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Decision Analysis for INEL Hazardous Waste Storage

**L. A. Page
J. A. Roach**

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**Idaho National Engineering Laboratory
EG&G Idaho, Inc.
Idaho Falls, Idaho 83415**

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ABSTRACT

In mid-November 1993, the Idaho National Engineering Laboratory (INEL) Waste Reduction Operations Complex (WROC) Manager requested that the INEL Hazardous Waste Type Manager perform a decision analysis to determine whether or not a new Hazardous Waste Storage Facility (HWSF) was needed to store INEL hazardous waste (HW). In response to this request, a team was formed to perform a decision analysis for recommending the best configuration for storage of INEL HW. Personnel who participated in the decision analysis are listed in Appendix B.

The results of the analysis indicate that the existing HWSF is not the best configuration for storage of INEL HW. The analysis detailed in Appendix C concludes that the best HW storage configuration would be to modify and use a portion of the Waste Experimental Reduction Facility (WERF) Waste Storage Building (WWSB), PBF-623 (Alternative 3). This facility was constructed in 1991 to serve as a waste staging facility for WERF incineration. The modifications include an extension of the current Room 105 across the south end of the WWSB and installing heating, ventilation, and bay curbing, which would provide approximately 1,600 ft² of isolated HW storage area. Negotiations with the State to discuss aisle space requirements along with modifications to WWSB operating procedures are also necessary.

The process to begin utilizing the WWSB for HW storage includes planned closure of the HWSF, modification to the WWSB, and relocation of the HW inventory. The cost to modify the WWSB can be funded by a reallocation of funding currently identified to correct HWSF deficiencies.

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ACRONYMS

B&W	Babcock & Wilcox Company
CFA	Central Facilities Area
CLRF	Central Laundry and Respiratory Facility
EPA	U.S. Environmental Protection Agency
HCRWSF	Hazardous Chemical and Radioactive Waste Storage Facility
HW	hazardous waste
HWSF	Hazardous Waste Storage Facility
ICPP	Idaho Chemical Processing Plant
INEL	Idaho National Engineering Laboratory
K-T	Kepner-Tregoe
MLLW	mixed low-level waste
MWSF	Mixed Waste Storage Facility
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Act
PBF	Power Burst Facility
PSU	Portable Storage Unit
RCRA	Resource Conservation and Recovery Act
RWMC	Radioactive Waste Management Complex
RWMSF	Radioactive Mixed Waste Staging Facility
SAR	safety analysis report
SMC	Special Manufacturing Capability
TAA	temporary accumulation area
TAN	Test Area North
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
WAC	waste acceptance criteria
WEDF	Waste Engineering Development Facility
WERF	Waste Experimental Reduction Facility
WMF	Waste Management Facility
WROC	Waste Reduction Operations Complex

Decision Analysis for INEL Hazardous Waste Storage

BACKGROUND

The capability for storage of hazardous waste (HW) in interim status or permitted status is required at the Idaho National Engineering Laboratory (INEL). The Technical Programs Unit in the Waste Reduction Operations Complex (WROC) is actively promoting direct shipment of HW from 90-day temporary accumulation areas (TAAs) to offsite commercial treatment, storage, and disposal (TSD) facilities; thus, bypassing the need for permitted HW storage. However, even if 100% of the INEL HW is directly shipped to offsite TSD facilities, the capability to store HW at the INEL in a permitted location is required (see Appendix A). This storage requirement remains because of the need to accommodate extreme situations such as TSD facility shutdowns due to U.S. Environmental Protection Agency (EPA) audits and possible shipment moratoriums.

The INEL Hazardous Waste Storage Facility (HWSF), which was constructed in 1943, has served as a HW storage facility for over 8 years. The operation of the HWSF is performed by WROC Operations. The HWSF is a half-cylinder concrete bunker located at the Central Facilities Area (CFA)-637, which was originally constructed for the storage of ammunitions. Due to the age of the facility, continual corrective maintenance is required to remain in compliance with regulations.

In August 1993, an evaluation performed to identify a new tenant for the CFA-617 Central Laundry and Respirator Facility (CLRF) recommended that the facility be used for HW storage. The laundry and respirator services that were conducted in the facility were transferred to a private sector contractor; thus, making CFA-617 available for alternative uses. HW storage was one of six candidates evaluated as a potential CLRF tenant. The Engineering and Research Application Radiological Research and Development Laboratories was the alternative CLRF tenant.

The WROC Manager must determine whether or not a new HW storage configuration is necessary. And, if a new HW storage configuration is necessary, is the CLRF the best alternative configuration for HW storage at the INEL. This decision analysis compares HW storage configuration alternatives and recommends the best alternative.

DECISION ANALYSIS

The Kepner-Tregoe (K-T) decision process was followed in this decision analysis to determine the best configuration for storage of INEL HW. A team of personnel from differing discipline areas contributed to the identification and evaluation of alternatives and criteria. Contributors are listed in Appendix B.

The following is a summary of the alternatives, criteria, and decision process for selection of the best configuration for HW storage. Details of the evaluation are documented in Appendix C.

Fifteen alternatives for HW storage were evaluated. These alternatives were selected from the current INEL interim or permitted status HW container storage units and facilities presently under consideration for HW storage. The alternatives evaluated include the following:

1. Store HW in the HWSF (CFA-637)
2. Store HW in the CLRF (CFA-617)
3. Store HW in the Waste Experimental Reduction Facility (WERF) Waste Storage Building (WWSB) [Power Burst Facility (PBF)-623]
4. Store HW in the Waste Engineering Development Facility (WEDF) (PBF-612)
5. Store HW in the Portable Storage Units (PSU) at the Mixed Waste Storage Facility (PBF-613)
6. Store HW at the Radioactive Waste Management Complex (RWMC) Waste Storage Facility [Waste Management Facility (WMF)-628]
7. Store HW at the RWMC Waste Storage Facility (WMF-629)
8. Store HW in the Radioactive Mixed Waste Staging Facility (RMWSF) [Idaho Chemical Processing Plant (ICPP)-1617]
9. Store HW in the Hazardous Chemical and Radioactive Waste Storage Facility (HCRWSF) (ICPP-1619)
10. Store HW in the Special Manufacturing Capability (SMC) Container Storage [Babcock & Wilcox Company (B&W)] [Test Area North (TAN)-628]
11. Store HW in the WEDF/PSU [Power Burst Facility (PBF)-612/PSU]
12. Store HW in the PSU/WWSB (PSU/PBF-623)
13. Store HW in the WEDF/WWSB (PBF-612/PBF-623)
14. Store HW in a newly constructed facility
15. Store HW in a facility provided by the private sector.

Twelve criteria were used to evaluate the alternative storage configurations. Each criterion was categorized as a "must" or a "want." Three criteria were identified as mandatory requirements that define the minimum capabilities for a HW storage configuration. These three "must" criteria are as follows:

1. Must provide a minimum HW storage capacity of 15,000 gal
2. Must not prevent the TSD of other waste types
3. Must be able to comply with requirements of Federal and State regulations, including DOE Orders for onsite operations [e.g., Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), Occupational Safety and Health Act (OSHA), National Fire Protection Association (NFPA), Architectural Engineering Standards, DOE Order 6430.1A].

Nine of the fifteen alternatives did not satisfy all the "must" criteria and, therefore, were not evaluated any further. The alternatives eliminated include 4, 5, 6, 7, 8, 9, 11, 13, and 15.

The alternatives that satisfied all the "must" criteria were compared against the "want" criteria and a weighted score was calculated for each alternative. The result yielded a comparison of the performance of the alternatives. The performance is a measure of how important each alternative is for the overall decision and which alternative best satisfies each criteria. The "want" criteria or desirable characteristics used to evaluate the alternatives are as follows:

1. Provide greater than minimum capacity
2. Provide one-layer storage
3. Minimize construction costs
4. Minimize operating costs
5. Minimize documentation
6. Expedite operational HW storage capability
7. Minimize impacts to other programs, excluding generator programs
8. Provide convenient personnel accommodations
9. Maximize safety features that are not required by regulation.

Alternative 3, store HW in the WWSB received the highest score, the combination WWSB/PSU, Alternative 12, received the second highest score, and the CLRF, Alternative 2, received the third highest score. The WWSB ranked high on all criteria except providing one-layer storage and providing as much storage capacity as possible. This storage limitation is a result of the decision to use only the minimum amount of space required to provide adequate surge capacity, thus, avoiding any impact on potential mixed low-level waste (MLLW) storage in the WWSB. The combination PSU/WWSB alternative received the next highest score. This alternative scored lower because operating costs are higher due to the difficulty of conducting

RCRA inspections and moving waste in and out of the PSUs. The use of the PSU/WWSB would also have an impact on potential storage of MLLW in the WWSB. The alternative with the third highest score was the CLRF. Construction costs are higher for this alternative because permitting, decontamination, and building modifications are required. Expediting this HW storage capability is improbable due to the time required to obtain a new permit. In addition, documentation is not minimized due to the requirement for a new permit [e.g., safety analysis report (SAR), waste acceptance criteria (WAC)].

Adverse consequences associated with implementing the three highest scoring alternatives were identified. These adverse consequences are identified and assessed to determine inherent risk in each alternative in Appendix B. There were no adverse consequences for the top three alternatives that had a high probability and a high seriousness risk that would impact a successful decision.

Table 1 provides a summary of the decision analysis.

Table 1. HW storage configuration decision summary sheet.

Evaluation criteria		Options ^a														
"Musts" ^b		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Must provide a minimum storage capacity of 15,000 gal		✓	✓	✓			✓	✓			✓		✓		✓	
2. Must not prevent the TSD of other waste types		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
3. Must be able to comply with requirements of Federal and State regulations, including DOE Orders for onsite operations (e.g., RCRA, TSCA, OSHA, NFPA, Architectural Engineering Standards, DOE Order 6430.1A)		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
"Wants" ^c		Weight ^d	Score/weighted score (weighted score = weight x score)													
1. Provide greater than minimum specified capacity	4	5 20	10 40	5 20							8 32		7 28		10 40	
2. Provide one-layer storage	1	2 2	10 10	2 2							8 8		10 10		10 10	
3. Minimize construction costs	9	5 45	4 36	7 63							4 36		9 81		0 0	
4. Minimize operating costs	10	4 40	9 90	9 90							2 20		4 40		10 100	
5. Minimize documentation (e.g., SAR, WAC, RCRA Permit and Inspection)	8	5 40	4 32	8 64							7 56		7 56		4 32	
6. Expedite operational HW storage capability	4	10 40	3 12	7 28							6 24		8 32		1 4	
7. Minimize impacts to other programs, excluding generator programs	6	10 60	6 36	8 48							4 24		5 30		10 60	
8. Provide convenient personnel accommodations, including offices, restrooms, change rooms, etc.	2	1 2	10 20	8 16							9 18		8 16		10 20	
9. Maximize safety features that are not required by regulations (e.g., loading docks, fixed safety showers, unlimited water supply, potable water in drum handling locations)	5	4 20	10 50	8 40							9 45		7 35		10 50	
Total		269	326	371							263		328		316	
Final ranking		6	3	1							5		2		4	

Table 1. (continued).

<p>a. The options that were evaluated in this analysis are as follows:</p> <ol style="list-style-type: none">1. Continue use of the HWSF (CFA-637)2. Modify and use the CLRF (CFA-617)3. Use portion of south end of WWSB (PBF-623)4. Use WEDF (PBF-612)5. Use the PSUs at the MWSF (PBF-613)6. Use Waste Storage Facility Type I Storage Module at RWMC (WMF-628)7. Use Waste Storage Facility Type II Storage Module at RWMC (WMF-629)8. Use RMWSF at ICPP (ICPP-1617)9. Use HCRWSF at ICPP (ICPP-1619)10. Use SMC Container Storage (TAN-628)11. Use a combination of WEDF and the PSUs12. Use a combination of WWSB and the PSUs13. Use a combination of WEDF and WWSB14. Construct a new facility15. Use a private sector facility
<p>b. "Musts" are go/no go criteria. Options that meet a "must" are indicated by a check (✓). Any alternative that does not meet <u>all</u> "musts" is not acceptable and does not receive further evaluation.</p>
<p>c. "Wants" are desirable characteristics for HW storage capability. They are not requirements that must be met, but are used to evaluate how well an alternative fulfills the HW storage needs.</p>
<p>d. Each "want" has been assigned a weight between 1 and 10 with 10 being the most important. Each option is evaluated against the "want" and ranked between 1 and 10, depending on how well the alternative satisfies the "want" with 10 being the highest score possible. The weighted scores for all "wants," the products of the respective weights and scores of each option for each "want," are summed to determine the final ranking of all the alternatives relative to each other.</p>

RECOMMENDATION

The results of the analysis indicate that the existing HWSF is not the best configuration for storage of INEL HW. The analysis detailed in Appendix C concludes that the best HW storage configuration would be to modify and use a portion of the WWSB, PBF-623 (Alternative 3). This facility was constructed in 1991 to serve as a waste staging facility for WERF incineration. The modifications include an extension of the current Room 105 across the south end of the WWSB and installing heating, ventilation, and bay curbing, which would provide approximately 1,600 ft² of isolated HW storage area. Negotiations with the State to discuss aisle space requirements along with modifications to WWSB operating procedures are also necessary.

IMPLEMENTATION

The process to begin utilizing the WWSB for HW storage includes modification to the WWSB, relocation of the HW inventory, and planned closure of the HWSF.

The estimated cost for these modifications is \$300K to \$400K and would require 18 to 24 months to complete. The cost to modify the WWSB could probably be funded by a reallocation of funding currently identified to correct HWSF deficiencies.

Design activities for the facility modifications could begin while negotiations with the State to define aisle space requirements are in progress.

Appendix A

Decision Analysis for Storage of INEL HW - Meeting Handout

DECISION ANALYSIS FOR STORAGE OF INEL HW - MEETING HANDOUT

Background:

With certain exceptions for small-quantity generators, anyone who accumulates hazardous waste (HW) for more than 90 days is an operator of a storage facility and is subject to the requirements of 40 CFR parts 264 and 265 and the permit requirements of 40 CFR part 270 [Reference 40 CFR §262.34]. These requirements are triggered by many of the operations conducted at the INEL. As a result, the need for a central Hazardous Waste Storage Facility was recognized in the early 1980's, and will continue into the foreseeable future.

The operation of the INEL Hazardous Waste Storage Facility (HWSF) is performed by ER&WM/WROC Operations. The program is housed in CFA-637 (fig. 1), an aged half-cylinder concrete bunker that was originally constructed for the storage of munitions. Due to the availability of the bunker, it was selected for the storage of HW on an interim basis; that activity has now continued for over eight years. Audits and appraisals persistently challenge the suitability of the facility for this continuing function (see attachment 1). Attachment 2 presents a graphical chronology of HWSF activities.

Recent Developments:

In November, 1991, a Value Engineering study¹ was completed which evaluated the options of existing facility expansion, conversion of another facility, or construction of a new facility. The study recommended the construction of a new facility as the best long term method of meeting existing and anticipated needs and regulations. There is an existing FY-96 Line Item Construction Project² for the design and construction of a HWSF (FY-99 occupancy) at the INEL.

In August, 1993, a team representing Facility Planning, Cost Estimating, Project Management, ER&WM, Operations, and D&D reviewed several alternative uses for the Central Laundry and Respirator Facility (CLRF) following closure. Using a modified Kepner-Tregoe decision analysis approach, the team evaluated six alternative programs for use of the CLRF and recommended, in a "combination" preferred alternative, the storage of HW³. The FY-96 LICP funding could be available to modify the CLRF as a HWSF.

¹ Summary results of Value Engineering (VE) study of the needs and requirements for an INEL Hazardous Waste Storage Facility, LCA-37-91, 11/13/91.

² ~ \$5,000k from TDD 21-E2 (Belongs to ADS number ID-4302-EG).

³ ~ \$700k from Cost Estimate Summary 93-2, file 3201 (F.P. Hanson).

Problems Associated With HW Management:

On occasion, generators must declare HW that is prohibited from storage by the HWSF Waste Acceptance Criteria or due to physical restrictions of the facility itself. Suitable storage, treatment or disposal is identified for such waste on a case-by-case basis through the coordinated efforts of WROC Technical Programs, Procurement, the responsible generator, and other involved organizations. A proportionately small percentage of HW within this category (2-3 instances per year) does pose an extreme and time-consuming technical challenge.

Approximately 50% of HW generated in CY-1993 required characterization. Generators of HW must complete a lengthy process of analyses, profiling, packaging, etc., prior to the formal acceptance of a waste for commercial treatment and disposal. A compliance issue is sure to arise if it is uncertain whether all requirements for proper dispositioning of the waste can be completed within the generator's Accumulation Time restraints. In this event, the generator typically offers the waste for interim storage at the HWSF because the waste management requirements for storage are less stringent than for treatment and disposal. It is important to remember that EG&G policy states that the RCRA "clock" is running while waste resides in a 90-day TAA. An estimated 10% of waste currently received at the HWSF is hampered by time restraints. Factors which impact the generator's ability to affect timely resolution may include:

- o Information turnaround. A significant delay can easily result while samples are taken, laboratory analysis is performed, characterization data is reduced, and profile information is prepared for submittal to the commercial TSDF.
- o Profile acceptance turnaround. The generator is dependent upon the commercial TSDF to evaluate the profile for acceptability, and formally notify the generator in a timely manner. The contract for procurement of services allows a nominal 45 days for turnaround. (Of 271 profiles currently awaiting evaluation, 99 have been in suspense for greater than 45 days. While the applicable commercial TSDF has acknowledged the problem, the generator, nonetheless, is placed in a dilemma.)
- o Transportation schedules. The involved INEL and commercial agencies request a minimum two-week prior notification of waste available for offsite shipment.
- o Procurement. In the event that existing contract(s) for treatment/disposal services exclude a particular waste, the generator and WROC Technical Programs must identify and pursue an available option. The generator must then anticipate a minimum of six weeks for the development of a contract.

EG&G Idaho, Inc., operates 120 to 130 Satellite Accumulation Areas, and nearly a dozen Temporary Accumulation Areas (90-day storage). Precise information regarding additional storage areas operated under the management of other INEL contractors is not currently available.

Activities to avoid or eliminate HW:

Implemented by the Pollution Prevention organization, the **Waste Minimization/Avoidance Program** promotes HW minimization/avoidance techniques which include:

- o Best management/operations practices
- o Good housekeeping
- o Waste segregation
- o Inventory control
- o Process improvements
- o Recycling & reuse
- o Material exchange

Approximately 111,000 lbs of HW was avoided in 1992 as a result of these cooperative activities.

Must/Want Additions (extracted from 1991 VE Study):

"Musts" in addition to the Strawman:

- o Storage for emergency supplies
- o Provide environmental exhaust air monitoring
- o Provide Safety - eyewash, communications, emergency shower, fire protection, alarm
- o Provide Health - restroom, shower, ventilation, change room
- o Transfer Point (receiving/shipping)
- o Covered Dock
- o Adequate Space (inspect/maneuver)
Material Handling
- o Allow segregation (6-8 areas)
- o Flexibility - expansion

"Wants" in addition to the Strawman:

- o Storage for normal supplies
- o Accommodate inspection (external)
- o Personnel accommodations - office
- o Location
- o One-layer storage
- o Accommodate sampling (internal)
Lab packing

Attachment 1

RECURRING HWSF COMPLIANCE ISSUES/BURDENS/CONCERNS

Regulatory Compliance:

- o H&V system:
 - o Wholly insufficient capacity to adequately ventilate the facility
 - o Undesirable configuration
 - System modifications to correct this deficiency have been identified; a design review is scheduled in the near future.
- o Lack of adequate space:
 - o For storage of protective clothing & respiratory equipment
 - o To accommodate equipment appropriate for safe handling of waste containers during:
 - o Radiation surveys of incoming waste
 - o Routine operations
 - o Emergency response
- o Lack of personnel change room facilities
- o Lack of fresh or potable water supplies:
 - o No restroom facilities, toilets or sinks
- o Inadequate protection & contingency measures:
 - o No fire protection or suppression systems
 - o No permanent eye wash stations
 - o No emergency shower
 - o No personnel decontamination capability
 - Corrective measures have been identified; an informal Design Review was held 12/02/93. This modification would install a portable emergency shower near the facility entrance.

Waste Management:

- o Inadequate protection from adverse weather:
 - o H&V incapable of preventing flammable liquid waste freeze-up without Operator intervention

- System modifications to correct this H&V deficiency have been identified; a design review is scheduled in the near future.
- Lack of adequate space:
 - For suitable storage of HW (Recent interpretation by state of Idaho resulted in 40% loss of storage capacity)
 - To accommodate sampling or repackaging activities
 - To support waste verification
 - Inappropriate facility design for effective utilization of floor space
- No loading/unloading facilities (e.g., covered loading dock)

Best Management Practices:

- Ill-designed to accommodate present-day codes and regulations. This is reflected by chronic findings, concerns and recommendations regarding:
 - Persistent structural problems
 - Cracking and leaking roof, floor, thresholds, and loading/unloading pad
 - Outward maintenance is performed to ensure regulatory compliance; causal factors are related to normal structural deterioration.
 - Lack of engineered Health & Safety features:
 - No inherent means to effectively collect, drain and remove accidental spills and leaks
 - No permanent atmosphere-monitoring capability
 - No Independent ventilation of flammable waste storage area
 - No Independent ventilation of reactive waste storage area
 - No HEPA-filtered sampling/repackaging area
 - Lack of adequate space:
 - To provide suitable segregation of waste by compatibility groups:
 - Limited to four segregated areas (the four waste types), whereas six to eight [49 CFR part 177, subpart C] are needed

- To provide contingency for unexpected "surge" in HW inventory, such as:
 - DOE nation-wide HW shipping moratorium
 - Sudden necessity for release of HW from contractor TAA(s)
- No office space (need: accommodations for 2-5 employees; current facility supplemented by an adjacent 20 ft. trailer).

Appendix B

Contributors

Appendix B

Contributors

Dan D. Bartel	WROC Technical Programs
Ann Bochmer	Environmental Technical Support
Dennis A. Conley	WERF Waste Storage Building
Maria Miles	Environmental Technical Support
Chuck T. Mullen	Facility Management
Lisa A. Page	INEL Hazardous Waste Type Manager
Roger R. Piscitella	INEL Low-Level Waste Type Manager
Penny N. Pink	WROC Technical Programs Unit Manager
David Rizor	WROC Technical Programs
Jay A. Roach	Mechanical Engineering
R. Mark Shaw	Waste Management Division, DOE-ID
Dave E. Sheldon	Construction Planning

Appendix C

Kepner-Tregoe Decision Analysis for INEL Hazardous Waste Storage

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Appendix C

Kepner-Tregoe Decision Analysis for INEL Hazardous Waste Storage

DECISION ANALYSIS

Decision Statement

What is the best configuration for storage of Idaho National Engineering Laboratory (INEL) hazardous waste (HW)?

Premise: Capability for storage of HW in interim status or permitted status is required at the INEL (see Appendix A).

Assumptions

1. Surge capacity includes a buffering capacity of 3 months of HW generation volume and one-third of the resident volume. The surge capacity provides a buffering storage capacity to accommodate extreme situations that may require time to contact the generators and assess and mitigate impacts of the situation [e.g., treatment, storage, and disposal (TSD) facility audit shutdowns, shipment moratorium]. Based on an annual generation volume of 41,347 gal (156.5 m³) (Magleby and Roach 1993) and resident volume of one third of the operating capacity of 16,366 gal^a, surge capacity equates to 15,792 gal (59.8 m³) as follows:

$$1/3(16,366 \text{ gal}) + (41,347 \text{ gal})/4 = 15,792 \text{ gal (59.8 m}^3\text{)}.$$

For purposes of this analysis, surge capacity will be rounded down to 15,000 gal. This is considered to be valid due to the conservativeness built into the waste volume projections. The inventory in the Hazardous Waste Storage Facility (HWSF) is tracked by numbers of containers, which can vary in size from 1 to 55 gal each. However, for this analysis, each container was considered to be a 55-gal drum. In addition, Waste Reduction Operations Complex (WROC) HW Operations is actively pursuing shipping INEL HW directly from temporary accumulation areas (TAAs) to the TSD facility, which will significantly reduce the resident volume of waste in the HWSF. Further conservativeness is built into the waste volume projections as documented in Assumption 2 below.

2. Volume projections are based on quantities documented in the *Waste Management Division Strategic Plan* (U.S. Department of Energy 1993). The plan identifies a zero-generation goal by the year 2030. To account for a gradual reduction in HW generation, a 7.1% [2,936 gal (11.2 m³)] yearly reduction from the baseline generation volume estimate of 41,347 gal (156.5 m³) is assumed.
3. Life cycle for the storage configuration is 25 to 30 years.

a. *Receiving Hazardous Waste Shipments at the Hazardous Waste Storage Facility, HWSF-DOP-3.2.1, pg. 5.*

4. Accommodations for sampling HW in a storage facility will not add to the overall space required if a separate area is not available for sampling. A process change to current practices can be made to allow sampling within a storage bay if the facility ventilation meets the industrial hygiene standards.
5. If a new HWSF is constructed, it will be conveniently located such that operational costs will be minimized.

Criteria

Criteria were identified and used to evaluate all alternatives that were defined as HW storage alternatives. Each criterion was categorized as a "must" or a "want." These criteria are both short and long term. The "must" criteria are mandatory requirements that define the minimum capabilities for a HW storage configuration. The "want" criteria are desirable characteristics that define the "ideal" configuration for storage of HW. An alternative that proves to be the best choice for any Kepner-Tregoe (K-T) decision analysis meets all the "must" criteria and offers the optimum compromise between all the "want" criteria.

"Musts"

As previously stated, the "must" criteria are essential to the storage capability. Any storage alternative that is evaluated against these criteria will fail if all these "must" criteria are not achieved. The following are the requirements that define the minimum capabilities for the HW storage configuration:

1. Must provide a minimum HW storage capacity of 15,000 gal.
2. Must not prevent the TSD of other waste types.
3. Must be able to comply with requirements of Federal and State regulations, including DOE Orders for onsite operations [e.g., Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), Occupational Safety and Health Act (OSHA), National Fire Protection Association (NFPA), Architectural Engineering Standards, DOE Order 6430.1A].

"Wants"

The "want" criteria are not essential to the storage capability but they are desirable. The relative importance of each "want" is indicated by the weight that has been assigned, where a weight of "10" indicates the most importance and a weight of "1" indicates the least importance. The desirable characteristics for the HW storage configuration and their rank of relative importance are listed in Table C-1.

Table C-1. "Wants" ranked by relative importance.

"Wants"	Weight
1. Provide greater than minimum capacity.	4
2. Provide one-layer storage	1
3. Minimize construction costs.	9
4. Minimize operating costs.	10
5. Minimize documentation [i.e., safety analysis report (SAR), waste acceptance criteria (WAC), RCRA permitting and inspection].	8
6. Expedite operational HW storage capability	4
7. Minimize impacts to other programs, excluding generator programs.	6
8. Provide convenient personnel accommodations, including offices, rest rooms, change rooms, etc.	2
9. Maximize safety features that are not required by regulation (e.g., loading docks, fixed safety showers, unlimited water supply, potable water in drum handling locations)	5

Alternatives

Alternatives for HW storage were selected from the current INEL interim or permitted status HW container storage units and facilities under consideration for HW storage, such as the Clean Laundry and Respirator Facility (CLRF) CFA-617. The alternatives for storage of INEL HW are as follows:

1. Store HW in the HWSF CFA-637. This alternative would require modifications such as a safety shower, roof repair, ventilation modifications, and sealing of the loading pad and interior floor.
2. Store HW in the CLRF CFA-617. This alternative would require permitting, decontamination, and extensive modification of this facility.
3. Store HW in the Waste Experimental Reduction Facility (WERF) Waste Storage Building (WWSB) PBF-623. This alternative would require extending Room 105 completely across the south end of the WWSB and installing heating, ventilation, and bay curbing as required. In addition, changes to aisle space requirements in this portion of the WWSB may have to be negotiated. Figure C-1 shows the present WWSB storage configuration. Figure C-2 shows the proposed WWSB HW storage configuration.
4. Store HW in the Waste Engineering Development Facility (WEDF) PBF-612. This alternative would require decontamination of this facility.

WWSB PBF-623 STORAGE CONFIGURATION

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Figure C-1. WWSB PBF-623 storage configuration.

WWSB USAGE FOR STORAGE OF
HAZARDOUS WASTE

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Figure C-2. WWSB usage for storage of HW.

5. Store HW in the Portable Storage Units (PSU) at the Mixed Waste Storage Facility (PBF-613). This alternative would require purchasing and emplacing as many PSUs as required to accommodate the required surge capacity for HW, 15,000 gal.
6. Store HW at the Radioactive Waste Management Complex (RWMC) Waste Storage Facility [Waste Management Facility (WMF)-628]. This alternative would require constructing a facility within this storage module that would completely isolate the HW from the alpha-contaminated low-level waste that is planned to be stored in this facility. In addition, the Part B Permit Application would have to be modified to include the same waste streams that are permitted in the HWSF.
7. Store HW at the RWMC Waste Storage Facility (WMF-629). This alternative would require the same activities as described above.
8. Store HW in the Radioactive Mixed Waste Staging Facility (RMWSF) Idaho Chemical Processing Plant (ICPP)-1617. This alternative would require coordinating waste management efforts between contractors, relocating the existing mixed low-level waste (MLLW) stored in this facility, and decontaminating the facility.
9. Store HW in the Hazardous Chemical and Radioactive Waste Storage Facility (HCRWSF) ICPP-1619. This alternative would require the same activities as described above.
10. Store HW in the Special Manufacturing Capability (SMC) Container Storage [Babcock & Wilcox Company (B&W)] Test Area North (TAN)-628. This alternative would require the same activities as described above.
11. Store HW in the WEDF/PSU (PBF-612/PSU). This alternative would require the same activities as described for Alternatives 4 and 5.
12. Store HW in the PSU/WWSB (PSU/PBF-623). This alternative would require the same activities as described for Alternative 5. The liquid HW would occupy the north, heated end of the WWSB. This alternative does not appear to provide enough room for cohabitation of MLLW and HW. The MWSF at the Special Power Excursion Reactor Test-IV (SPERT-IV) would have to remain operational to support MLLW activities. If cohabitation of HW and MLLW were possible in the north end of WWSB, extensive modifications to the structure would have to be performed.
13. Store HW in the WEDF/WWSB (PBF-612/PBF-623). This alternative would require activities as described above for use of these facilities.
14. Store HW in a newly constructed facility. This alternative would provide an ideal HW storage facility at considerable cost.
15. Store HW in a facility provided by the private sector. This alternative would require construction of an onsite facility that is operated by the private sector, construction of an offsite facility operated by the private sector, or agreement by an existing offsite TSD facility to accept HW for storage that it is not permitted to treat because some of the current and projected inventory of HW includes "problem" wastes for which a permitted treatment process does not exist.

Alternatives Analysis

Based on the best available information about each alternative, the alternatives are assessed against the criteria. The results of the alternatives analysis were summarized earlier in Table 1.

Requirements Analysis

First, each alternative is assessed to determine if it meets the "must" requirements. If any alternative fails to meet these minimum requirements, that alternative is eliminated and not considered in the remainder of the analysis (the gray shading indicates alternatives that were eliminated for each "must"). Table C-2 is the assessment of the HW storage configurations against the "must" criteria.

Table C-2. Summary of the alternatives analysis against "must" criteria.

"Must" Criteria 1: Must provide a minimum HW storage capacity of 15,000 gal.			
Alternative	"Must" information	Go	No go
HWSF (CFA-637)	Permitted capacity (PC) = 24,000 gal; Usable capacity (UC) = 16,366 gal	Go	
CLRF (CFA-617)	PC = UC = approx. 87,288 gal; This estimate is based on two factors: (1) only 75% of the facility area will be useable for HW storage, this equates to 9,195 ft ² ; (2) using the HWSF as a benchmark, 1,724 ft ² provides a storage capacity of 16,366 gal. This equates to 87,288 gal for 9,195 ft ²).	Go	
WWSB (PBF-623)	PC = 181,026 gal; UC = approx 60,000 gal; The PC was calculated using decontamination and decommissioning bins (3 x 2 x 1 m) stacked three-high, in the south portion of WWSB, and pallets containing four 71-gal drums, stacked two-high, in the north portion of WWSB. However, the PC is higher than the actual maximum storage capacity due to erroneous calculations for maintaining proper structural clearances. The WWSB has a useable area of 7,840 ft ² , using the HWSF as a benchmark, this equates to a storage capacity of 74,425 gal. However, the WWSB requires 8-ft wide main aisles for fork lift traffic, which is not required in the HWSF. Therefore, the estimated UC has been reduced to 60,000 gal (see Figure C-1).	Go	
WEDF (PBF-612)	PC = UC = 1,100 gal; Insufficient capacity; storage dedicated to the treatability demonstrations.		No go
PSU (33 units)	PC = UC = 62,500 gal (50 units); Current inventory = 47,000 gal of mixed waste; 60% of the hazardous waste is liquid requiring a heated storage facility; the PSUs are not heated.		No go
RWMC (WMF-628)	PC = UC = 29,700,000 gal;	Go	

Table C-2. (continued.)

"Must" Criteria 1: Must provide a minimum HW storage capacity of 15,000 gal.			
Alternative	"Must" information	Go	No go
RWMC (WMF-629)	PC = UC = 29,700,000 gal;	Go	
RMWSF (ICPP-1617)	PC = 134,640 gal, UC = 18,000 gal; This facility is currently filled to capacity with mixed waste. However, the reported useable area is 640 ft ² ; insufficient storage capacity.		No go
HCRWSF (ICPP-1619)	PC = 12,000 gal, UC = 1,604 gal; 900 gal of mixed waste in current inventory (60% of capacity); insufficient storage capacity.		No go
SMC (TAN-628)	PC = 33,000 gal, UC = 33,000 gal.	Go	
WEDF/PSU	WEDF storage dedicated to treatability studies.		No go
PSU/WWSB	Store liquid hazardous waste in the WWSB and solid hazardous waste in PSUs.	Go	
WEDF/WWSB	WEDF storage dedicated to treatability studies.		No go
New facility	Build to capacity requirements.	Go	
Private sector	HW storage capability is required to accommodate emergency situations such as TSD facility shutdowns, temporary or permanent, due to EPA audits, shipping moratorium, etc.; private sector TSD facilities located offsite cannot guarantee storage capability for these situations. Capability to store HW in an onsite private sector TSD facility that meets all DOE requirements has never been administratively accomplished or approved.		No go

Table C-2. (continued.)

"Must" Criteria 2: Must not prevent the TSD of other waste types.			
Alternative	"Must" information	Go	No go
HWSF (CFA-637)	No impact on other waste types.	Go	
CLRF (CFA-617)	No impact on other waste types.	Go	
WWSB (PBF-623)	WWSB is designed to store mixed waste prior to incineration at WERF; the decision not to begin incineration at WERF at this time eliminates the need for mixed waste storage at the WWSB. This analysis assumes that incineration will not be performed at the WERF facility. Approximately one-third of the WWSB is required for storage of HW.	Go	
WEDF (PBF-612)	Did not meet "must" criteria 1.		No go
PSU (33 units)	Did not meet "must" criteria 1.		No go
RWMC (WMF-628)	Storage dedicated to alpha-low-level waste. This option might have been feasible except that one of the five planned Type II Storage modules has been dedicated to storage of the waste remediated from Pit 9, which has greatly reduced storage available to the Transuranic Program for storage of reconfigured waste.		No go
RWMC (WMF-629)	Storage dedicated to alpha-low-level waste. This option might have been feasible except that one of the five planned Type II Storage modules has been dedicated to storage of the waste remediated from Pit 9, which has greatly reduced storage available to the Transuranic Program for storage of reconfigured waste.		No go
RMWSF (ICPP-1617)	Did not meet "must" criteria 1.		No go
HCRWSF (ICPP-1619)	Did not meet "must" criteria 1.		No go
SMC (TAN-628)	Facility currently has 16,500 gal of mixed waste in inventory (50% of capacity). This inventory and capacity information was provided by INEL MLLW Technical Support personnel. Use of this facility would require relocating this waste to another MLLW storage facility and decontamination of the facility.	Go	
WEDF/PSU	Did not meet "must" criteria 1.		No go
PSU/WWSB	Store solid HW in PSUs and store liquid HW in north, heated end of WWSB.	Go	

Table C-2. (continued.)

"Must" Criteria 2: Must not prevent the TSD of other waste types.			
Alternative	"Must" information	Go	No go
HWSF (CFA-637)	No impact on other waste types.	Go	
WEDF/WWSB	Did not meet "must" criteria 1.		No go
New facility	New facility would be constructed specifically for storage of HW.	Go	
Private sector	Does not meet "must" criteria 1.		No go

Table C-2. (continued.)

"Must" Criteria 3: Must be able to comply with requirements of Federal and State regulations, including DOE Orders for onsite operations (e.g., RCRA, TSCA, OSHA, NFPA, Architectural Engineering Standards, DOE Order 6430.1A).			
Alternative	"Must" information	Go	No go
HWSF (CFA-637)	Electrical systems deteriorated, structural systems deteriorated, and not in compliance with applicable regulations. Deficiencies have been identified [heating, ventilation, and air condition (HVAC); roof; concrete pad/floor and curbing; water supply; etc.] but are determined to be correctable. This facility was constructed in 1943 and will require constant corrective maintenance to remain in regulatory compliance.	Go	
CLRF (CFA-617)	Roof deteriorated. Facility modifications required to enable HW storage. Facility constructed in 1981.	Go	
WWSB (PBF-623)	No deficiencies. Facility constructed in 1991. Facility modifications are necessary to provide an isolated area for storage of HW and allow for possible storage of MLLW in the remainder of the facility.	Go	
WEDF (PBF-612)	Did not meet "must" criteria 1.		No go
PSU (33 units)	Did not meet "must" criteria 1.		No go
RWMC (WMF-628)	Did not meet "must" criteria 2.		No go
RWMC (WMF-629)	Did not meet "must" criteria 2.		No go
RMWSF (ICPP-1617)	Did not meet "must" criteria 1.		No go
HCRWSF (ICPP-1619)	Did not meet "must" criteria 1.		No go
SMC (TAN-628)	Electrical systems deteriorated, structural systems deteriorated, not in compliance with applicable regulations. Facility constructed in 1958. However, the actual storage area is located within this facility. This area was modified and updated a few years ago and has an interim status permit for storage of waste with hazardous constituents. Any noncompliances should be relatively easy to correct.	Go	
WEDF/PSU	Did not meet "must" criteria 1.		No go
PSU/WWSB	The WWSB is a relatively new facility and the PSUs that are purchased for storage could be made to meet all requirements.	Go	

Table C-2. (continued.)

"Must" Criteria 3: Must be able to comply with requirements of Federal and State regulations, including DOE Orders for onsite operations (e.g., RCRA, TSCA, OSHA, NFPA, Architectural Engineering Standards, DOE Order 6430.1A).			
Alternative	"Must" information	Go	No go
WEDF/WWSB	Did not meet "must" criteria 1.		No go
New facility	A new facility could be built to all regulatory requirements.	Go	
Private sector	Did not meet "must" criteria 1.		No go

Characteristic Analysis

Next, each alternative is compared against the "want" criteria. The scoring is based on a 10 to 0 scale. Once again, using the best information available, the information on the alternatives is compared to determine which alternative best satisfies the criteria. This alternative receives a score of 10. The other alternatives are scored relative to the alternative that scored the 10. Once the scoring is complete, a weighted score is calculated for each alternative. The result yields a comparison of the performance of the alternatives. The performance is based on how important each alternative is for the overall decision and which alternative best satisfies each criteria. Table C-3 assesses the HW storage configurations against the "want" criteria.

Table C-3. Summary of the alternatives analysis against "want" criteria.

"Want" Criteria 1: Provide as much storage capacity as possible (minimum storage capacity requirement = 15,000 gal).			
		Weight = 4	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	UC = 16,366 gal, Uscable Area (UA) = 1,724 ft ² ; The UC/UA ratio in the HWSF will be used as a benchmark to determine capacities of other facilities as required.	5	20
CLRF (CFA-617)	UC = 87,288 gal, UA = 9195 ft ² ; This capacity is based on the HWSF UC/UA ratio as calculated for "must" 1.	10	40
WWSB (PBF-623)	UC = approx. 60,000 gal, UA = 7,840 ft ² ; This capacity is based on the same justification documented for "must" 1. This alternative actually would use only the minimum amount of space required to provide adequate surge capacity for storage of HW; however, additional space is available at the expense of significant MLLW storage capacity. Consequently, this alternative will be assumed to not use any space above the minimum requirements.	5	20
SMC (TAN-628)	UC = 33,000 gal; This capacity is based on information provided by MLLW Technical Support personnel concerning INEL current MLLW inventories.	8	32

Table C-3. (continued.)

"Want" Criteria 1: Provide as much storage capacity as possible (minimum storage capacity requirement = 15,000 gal).			
		Weight = 4	
Alternative	"Want" information	Score	Weight Score
PSU/WWSB	For PSUs: The PSUs are permitted for 62,500 gal and the facility is physically limited to 50 units. The current inventory is approximately 47,000 gal and 33 PSUs have been placed at the facility. An 8 x 20-ft PSU will provide approximately 1,250 gal. Therefore, the maximum HW that could be stored in PSUs is 15,500 gal. The PSUs can only store solid HW, and 40% of the HW is solid. Consequently, the requirement for storage of solid HW is 6,000 gal. For WWSB: The heated portion of WWSB would be used for storage of liquid HW, which constitutes 9,000 gal of the total required storage capacity. The UC is approximately 31,300 gal. This is based on a UA of approximately 3,288 ft ² and the HWSF UC/UA ratio.	7	28
New facility	A new facility can be built to any size required to provide adequate storage space; however, a larger facility will cost more to construct.	10	40

Table C-3. (continued.)

"Want" Criteria 2: Provide one-layer storage.			
		Weight = 1	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	UA = 1,784 ft ² ; This area would not provide one-layer storage for the required HW storage capacity of 15,000 gal.	2	2
CLRF (CFA-617)	UA = 9,195 ft ² ; For purposes of this evaluation, an assumption will be made that a UA equal to twice that of the HWSF would provide capacity for one-layer storage. This would be approximately 3,500 ft ² . Therefore, this facility would provide one-layer storage.	10	10
WWSB (PBF-623)	UA = 7,840 ft ² ; Assuming that only the space required to provide one-layer storage would be utilized, this area would be adequate. However, utilization of this extra space in the WWSB would absorb valuable MLLW storage capacity with little "added-value" to the HW operations. Consequently, this alternative will be assumed to utilize only the space required to provide the minimum identified HW storage capacity of 15,000 gal.	2	2
SMC (TAN-628)	UA = 3,480 ft ² ; This UA is based on the permitted capacity of 33,000 gal and the HWSF UC/UA ratio. Consequently, this facility would probably just provide one-layer storage. Utilization of this facility would have significant impact to B&W operations.	8	8
PSU/WWSB	For PSUs: Available space in the PSUs is approximately 15,500 gal. Based on the need for 6,000 gal of storage capacity for solid HW, this would be adequate to provide one-layer storage. For WWSB: The north end of the WWSB has capacity of 31,300 gal, based on the calculation for "want" 1. This would be adequate to provide one-layer storage. However, this would absorb valuable MLLW storage capacity.	10	10
New facility	A new facility could be constructed large enough to provide one-layer storage at additional cost.	10	10

Table C-3. (continued.)

"Want" Criteria 3: Minimize construction costs.			
		Weight = 9	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	Costs to correct deficiencies in HVAC, water supply, roof, concrete pad/floor and curbing (estimated cost of \$500K to \$600K).	5	45
CLRF (CFA-617)	Estimated cost breakdown of using this facility is as follows: Permitting = \$1,000K; D&D = \$1,000K; Building mods = \$1,000K. This information is based on previous studies performed to determine the best use for this facility.	2	18
WWSB (PBF-623)	Providing separate storage space for HW, approximately 1,600 ft ² , in Room 104 and Room 105 in the south end of WWSB would require modification to the HVAC system, interior walls, curbing, etc. (estimated cost of \$300K to \$400K) (see Figure C-2).	7	63
SMC (TAN-628)	Use of this facility would require relocation of 16,500 gal of MLLW, modification of B&W operating procedures, and decontamination of the facility (estimated cost of \$2,000K).	4	36
PSU/WWSB	Store liquid HW in the WWSB and solid HW in PSUs. Approx 9,000 gal liquid HW and 6,000 gal solid HW. Approximately five additional PSUs would be required at a cost of about \$75K. WWSB would not have to be modified for storage of liquid HW; however, the existing HW would have to be relocated there at an estimated cost of \$50K.	9	81
New facility	Estimated construction costs of a new facility are between \$5,000K and \$6,000K. In addition, permitting would cost \$1,000K.	0	0

Table C-3. (continued.)

"Want" Criteria 4: Minimize operating costs.			
		Weight = 10	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	Operating costs of the HWSF would be high due to the age of the building and the constant corrective maintenance required to keep the facility in compliance with regulations.	4	40
CLRF (CFA-617)	Operating costs of the CLRF would be relatively low; however, these costs would be lower if the facility was located closer to the HW operations personnel	9	90
WWSB (PBF-623)	Operating costs of the WWSB would be low due to the age of the facility (constructed in 1991) and the close proximity to the HW operations personnel. In addition, the bays could be laid out to maximize the efficiency of the facility.	9	90
SMC (TAN-628)	The location of this facility would make operating costs relatively high. In addition, the building that this storage is located in was built in 1958 and is beginning to deteriorate according to Facility Maintenance records.	2	20
PSU/WWSB	Utilization of the north end of WWSB for HW storage would not have high operation costs for HW management; however, this alternative would require continued, extensive use of PSUs for storage of MLLW. These units are very expensive to move waste into and out of and to conduct RCRA inspections. Adding more PSUs for HW would add to this overall waste management operations cost.	4	40
New facility	A new facility could be designed and located to maximize the efficiency of HW operations.	10	100

Table C-3. (continued.)

"Want" Criteria 5: Minimize documentation (i.e., SAR, WAC, RCRA permitting and inspection).			
		Weight = 8	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	No additional documentation would be required for this alternative. However, documentation such as SARs, WACs, operating procedures, permits, etc. would not be reduced.	5	40
CLRF (CFA-617)	Use of the CLRF would require a new permit, SAR, WAC, etc. at significant effort and expense, and it would eventually eliminate the need for these documents for the HWSF. However, documentation requirements would not be reduced.	4	32
WWSB (PBF-623)	Storage of HW in an isolated area in the WWSB would require some aisle space negotiations with the State. In addition, the operating procedures for the WWSB might have to be modified.	8	64
SMC (TAN-628)	Use of the SMC facility might require modifications to B&W operating procedures, including handling of MLLW.	7	56
PSU/WWSB	This alternative would require procedure changes for two facilities, as well as notification to the State of additional PSUs being added to this facility.	7	56
New facility	A new facility would require a new permit, SAR, WAC, operating procedures, etc. at substantial effort and cost. This would eventually eliminate the need for these documents for the HWSF, but the overall amount of documentation for waste management would not be reduced.	4	32

Table C-3. (continued.)

"Want" Criteria 6: Expedite operational HW storage capability.			
		Weight = 4	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	Continued use of the HWSF for storage of HW would not cause any delays or perturbations in the system.	10	40
CLRF (CFA-617)	Modification, preparing documentation, decontamination, and permitting of this facility would require between 4 and 5 years.	3	12
WWSB (PBF-623)	Aisle space negotiations would have to be completed with the State and the necessary modifications before this facility could be utilized. These activities would probably take about 18 to 24 months.	7	28
SMC (TAN-628)	This facility would have to be decontaminated and a new system for handling HW and MLLW (for B&W) would have to be developed and documented. These activities would take between 24 and 30 months.	6	24
PSU/WWSB	This alternative would require development of new HW procedures and procurement and emplacement of five PSUs. These activities would take between 12 and 18 months.	8	32
New facility	Design, construction, and permitting of a new facility would require between 5 and 6 years.	1	4

Table C-3. (continued.)

"Want" Criteria 7: Minimize impacts to other programs, excluding generator programs.			
		Weight = 6	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	This alternative would have no impacts to other programs.	10	60
CLRF (CFA-617)	This alternative would have an impact to a program within the Laboratory Operations & Compliance Group that wants to use this facility for a Radiological Analytical Lab.	6	36
WWSB (PBF-623)	Constructing a wall across the south end of WWSB and establishing an isolated area for storage of HW would have some minor impact on the MLLW operations. However, this impact is minimal for the following reasons: (1) U.S. Department of Energy Headquarters has decided to not incinerate MLLW at WERF at this time, consequently the importance of using WWSB for a processing staging area for WERF is reduced, and (2) the UC of WWSB calculated for "must" 1 indicates that this facility would not provide enough capacity to close a significant number of MLLW storage facilities above those that can be closed with a portion of the building dedicated to HW storage (see Figure C-2).	8	48
SMC (TAN-628)	Utilization of this facility for storage of HW would greatly impact the MLLW management activities of B&W, as well as EG&G Idaho, because the B&W MLLW would have to be stored in some other INEL facility.	4	24
PSU/WWSB	Use of these facilities for storage of HW would prevent consolidation and closure of certain MLLW storage facilities that otherwise could be closed.	5	30
New facility	Construction of a new facility would not impact any other program at all.	10	60

Table C-3. (continued.)

"Want" Criteria 8: Provide convenient personnel accommodations, including offices, restrooms, change rooms, etc.			
		Weight = 2	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	The HWSF is very limited in size and is isolated from HW operations facilities; consequently, providing these conveniences is, for all practical purposes, impossible.	1	2
CLRF (CFA-617)	This facility has existing offices and restrooms and has sufficient capacity to provide all of these conveniences within the facility.	10	20
WWSB (PBF-623)	This facility is located at the WERF facility. All of the above mentioned conveniences are available in adjacent buildings.	8	16
SMC (TAN-628)	This storage is located within a larger facility that has many of the conveniences listed above. However, complete information on the facility provisions was not available.	9	18
PSU/WWSB	The WWSB has adjacent buildings to provide the mentioned conveniences, as stated above. The PSUs are located adjacent to the SPERT-IV building, which also can provide most of these items.	8	16
New facility	A new facility would be designed to include all necessary personnel accommodations.	10	20

Table C-3. (continued.)

"Want" Criteria 9: Maximize safety features that are not required by regulation (e.g., loading docks, fixed safety showers, unlimited water supply, potable water in drum handling locations, etc.).			
		Weight = 5	
Alternative	"Want" information	Score	Weight Score
HWSF (CFA-637)	The HWSF does not currently have these provisions; however, a safety shower is planned to be installed adjacent to the facility and some of the other items listed could be added to the HWSF.	4	20
CLRF (CFA-617)	The CLRF could be modified to include all of the provisions listed above.	10	50
WWSB (PBF-623)	Other than the loading dock, the WWSB, or some adjacent building, can provide all of the items listed above.	8	40
SMC (TAN-628)	This facility was modified and set up for MLLW storage about 2 years ago. Accordingly, in absence of detailed data, an assumption has been made that this facility could provide almost all of these safety features.	9	45
PSU/WWSB	As previously stated, the WWSB, or some adjacent building, could provide most of the safety features listed. However, the PSUs have lighting and ventilation deficiencies that do not maximize safety.	7	35
New facility	A new facility would be designed to include any features practicable that improve the safety of the facility operations.	10	50

Risk Assessment

Any adverse consequences associated with implementation of each alternative are identified in Table C-4. An assessment of the risk inherent in each alternative depends on the number of adverse consequences identified. The probability and seriousness of any risks are evaluated to determine the potential impact on the success of the decision. The consequences are ranked H = high, M = medium, and L = low.

Table C-4. Assessment of adverse consequences (P = Probability; S = Seriousness).

Store HW in the WERF Waste Storage Building (Alternative 3)		
Adverse consequences	P	S
Transportation impacts relative to loading and unloading	L	L
WWSB located in a Radioactive Materials Management Area (RMMA) designated area	L	M
Staffing not maintained due to WERF closure	M	L
Impact to mixed waste operations	M	L
Funding not available to complete the WWSB modifications as designed within the planned schedule	L	M

Store HW in the Central Laundry and Respirator Facility (Alternative 2)		
Adverse consequences	P	S
Lack of security and higher population/personnel in the CFA leads to greater risk for accidental or intentional intrusion	L	H
Accidents could become more serious because a higher percentage of persons in the area are not accustomed to handling waste	L	H
Funding not available to complete the CLRF modifications as designed within the planned schedule	M	M
CLRF located in a RMMA designated area	L	M

Store HW in the PSU/WWSB (Alternative 12)		
Adverse consequences	P	S
Impact to mixed waste operations if WERF began to incinerate	L	H
HW storage operations in PSUs are logistically difficult to inspect, costly to operate, have few desirable characteristics, and allow only solid waste storage.	H	M
PSU/WWSB located in a RMMA designated area	L	M

REFERENCES

Magleby, M. T., and J. A. Roach, 1993, *Hazardous Waste Type Implementation Plan*, ER&WM-PD-93-028, September 1993.

U.S. Department of Energy, 1993, *Waste Management Division Strategic Plan*, DOE/ID-10429, May 1993.

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