also considered. The lack of rail access and high cost of installing and operating a new rail spur, load-in and load-out stations, and double-contained railcars were reasons for not pursuing this alternative further.

Various waste treatment methodologies were considered. However, they were not adopted because none were considered cost effective and were not consistent with RL's strategy of addressing treatment of similar wastes in a comprehensive site-wide approach.

INFORMATION ADDED TO THE EA TO BE CONSIDERED IN THE FINAL DECISION:

- Executive Summary, page E-3, third paragraph - "Two alternatives to the proposed action, shipping the liquid wastes by rail tank car and alternative treatment of wastes at 222-S, were considered. These alternatives were found to require extensive permitting and construction and were more complex and less cost effective than replacing the transfer pipelines."

- Section 3.0, Alternatives to the Proposed Actions, first paragraph - "Alternatives evaluated for the liquid mixed waste line replacement and the 219-S upgrade were No-Action Alternatives for each of the related proposed actions, transferring wastes from 219-S to the tank farms via a rail car, and treatment options such as evaporation to reduce the volume of waste or sugar denitration to treat acidic wastes. The railcar and

DEC 14 1994

Russell Jim -4-
94-ASB-077

treatment option alternatives were conceptually evaluated and were found to be more complex or less cost effective than constructing the replacement pipelines."

- Section 3.1.2. Rail Transport to the Tank Farms - "This alternative would require construction of a rail spur to the 219-S facility and a regulatory compliant transfer system to load tank cars. This alternative was dismissed because of the cost and complexity of siting and constructing a rail spur and transfer system to handle the relatively small volume of liquid waste."

- Section 3.1.3. Other Treatment Options - Options for treating the wastes at the 222-S Laboratory or constructing an additional treatment facility were considered. An evaporator could be constructed to concentrate the wastes and reduce the volume. This reduced waste volume would then be trucked to the tank farm. Other options include constructing a facility which would use a sugar denitration process to treat the waste. These alternatives were dismissed for a variety of reasons. These reasons include increased complexity in the design and permitting of a new facility and product waste disposal. These alternatives would also entail a higher cost necessary for feasibility studies as well as construction of new treatment facilities. Continuing to transfer the wastes to the tank farms, where further treatment of the wastes would be considered as part of the TWRS Program, would be more environmentally sound and cost effective.

ISSUE: "4. Identification of long-lived radioactive wastes in waste streams requiring deep geologic isolation." "5. Identification of the expected maximum specific activity of the waste generated by the 222-S Laboratory." "8. Identification of organic waste in the 222-S waste stream."

RESPONSE: The long-lived radionuclides in the 219-S waste stream consist of those nuclides usually found in waste tank core samples. They include the following radionuclides: 3-H, 14-C, 60-Co, 90-Sr, 99-Tc, 129-I, 137-Cs, 238/239-Pu, 233/234/235/238-U. The waste stream also contains heavy metals in concentrations above RCRA hazardous waste limits. These metals include arsenic, barium, cadmium, lead, mercury, selenium, silver.

The expected maximum radioactive inventory of the 219-S facility is 200 curies. The major radionuclides and concentrations are: 137-Cs (125 Ci) and 90-Sr (50 Ci). 147-Pm (not a long-lived radionuclide) accounts for another 15 Ci. The remaining activity is distributed among the lesser radionuclides. The waste stream is 98.5% water. After processing through the evaporator to reduce water content, the remaining waste stream would require treatment and disposition as for other tank wastes, including disposal in a deep geologic repository.

The current average batch size is approximately 3500 gallons and the transfer interval is nominally 30 days. Therefore the annual liquid effluent stream is approximately 42,000 gallons.

The 219-S waste stream is limited to less than 1 gram/liter total organic carbon. The primary organic constituent is ethyl alcohol generated during glassware rinses. No water insoluble organics are allowed, per administrative control and procedures, in the waste stream. However, there are ppb quantities of methyl ethyl ketone, methyl iso-butyl ketone and xylene in the waste stream. These are generated during radiochemical separation procedures and are present in part per billion concentrations in the aqueous waste disposed of to the tank system.

INFORMATION ADDED TO THE EA TO BE CONSIDERED IN THE FINAL DECISION:

- Appendix A - Added table giving the average liquid waste analysis. Appendix A of the Environmental Assessment identifies the "Range Of Operation" which is the design criteria guideline for this waste system. Fluid properties, radioactive material information, and chemicals in aqueous solution are also included.

- First page of Section 1.0, Purpose and Need for the Proposed Action, first paragraph under Section 1.1, Background - "The range of characteristics of the waste to the drainlines are summarized in Appendix A."

ISSUE: "6. Impact on use of double shell tanks." "7. Effect of mixing 222-S waste streams in SY tanks." Volume of waste that the tank farms can handle. Does the volume of waste warrant the waste line?

RESPONSE: This waste stream has been and is being managed through existing double shelled tank operations and no adverse future effect on the double shell tank system is anticipated. In addition, the relative volume of this stream is small compared to that of the double shell tank system.

This waste stream will not have a detrimental effect on the existing wastes of the SY tanks. The waste is analyzed and then treated at the 219-S facility to meet the tank farm waste acceptance criteria prior to transfer.

INFORMATION ADDED TO THE EA TO BE CONSIDERED IN THE FINAL DECISION:

- Executive Summary, Page ES-1, second paragraph - "The annual volume of liquid mixed waste transferred is approximately 159,000 liters (42,000 gallons). This quantity could either increase or decrease in the future depending on analytical needs."

- First page of Section 1.0, Purpose and Need for the Proposed Action, second paragraph of Section 1.1, Background - "The annual volume of low-level mixed waste transferred is approximately 159,000 liters (42,000 gallons). This quantity could either increase or decrease in the future depending on analytical needs."

DEC 14 1994

Russell Jim -6-
94-ASB-077

- Section 2.0, Description of the Proposed Action, second paragraph - "Following completion of construction, the systems are projected to operate for at least 30 years. Management of the liquid wastes in the Hanford Tank Farms and the ultimate disposition of these wastes is the responsibility of the TWRS Program. The proposed action is a connected action to the overall TWRS Program. This action would not limit the choice of reasonable alternatives for the TWRS Environmental Impact Statement under preparation because the action covers only the replacement of an existing system for an existing waste stream that represents a small part of the overall volume of waste managed by the TWRS Program. Therefore, this is an allowable interim action during the preparation of the TWRS EIS per 40 CFR 1506.1.

ISSUE: "9. Details associated with the modification of the existing lag storage tank at the laboratory." Is installation and ultimate removal of the double containment really increasing the human health and environmental protection?

RESPONSE: The new tank 104 shall replace the existing tank 103. Due to the extremely high cost of installing secondary containment for tank 103, it was determined to be more cost effective to replace it. The physical arrangement and configuration of tank 103 would have required extensive facility modifications to meet the regulatory requirements.

The volume of tank 104 is proposed to increased from that of tank 103 in order to maximize the use of existing space. The increase in volume is expected to be approximately 400 gallons. A Notice Of Intent (NOI) shall be processed for public review and comment prior to incorporation of this volume increase. Although the waste storage volume shall increase slightly, the actual waste volume generated by the laboratory will not be effected by this action.

The liner system that is to be installed in the 219-S facility is required to provide secondary containment for the tanks and ancillary piping system per the RCRA/WAC requirements for treatment, storage and disposal facilities. The EA is not intended to question the secondary containment requirements of the RCRA and the Washington Administrative Codes. No information was added to the EA for this concern. Therefore, the issue of whether this action to provide double containment increases the human health and environmental protection is not resolved.

If you have any questions, please contact me on (509) 376-6667.

Sincerely,

Paul F. X. Dunigan, Jr.

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

WPD:PKC

Attachment

9/20/94

ISSUES FOR DISCUSSION AT A MEETING BETWEEN DOE\RL AND YAKAMA NATION REPRESENTATIVE-- Folder

SUBJECT: DOE\RL PROJECT WO87 ENVIRONMENTAL ASSESSMENT; RADIOACTIVE WASTE PIPELINE REPLACEMENT AND OTHER MODIFICATIONS ASSOCIATED WITH 222 LABORATORY--

1. ALTERNATIVES TO NEW PIPELINE INVOLVING SURFACE TRANSPORTATION AND COMPARISON OF IMPACTS WITH OTHER ALTERNATIVES.

2. IMPACTS ASSOCIATED WITH THE DISPOSITION SCENARIOS ASSOCIATED WITH THE D&D OF NEW AND OLD PIPELINE AND OTHER WASTE MATERIALS.

3. ALTERNATIVES FOR SOLIDIFICATION OF WASTE LIQUIDS AND STORAGE IN AN INTERIM DRY CONDITION UNTIL AN ACCEPTABLE DISPOSAL FACILITY IS IDENTIFIED.

4. IDENTIFICATION OF LONG-LIVED RADIOACTIVE WASTES IN WASTE STREAMS REQUIRING DEEP GEOLOGIC ISOLATION.

5. IDENTIFICATION OF THE EXPECTED MAXIMUM SPECIFIC ACTIVITY OF THE WASTE GENERATED BY THE 222 S LABORATORY.

6. IMPACT ON USE OF DOUBLE SHELL TANKS.

7. EFFECT OF MIXING 222 S WASTE STREAMS IN SY TANKS.

8. IDENTIFICATION OF ORGANIC WASTES IN THE 222 S WASTE STREAM.

9. DETAILS ASSOCIATED WITH THE MODIFICATION OF THE EXISTING LAG STORAGE TANK AT THE LABORATORY.

222-S RADIOACTIVE LIQUID WASTE LINE REPLACEMENT AND 219-S SECONDARY CONTAINMENT UPGRADE

HANFORD SITE, RICHLAND, WASHINGTON

U.S. DEPARTMENT OF ENERGY

FINDING OF NO SIGNIFICANT IMPACT

JANUARY 1995

This page intentionally left blank.

AGENCY: U.S. Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. Department of Energy (DOE) has prepared an Environmental Assessment (EA), DOE/EA-0944, to assess potential environmental impacts associated with replacement of the 222-S Laboratory (222-S) radioactive liquid waste drain lines to the 219-S Waste Handling Facility (219-S), the upgrade of 219-S, and replacement of the transfer lines from 219-S to the 241-SY Tank Farm in the 200 West Area of the Hanford Site, Richland, Washington. Alternatives considered in the review process were: the No Action alternative; rail transport of liquid wastes to the tank farms; the treatment of the liquid waste at 222-S; and the proposed action.

Based on the analysis in the EA, and considering preapproval comments from the State of Washington and the Yakama Indian Nation, DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.

ADDRESSES AND FURTHER INFORMATION:

Single copies of the EA and further project information about the proposed action are available from:

Ms. J. M. Hennig, Director
Waste Programs Division
U.S. Department of Energy
Richland Operations Office
Richland, Washington 99352
(509) 376-1366

For further information regarding the DOE NEPA process, contact:

Ms. Carol M. Borgstrom, Director
Office of NEPA Oversight
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585
(202) 586-4600 or (800) 472-2756

PURPOSE AND NEED: DOE needs to take action to bring the 222-S Laboratory (222-S) radioactive liquid waste lines and the 219-S Waste Handling Facility (219-S) into compliance with existing secondary containment and leak detection requirements of the Washington Administrative Code (WAC) 173-303 to reduce potential risks to the environment and worker safety, and reduce the risk of laboratory shutdown due to failure of the waste system. DOE also needs to bring 219-S into compliance with seismic design standards required by DOE Order 6430.1A.

BACKGROUND: The 222-S Laboratory was built in 1951 to support the 202-S Reduction-Oxidation (REDOX) Plant and the 200 Area tank farms. The laboratory is now used to perform analytical services on radioactive samples in support of the Tank Waste Remediation System and Site Environmental Restoration programs. Activities conducted at 222-S include decontamination of analytical processing and support equipment and disposal of non-archived radioactive samples resulting in the generation of low-level liquid mixed waste. The liquid mixed waste streams are drained through pipelines in the 222-S service tunnels and underground concrete encasements to two of three tanks in 219-S, where they are accumulated. Periodically, the liquid waste in the two tanks is transferred to a third tank where it is sampled. If necessary, the hydroxide and nitrite concentrations are adjusted to meet tank farm waste acceptance criteria. When the liquid waste meets the waste acceptance criteria, it is transferred to the tank farm.

The waste historically was transferred from 219-S through a buried pipeline to the 241-SY Tank Farm in the 200 West Area for storage. However, the current practice is to transfer waste via tanker truck from 219-S to a tank farm in the 200 East Area because of concerns about the integrity of the existing line between 219-S and 241-SY Tank Farm. The Washington State Department of Ecology (Ecology) is now allowing this to be done on an interim basis under a Part A Dangerous Waste Permit.

219-S is a treatment, storage, and/or disposal (TSD) unit under WAC 173-303, Dangerous Waste Regulations, and must meet state requirements for secondary containment and leak detection. The waste drain and transfer lines must also meet these requirements. The purpose and need for agency action is to bring the waste lines and 219-S into compliance with existing secondary containment and leak detection requirements in WAC 173-303, upgrade 219-S to meet seismic design standards, reduce risks to worker safety and environmental contamination, and reduce the risk of laboratory shutdown due to failure of the waste system. Most of the drain and transfer piping is approximately 40 years old and the aging pipes in the 222-S service tunnels have developed leaks that have increased radiation levels in the service tunnels. Use of tanker trucks to transfer the waste is a temporary measure permitted by Ecology and would require construction of a permanent loadout station to continue on a long term basis.

222-S is expected to remain in use for the next 30 years to serve the Hanford Site environmental cleanup mission. Because of increased sampling and analytical requirements necessary to meet environmental compliance and remediation commitments, the use of the hot cells within the laboratory has increased. Failure of the drain and transfer piping systems or any of the 219-S tanks would result in shut down of the laboratory and hot cells.

PROPOSED ACTION: The 222-S Radioactive Liquid Waste Line Replacement project will replace drain piping in the 222-S service tunnels, the piping in the underground concrete encased pipe trenches between the 222-S service tunnels and 219-S, and the waste transfer lines between 219-S and the receiving tank farm. All of the new piping will be double-walled to provide secondary containment. Leak detection and flow monitoring instrumentation will be installed at various locations. No new concrete encasements will be required. Piping materials will be selected for compatibility with the waste streams to be contained and both metallic and non-metallic materials will be considered.

Two sets of new double-walled drain lines will be installed which would extend from 222-S to 219-S. One set would consist of up to four new lines, while the other set would consist of two lines. These two sets of lines would cover distances of 52 meters (170 feet) and 21 meters (70 feet) respectively. Spare lines may be installed to provide a completely redundant

system. Excavation in a previously disturbed area will be required between the tunnel exits from 222-S and 219-S to expose the top of the existing concrete-encased pipe trenches. The lines in the existing concrete encased pipe trenches between the service tunnel exit and the tanks in 219-S will be removed as necessary to make room for the new piping. The trenches will then be backfilled and the soil stabilized.

The new drain pipelines will be pipe-in-pipe encased from where the piping enters the 222-S service tunnels to the inside of the 219-S concrete confinement. Any leakage that reaches the outer pipes will drain into a leak detection and collection sump, and will be transferred to the tanks at 219-S.

The project will also install two new double contained waste transfer lines with leak detection from 219-S to the 244-S Double Contained Receiver Tank south of the 241-SY Tank Farm. One pipeline will transfer the liquid waste and one pipeline will be a spare. A new route will be chosen for the transfer piping to the tank farm, a distance of about 1,100 meters (3,650 feet). Trenching will be required for the new lines and some existing vegetation will have to be cleared. This trench will also be stabilized, including revegetation with compatible plants.

The section of piping in the concrete encasement between 219-S and the 202-S REDOX D-Cell, and the transfer piping from D-Cell to the 241-S-151 diversion box (which will be bypassed), will be capped and left in place. The piping and concrete encasements will be included in work plans for the 200 West Area past-practice operable units, and disposed of as part of the environmental restoration program. The portion of the transfer piping within the REDOX Plant will be included in the eventual decontamination and decommissioning of that facility. Appropriate environmental reviews will be performed for those actions.

The 222-S service tunnels will be decontaminated to as low as reasonably achievable (ALARA) levels to reduce radiation exposure to construction and operating personnel. The existing hot cell drain piping containing residues of radionuclides and chemicals will be removed and disposed of in conjunction with installation of the new drain piping. Old pipe and associated equipment in the service tunnels, and in the concrete encasements to 219-S,

will be removed as necessary. Removal and disposal of contaminated pipes and equipment and associated wastes will be accomplished in accordance with all applicable federal and state regulations, DOE orders, and ALARA principles.

The 219-S Secondary Containment Project will upgrade 219-S to meet secondary containment, leak detection, and seismic design requirements. 219-S contains three tanks (101, 102, and 103) used to receive and treat the liquid low-level mixed waste. Tanks 101 and 102 are each 15,000 liter (4,000 gallon) tanks and are located in Cell A, which contains one compartment. Tank 103 is a 5,700 liter (1,500 gallon) tank in Cell B, which contains two compartments. Tanks 101 and 102 and associated piping in Cell A will be removed and the tanks and the compartment will be decontaminated and inspected. If it is found to be feasible, Tanks 101 and 102 will be reconditioned and reinstalled. If it is determined that the tanks need to be replaced, the old tanks will be disposed of and new tanks and piping will be installed. Tank 103 in Cell B will be isolated and removed from service because of its condition and structural access problems and a new 7,200 liter (1,900 gallon) tank (Tank 104) and new pipe jumpers will be installed in the spare compartment in Cell B to replace Tank 103.

The cell compartments to be used will be repaired and recoated with a chemically resistant sealer and lined with stainless steel to provide secondary containment and leak detection. New shims and seismic restraints for the tanks will be installed. New transfer pumps, valves, instruments, and necessary piping will also be installed.

ALTERNATIVES CONSIDERED: Alternatives evaluated for the radioactive liquid mixed waste line replacement and the 219-S upgrade included No-Action Alternatives for both related actions, transferring the waste from 219-S to the tank farms by rail cars, and utilizing alternative waste treatment options. Other alternatives, such as repairing the lines in the 222-S service tunnels on an as needed basis or replacing only portions of the waste transfer lines, were considered, however, they were dismissed as not meeting the purpose and need for the proposed action. Specifically, compliance with regulatory requirements for secondary containment and seismic standards would not be achieved, and the potential for

environmental contamination, the risk of radiation exposure to maintenance workers, and the possibility of laboratory shutdown would continue.

In the No-Action Alternative for the radioactive liquid mixed waste line replacement, the drainage and transfer systems would not be replaced or upgraded. Drain line leakage in the service tunnels would continue and the probability of a large release to the service tunnels would increase. This alternative could result in increased radiation exposure to maintenance workers and extended laboratory downtime. The underground concrete-encased lines would continue to be out of compliance with DOE orders and state requirements and would continue to pose the risk of a substantial release to the environment. The existing underground line from 219-S to the 241-S-151 diversion box, and the diversion box, would continue to be out of compliance with secondary containment requirements.

The current interim practice of transferring waste from 219-S via tanker truck to a tank farm in the 200 East Area would have to continue under the No-Action Alternative to replacing the waste lines. The long term safety and radiation exposure risks of transferring and transporting the wastes by truck would continue. In addition, Ecology is allowing this activity only as an interim measure under the Dangerous Waste Permit, Part A.

In the No-Action Alternative for the 219-S Waste Handling Facility upgrade, the regulatory requirements for secondary containment and leak detection would not be met. Without the addition of seismic restraints, the tanks in 219-S would be subject to toppling during a seismic event. The vertical and horizontal shims and lap joint flanges supporting the tanks would soon go beyond design life, and the tank cell chemical resistant coating would continue to deteriorate and would not protect the concrete. The No-Action Alternative could result in failure of the tanks in 219-S which would severely disrupt or stop laboratory operations. This would adversely impact Hanford programs that rely on 222-S.

The alternatives of transferring waste via rail cars and alternative treatment options were evaluated and found to more complex and less cost effective than the proposed action.

ENVIRONMENTAL IMPACTS:

Construction Impacts: There will be no planned releases of gaseous or particulate radioactive or hazardous emissions to the atmosphere during construction activities. Unplanned releases, if any, would be within the bounds for normal operations and accident scenarios, as described below. Some nonhazardous dust, exhaust gases, and heat from construction vehicles and equipment will be discharged to the air; however, dust control will be maintained by spraying with raw water as necessary, and vehicle exhaust would be minimal. Construction activities and equipment will also result in slightly elevated noise levels. No liquid discharges to the environment other than water for dust control are anticipated during construction.

There will be potential for radiation exposure to workers during the construction activities. Exposure to workers will be maintained to ALARA principles and below regulatory standards. Insufficient information was available to estimate potential worker exposures, so an upper bound case was used based on the workers receiving a dose which corresponds to the administrative control level set by the Hanford construction contractor. Under this upper bound case, the dose to workers would be 0.5 rem each, for a total of 72 person-rem resulting in a calculated 0.029 cancer deaths. Actual exposures will probably be much lower.

It is expected that construction risks will be adequately mitigated by job safety planning and using approved radiological and industrial safety procedures.

Removal of radioactively contaminated materials and equipment such as pipe, treatment tanks, valves, concrete, and soil, and removal of asbestos insulation materials around piping, will generate hazardous waste. All waste will be disposed of in existing Hanford Site waste management units, or approved permitted offsite facilities, if required. An estimated maximum of 62 cubic meters (2,200 cubic feet) of low-level mixed waste requiring about 17 large burial boxes will be generated by the proposed action. It was also estimated that up to 297 cubic meters (10,500 cubic feet) of materials may eventually need to be disposed of when the 222-S and 219-S facilities are no longer needed. This total includes the

components to be installed by this project as well as existing structures (drain lines and encasements) left in place. During 1992, a total of 447 cubic meters (15,800 cubic feet) of low-level mixed waste was generated at the Hanford Site. No new facilities or modification to existing waste management facilities will be required.

No wetlands, critical wildlife habitat, archeological sites, or other cultural resources are known to be located in the vicinity. The 200 Area Plateau is not on the 100- or 500-year floodplain.

Operational Impacts: During current normal operations, very small quantities of radionuclides are released due to evaporation from the three waste tanks in 219-S which are vented by an exhaust fan through High-Efficiency Particulate Air filters to an exhaust stack. An upper bound source term was determined for radionuclides and the filtered release of radionuclides was calculated to total 4.4×10^{-12} curies annually. The calculated dose to the maximally exposed offsite individual is less than 2.0×10^{-6} roentgen equivalent man (rem)/year Effective Dose Equivalent (EDE). This is equivalent to 1.0×10^{-9} latent cancer fatality (LCF) or a probability of the maximally exposed offsite individual becoming a LCF of 1 in 1 billion. Completing the waste line replacement and 219-S upgrades will have the positive effect of reducing radiation exposure to workers during normal operations, and minimizing the risk of accidental release of waste to the environment.

Socioeconomic Impacts: The socioeconomic impacts of the proposed action were not quantified, but are not expected to be substantial. There would be no change in the number of operating personnel. Construction activities, however, might require a small temporary increase in the number of construction workers in the area.

Potential Accidents: A review of the waste system operation was performed to select accidents that could happen during the lifetime of the waste transfer and treatment system. The upper bounding accident postulated is the rupture of a double-contained transfer line during a pressurized waste transfer operation to produce a spray release. A rupture of the pipeline could occur either from a seismic event or from accidentally breaching the buried line with heavy equipment while liquid waste is being transferred.

Health effects from the postulated accident in the form of LCF based on International Commission on Radiological Protection (ICRP) dose-to-risk conversion factors were estimated for the calculated radiological doses. The health effect to the maximally exposed individual onsite would be 1.0×10^{-6} LCF; 3.7×10^{-8} LCF to the maximally exposed individual offsite; 2.6×10^{-5} LCF to the maximally exposed offsite population; and 6.0×10^{-12} LCF to the average potentially exposed offsite individual, should the accident occur. The duration and quantity of the liquid discharge from the postulated accident would be limited and no migration into the groundwater would be expected.

Hazardous chemicals are constituents of the liquid waste along with radionuclides in the 222-S mixed-waste effluent. The aqueous waste solutions from the laboratory may contain chloride, nitric acid, carbonate, hydroxide, fluoride, nitrite, phosphate, sodium, sulphate, and organic carbon compounds. Although no exposure is expected during normal operations, the postulated accident scenario may lead to some exposure. Health effects from exposure to hazardous chemicals will be limited to chemical burns and effects due to inhalation. The risk of personnel contamination from leaks or spills will actually be reduced by implementing the proposed action. The systems will be designed to avoid worker contact with the wastes and procedures and regulations to protect workers will be in place.

Environmental Justice: As required by Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, potential disproportionately high and adverse human health or environmental effects from this proposed action on minority or low-income populations were considered. No disproportionate impacts were identified.

Cumulative Impacts: The potential impacts of the proposed action are not expected to have a substantial cumulative effect when considered with other activities on the Hanford Site.

DETERMINATION: Based on the analysis in the EA, and after considering the preapproval review comments of the State of Washington and the Yakama Indian Nation, I conclude that the proposed 222-S radioactive liquid waste line replacement and 219-S secondary containment upgrade does not constitute a major federal action significantly affecting the

quality of the human environment within the meaning of NEPA. Therefore an EIS for the proposed action is not required.

Issued at Richland, Washington this 24th day of January 1995.

John D. Wagoner
Manager
Richland Operations Office