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		Design Agent			
1	1	Cog.Eng. C. M. McConville H5-49 9-16-96			
1	1	Cog. Mgr. J. S. Garfield H5-49 9-14-96			
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		Safety			
		Env.			

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C. M. McConville 9-16-96 Signature of EDT Originator Date	Authorized Representative for Receiving Organization Date 9/16/96	J. S. Garfield 9/16/96 Design Authority/ Cognizant Manager Date	[] Approved [] Approved w/comments [] Disapproved w/comments

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
J. S. Garfield, 376-2745	W. J. Taylor, RL	9652292 DPO-96-39

Subject: TRANSMITTAL OF DECISION DOCUMENT FOR FUNCTION 4.2.4, DISPOSE WASTE TO THE U.S. DEPARTMENT OF ENERGY, RICHLAND FIELD OFFICE

INTERNAL DISTRIBUTION

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Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

May 31, 1996

9652292

Mr. W. J. Taylor, Director
Waste Disposal Division
U.S. Department of Energy
Richland, Washington 99352

Dear Mr. Taylor:

TRANSMITTAL OF DECISION DOCUMENT FOR FUNCTION 4.2.4, DISPOSE WASTE, WHC-SD-WM-ES-381, TO THE U.S. DEPARTMENT OF ENERGY, RICHLAND FIELD OFFICE

References: (1) DOE/RL-95-74, "Tank Waste Remediation System Requirements Review Action Plan," Revision 3, dated April 1996.

(2) DOE/EIS-0189D, "Draft Environmental Impact Statement for the Tank Waste Remediation System," dated April 1996.

(3) Letter, J. E. Kinzer, RL, to President, WHC, "Tank Waste Remediation System (TWRS) Systems Engineering Management Policy," 95-RTI-107, dated October 31, 1995.

(4) DOE/RL-93-102, "Fiscal Year 1995 Hanford Mission Plan," Volume 1, Site Guidance, dated September 1994.

This letter transmits supporting document WHC-SD-WM-ES-381, Revision 0, "Decision Document for Function 4.2.4, Dispose Waste," , to the U.S. Department of Energy, Richland Operations Office (RL) for your review and concurrence (see Attachment). The decision document follows a decision analysis procedure that is consistent with the Systems Engineering approach implemented by RL and Westinghouse Hanford Company (WHC) (Reference 3). In addition, the decision document satisfies recommendations from the Tank Waste Remediation System (TWRS) Systems Requirements Review (SRR) team (Reference 1), which identified the need to formally document analyses and planning assumptions.

Function 4.2.4, Dispose Waste, is defined as performing storage of solidified waste (i.e., immobilized high-level waste (IHLW), solidified Cs, and processed Cs/Sr capsules); disposing of immobilized low-activity waste (ILAW) in a safe, efficient, and environmentally acceptable manner; and closure of tank farm operable units (WHC-SD-WM-FRD-020, Revision 0).

Requirements applicable for accomplishing the Dispose Waste function have been identified and reviewed with RL personnel. An architecture for accomplishing the identified functions and requirements must be selected to enable further decomposition of the TWRS mission into identifiable work scope elements.

To further analyze this system and define the work scope necessary to accomplish this function, alternative architectures for accomplishing the Dispose Waste have been evaluated. The attached decision document contains the analysis of alternative architectures for accomplishing the Dispose Waste function.

The first step in conducting an analysis of alternative architecture is to define the problem statement(s) addressed by the analysis. The subsequent steps in conducting analysis of alternative architectures require: establishing a set of decision criteria for evaluating alternatives; screening the alternatives for compliance with requirements; estimating the expected performance of alternatives in terms of the decision criteria; evaluating risks; and formulating a recommendation/decision.

For the Dispose Waste function, the problem statements addressed as follows:

1. Will the IHLW be disposed onsite or offsite?

2. Will the ILAW be disposed onsite or offsite?

3. Will the tank farm operable units be closed according to requirements for clean closure, landfill closure, or modified closure?

The draft TWRS Environmental Impact Statement (EIS) provides an analysis of alternative architectures for the first and second of these problem statements (Reference 3). When published, the TWRS EIS record of decision will be the formal documentation for these two architecture selections. RL is planning to produce at a future date a supplemental EIS to analyze alternatives for closure of the tank farm operable units.

Until the TWRS EIS record of decision is available and the supplemental EIS for closure of tank farms operable units is completed, planning assumptions must be established for guiding the definition of work scope for the TWRS Program. WHC recommends to RL the following interim planning assumptions be adopted for the Dispose Waste function:

1. The IHLW (including waste products of dispositioned cesium/strontium capsules) will be disposed at a geologic repository located offsite. However, interim storage of IHLW at the Hanford Site will be provided until the waste is accepted by DOE for disposal at the offsite repository.

2. The ILAW will be stored onsite then disposed at a near-surface engineered disposal facility at the Hanford Site.

3. The tank farm operable units will be closed as a landfill in accordance with WAC 173-303 regulations.

The recommended planning assumptions are consistent with the Nuclear Waste Policy Act (NWPA) of 1982, as amended (Public Law 97-425, January 7, 1983); DOE Order 5820.2A, *Radioactive Waste Management*; Washington Administrative Code; and the recommended disposal strategy of the TWRS-EIS. The NWPA requires interim storage of IHLW onsite until the waste is accepted by RL at an offsite repository. The DOE Order 5820.2A requires ILAW to be disposed on the site at which it is generated, if practical. Closure of operable units as a landfill is consistent with the strategy identified in the "Hanford Federal Facility Agreement and Consent Order," as well as the planning assumptions documented by RL in the Hanford Mission Plan (Reference 4).

Followup Actions

WHC will issue the attached "Decision Document for Function 4.2.4, Dispose Waste," as supporting document WHC-SD-WM-ES-381.

Upon receipt of RL concurrence, WHC will update the following:

- Supporting document, WHC-SD-WM-ES-381 (see Attachment), will be revised to incorporate RL comments.

- The TWRS Functions and Requirements document and technical requirements specifications will reference WHC-SD-WM-ES-381 (see Attachment) as a basis for the function 4.2.4 architecture selection.

- The TWRS multi-year program planning will be premised on the planning assumptions documented in WHC-SD-WM-ES-381 (see Attachment).

If you have any questions, or require further information, please contact Mr. J. S. (John) Garfield, 376-2745.

Very truly yours,

J. O. Honeyman, Director
Disposal Program Office
Tank Waste Remediation System

lap

Attachment

9652292

RL - C. P. Bader
D. D. Button
N. R. Brown
R. Carreon
P. E. LaMont
V. L. Saladin
C. D. West
A. H. Wirkkala - w/o attachment

9652292
ATTACHMENT 1

Transmittal of Decision Document for Function 4.2.4, Dispose Waste, WHC-SD-WM-ES-381, Revision 0

Consisting of 18 pages,
including cover page

Decision Document for Function 4.2.4, Dispose Waste

C. M. McConville, K. D. Boomer, R. D. Claghorn, E. A. Fredenburg, and M. E. Johnson
Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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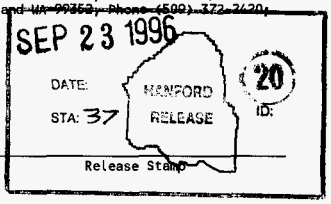
Abstract: This report formally documents the planning assumptions for Function 4.2.4, *Dispose Waste*, to provide a basis for lower level Tank Waste Remediation System (TWRS) Disposal Program decisions and analyses. The TWRS Environmental Impact Statement (DOE/EIS 1996) and a supplemental Environmental Impact Statement for closure of operable units will provide the ultimate Records of Decision for the TWRS strategy at this level. However, in the interim, this decision document provides a formal basis for the TWRS Dispose Waste planning assumptions. Function 4.2.4 addresses the disposition of immobilized high-level waste (IHLW), the disposition of immobilized low-activity waste (ILAW), and closure of the tank farm operable units.



Release Approval — Date

Approved for Public Release

WHC-SD-WM-ES-381
Revision 0

DECISION DOCUMENT FOR FUNCTION 4.2.4, DISPOSE WASTE

R. D. Claghorn
E. A. Fredenburg
M. E. Johnson
C. M. McConville

May 1996

Westinghouse Hanford Company
Richland, Washington

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DECISION DOCUMENT FOR FUNCTION 4.2.4, DISPOSE WASTE

1.0 INTRODUCTION

This report formally documents the planning assumptions for Function 4.2.4, *Dispose Waste*, to provide a basis for lower level Tank Waste Remediation System (TWRS) Disposal Program decisions and analyses. The TWRS Environmental Impact Statement (TWRS-EIS) (DOE/EIS 1996) and a supplemental EIS for closure of operable units will provide the ultimate Records of Decision (ROD) for the TWRS strategy at this level. However, in the interim, this decision document provides a formal basis for the TWRS Dispose Waste planning assumptions.

Function 4.2.4 addresses the disposition of immobilized high-level waste (IHLW), the disposition of immobilized low-activity waste (ILAW), and closure of the tank farm operable units. Figure 1 shows the recommended architecture selection for Function 4.2.4, and its predecessor, Function 4.2, *Remediate Tank Waste*.

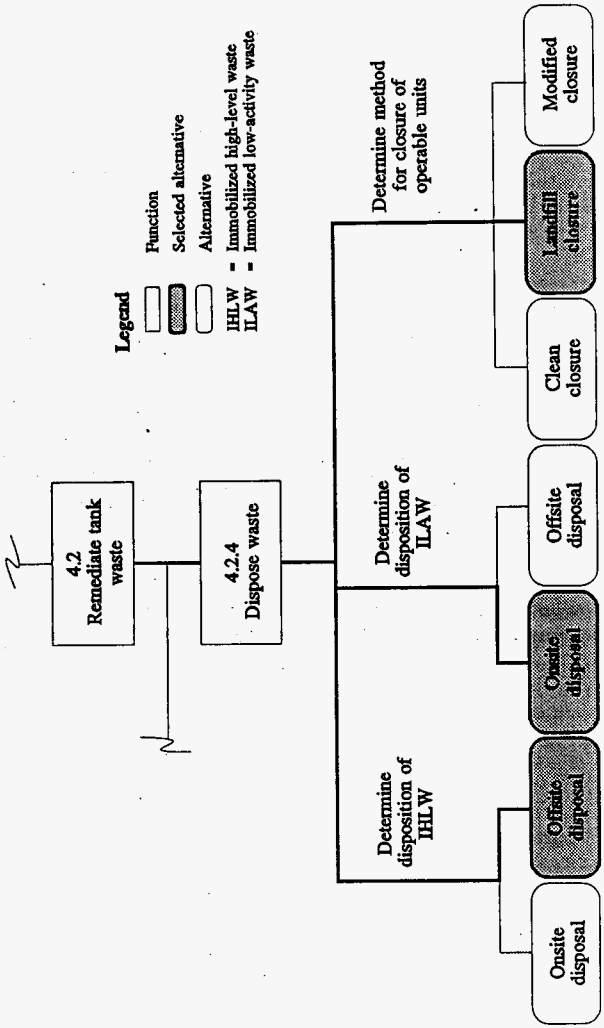
This decision document follows a decision analysis procedure that is consistent with the Systems Engineering approach recommended by the U.S. Department of Energy-Richland Operations Office (RL) and Westinghouse Hanford Company (WHC) (DOE 1995). In addition, the decision document satisfies recommendations from the TWRS systems requirements review (SRR) team (DOE/RL 1996). The TWRS SRR team noted two principal findings with regard to previous TWRS decision analysis methods:

1. "Processes for retrieval, pretreatment, and immobilization of wastes often have been based on unverified assumptions rather than being selected from the results of defensible analyses of viable alternatives." (DOE/RL 1996, Summary of Findings)

2. "None of the decisions were supported by documented technically defensible data and analysis." (DOE/RL 1996, Section 2.2.6).

The decision analysis procedure complies with the recommendations of the SRR team by "...conducting verifiable alternatives analyses and sensitivity analyses to define and document a robust architecture for TWRS that avoids delays, is not vulnerable to single-point failures, meets stakeholder expectations, and significantly improves performance." (DOE/RL 1996, General Recommendations). An initial evaluation is performed that screens alternatives against a pre-approved set of decision criteria. The results are then presented to a decision maker who selects the preferred alternative. This report clearly states the decision and documents the preferred alternative, alternatives considered, decision criteria, rationale for selection, and assumptions.

Figure 1. Architecture Selection for Tank Waste Remediation System Functions 4.2 and 4.2.4



2.0 STATEMENT OF THE DECISION

The disposal baseline consists of three components: (1) disposal of IHLW, (2) disposal of ILAW, and (3) closure of tank farm operable units. The Function 4.2.4 decision addresses the following questions:

1. Will the IHLW be disposed onsite or offsite?
2. Will the ILAW be disposed onsite or offsite?
3. Will the operable units be closed according to requirements for clean closure, landfill closure, or modified closure?

3.0 DECISION MAKER

The decision maker reviews the decision analysis and forwards a recommendation to RL. J. O. Honeyman is the responsible WHC decision maker.

4.0 DECISION ACTION OFFICER

The action officer is responsible for ensuring the decision analysis is conducted in accordance with system engineering principles. The action officer presents the results of the decision analysis to the decision maker for review and approval. J. S. Garfield is the decision action officer.

5.0 IMMOBILIZED HIGH-LEVEL WASTE DISPOSAL

This section documents the IHLW disposal portion of the Function 4.2.4 decision. Section 5.1 describes the recommended planning assumptions for the IHLW disposal alternative. Section 5.2 discusses the required selection date for the IHLW disposal portion of the Function 4.2.4 decision. Section 5.3 lists the IHLW disposal alternatives considered. The IHLW disposal alternatives were initially screened for compliance with regulatory constraints. The screening identified only one regulatory compliant alternative for IHLW disposal. The regulatory constraints that identify the recommended planning assumption for IHLW disposal are discussed in Section 5.4. Finally, Section 5.5 lists the key assumptions for the IHLW portion of the Function 4.2.4 decision analysis.

5.1 RECOMMENDED PLANNING ASSUMPTION FOR HIGH-LEVEL WASTE DISPOSAL

The recommended planning assumption for the disposal of IHLW will send the treated waste (including the waste products of dispositioned cesium and strontium capsules) to an offsite geological repository. However, interim storage of IHLW at the Hanford Site must be provided until the waste is accepted by DOE for disposal at the offsite repository (NWPA, Section III[a][5]). The recommended IHLW alternative is consistent with the preferred alternative for treatment and disposal of Hanford Site tank wastes as described in the Draft TWRS-EIS (DOE/EIS 1996).

5.2 HIGH-LEVEL WASTE DISPOSAL ALTERNATIVE DATE OF SELECTION

Establishing a planning assumption for disposal of IHLW is a predecessor for determining fiscal year planning and cost estimates as well as interfaces with the Phase I Privatization processing of tank wastes. The TWRS Privatization Request for Proposals (RFP) assumes the immobilized HLW canisters will be interim store by DOE before transportation to the offsite repository. This assumption should be formally documented.

5.3 HIGH-LEVEL WASTE DISPOSAL ALTERNATIVES

The IHLW disposal portion of the Function 4.2.4 decision considered two alternatives:

1. **Onsite disposal of IHLW.** The IHLW would be received from the waste treatment facilities and transported to a disposal facility located at the Hanford Site.

2. **Offsite disposal of IHLW.** The IHLW would be sent to an offsite geological repository. Interim storage of IHLW at the Hanford site would be provided until the waste is accepted by the DOE for disposal at the offsite repository.

5.4 HIGH-LEVEL WASTE DISPOSAL RATIONALE FOR SELECTION

The two IHLW disposal alternatives were screened against the NWPA of 1982, as amended (Public Law 99-425, September 30, 1986). The amended NWPA supports the development of repositories for the disposal of HLW and spent nuclear fuel. Presently, the only candidate site being evaluated for construction of a repository for the disposal of HLW and spent nuclear fuel is the Yucca Mountain site in Nevada, as directed by the *Nuclear Waste Policy Amendments Act of 1987.* In addition, the NWPA requires generators and owners of HLW to provide for the interim storage of such waste until the waste is accepted by the DOE for disposal at a repository (NWPA section III[a][5]).

As a result of the NWPA and its amendments, the recommended IHLW disposal planning assumption is to dispose of the waste at an offsite repository, and would also require interim storage of the IHLW onsite until the waste is accepted by DOE at the repository.

5.5 ASSUMPTIONS FOR DISPOSAL OF HIGH-LEVEL WASTE

The key assumptions related to the disposal of IHLW are discussed below:

Hanford Shipments to Offsite Geological Repository will Follow Shipments From Other DOE Sites. The HLW geological repository is scheduled to begin receipt of IHLW beginning in 2015 (DOE 1994, item 3.2.1.3). It is anticipated that IHLW will be initially received at the repository from other DOE sites (i.e., West Valley Demonstration Project and Savannah River Site) because these sites will have already initiated immobilization operations.

Sufficient Onsite Interim Storage Capacity. It is assumed that sufficient interim storage capacity for all the IHLW canisters and the product from the disposition of cesium and strontium capsules will be provided at the Hanford Site.

Monitoring of Interim-Stored IHLW Canisters. The IHLW canisters will be monitored while at the interim storage facility. Canisters that are determined not to comply with geologic repository waste acceptance criteria will be evaluated for re-work at the HLW immobilization facility, re-packaging, or acceptance by the geological repository as a non-standard waste form.

6.0 IMMOBILIZED LOW-ACTIVITY WASTE DISPOSAL

This section documents the ILAW disposal portion of the Function 4.2.4 decision. Section 6.1 describes the recommended planning assumptions for ILAW disposal. Section 6.2 discusses the required selection date for the ILAW disposal portion of the Function 4.2.4 decision. Section 6.3 lists the ILAW disposal alternatives considered. The ILAW disposal alternatives were initially screened for compliance with regulatory constraints. The screening identified only one regulatory compliant alternative for ILAW disposal. The regulatory constraints which identify the recommended ILAW disposal planning assumption are discussed in Section 6.4. Finally, Section 6.5 lists the key assumptions for the ILAW disposal portion of the Function 4.2.4 decision analysis.

6.1 RECOMMENDED PLANNING ASSUMPTION FOR LOW-ACTIVITY WASTE DISPOSAL

The recommended planning assumption for ILAW disposal will dispose of the waste in a near-surface engineered disposal facility at the Hanford Site. The ILAW from tank waste treatment facilities will be stored, and if required, transferred to other onsite facilities for disposal. The recommended ILAW disposal planning assumption is consistent with the preferred alternative for treatment and disposal of Hanford tank wastes as described in the Draft TWRS-EIS (DOE/EIS 1996).

6.2 LOW-ACTIVITY WASTE ALTERNATIVE DATE OF SELECTION

The TWRS Privatization RFP assumes the DOE will receive and interim store containers of ILAW from the private contractor's facilities. Subsequently, the containers of ILAW are assumed to be disposed at the Hanford Site. This assumption should be formally documented.

6.3 LOW-ACTIVITY WASTE DISPOSAL ALTERNATIVES

The ILAW disposal decision considered two alternatives:

1. **Onsite disposal of ILAW.** The ILAW would be received from the waste treatment facilities and transported to a storage/disposal facility at the Hanford Site

2. **Offsite disposal of ILAW.** The ILAW would be received from the waste treatment facilities and transported to a disposal facility located at another DOE site or a commercially licensed LAW disposal facility.

6.4 LOW-ACTIVITY WASTE DISPOSAL RATIONALE FOR SELECTION

The two ILAW disposal alternatives discussed in Section 6.2 were screened against DOE Order 5820.2A, *Radioactive Waste Management* (DOE 1989). The Order states it is DOE's policy to dispose of DOE ILAW on the site at which it is generated, if practical, or if onsite disposal capability is not available, transport to another DOE disposal facility (DOE Order 5820.2a, chapter III, Section 2.c).

The Hanford Site is capable of providing an ILAW disposal facility, and it is practical to dispose of the ILAW onsite. Therefore, as a result of DOE Order 5820.2A, the recommended ILAW disposal planning assumption is to dispose of the waste on the Hanford Site.

6.5 ASSUMPTIONS FOR DISPOSAL OF LOW-ACTIVITY WASTE

The key assumptions related to the disposal of ILAW are discussed below:

ILAW Storage/Disposal Facility Conceptual Architecture will Enable Retrieval and Repackaging of ILAW Containers. The Hanford Site stakeholders have expressed the desire to use "... retrievable waste forms when potential hazards from the waste may require future retrieval and when retrievability does not cause inordinate delays in getting on with cleanup..." (Drummond 1993, pg. 11). This stakeholder value has been interpreted to mean the disposal facility will be designed to allow for retrieval and repackaging of the ILAW containers for up to 50 years after emplacement of the containers, if conditions warrant.

ILAW Performance Assessment Will Determine Disposal Location of ILAW Containers. The ILAW containers will be stored until a performance assessment (PA) has been completed. The results of the PA will determine if the stored ILAW will be moved to a disposal facility. The ILAW storage/disposal facilities will receive containers from June 2002 through calendar year 2021, after which closure of the facility will be conducted in accordance with the TWRS Privatization planning assumptions (Bader 1995).

7.0 CLOSURE OF OPERABLE UNITS

This section documents the closure of operable units portion of the Function 4.2.4 decision. Section 7.1 describes the recommended planning assumptions for closure of operable units. Section 7.2 discusses the required selection date for the closure of operable units portion of the Function 4.2.4 decision. Section 7.3 lists the closure of operable units alternatives considered and discusses each alternative in terms of compliance with requirements. The rationale for selecting a recommended alternative is discussed in Section 7.4. Finally, Section 7.5 lists the key assumptions for the closure of operable units portion of the Function 4.2.4 decision analysis.

7.1 RECOMMENDED PLANNING ASSUMPTIONS FOR CLOSURE OF OPERABLE UNITS

Landfill closure is recommended as an interim planning assumption until the environmental impacts have been assessed and public input has been received through the Nation Environmental Protection Act (NEPA) process. Landfill closure of operable units is consistent with the preferred alternative for treatment and disposal of Hanford Site tank wastes as described in the Draft TWRS-EIS (DOE/EIS 1996). The preferred alternative assumes that up to 10.2 m^3 (360 ft^3) of waste may remain in each single-shell tank (SST) at closure. The Washington State Department of Ecology (Ecology) has stated that this amount of residual waste would not permit clean closure of SST farms.

7.2 CLOSURE OF OPERABLE UNITS ALTERNATIVE DATE OF SELECTION

The SST closure plan for the first SST farm or operable unit is scheduled for submittal to the Ecology by November 30, 2004 (milestone M-45-06-T01). Ecology plans to issue a final closure/post-closure plan for selected closure demonstration by September 30, 2006 (milestone M-45-06-T02). The final closure work plan will document the selected alternative for closure of the first SST farm or operable unit. This will set a precedent for the balance of the SST farms or SST operable units.

7.3 TANK FARM OPERABLE UNIT CLOSURE ALTERNATIVES

The closure of tank farm operable units portion of the Function 4.2.4 decision considered three alternatives: (1) clean closure, (2) landfill closure, and (3) modified closure. Each alternative requires different cleanup levels as defined by the state of Washington and DOE. Table 1 lists the regulatory requirements which differentiate the closure alternatives.

Each closure alternative is subject to the following three requirements:

1. WAC 173-303-610(2)(a), general closure performance standard

The Hanford Site RCRA Permit (Ecology 1995) states the facility shall be closed according to the General Closure Performance Standard, WAC 173-303-610(2)(a) in a manner that minimizes the need for further maintenance, controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, postclosure escape of dangerous waste, dangerous constituents, leachate, contaminated run-off, or dangerous waste decomposition products to the ground, surface water, ground water, or the atmosphere; returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.

2. WAC 173-303-640(8), closure and postclosure care of tank systems

The closure standard for tank systems, WAC 173-303-640(8), serves as a discriminator for the closure alternatives. If the operator demonstrates that all contaminated soils can be practicably removed or decontaminated, then the tank system must be closed in accordance with the Model Toxics Control Act (MTCA) (WAC 173-340). If not all contaminated soils can be practicably removed or decontaminated, then the tank system must be closed in accordance with landfill requirements (173-303-665(6)).

3. DOE Order 5820.2A, Chapter III

Chapter III of DOE Order 5820.2A states that disposal sites shall prepare and maintain a site specific radiological performance assessment for the disposal of waste to: protect public health and safety; assure that external exposure to the waste does not exceed 25 mrem/yr to any member of the public; assure that 100 years after closure an individual exposed to the facility will not receive more than 100 mrem/yr for continuous exposure or 500 mrem for a single acute exposure.

Table 1. Regulatory Requirements for Closure Alternatives.

	Cleanup standards[a]	Surface barrier	Post-closure monitoring period
Clean closure	General Closure Performance Standard, WAC 173-303-610(2)(a)[b]	Not required	None
	Closure Standard for Tank Systems, WAC 173-303-640(8)[e]		
	DOE Order 5820.2A, Chapter III[f]		
	Model Toxics Control Act (MTCA) (WAC 173-340) Method B cleanup levels:[c,d]		
Landfill closure	General Closure Performance Standard, WAC 173-303-610(2)(a)[b,c]	Required[g]	30 years[h]
	Closure Standard for Tank Systems, WAC 173-303-640(8)[e]		
	DOE Order 5820.2A, Chapter III[f]		
Modified closure	General Closure Performance Standard, WAC 173-303-610(2)(a)[b]	Not required	5 years[i]
	Closure Standard for Tank Systems, WAC 173-303-640(8)[e]		
	DOE Order 5820.2A, Chapter III[f]		
	MTCA (WAC 173-340) Method C cleanup levels:[c,d]		

[a]Shading highlights differences among the cleanup standards for the three closure alternatives.

[b]Hanford Site RCRA Permit Performance Standards for Facility Closure state the Facility shall be closed according to the General Closure Performance Standard, WAC 173-303-610(2)(a) (see Section 7.3).

[c]Hanford Site RCRA Permit Performance Standards for Soil/Groundwater Closure (Ecology 1995):

- Clean Closure cleanup levels are specified by WAC 173-303-610(2)(b) or background levels, whichever is greater, (Conditions II.K.1 and II.K.2).
- Modified Closure cleanup levels are specified under Method C of WAC 173-340 (Condition II.K.3).
- Landfill Closure cleanup levels are specified by WAC 173-303-610 (Condition II.K.4).

[d]Model Toxics Control Act (MTCA), WAC 173-340, defines Method B and Method C as follows:

MTCA (WAC 173-340) Method B cleanup levels:

- Lifetime cancer risk cannot exceed 1-in-1,000,000 for individual carcinogens
- If more than one hazardous substance present, total lifetime cancer risk cannot exceed 1-in-100,000.

MTCA (WAC 173-340) Method C cleanup levels:

- Used when cleanup levels under Method B are impossible to achieve, are lower than background concentrations, or may cause more environmental harm than good.
- Lifetime cancer risk cannot exceed 1-in-100,000 for individual carcinogens
- If more than one hazardous substance present, total lifetime cancer risk cannot exceed 1-in-100,000.

[e]WAC 173-303-640(8) states that if all contaminated soils can be practicably removed or decontaminated, then the tank system must be closed in accordance with MTCA (WAC 173-340). If not all contaminated soils can be removed, the tank system must be closed in accordance with landfill requirements (173-303-665(6)).

[f]DOE Order 5820.2A, Chapter III states that disposal sites shall prepare and maintain a site specific radiological performance assessment for the disposal of waste (see section 7.3).

[g]WAC 173-303-665(6)(a) states an operable unit closed as a landfill must be covered with a surface barrier.

[h]WAC 173-303-610(7)(a) states ground water monitoring, and maintenance and monitoring of waste containment systems must continue for 30 years after completion of landfill closure.

[i]Hanford Site RCRA Permit Condition II.K.3 states access to the operable unit will be restricted for a minimum of five years following completion of modified closure. If periodic assessments identify contamination above the allowable limits, the units must be further remediated or the requirements of landfill closure must be followed.

The regulatory requirements which differentiate the closure alternatives were determined from the Hanford Site RCRA Permit (Ecology 1995). The RCRA permit lists the following performance standards for soil/groundwater closure:

- Clean Closure cleanup levels are specified by WAC 173-303-610(2)(b), or background levels, whichever is greater, (Ecology 1995, Conditions II.K.1 and II.K.2). WAC 173-303-610(2)(b) specifies Method B of the Model Toxics Control Act (MTCA), as defined by WAC 173-340. MTCA Method B is the standard method for determining cleanup levels for ground water, surface water, soil, and air. Method B cleanup levels are based upon the upper bound of the estimated excess lifetime cancer risk of one in one million (1×10^{-6}) for individual carcinogens. If more than one type of hazardous substance is present and/or pathways of exposure, the total excess cancer risk for a site shall not exceed one in one hundred thousand (1×10^{-5}).

- Landfill Closure cleanup levels are specified by WAC 173-303-610, general closure performance standard (Ecology 1995, Condition II.K.4).

- Modified Closure cleanup levels are specified under MTCA Method C of WAC 173-340 (Ecology 1995, Condition II.K.3). Method C is a conditional method which is used when cleanup levels under Method B are impossible to achieve, are lower than background concentrations, or may cause more environmental harm than good. MTCA Method C is similar to Method B. The main difference is that the lifetime cancer risk is set at one in one hundred thousand (1×10^{-5}) for both individual substances and for the total risk caused by all substances on a site.

7.4 CLOSURE OF OPERABLE UNITS RATIONALE FOR SELECTION

The three closure alternatives were screened against the Draft TWRS-EIS (DOE/EIS 1996) recommended disposal strategy and the applicable WAC regulatory requirements. Although the Draft TWRS-EIS did not assess closure strategies, the recommended disposal strategy assumes the following:

- Residual waste will remain in the tanks (99 percent removal of tank wastes)

- The tanks will remain in the ground

- The tanks will be filled to prevent subsidence

- Engineered barriers will be constructed to prevent the spread of contamination.

The clean closure alternative is screened out since it does not allow residual waste in the tanks, and is therefore incompatible with the current waste retrieval planning basis and the TWRS-EIS preferred alternative. The modified closure alternative is screened out because it is subject to the requirements of Method C of the Model Toxics Control Act (MTCA). The MTCA Method C cleanup requirements would not be met if up to 10.2 m^3 (360 ft^3) of waste remain in the SSTs following retrieval. Subject to confirmation in subsequent performance evaluations of closed tank

farm operable units, it is assumed that only landfill closure is achievable with the current waste retrieval planning basis.

7.5 ASSUMPTIONS FOR CLOSURE OF OPERABLE UNITS

The key assumptions related to the closure of tank farm operable units are discussed below:

Residual Waste Complies with Regulations for Near-Surface Disposal. Retrieval removes waste from tanks to the extent necessary to meet Tri-Party Agreement Milestone M-45-00 criteria. The residual waste will be classified by the NRC as non-HLW, and therefore would not require a HLW disposal site license.

Soil Beneath Leaking Tanks Will Not be Decontaminated. Waste has leaked from many of the SSTs, resulting in contamination of the soil beneath the tanks. Washing or excavation of the soil to remove contaminants will not be undertaken. Decontamination of the soil beneath the SSTs would require removal of the tank shells and the complete removal of waste from the USTs. Complete removal of tank waste is not included in the current retrieval baseline, and is not required by existing regulations, federal law, or the Tri-Party Agreement.

Final Plan for Closure of Operable Units to be Issued by Ecology before September 30, 2006. A closure work plan will be developed with the Ecology in accordance with Tri-Party Agreement Milestone M-45-06. A tank closure/post-closure plan to demonstrate closure of a selected operable unit will be submitted to Ecology for approval by November 30, 2004. Ecology will issue the final plan for closure of the selected operable unit by September 30, 2006 (Ecology et al. 1994).

Tanks Will Not be Removed. A surface barrier will be placed to limit water infiltration and contaminant transport. The tanks will be stabilized with an engineered fill to prevent eventual tank failure and resultant degradation of the surface barrier.

Final Disposal Decision will be Provided by an EIS-ROD. The ROD for the TWRS-EIS (DOE/EIS 1996) will provide the final decision for the disposition of IHLW and ILAW. Alternatives for closure of operable units will be evaluated in a supplement to the TWRS-EIS. The ROD to the supplemental EIS will provide the final decision on closure of operable units. However, in the interim, this decision document provides a technical basis for conducting further evaluations.

8.0 DECISION ACCEPTANCE

The planning assumptions for Function 4.2.4, *Dispose Waste*, are as follows:

1. The IHLW (including waste products of dispositioned cesium/strontium capsules) will be disposed at a geologic repository located offsite. However, interim storage of IHLW at the Hanford Site will be provided until the waste is accepted by DOE for disposal at the offsite repository (Nuclear Waste Policy Act, Section III[a][5]).

2. The ILAW will be stored onsite then disposed at a near-surface engineered disposal facility at the Hanford Site (DOE Order 5820.2A).

3. The tank farm operable units will be closed as a landfill in accordance with WAC 173-303-610(2)(a), 173-303-640(8) and DOE Order 5820.2A.

The recommended planning assumptions for the disposal of IHLW and ILAW are consistent with the preferred alternative for treatment and disposal of Hanford tank wastes as described in the Draft TWRS-EIS (DOE/EIS 1996). The ROD for the TWRS-EIS will provide the final decision for the TWRS strategy for disposal of IHLW and ILAW at this level. Alternatives for closure of operable units will be evaluated in a supplement to the TWRS-EIS. The ROD to the supplemental EIS will provide the final decision on closure of operable units. However, in the interim, this decision document provides a technical basis for conducting further evaluations.

Responsible Decision Maker: _____ 5/31/96
J. O. Honeyman Date

DOE Concurrence: _____ _____
W. J. Taylor Date

Decision Action Officer: _____ 5/31/96
J. S. Garfield Date

9.0 REFERENCES

Bader, C. P., 1995, *Tank Waste Remediation System (TWRS) Guidance for Update of the Multi-Year Program Plan (MYPP) - Supplemental Guidance for the Disposal Program*, memorandum 95-PRI-073 to President, Westinghouse Hanford Company (July 26, 1995), Office of Tank Waste Remediation, U.S. Department of Energy, Richland, Washington.

DOE, 1989, *Radioactive Waste Management*, DOE Order 5820.2A, U.S. Department of Energy, Washington, D.C.

DOE, 1994, *Waste Acceptance System Requirements Document (WASRD)*, DOE/RW-0351P, Rev. 1, U.S. Department of Energy Office of Civilian Radioactive Waste Management, Washington, D.C.

DOE, 1995, J. E. Kinzer, *Tank Waste Remediation System (TWRS) Systems Engineering Management Policy*, (Letter #95-RTI-107 to President, Westinghouse Hanford Company, October 31, 1995) U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE, 1996, *Tank Waste Remediation System Privatization Request for Proposals (RFP)*, RFP No. DE-RP06-96RL13308, U.S. Department of Energy, Richland, Washington.

DOE/EIS, 1996, *Tank Waste Remediation System Environmental Impact Statement*, DOE/EIS-0189D, U.S. Department of Energy and Washington State Department of Ecology, Richland, Washington.

DOE/RL, 1996, *Tank Waste Remediation System Requirements Review Action Plan*, DOE/RL-95-74, Rev. 2, United States Department of Energy, Richland, Washington.

Drummond, M. E., 1993, *Final Report Hanford Tank Waste Task Force*, September 1993, U. S. Department of Energy, Richland, Washington.

Ecology, EPA, and DOE, 1994, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and the U.S. Department of Energy, Olympia, Washington.

Ecology, 1995, *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, Rev. 2, WA 7890008967, Hanford Facility, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303, 1995, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-340, 1991, "Model Toxics Control Act Cleanup Regulations," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WHC 1995, *Tank Waste Remediation System Multi-Year Program Plan*, WHC-SP-1101, Rev. 1A, Westinghouse Hanford Company, Richland, Washington.

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