DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
8725 JOHN J. KINGMAN ROAD, SUITE 3229
FORT BELVOIR, VIRGINIA 22060-6223

DNSC-ME

IN REPLY REFER TO

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RECEIVED REGION 1

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Q-5

United States Nuclear Regulatory Commission
Region 1, Nuclear Materials Safety Branch
Division of Nuclear Materials Safety
ATTN: Ms Betsy Ullrich
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

Re: Defense Logistics Agency, Request for Additional Information Concerning Application for Amendment to License, Control No. 138458/License No. STC- 133

Defense Logistics Agency, Request for Additional Information Concerning Application for Amendment to License, Control No. 138087/ License No. STC- 133 04000341

Dear Ms. Ullrich:

Letters received from the Nuclear Regulatory Commission (both dated December 18, 2006) requested additional information concerning our Decommissioning/Remediation Plan submitted on September 29, 2006 for the Curtis Bay, Maryland and the Hammond, Indiana Defense National Stockpile Center (DNSC) depots. Essentially, both letters (Control No. 138087 for Hammond and Control No. 138458 for Curtis Bay) requested the same information in a series of seven questions. The Curtis Bay letter had one additional question (No. 8) concerning groundwater testing at Curtis Bay. The questions have been repeated in the responses.

The DNSC responses for both letters are attached. Our draft DNSC Environmental Assessment for cleanup at Curtis Bay and Hammond is also included as an attachment.

Sincerely,

Michael Pecullan
Radiation Safety Officer

Attachments

138087

NMSS/RGN1 MATERIALS-002

Printed on Recycled Paper

(1/19/2007) Defense Logistics Agency Request for Additional Information Concerning Application for Amendment to License, Control No. 138087, Hammond, IN

1. **In your facility description in Section 3, discuss any environmental issues that may be present at the Hammond Depot that may be affected by the decommissioning of the site, such as the presence of endangered species, commercially important species, historical and cultural resources, scenic resources, etc. If no such environmental issues or concerns are present, so state.**

   There are no environmental issues that may be affected by the decommissioning of the site. There are neither endangered species nor commercially important species on the depot. There are neither historical and cultural resources nor scenic resources on the depot. Hammond Depot is in a heavily industrialized area in Hammond, Indiana. DNSC has prepared a draft environmental assessment that considers the potential for significant impacts to the human environment at Hammond and Curtis Bay Depots. A copy of that draft environmental assessment is attached for your information.

2. **In Section 6.2.3, describe more specifically the types of "standard industrial equipment" and "good housekeeping practices" that you expect to use for decommissioning activities at the Hammond Depot. The descriptions need not be exhaustive or all-inclusive, but should provide sufficient detail to understand the type and scope of decommissioning activities that will be performed. Your response should include the applicable information requested in Section VIII.a., b., and c. for contaminated structures, equipment, and soil, such as a description of remediation techniques; a summary of radiation protection methods and control procedures; a summary of existing procedures; and a summary of any unique safety or remediation issues at the Hammond Depot.**

   The remediation contractor has prepared a draft Technical Approach for the Hammond Depot. The Technical Approach includes "Remediation Work Instructions" and a corresponding "Remediation Technical Approach" for each area of concern (i.e., exterior soil contamination) and each contaminated structure that were identified in the site's characterization. A copy of the draft Technical Approach for both depots is attached for your information. The Remediation Work Instructions includes a list of the equipment that will be required. Additional details with regard to Section VIII.a, b., and c. of NUREG-1757, Volume 1, Revision 2, Appendix D are provided in Tables 2-1, 2-2, and 2-3, respectively.

Table 2-1. Contaminated Structures[a]

Bullet	Response
A summary of the remediation tasks planned for each room or area in the contaminated structure, in the order in which they will occur	Please see the attached draft Technical Approach plan. The specific order for which the buildings will be remediated will be dependent on factors including, but not limited to, field efficiencies and weather. The most extensive remediation activities will occur in Building 200E.
A description of the remediation techniques that will be employed in each room or area of the contaminated structure	Please see attached Technical Approach plan.
A summary of the radiation protection methods and control procedures that will be employed in each room or area	The Remediation Work Instructions in the Technical Approach plan identifies a checklist for Health Physics and Safety concerns for each building or area of concern. A radiation work permit will be used in each location. The requirement for air sampling is also identified as well as postings for the area.
A summary of the procedures already authorized under the existing license and those for which approval is being requested in the DP	The Technical Approach plan is being used in lieu of procedures.
A commitment to conduct decommissioning activities in accordance with written, approved procedures	The Technical Approach plan is being used in lieu of procedures.
A summary of any unique safety or remediation issues associated with remediating the room or area	No unique safety or remediation issues have been identified with contaminated structures at the Hammond Depot.
For Part 70 licensees, a summary of how the licensee will ensure that the risks addressed in the facility's Integrated Safety Analysis will be addressed during decommissioning	Not applicable

[a]Reference NUREG-1757, Volume 1, Revision 2, Appendix D, Section VIII.a

Table 2-2. Contaminated Systems and Equipment[a]

Bullet	Response
A summary of the remediation tasks planned for each system in the order in which they will occur, including which activities will be conducted by licensee staff and which will be performed by a contractor	There are not any functional contaminated systems or equipment at Hammond Depot; albeit, there is some nonfunctioning ductwork in Building 200E that has some external contamination. This ductwork will be removed and disposed as part of the remediation activities of the building.
A description of the techniques that will be employed to remediate each system in the facility or site	
A description of the radiation protection methods and control procedures that will be employed while remediating each system	
A summary of the equipment that will be removed or decontaminated and how the decontamination will be accomplished	
A summary of the procedures already authorized under the existing license and those for which approval is being requested in the DP	
A commitment to conduct decommissioning activities in accordance with written, approved procedures	
A summary of any unique safety or remediation issues associated with remediating any system or piece of equipment	
For Part 70 licensees, a summary of how the licensee will ensure that the risks addressed in the facility's Integrated Safety Analysis will be addressed during decommissioning	Not applicable

[a]Reference NUREG-1757, Volume 1, Revision 2, Appendix D, Section VIII.b

Table 2-3. Soil[a]

Bullet	Response
A summary of the removal/remediation tasks planned for surface and subsurface soil at the site in the order in which they will occur, including which activities will be conducted by licensee staff and which will be performed by a contractor	Please see attached Technical Approach plan. The specific order for which the exterior surface and subsurface soils will be remediated will be dependent on factors including, but not limited to, field efficiencies and weather.
A description the techniques that will be employed to remove or remediate surface and subsurface soil at the site	The contaminated soil will typically be excavated and deposited into containers which will subsequently be shipped off-site for disposal of the material.
A description of the radiation protection methods and control procedures that will be employed during soil removal/remediation	The Remediation Work Instructions in the Technical Approach plan identifies a checklist for Health Physics and Safety concerns for each area of concern. A radiation work permit will be used in each location. The requirements for air sampling are also identified as well as postings for the area.
A summary of the procedures already authorized under the existing license and those for which approval is being requested in the DP	The Technical Approach plan is being used in lieu of procedures.
A commitment to conduct decommissioning activities in accordance with written, approved procedures	The Technical Approach plan is being used in lieu of procedures.
A summary of any unique safety or removal/remediation issues associated with remediating the soil	There are not any known unique safety or removal/remediation issues.
For Part 70 licensees, a summary of how the licensee will ensure that the risks addressed in the facility's Integrated Safety Analysis will be addressed during decommissioning	Not applicable.

[a]Reference NUREG-1757, Volume 1, Revision 2, Appendix D, Section VIII.c

3. **In Section 6.2.4, provide a schedule for decommissioning activities at the Hammond Depot. Of particular interest will be the schedule for final status surveys. If sufficient inspection occurs during the decommissioning process, it may not be necessary to perform confirmatory surveys. Your response should include the applicable information requested in Section VIII.e of NUREG-1757, Volume 1, Revision 1, such as a chart detailing proposed remediation tasks and order and a commitment to update the schedule frequently enough that the NRC may inspect activities. If the schedule will not meet the 10 CFR 30.36 timeframe, you should submit request for an alternate schedule to complete decommissioning the Hammond Depot.**

   A Gantt chart of the decontamination/remediation activities at Hammond Depot is inserted for NRC review.

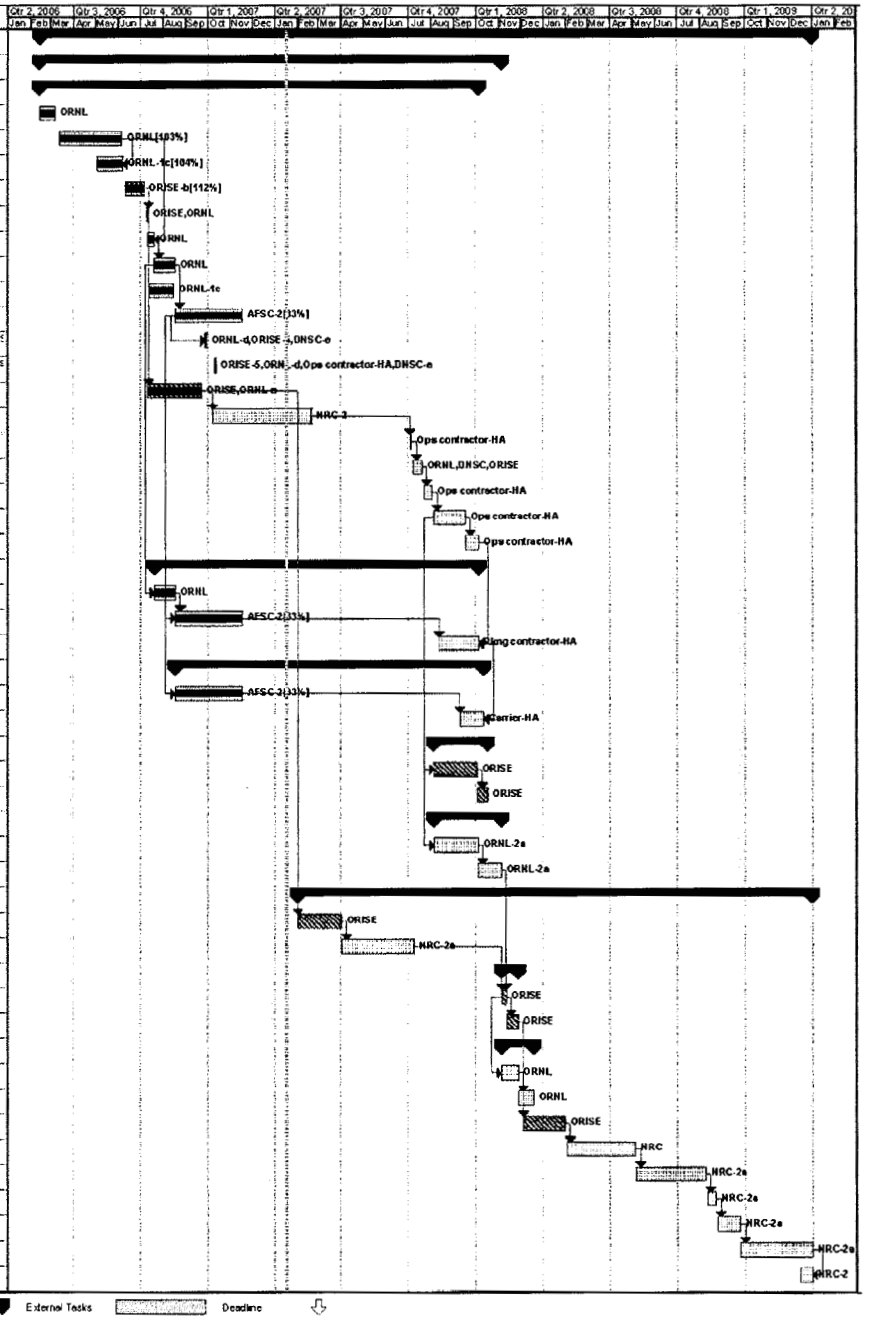
   Circumstances may require the project activities to be rescheduled. The schedule of activities will be updated at least every two weeks. When substantive changes occur, NRC will be notified.

   As shown in the inserted Gantt chart, on-site decommissioning and remediation activities at Hammond Depot, including the final status surveys, are expected to be completed within a five month period following start of work. The expected duration of decommissioning/remediation activities at Hammond Depot is well within the 24 months allowed by 10 CFR 40.42 and 10 CFR 30.36.

   Illustrative of the commitment by DNSC to perform the actions in a timely manner is the following information extracted from an internal email regarding assignment of personnel to similar decommissioning and remediation activities at Curtis Bay Depot:

> To: Radiological Officers-
>
> The following instructions have been reviewed and approved by the Director, DNSC-M
>
> Beginning the week of 3/12/07 a decontamination contractor, World Environmental, will begin operations at Curtis Bay. Work week will be 5 ten hour days from Monday AM to Friday PM and will encompass the months of March thru and including June '07. The contractor is working directly for the US Army Joint Munitions Command under a MIPR issued by DNSC. Personnel from the Oak Ridge National Laboratory and the Oak Ridge Institute of Science & Education will be present for technical support on behalf of DNSC. As the NRC Licensee it is our (DNSC) responsibility to provide full time review and oversight of operations during the project.
>
> There are a total of 16 work weeks within the noted time frame. Most of you will be given two one week assignments on the project but not necessarily contiguous. In an effort to accommodate your schedules we are asking you to identify two weeks when you would prefer to work at Curtis Bay. If you want more than two weeks please let us know. Also, please clear your requested dates with your supervisor before submitting them.
>
> Your written response via e-mail to the project manager (Mike Pecullan) is due in this office NLT Friday January 19th. In case of a conflict we will make the final decision; preference will be given to anyone who wants contiguous assignments.

ID		Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		**Hammond Depot Decontamination and Decommissioning**	**721 days**	**Wed 2/15/06**	**Wed 12/31/08**		
2		**Decon activities at Hammond**	**433 days**	**Wed 2/15/06**	**Mon 11/5/07**		
3		**Decon-HA**	**412 days**	**Wed 2/15/06**	**Fri 10/5/07**		
4	✓	Write outline for decon SOW-HA	15 days	Wed 2/15/06	Tue 3/7/06		ORNL
5	✓	Write draft decon SOW	59 days	Tue 3/14/06	Tue 6/6/06		ORNL[103%]
6	✓	Prepare draft waste delineation spreadsheet-HA	24 days	Thu 5/4/06	Wed 6/7/06	5FF	ORNL-1c[104%]
7	✓	Prepare draft programmatic work plan-HA	17 days	Mon 6/12/06	Thu 7/6/06		ORISE-b[112%]
8	✓	Transfer characterization survey results-HA	1 day	Tue 7/11/06	Tue 7/11/06	7	ORISE,ORNL
9	✓	Incorporate characterization survey results into decon SOW-HA	7 days	Wed 7/12/06	Thu 7/20/06	5FF	ORNL
10	✓	Write decon SOW-HA	20 days	Fri 7/21/06	Thu 8/17/06	9	ORNL
11	✓	Prepare final waste delineation spreadsheet-HA	23 days	Fri 7/14/06	Tue 8/15/06		ORNL-1c
12	✓	Award decon contract-HA	65 days	Fri 8/18/06	Fri 11/17/06	10	AFSC-2[33%]
13	✓	Conduct walkthrough-HA	2 days	Thu 9/28/06	Fri 9/29/06	12SS+28 days	ORNL-d,ORISE-5,DNS
14	✓	SOW Q&A-HA	2 days	Wed 10/11/06	Thu 10/12/06		ORISE-5,ORNL-d,Ops
15	✓	Prepare decommissioning/remediation plan-HA	52 days	Wed 7/12/06	Fri 9/22/06	7FS+1 day	ORISE,ORNL-e
16		NRC reviews decommissioning/remediation plan-HA	91 days	Mon 10/9/06	Tue 2/20/07	15FS+10 days	NRC-2
17		Contractor delivers proposed work plan to DNSC-HA	2 days	Thu 7/5/07	Fri 7/6/07	16FS+92 days	Ops contractor-HA
18		Review work plan-HA	10 days	Mon 7/9/07	Fri 7/20/07	17	ORNL,DNSC,ORISE
19		Prepare final work plan-HA	10 days	Mon 7/23/07	Fri 8/3/07	18	Ops contractor-HA
20		Decon 200E & ADC 2	30 days	Mon 8/6/07	Mon 9/17/07	19	Ops contractor-HA
21		Conduct remainder of decon operations-HA	14 days	Tue 9/18/07	Fri 10/5/07	20	Ops contractor-HA
22		**Waste packaging-HA**	**304 days**	**Fri 7/21/06**	**Fri 10/5/07**		
23	✓	Write waste packaging SOW-HA	20 days	Fri 7/21/06	Thu 8/17/06	10SS	ORNL
24	✓	Award waste packaging contract-HA	65 days	Fri 8/18/06	Fri 11/17/06	12SS,23	AFSC-2[33%]
25		Package wastes-HA	39 days	Mon 8/13/07	Fri 10/5/07	21FF,24	Pkng contractor-HA
26		**Transport waste-HA**	**285 days**	**Fri 8/18/06**	**Fri 10/12/07**		
27	✓	Award transportation and disposal contract-HA	65 days	Fri 8/18/06	Fri 11/17/06	24SS	AFSC-2[33%]
28		Transport and dispose of packaged wastes-HA	25 days	Mon 9/10/07	Fri 10/12/07	25FF+5 days,27	Carrier-HA
29		**Assess decontamination adequacy-HA**	**52 days**	**Mon 8/6/07**	**Wed 10/17/07**		
30		Perform remedial action support survey - HA	42 days	Mon 8/6/07	Wed 10/3/07	20SS	ORISE
31		Write assessment of decontamination adequacy at HA	10 days	Thu 10/4/07	Wed 10/17/07	30	ORISE
32		**Monitor & Record cleanup and transport-HA**	**65 days**	**Mon 8/6/07**	**Mon 11/5/07**		
33		Monitor & Record decontamination activities-HA	43 days	Mon 8/6/07	Thu 10/4/07	20SS	ORNL-2a
34		Prepare photographic record of decontamination activities-HA	22 days	Fri 10/5/07	Mon 11/5/07	33	ORNL-2a
35		**FSS activities at Hammond**	**488 days**	**Fri 2/2/07**	**Wed 12/31/08**		
36		Write FSS plan-HA	42 days	Fri 2/2/07	Mon 4/2/07	15FS+88 days	ORISE
37		NRC reviews FSS plan-HA	68 days	Tue 4/3/07	Mon 7/9/07	36	NRC-2a
38		**FSS operations at Hammond**	**15 days**	**Tue 11/6/07**	**Wed 11/28/07**		
39		Perform FSS of soils-HA	5 days	Tue 11/6/07	Mon 11/12/07	34,37	ORISE
40		Perform FSS of buildings-HA	10 days	Tue 11/13/07	Wed 11/28/07	39	ORISE
41		**Monitor & Record FSS-HA**	**30 days**	**Tue 11/6/07**	**Wed 12/19/07**		
42		Monitor FSS-HA	15 days	Tue 11/6/07	Wed 11/28/07	39SS	ORNL
43		Prepare photographic record of FSS-HA	15 days	Thu 11/29/07	Wed 12/19/07	42	ORNL
44		Write FSS report-HA	37 days	Thu 12/6/07	Thu 1/31/08	40FS+5 days	ORISE
45		NRC reviews FSS report-HA	66 days	Mon 2/4/08	Mon 5/5/08	44FS+1 day	NRC
46		NRC prepares a draft EA for license amendment-HA	66 days	Tue 5/6/08	Fri 8/8/08	45	NRC-2a
47		NRC holds public mtgs-HA	10 days	Mon 8/11/08	Fri 8/22/08	46	NRC-2a
48		NRC allows time for public comments-HA	22 days	Mon 8/25/08	Wed 9/24/08	47	NRC-2a
49		NRC incorporates public comments in final EA-HA	66 days	Thu 9/25/08	Wed 12/31/08	48	NRC-2a
50		NRC issues FONSI-HA	10 days	Tue 12/16/08	Wed 12/31/08	49FF	NRC-2



Project: Hammond D & D
Date: Tue 1/16/07
File: D&D-Hammond.mpp

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

The contractor, World Environmental, will be generating schedules and milestone status reports. ORNL will generate a daily report and this report is available upon request. This report will contain several digital photographs made to establish the record. An example follows:

UT-BATTELLE OAK RIDGE NATIONAL LABORATORY	Thorium Nitrate Project Phase IV	August 15, 2007

DAILY REPORT

Work Location — Hammond Depot, Hammond, Indiana

On-Site Representatives

UT-Battelle	Bill Hermes	
ORISE	Tim Vitkus	
DNSC	Mike Pecullan	Eric Deal
World Environmental	Brad Squibb	

Visitors

None.

Weather Conditions

Light rain until ~1100, sunny thereafter, average temp =75°F

Description of work areas

Burn Cage
Building 200E
Building 200E closet

Description of Activities

{The information in this document is provided for example purposes only.}

The contractor arrived on site. A backhoe was delivered to the site. The contractor mobilized to the burn cage area and began excavating the soil. Approximately 1 foot of soil/slag has been removed over an area of approximately 500 square feet.

Continue text for other items

One item . . .

Two item . . .

Three item . . .

Four item . . .

Five item . . .

Six item . . .

A floor scabbler was also delivered to the site and it was moved to building 200E. Decontamination of the floor began with the contractor removing approximately 0.25 inch of concrete from the floor over a surface area of approximately 2500 square feet. There have not been any operational problems thus far.

The contractor's personnel are wearing appropriate PPE, and there have not been any safety issues.

Prepared by: Bill Hermes August 15, 2007

4. **In Section 8.0, describe the additional training that will be provided for personnel and contractors who will be involved in radiological decommissioning activities at the Hammond Depot. Specify who will provide the training, the topics that will be covered, and the approximate amount of time that will be spent on the various topics. Explain how this will differ from the decommissioning/remediation safety briefing provided by ORNL to Hammond Depot personnel.**

Additional training for DNSC personnel will be three days by ORISE and contractor personnel, as described below.

DEFENSE NATIONAL STOCKPILE CENTER
THREE DAY RADIATION REFRESHER

February 27 – March 1, 2007

Coordinated by Alex J. Boerner, CHP

Conducted By

Professional Training Programs
Health Physics and Training Group
Independent Environmental Assessment and Verification
Oak Ridge Associated Universities

The training staff is:

Professional Training Teaching Staff*
Alex J. Boerner, CHP, Health Physicist
Matthew Buchholz, Health Physicist
Jeff A. Chapman, CHP, Health Physicist
Dale Condra, Laboratory Manager
Dean Herrera, Health Physics Technician
Timothy J. Vitkus, CHP, Health Physicist
Marsha Worthington, Health Physics Technician

Support Staff

Kristy Pond, Registrar

*Additional ORISE staff involved with the CBD and HD D&D projects will meet the participants during the course.

The agenda with subject matter and duration is:

Date	Time	Topic	Instructor	Location
Tuesday Feb 27	8:30 AM	Welcome, Registration, and Photo	Boerner/McCloud	Room 135
	9:00 AM	Course Introduction	Boerner	Room 135
	10:30 AM	REVIEW OF RADIATION SAFETY TOPICS	BUCHHOLZ	Room 135
	12:00 N	Lunch		
	1:00 PM	OVERVIEW OF D&D PROCESS: HISTORICAL SITE ASSESSMENT PROCESS, SCOPING, CHARACTERIZATION, DCGLS, REMEDIAL ACTION SUPPORT, FINAL STATUS SURVEYS, IV SURVEYS	VITKUS	Room 135
	3:30 PM	RADIOACTIVE SAMPLING AND ANALYSIS	CONDRA	Room 135
Wednesday Feb 28	8:00 AM	REGULATIONS AND RESPONSIBILITIES	BOERNER	Room 135
	9:30 AM	DECONTAMINATION TECHNIQUES	SQUIBB	Room 135
	11:30 AM	Lunch		
	1:00 PM	Tour: Energy Solutions (formerly Duratek)	Boerner	Energy Solutions

Thursday	8:00 AM	Field: Gamma Walkover Measurements	Herrera/Boerner	ANC
Mar 1	12:00 N	Lunch		
	1:00 PM	Lab: Detection/Decon techniques	Worthington/Buchholz	TBD
	2:30 PM	WASTE MANAGEMENT	CHAPMAN	Room 135
	4:00 PM	Critique/course evaluation	Boerner	Room 135
	4:30 PM	Adjourn	Boerner	Room 135

The decommissioning/remediation safety briefing provided by ORNL to depot personnel is conducted separately for each depot and will cover all aspects of radiological and industrial health and safety associated with the site specific decommissioning activities. The material will be provided in the form of a power point file sent to all DNSC personnel and then reviewed with them when they are on site. Emphasis will be placed on ensuring that depot personnel stay well away from contractor operations that could generate an airborne hazard. The ORNL and contractor personnel training programs are managed and controlled under separate training programs, with certifications maintained by company training officers. The matrix for contractor personnel (World Environmental) is provided below. The training includes mastering site specific procedures and work plans. A plan of the day/safety meeting is required each morning.

Per the Statement of Work, the Contractor shall provide training records, including dates when training expires, prior to award in the form of a checklist for each of the core team personnel. If a core team member does not have adequate training at the time of the submission of the bid, the proposal must provide a schedule for that individual to obtain the necessary training. The checklist shall also list the training requirements/records to be in place for all personnel to be working at the DNSC depot: equipment operators, asbestos crews, and health physics/radiological control officers/technicians involved in the project. The proposal shall include the procedure to be used to maintain and store current training records at the DNSC site for easy retrieval and verification by DNSC or their representatives. The Contractor is responsible for providing the necessary training to their employees, and the training shall be provided to each employee based on the employee's job activities. The Contractor's personnel must only perform job activities for which they have received the appropriate training. Three weeks prior to deployment to the site, the Contractor shall submit a checklist of all specific personnel and their training qualifications to the DNSC POC. If new personnel are added, these persons must receive the necessary training and their training qualifications shall be submitted to the DNSC POC prior to deploying to the DNSC sites.

World Environmental Technologies
Employee Training Record

		40-Hour HAZWOPER	8-Hour HAZWOPER Refresher	Respiratory Protection	Radiation Worker Training	Forklift Training	30 hour Construction Course	Advanced Radioactive Material Shipping	Confined Space Entry	First Aid	Bloodborne Pathogens
Project Manager	Brad Squibb	X	X	X	X			X	X	X	X
H&S Officer	John Riffe	X	X	X			X			X	X
CHP	Leslie W. Cole	X	X		X						X
Field Staff	Chad Hollaway	X	X	X	X	X		X	X	X	X
Field Staff	Greg McFeely	X	X	X	X	X			X	X	X
Field Staff	Blake Squibb	X	X	X	X	X			X	X	X
Field Staff	Shane Woolcock	X	X	X	X						X
Field Staff	Steve Stanek	X	X	X		X			X	X	X
Field Staff	Tom Mottet	X	X	X	X	X			X		X

5. **As described in Section 9.2.2, you may perform air sampling during remediation activities at the Hammond Depot. Please provide a brief description of the criteria you will use in an air sampling program and internal dose assessment for workers. You should review the information requested in Section X.a, X.b, and X.c and include applicable information in your response.**

AIR SAMPLING

The contractor air sampling program will involve the use of RAS -1 Air Samplers (Area) and Breathing Zone (BZ) samplers. The air samplers will be run during all remediation activities for the entire shift. The air samplers are checked by a "V flow" calibrated flow gauge every day.

Fifty percent of the derived air concentration (DAC) is the contractor action level for investigations.

Time and flow will be considered in the use of RAS and BZ samples to ensure enough volume has been collected on the filter to ensure counting techniques can see at least 10% of DAC.

A low background alpha/beta counter will be used to count the air samples. The air sample analysis will be set up to where the radiation safety officer can interpret data the next morning based on an initial count to see if there was a problem, versus waiting 72 hours for Radon/Thoron decay. The counting shall be used for maintaining operational controls.

RESPIRATORY

The contractor has a fully functional Respiratory Protection Program that involves annual training, medical screening, quantitative fit testing, selection of respirators etc.

INTERNAL EXPOSURE DETERMINATION

Internal Dose exposure - A bioassay program involving urine and/or fecal will be implemented. This will include a baseline sample and a frequency to be determined. The contractor will manage dose assessment based on bio-assay results.

Applicable site procedures are approved by the operations manager, radiation safety officer and president and include: bio-assay Program; supplement for bio-assay and dose calculations; air monitoring ion the process area; and air sample counting procedure.

6. **Section 9.4 is entitled "Surveys for Release of Solid Materials". Confirm that you will clarify this title to refer to only "surface-contaminated" materials. The NRC does not have approved standard release criteria for unrestricted release of solid contaminated materials other than soil and effluents (liquids and airborne). If other solid contaminated materials are known to be present at the site, criteria must be approved for that material prior to release of the item(s) for unrestricted use.**

The title of Section 9.4 has been changed from "Surveys for Release of Solid Materials" to "Surveys for Release of Surface-Contaminated Materials", with the impacted page attached.

As shown in Section 9.4.1, Section 9.4 was written to address removal of surface-contamination from supplies and equipment.

7. **Section 11.2 states that you do not anticipate that liquid radioactive waste will be generated during decommissioning. However, at a minimum, you should have plans to determine if contaminated liquids are generated in the event that liquids are used in activities such as cleaning and/or decontamination of equipment used during remediation activities at the Hammond Depot. Describe plans you have for verifying if liquids used during remediation activities become contaminated, and your disposal options if contaminated liquids are generated.**

   Liquids that are generated in activities such as cleaning and/or decontamination of equipment will be collected in an appropriate container, sampled, and analyzed for the primary contaminants of concern (e.g., thorium). If the analysis indicates that the concentration of the contaminants meet the specifications for free release, then the liquids will be disposed of accordingly. If the analysis indicates that the concentration of the contaminants exceed the specifications for free release, then the liquids will be held in an appropriate container. Potential disposal and/or treatment options will be evaluated for the liquids on a case-by-case basis. For example, a cost-effective treatment process may be dependent on the volume of the liquid and the concentration of contamination. After the treatment process, the liquid will be sampled and analyzed, and the results will be compared to the specification for release. The contaminants that are removed from the liquid (along with the corresponding treatment media) will be evaluated and disposed at an appropriate facility.

ATTACHMENT A

DRAFT ENVIRONMENTAL ASSESSMENT

DRAFT ENVIRONMENTAL ASSESSMENT

REMOVAL OF LOW-ACTIVITY CONTAMINATION

DRAFT

January 2007

Defense Logistics Agency
Defense National Stockpile Center
Fort Belvoir, Virginia

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DRAFT

SUMMARY

The Defense National Stockpile Center (DNSC) is preparing this environmental assessment (EA) to address the potential environmental impacts of the proposed cleanup of low-activity radioactive contamination at two facilities: Curtis Bay Depot, Curtis Bay, Maryland and Hammond Depot, Hammond, Indiana. These facilities were previously used for storing commodities containing source material (10 CFR 40.4) regulated by the Nuclear Regulatory Commission (NRC). DNSC is a field activity of the Defense Logistics Agency (DLA) and is responsible for providing safe, secure, and environmentally sound stewardship of these facilities.

The stockpiles of commodities containing source material have been removed from the Curtis Bay and Hammond Depots. At the Curtis Bay Depot, the commodities containing source material (columbium/tantalum, thorium nitrate, tungsten ore and concentrates, thorium hydroxide, thorium oxide, monazite sand, uranium pitchblende ore, and sodium sulfate) were previously stored in 16 of the original 59 warehouses. Since the middle 1980s, over 19,000 drums of thorium nitrate were stored in three warehouses: B-911, B-912, and B-913. Previously the thorium nitrate stockpile was stored for short periods in six other warehouses on the Curtis Bay site. At the Hammond Depot site, the commodities containing source material (columbium/tantalum, thorium nitrate, monazite sands, sodium sulfate, and tungsten ore and concentrates) were previously stored in two of the three warehouses on the site. Cleanup of any residual contamination from storage of the commodities containing source material is one task DNSC must complete before the depots can be closed.

DNSC proposes to terminate its NRC materials license for Curtis Bay and Hammond Depots. DNSC's preferred action would be to remove and dispose of radioactive contamination resulting from the storage of its stockpiles of commodities containing regulated source material.

In a previously prepared EA, *Environmental Assessment: Disposition of Thorium Nitrate* (the thorium nitrate EA), DNSC evaluated the potential environmental impacts resulting from removal and disposal of the last commodity containing source material stored at Curtis Bay and Hammond Depots: roughly seven million pounds of thorium nitrate stored in over 21,000 drums. The thorium nitrate EA concluded that the proposed action would result in no significant adverse impacts to the human environment. Because the preferred action for this EA involves much smaller quantities of source material (residual contamination only) and a relatively short period of time has elapsed since preparation of the thorium nitrate EA, the findings from the thorium nitrate EA are incorporated by reference for resource categories that would have little potential for change: ecological resources, including threatened and endangered species; water resources; waste disposal; socioeconomics; environmental justice; and cultural resources.

The focus of this EA is concentrated on the potential for environmental impacts from standard remediation operations on land use; human health and safety; noise; transportation; and air quality. The potential environmental impacts are assessed at both of the stockpile storage sites and along the potential transportation corridors. Cumulative impacts of the proposed action and no-action alternative are evaluated. Potential impacts to human health from accidents are also assessed.

Because injuries sustained in traffic and/or rail accidents could result in fatalities, these accidents would produce the greatest potential for adverse impacts resulting from the proposed action. The potential impacts to human health from such accidents are evaluated. The accident analysis addresses only potential impacts to individuals because all credible accidents are sufficiently small that they would not produce large or permanent impacts on a greater scale.

Accident analyses are framed in probabilistic terms; accident analysis can only estimate the likelihood that a particular event would occur. The results of the accident analysis in this EA demonstrate that much less than one fatality would be expected to result from injuries sustained in traffic and/or rail accidents that may occur during transport of the low-activity radioactive contaminants. Because all the materials contaminated with low-activity radioactivity are solids, accidental spills, if any were to occur, could be contained and cleaned up quickly. Therefore, traffic and rail accidents during transportation of the low-activity radioactive contaminants would be expected to produce no significant adverse impacts on human health or the human environment.

Based on the analysis of the potential impacts to the human environment from standard remediation operations, including waste disposal, to water resources, land use and ecological resources, socioeconomics, human health and safety, and environmental justice, this EA concludes that the proposed action would be expected to produce no significant adverse impacts. Additionally, indirect and/or cumulative impacts would also be expected to produce no significant adverse impacts to the human environment.

Based on the results of the analyses performed during the preparation of this EA, the proposed action would be expected to produce no significant adverse impacts to the human environment. The findings of this EA corroborate the findings of the thorium nitrate EA that evaluated the potential for significant adverse impacts from disposition of the thorium nitrate stockpile. *Therefore, an environmental impact statement is not necessary, and a finding of no significant impact is recommended.*

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ACRONYMS, ABBREVIATIONS, AND INITIALISMS

AJMC	Army Joint Munitions Command
ALARA	as low as reasonably achievable
CFR	*Code of Federal Regulations*
DLA	Defense Logistics Agency
DNSC	Defense National Stockpile Center
DoD	Department of Defense
DOE	Department of Energy
DOT	U.S. Department of Transportation
EA	environmental assessment
EIS	environmental impact statement
ISO	(accepted designation for) International Organization for Standardization
NEPA	National Environmental Policy Act
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
SI	(accepted designation for) International System of Units
U.S.C.	*United States Code*
USEI	US Ecology Idaho

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GLOSSARY

activity—the number of nuclear transitions occurring in a given quantity of *radioactive material* per unit of time. For example one disintegration/second is a becquerel (Bq), which has replaced curie (Ci) as the standard unit of activity. 10 CFR §20.1005

contamination—undesired radioactive material that is deposited on the surface of or inside structures, areas, objects or people.

criteria pollutants—the atmospheric pollutants for which *National Ambient Air Quality Standards* exist: sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, lead, and particulate matter less than or equal to 2.5 μm in aerodynamic diameter.

cumulative impacts—impacts that result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects, and any resulting environmental degradation, that are the focus of cumulative impact analysis. The concept of cumulative impacts takes into account all disturbances because cumulative impacts result in the compounding of the effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (federal, non-federal, or private) is taking the actions.

gray—the SI (International System of Units) unit of absorbed dose. One gray (Gy) is equal to an absorbed dose of 1 joule/kg (1 Gy = 100 rad). (The joule is the SI unit of energy, abbreviated as J.) 10 CFR §20.1004.

industrial-type accidents—a broad term for any undesired event that results in injury to workers or damage to property or the human environment during or as a result of work activities.

isotope—any two or more forms of an element having identical or very closely related chemical properties and the same atomic number but different atomic weights or mass numbers.

low-level radioactive waste—a general term for a wide range of radioactive wastes. Industries, hospitals, and medical, educational, or research institutions; private or government laboratories; and nuclear fuel cycle facilities (e.g., nuclear power reactors and fuel fabrication plants) that use radioactive materials generate low-level radioactive wastes as part of their operations. These wastes are generated in many physical and chemical forms and levels of contamination. Low-level waste by definition is radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste) (see 10 CFR §61.2).

millirem—one one-thousandth of a *rem*.

millisievert—one one-thousandth of a *sievert*.

National Ambient Air Quality Standards—standards established by the Environmental Protection Agency that apply for outdoor air throughout the United States.

rad—the special unit for radiation absorbed dose, which is the amount of energy from any type of ionizing radiation (e.g., alpha, beta, gamma, neutrons, etc.) deposited in any medium (e.g., water, tissue, air). A dose of one rad means the absorption of 100 ergs (a small but measurable amount of energy) per gram of absorbing tissue (100 rad = 1 gray). 10 CFR §20.1004.

radiation—(ionizing radiation) means alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation, as used in this part, does not include non-ionizing radiation, such as radio- or microwaves, or visible, infrared, or ultraviolet light. 10 CFR §20.1003

radiation dose—in general, dose is a measure of the biological damage to living tissue from radiation exposure. The absorbed dose is given in *rem* or *sieverts*. In non-biological material, dose represents the energy absorbed from the radiation in a gram of the material. It is measured in *rad* (or the metric unit of *grays*).

radiation field—the sum of all types of radiation at a location.

radioactive material—any material that spontaneously emits *radiation*, generally alpha or beta particles, often accompanied by gamma rays, from the nucleus of its atoms.

rem—the acronym for Roentgen Equivalent Man, a standard unit that measures the effects of ionizing radiation on humans. The dose equivalent in rems is equal to the absorbed dose in rads multiplied by the quality factor of the type of radiation (see 10 CFR §20.1004 for a list of the quality factors by type of radiation). 10 CFR §20.1004.

sievert—The SI unit for dose equivalent equal to 1 Joule/kilogram. 1 sievert = 100 rem. (see also *rem*.) The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor (see 10 CFR §20.1004). 10 CFR §20.1004.

source material—". . .means (1) uranium or thorium or any combination of uranium and thorium in any physical or chemical form; or (2) ores that contain, by weight, one-twentieth of 1 percent (0.05 percent), or more, of uranium, thorium, or any combination of uranium and thorium. Source material does not include special nuclear material. 10 CFR §20.1003.

special nuclear material—". . .means (1) plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing but does not include source material. 10 CFR §20.1003.

thorium—a naturally occurring, radioactive metal (see *radioactive material*). Small amounts of thorium are present in all rocks, soil, above-ground and underground water, plants, and animals. More than 99% of natural thorium exists in the form (*isotope*) thorium-232.

thorium nitrate—anhydrous thorium nitrate (i.e., containing no water molecules) has the chemical formula $Th(NO_3)_4$ and a molecular weight of 480.06. The thorium nitrate formerly in the stockpile had water molecules associated with it and had the chemical formula $Th(NO_3)_4 \cdot 5H_2O$, which is called thorium nitrate pentahydrate. Nearly all the *thorium* in nature and formerly in the stockpile occurs in the form of thorium-232.

threatened and endangered species—An endangered species is any animal or plant that is facing extinction throughout all or a significant part of its range as a result of anthropogenic (human-caused) or natural changes in the human environment. Requirements for declaring a species endangered are contained in the Endangered Species Act. A threatened species is any plant or animal that is likely to become endangered in the foreseeable future.

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1. NEED FOR THE PROPOSED ACTION

The Defense National Stockpile Center (DNSC) proposes to remove and dispose of radioactive contamination at two U.S. locations resulting from the storage of commodities regulated as source material (10 CFR 40.4) by the Nuclear Regulatory Commission. The purpose of the proposed action is to terminate the DNSC's Nuclear Regulatory Commission (NRC) materials license for Curtis Bay and Hammond Depots. DNSC needs to perform the proposed action because the commodities containing source material have been removed and no new radioactive materials are being acquired.

1.1 INTRODUCTION AND BACKGROUND

This environmental assessment (EA) has been prepared by the DNSC to address the potential environmental impacts of the proposed cleanup of low-activity radioactive contamination at two facilities previously used for commodities containing source material. Through the Strategic and Critical Materials Stock Piling Act of 1939, the National Defense Stockpile was established by Congress to minimize U.S. dependence on foreign sources of essential materials during times of national emergency. Between 1949 and 1988, the General Services Administration managed the program. In 1988, the responsibility for the National Defense Stockpile was transferred to the Secretary of Defense, who delegated the Defense Logistics Agency (DLA) to be the program manager. DNSC is a field activity of DLA and is responsible for providing safe, secure, and environmentally sound stewardship of its facilities.

The DNSC's stockpiles of commodities containing source material were acquired between 1958 and 1980. One part of the stockpiles (thorium nitrate) was obtained for the Atomic Energy Commission, a predecessor to the U.S. Department of Energy (DOE), and has been transferred back to DOE. All the commodities containing source material have been removed from two locations: Curtis Bay Depot in Maryland and Hammond Depot in Indiana.

The U.S. Congress has enacted legislation (Public Laws 98-525, 99-661, 100-456, and 107-107) that cumulatively classified the entire radioactive materials stockpile as excess material and provided DNSC the authority to dispose of the material. Congress has determined that over 95% of the National Defense Stockpile inventory, including the commodities containing source material, is excess to Department of Defense (DoD) needs and has directed its disposal. In 2005, DNSC completed the final disposition of the thorium nitrate stockpile from the Curtis Bay and Hammond Depots. As DNSC sells or disposes of materials in its inventory it is vacating those depots where materials have previously been stored. The Curtis Bay Depot no longer has a permanent staff, and the Hammond Depot is expected to close in 2012. At that time, it is expected that DNSC will reduce in size of personnel and facilities and will be reorganized into the Defense Logistics Agency's infrastructure. Therefore DNSC must provide for the safe stewardship and cleanup of these facilities.

1.2 STORAGE DEPOTS

The DNSC has managed the storage of millions of pounds of commodities containing source material at Curtis Bay (Fig. 1) and Hammond Depots (Fig. 2). Curtis Bay Depot is located in Anne Arundel County, Maryland, less than 0.5 mile (0.8 kilometers) from Baltimore County and the city of Baltimore. The street address for Curtis Bay Depot is 710 Ordnance Road, Baltimore,

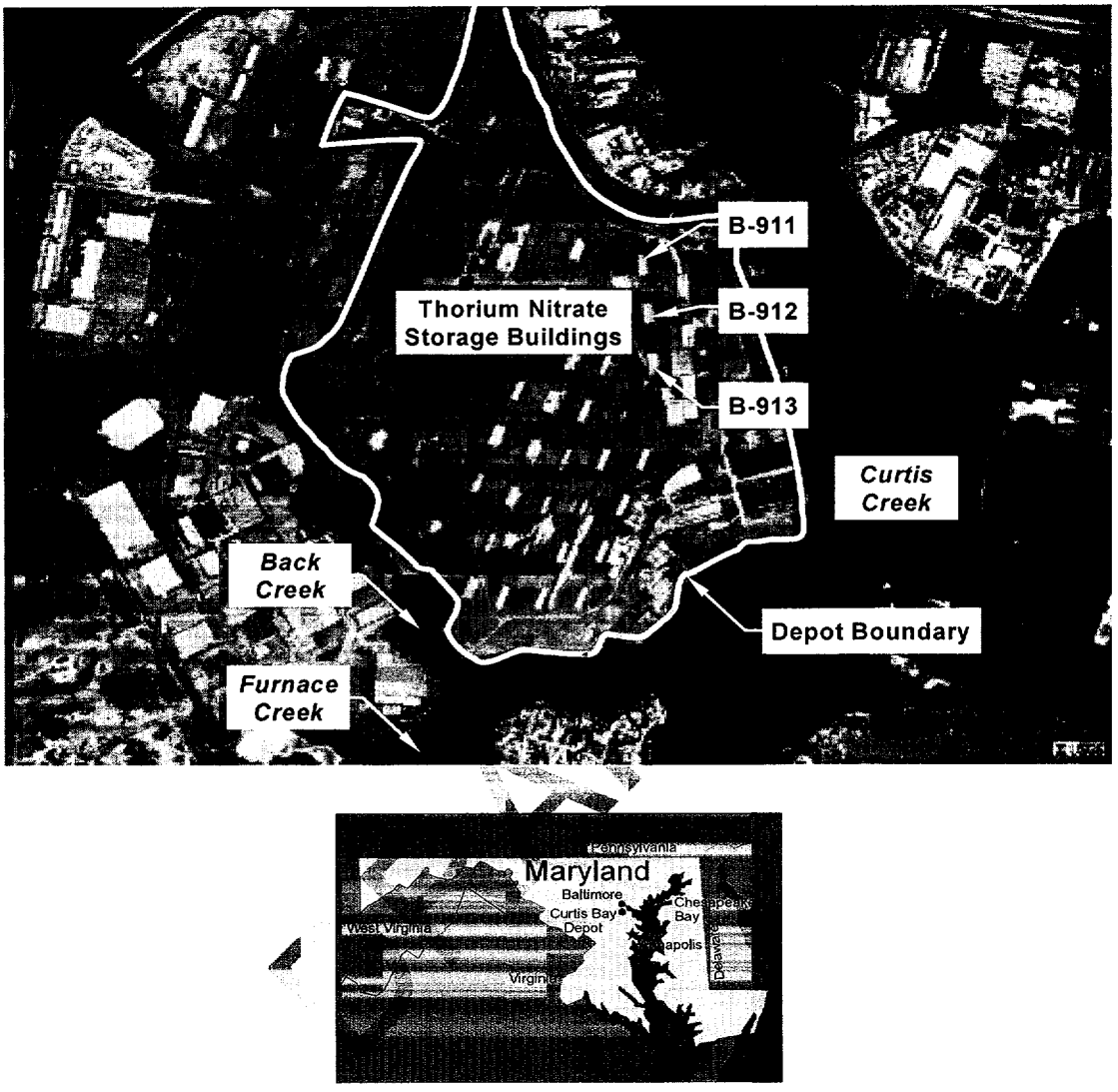

Fig. 1. Aerial photograph of Curtis Bay Depot and its environs.

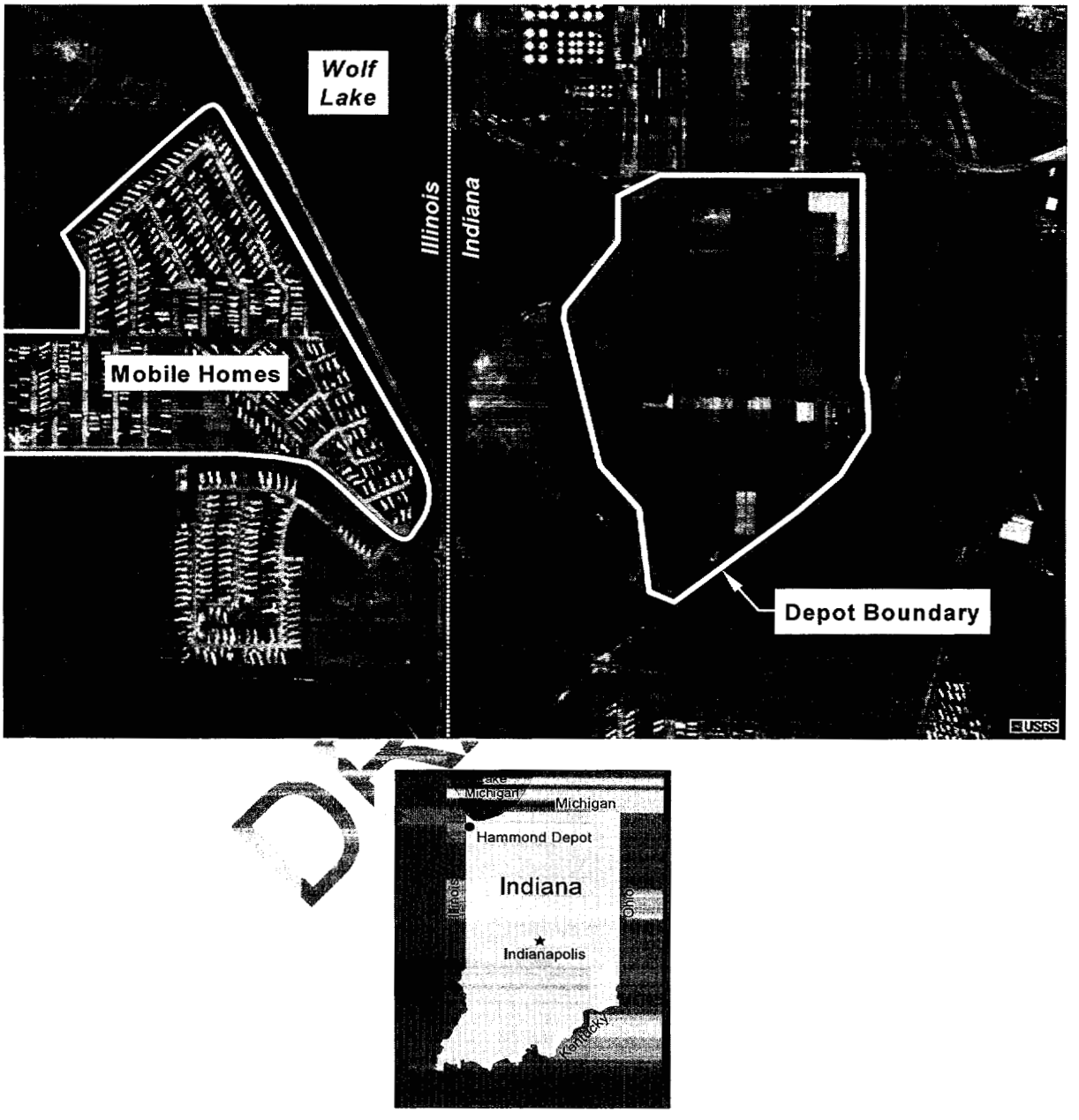

Fig. 2. Aerial photograph of Hammond Depot and its environs.

Maryland. Curtis Bay Depot borders Back, Curtis, and Furnace creeks. The Chesapeake Bay is about 8 miles (13 kilometers) to the east (Fig. 1). Hammond Depot is located in Lake County, Indiana, less than 0.1 mile (0.2 kilometers) from Cook County, Illinois, and the city of Chicago. The street address for Hammond Depot is 3200 Sheffield Avenue, Hammond, Indiana. Hammond Depot borders Wolf Lake, and Lake Michigan is about 2.5 miles (4.0 kilometers) to the north (Fig. 2).

At the Curtis Bay Depot, the stockpiles of commodities containing source material (columbium/tantalum, thorium nitrate, tungsten ore and concentrates, thorium hydroxide, thorium oxide, monazite sand, uranium pitchblende ore, and sodium sulfate) were previously stored in 16 of the original 59 warehouses (Table 1). Since the middle 1980s, over 19,000 drums of thorium nitrate were stored in three warehouses: B-911, B-912, and B-913. Previously the thorium nitrate stockpile was stored for short periods in six other warehouses on the site. At Hammond Depot, the stockpiles of commodities containing source material (columbium/tantalum, thorium nitrate, monazite sands, sodium sulfate, and tungsten ore and concentrates) were previously stored in two of the three warehouses on the site (Table 2). Cleanup of any residual contamination from storage of the commodities containing source material must be completed before the depots can be closed.

Table 1. Potential radioactive contamination of Curtis Bay Depot warehouses[a]

Warehouses	Surface area-floor (ft^2)	Possible radioactive contaminants
1021	144,000	---[b]
1022	144,000	thorium nitrate
A-921	11,000	thorium nitrate, monazite sand
A-922	11,000	---
B-911	11,000	thorium nitrate, monazite sand, sodium sulfate, uranium pitchblende ore
B-912	11,000	thorium nitrate
B-913	11,000	thorium nitrate, thorium hydroxide, thorium oxide
C-1131	11,000	---
C-1132	11,000	---
C-1133	11,000	---
C-1134	11,000	---
D-1121	11,000	---
D-1122	11,000	---
D-1123	11,000	---
D-1124	11,000	---
D-1125	11,000	---
E-1111	11,000	---
E-1112	11,000	---
E-1113	11,000	---
E-1114	11,000	---
E-1115	11,000	---
E-1116	11,000	---
F-731	11,000	thorium nitrate
F-732	11,000	---
F-733	11,000	---
F-734	11,000	thorium nitrate
F-735	11,000	thorium nitrate
F-736	11,000	monazite sand
F-737	11,000	thorium nitrate, monazite sand
G-721	11,000	sodium sulfate

Table 1. (cont.)

Warehouses	Surface area-floor (ft^2)	Possible radioactive contaminants
G-722	11,000	---
G-723	11,000	---
G-724	11,000	---
G-725	11,000	---
G-725	11,000	---
G-726	11,000	---
H-711	3,040	sodium sulfate
H-712	3,040	sodium sulfate
H-713	3,040	sodium sulfate
H-714	3,040	sodium sulfate
H-715	3,040	sodium sulfate
I-531	3,040	---
I-631	3,040	---
I-632	3,040	---
I-633	3,040	---
I-634	3,040	---
I-634 igloo	3,040	---
I-636	3,040	---
I-641	3,040	---
J-521	3,000	---
J-522	3,000	---
J-621	3,000	---
J-622	3,000	---
K-511	3,000	---
K-611	3,000	---
K-612	3,000	---
K-613	3,000	---
K-614	3,000	---
K-615	3,000	---
K-616	3,000	---

[a]Abelquist, E.W. and T.J. Bauer, *Historical Site Assessment of the Curtis Bay Depot Curtis Bay, Maryland,* prepared for the Defense National Stockpile Center by Oak Ridge Institute for Science and Education, Oak Ridge, Tenn., May 2005.

[b]No known radioactive contaminants at the time of the Historical Site Assessment

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Table 2. Potential radioactive contamination of Hammond Depot warehouses[a]

Warehouses	Surface area-floor (ft^2)	Possible radioactive contaminants
100E	50,000	---[b]
200E	50,000	columbium/tantalum, thorium nitrate, monazite sands, sodium sulfate, and tungsten ore and concentrates
100W	50,000	columbium/tantalum, thorium nitrate, monazite sands, sodium sulfate, and tungsten ore and concentrates

[a]Bauer, T.J. and T.J. Vitkus, *Historical Site Assessment of the Hammond Depot Hammond, Indiana,* prepared for the Defense National Stockpile Center by Oak Ridge Institute for Science and Education, Oak Ridge, Tenn., August 2005.

[b]No known radioactive contaminants at the time of the Historical Site Assessment

1.3 WASTE DISPOSAL SITE

DNSC proposes to dispose of the materials resulting from cleanup of the Curtis Bay and Hammond Depot buildings and facilities. The disposal site will be determined by the Army Joint Munitions Command (AJMC). The AJMC is the DoD Executive Agency responsible for effecting the disposal of radioactively contaminated materials resulting from activities conducted by DoD agencies. For the purpose of conducting a bounding analysis in Chapter 3, the distance from the disposal site to either Curtis Bay or Hammond Depot is conservatively assumed to be 3,000 miles (4,820 kilometers).

A commercial hazardous waste disposal facility, US Ecology Idaho, Inc. (USEI), will be used as a surrogate for the potential disposal site. USEI operations are regulated by the State of Idaho under RCRA Subtitle C. This regulation charges the Environmental Protection Agency and the State of Idaho to ensure that impacts to the environment are appropriately limited.

Under an agreement with the State of Idaho, USEI can accept and dispose of materials that contain thorium, uranium, and their decay products at concentrations below 0.05% by mass, the definition of source material given in 10 CFR 20.1003 and 10 CFR 40.4. Additionally USEI has been granted permits that allow it to receive, treat if necessary, and dispose of hazardous and mixed wastes. At USEI wastes are disposed of in below-ground storage cells.

At USEI hazardous, low-activity radioactive and mixed wastes are placed in appropriately configured disposal cells. During the most recently reported calendar year, 2005, over 583,000 tons (529,000 metric tons) of wastes were shipped to USEI for disposal (IDEQ 2005). The quantities of hazardous wastes shipped to USEI from calendar year 2000 through calendar year 2005 are listed in Table 3.

Table 3. Quantities of hazardous wastes received at US Ecology Idaho for disposal

Calendar Year	Mass (tons)	Mass (metric tons)
2005[a]	583,000	529,000
2004[a,b]	318,000	288,000
2003[b,c]	395,000	358,000
2002[c,d]	257,000	233,000
2001[d,e]	204,000	185,000
2000[e]	163,000	148,000

[a] *Hazardous Waste Management in Idaho 2005*, Idaho Department of Environmental Quality, <http://www.deq.state.id.us/waste/data_reports/haz_waste/haz_waste_2005.pdf> (25 October 2006)
[b] *Hazardous Waste Management in Idaho 2004*, Idaho Department of Environmental Quality, <http://www.deq.state.id.us/waste/data_reports/haz_waste/haz_waste_2004.pdf> (25 October 2006)
[c] *Hazardous Waste Management in Idaho 2003*, Idaho Department of Environmental Quality, <http://www.deq.state.id.us/waste/data_reports/haz_waste/haz_waste_2003.pdf> (25 October 2006)
[d] *Hazardous Waste Management in Idaho 2002*, Idaho Department of Environmental Quality, <http://www.deq.state.id.us/waste/data_reports/haz_waste/haz_waste_2002.pdf> (25 October 2006)
[e] *Hazardous Waste Management in Idaho 2001*, Idaho Department of Environmental Quality, <http://www.deq.state.id.us/waste/data_reports/haz_waste/haz_waste_2001.pdf> (25 October 2006)

The USEI site occupies about 1,400 acres (565 hectares) in arid southern Idaho; about 160 acres (65 hectares) are within the fence where disposal actions are occurring. The land has been extensively disturbed. The original contours of the land have been modified and engineered disposal cells have been constructed.

Presently USEI has about 2 million yd^3 (1.5 million m^3) of available disposal capacity. USEI is licensed to dispose of 3.6 million yd^3 (2.7 million m^3) of hazardous waste, and USEI is planning an expansion that would add about 27 million yd^3 (20 million m^3) to its disposal capacity.

1.4 DETERMINATION OF CONTAMINATED STRUCTURES AND MATERIALS

Radiological characterization surveys were conducted at Curtis Bay and Hammond Depots (Vitkus 2006a and 2006b). These surveys identified six contaminated structures at Curtis Bay Depot: Buildings B-911, B-912, B-913, and F-731 and the concrete pads of Buildings F-737 and G-723. Two contaminated structures were identified at Hammond Depot: Buildings 100E and 200E. The soil beneath Building B-911 is contaminated as a result of material migrating through floor cracks and expansion joints; the soil beneath the loading dock at Building B-911 is contaminated; and the soil beneath Building B-912 may be contaminated. The blast-furnace slag beneath Building 200E is contaminated as a result of material migrating through floor cracks and expansion joints.

The characterization surveys also identified areas of outdoor contamination (Vitkus 2006a and 2006b). At Curtis Bay Depot, the survey identified 11 areas of near-surface [< 12 inches (≤ 0.3 meters)] contamination and one area, a formerly utilized radioactive waste burial pit, with deep contamination [4-12 feet (1.2-3.7 meters)]. At Hammond Depot, the soil covers blast-furnace slag. In the areas sampled, the depth of soil covering the slag varies from 0.75 to 20 inches (0.02 to 0.5 meter). The typical depth of soil above the slag is 15 inches (0.37 meter). The survey identified seven areas of contaminated soil that are covering slag. None of the slag in outdoor areas was found to be contaminated.

1.5 CHARACTERISTICS OF CONTAMINATED MATERIALS

The radioactively contaminated materials are expected to be soils, blast-furnace slags, and building materials, for example concrete and wood. The radioactive contaminants are expected to be natural thorium, uranium, and their decay products. For bounding purposes, a conservative estimate is made of the total thorium-232 activity contained in the materials removed for disposal from each depot: Curtis Bay Depot – 40 milliCuries (15 billion Becquerels) and Hammond Depot – 160 milliCuries (59 billion Becquerels). Thorium is used as the limiting example because it is the dominant source material found during the radiological characterization surveys.

1.6 QUANTITIES OF CONTAMINATED MATERIAL

Based on the results of the radiological characterization surveys (Vitkus 2006a and 2006b), conservative estimates of the affected volumes at Curtis Bay and Hammond were determined. The estimated volumes of radioactively contaminated materials at Curtis Bay Depot are 1,220 cubic yards (930 cubic meters) of soil and 250 cubic yards (190 cubic meters) of building materials. The soil volume includes the wooden tops and bottoms and zinc-clad bands from

22,000 containers that were buried following a repackaging campaign in the early 1960s and later exhumed and reburied at the present location (Abelquist and Bauer 2005). The estimated volumes of radioactively contaminated materials at Hammond Depot are 120 cubic yards (90 cubic meters) of blast furnace slag, 1,080 cubic yards (820 cubic meters) of soil, and 210 cubic yards (160 cubic meters) of building materials.

Using bulk densities, the associated masses are computed from the volumes of radioactively contaminated materials. The estimated masses of radioactively contaminated materials at Curtis Bay Depot are 1,640 tons (1,490 metric tons) of soil (including the buried packaging materials) and 510 tons (460 metric tons) of building materials. The estimated masses of radioactively contaminated materials at Hammond Depot are 240 tons (220 metric tons) of blast furnace slag, 1,440 tons (1,310 metric tons) of soil, 360 tons (330 metric tons) of concrete, and 60 tons (50 metric tons) of asphalt. The total mass of radioactively contaminated materials from the two sites is estimated to be 4,250 tons (3,860 metric tons).

The estimated mass of radioactively contaminated material requiring disposal is small compared to the quantities of material disposed of at USEI. The combined mass of contaminated material from both depots is less than 0.8% of the mass disposed of at USEI during calendar year 2005. It is also less than 1.4% of the average mass disposed of at USEI during calendar years 2000 through 2005.

1.7 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA assesses the potential environmental impacts of the alternatives for disposal of materials that were radioactively contaminated during the storage of DNSC's stockpiles of radioactive source materials. The study has been performed and documented in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality Regulations implementing NEPA, and with DLA Regulation 1000.22, "Environmental Considerations in DLA Actions in the United States." As required under these regulations, the no-action alternative is also considered.

The potential for environmental impacts is assessed at each of the former storage sites and along the potential transportation corridors. Cumulative impacts of the proposed action and no-action alternative are also evaluated. The areas of assessment include potential impacts to land use; ecological resources, including threatened and endangered species; water resources; waste disposal; socioeconomics; human health and safety; environmental justice; cultural (archaeological and historic) resources; noise; transportation; and air quality. Potential impacts to human health from accidents are also assessed.

1.8 REFERENCES

Abelquist, E.W. and T.J. Bauer 2005, *Historical Site Assessment of the Curtis Bay Depot Curtis Bay, Maryland,* Oak Ridge Institute for Science and Education, Oak Ridge, Tenn.

IDEQ (Idaho Department of Environmental Quality) 2005, *Hazardous Waste Management in Idaho 2005*, http://www.deq.state.id.us/waste/data_reports/haz_waste/haz_waste_2005.pdf (25 October 2006)

Vitkus, Tim 2006a. *Radiological Characterization Survey of the Hammond Depot, Hammond, Indiana*, Oak Ridge Institute for Science and Education, Oak Ridge, Tenn.

Vitkus, Tim 2006b. *Radiological Characterization Survey of the Curtis Bay Depot, Curtis Bay, Maryland*, Oak Ridge Institute for Science and Education, Oak Ridge, Tenn.

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2. ALTERNATIVES CONSIDERED

Two alternatives have been identified: removal and disposal of radioactively contaminated building materials, soils, and slags and no-action.

The DNSC's radioactive materials stockpiles at Curtis Bay and Hammond Depots have been removed. Maintaining the facilities as radiation storage areas is not compatible with DNSC's long-range operational plan to reduce its inventory of commodities and storage locations. Therefore, from this point forward in the EA the proposed action will be described as removal and disposal. Because there is only one viable alternative, the preferred alternative and the proposed action are the same.

2.1 PROPOSED ACTION—REMOVE AND DISPOSE OF LOW-ACTIVITY RADIOACTIVELY CONTAMINATED BUILDING MATERIALS, SOILS, SLAGS AND PACKING MATERIALS

In the proposed action, low-activity radioactively contaminated building materials and soils from Curtis Bay and Hammond Depots and low-activity radioactively contaminated slags from Hammond Depot would be removed, placed in shipping containers, and transported by truck, rail, or a combination of truck and rail to a commercial disposal site. At the commercial disposal site the shipping containers would be emptied and returned to the subcontractor.

The AJMC will administer the subcontract for the proposed remediation and disposal. According to the typical terms of such contracts, required training for workers would minimize the potential risks to workers. That training will include the following general categories:

- Occupational Safety and Health Administration (OSHA) safety training
- radiation safety
- OSHA certification of all heavy equipment operators
- Department of Transportation (DOT) training
- waste management training
- respirator training as dictated by hazardous waste operations requirements, including medical approval for the wearing of a respirator

The estimated requirements for transporting the radioactively contaminated building materials, soils, slags, and packing materials to the surrogate disposal site are given in Table 4. The numbers of tractor-trailer and rail shipments have been computed using the masses presented in Section 1.6. The estimated transportation requirements are for highway only or rail-only transport. No container would be completely filled because the maximum weight for each container would be attained before the volume limit; all the radioactively contaminated materials are sufficiently dense that no shipments would be limited by volume. The distance from each depot to the disposal site is conservatively assumed to be 3,000 miles (4,800 kilometers). The rail shipments are assumed to occur in units of four gondola cars; the unit for truck shipments is assumed to be a power unit (tractor) with a single trailer. The total highway miles would be 606,000 (975,000 kilometers) and the total rail miles would be 36,000 (58,000 kilometers).

Table 4. Estimated transportation requirements for single-mode shipment

	Number of tractor-trailers	Number of highway shipments	Total shipment miles[a] (millions)	Number of gondola cars	Number of rail shipments	Total shipment miles[a,b] (millions)
Curtis Bay Depot	102	102	0.306	24	6	0.018
Hammond Depot	100	100	0.300	24	6	0.018
TOTAL	202	202	0.606	48	12	0.036

[a]The distance from each DNSC depot to the disposal site is conservatively assumed to be 3,000 miles (4,800 kilometers).

[b]Gondola cars are assumed to be transported in units of four.

DNSC expects to complete the proposed action within a total of 18 months and before the end of calendar year 2007. All work would be conducted in compliance with applicable federal, state, and local regulations and requirements.

2.2 NO-ACTION ALTERNATIVE—CONTINUED SUPERVISION OF THE CURRENT LOCATIONS

Under the no-action alternative, contamination resulting from the storage of radioactive materials Curtis Bay and Hammond Depots would remain there. No changes would be made to the present warehouses. DNSC would continue to ensure the safety of its workers and the public. DNSC would not be able to terminate its NRC license for the Curtis Bay and Hammond Depots. Hence, DNSC would not be able to divest itself of the facilities at the Curtis Bay and Hammond Depots. The depots could not be closed as required by the long-term plans of the DLA, causing an adverse programmatic impact for DNSC and DLA and preventing the depots from being released for further use or development.

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3. ENVIRONMENTAL CONSEQUENCES

At the Curtis Bay and Hammond Depots and along the transportation corridors, the potential for environmental consequences resulting from the disposition of the thorium nitrate stockpile was examined in the EA prepared for that action (DNSC 2003). The results are listed in Table 5 by category. For those categories where the potential for change is very small, the rationale is provided in Table 5 and a conclusion of no significant impact is drawn. Where a change in potential consequences may occur, the section number is given where the evaluation occurs in this chapter.

Table 5. Overview of the potential for environmental consequences

Topic evaluated for potential environmental consequences	Environmental Assessment: Disposition of Thorium Nitrate[a]		Current Environmental Assessment	
	Curtis Bay Depot	Hammond Depot	Curtis Bay Depot	Hammond Depot
Land use	NSI[b]	NSI	Section 3.1	Section 3.1
Human health and safety	NSI	NSI	Section 3.2	Section 3.2
Noise	NSI	NSI	Section 3.3	Section 3.3
Transportation	NSI	NSI	Section 3.4	Section 3.4
Air quality	NSI	NSI	Section 3.5	Section 3.5
Ecological resources	NSI	NSI	There have been neither changes to ecological resources, including threatened and endangered species, reported in the thorium nitrate environmental assessment[a] (EA) nor the potential to affect them. NSI	There have been neither changes to ecological resources, including threatened and endangered species, reported in the previous EA[a] nor the potential to affect them. NSI
Waste disposal	NSI	NSI	As reported in the previous EA, wastes are taken to off-site permitted facilities for disposal. The waste quantities are small compared with the available capacity. Hence, the proposed action has a very limited potential to affect waste disposal resources. NSI	As reported in the previous EA, wastes are taken to off-site permitted facilities for disposal. The waste quantities are small compared with the available capacity. Hence, the proposed action has a very limited potential to affect waste disposal resources. NSI

Table 5. Overview of the potential for environmental consequences (cont.)

Topic evaluated for	Environmental Assessment: Disposition	

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potential environmental consequences	of Thorium Nitrate[a]		Current Environmental Assessment	
	Curtis Bay Depot	Hammond Depot	Curtis Bay Depot	Hammond Depot
Water resources	NSI	NSI	There have been neither changes to water resources reported in the previous EA nor the potential to affect them. NSI	There have been neither changes to water resources reported in the previous EA nor the potential to affect them. NSI
Environmental justice	NSI	NSI	There will be no offsite impacts; hence, there have been no changes to the potential for affecting minority and economically disadvantaged populations reported in the previous EA . NSI	There will be no offsite impacts; hence, there have been no changes to the potential for affecting minority and economically disadvantaged populations reported in the previous EA . NSI
Cultural resources	NSI	NSI	There have been neither changes to cultural resources reported in the previous EA nor does the proposed action present the potential to affect them. Only previously disturbed areas will be excavated. NSI	There have been neither changes to cultural resources reported in the previous EA nor does the proposed action present the potential to affect them. Only previously disturbed areas will be excavated. NSI

[a]*Environmental Assessment: Disposition of Thorium Nitrate*, October 2003, Defense Logistics Agency, Defense National Stockpile Center, Fort Belvoir, Va.

[b]NSI = no significant impact

The possibility for consequences from the proposed action to be in excess of those evaluated in DNSC 2003 is great enough that detailed evaluations are conducted for five categories: land use, human health and safety, noise, transportation, and air quality. A conclusion of no significant impact is drawn without extensive data collection and analysis for the remaining six categories: ecological resources, waste disposal, water resources, socioeconomics, environmental justice, and cultural resources.

3.1 LAND USE

3.1.1 Existing Environment

Both Curtis Bay Depot and Hammond Depot are previously disturbed industrial sites. As seen in the aerial photographs in Figs. 1 and 2, development exists on all sides of the depots that do not border bodies of water.

3.1.2 Potential Impacts of the Proposed Action

There would be no significant adverse impacts to future land use at either depot because temporary structures would be used on the previously disturbed depot sites for containment and container or conveyance loading processes. There would be no irrecoverable disturbance of lands. Any spills would be cleaned up. Best construction practices would be followed. At Curtis Bay Depot, removal of materials from the radioactive waste burial pit would be completed by refilling and contouring the area using soils taken from nearby locations. At Hammond Depot the soil removed from the roughly 0.65-acre (0.26-hectare) radioactively contaminated site along the western boundary of the site would not be refilled. The area would be retained as a storm water retention pond.

Removal of the low-activity radioactively contaminated materials from both depots would have a significant positive impact for DNSC and DLA. The sites would then be ready for release from the encumbrance of the radioactive materials license, STC 133, issued by the Nuclear Regulatory Commission (see Appendix A).

3.1.3 Potential Impacts of the No-action Alternative

The continuing presence of radioactively contaminated soils, building materials, and slag at the depots would produce an adverse programmatic land use impact for DNSC and DLA. The depots could not be released for further use or development.

3.2 HUMAN HEALTH AND SAFETY

3.2.1 Existing Environment

Before the thorium nitrate stockpile was removed in 2005, workers at the Curtis Bay and Hammond Depots examined the stockpile to ensure that it remained in good condition and that the inventory locations and counts were correct. The inspections were conducted every 6 months at Curtis Bay and annually at Hammond Depot. According to DNSC records, these actions resulted in typical radiation doses of less than 0.2% of the annual limit for radiation workers [5,000 millirems (50 millisieverts)] prescribed in NRC regulations (10 CFR §20.1201) at either depot. Because the thorium nitrate is gone, the potential for radiation exposures is greatly reduced. Negligible incidental exposures may occur when the depot workers are in the vicinity of contaminated soils or building materials.

3.2.2 Potential Impacts of the Proposed Action

In addition to the project-specific health and safety measures described in the contractor's site-specific work plan, compliance with all Occupational Safety and Health Administration (OSHA), NRC, and DoD regulations for the type of work associated with the remediation, packaging, and disposal would be required. Appendix B provides a representative list of the regulations, statutes, and federal orders that are relevant to the proposed action.

All workers would be trained in the potential hazards associated with the proposed action. Additionally, each worker would be issued and required to wear personal protective equipment appropriate to the hazards that may be encountered during the proposed action. Required training for workers would minimize the potential risks to workers. To ensure the prompt handling of such

potential hazards, the contractor performing work at the Curtis Bay and Hammond Depots would be required to have health and safety plans for addressing potential hazards.

During the proposed action at the DNSC Depots, the operations crews have the greatest potential to receive the largest radiation doses. In accordance with the best industry practices and NRC requirements, the radiation exposure will be kept as low as reasonably achievable (ALARA). To provide assurance that no adverse impacts to human health would be expected to occur, both administrative controls and physical controls would be implemented. In the unlikely event that an individual's cumulative radiation dose would approach the allowable annual limit, 5,000 millirems (50 millisieverts) (10 CFR §20.1201), substitution of workers would be implemented. If any work poses an inhalation hazard because of airborne radioactivity, an enclosure would be placed around the immediate work site and workers would wear appropriate personal protective equipment, including respirators.

3.2.3 Potential Impacts of the No-action Alternative

Under the no-action alternative, depot workers would continue to receive negligible radiation exposure. Workers would continue to exercise care to prevent transfer of loose surface contamination to non-contaminated areas. Hence, no significant adverse impacts would be expected to occur.

3.3 NOISE

3.3.1 Existing Environment

The DNSC depots identified in this EA exist within industrial areas, with the normal levels of noise produced by transportation and material moving equipment.

3.3.2 Potential Impacts of the Proposed Action

Diesel powered electrical generators would be used for the proposed action because Curtis Bay Depot does not have sufficient electrical service available,. The generators would be equipped with standard noise reduction equipment, and they would be operated only during working hours. Hammond Depot may have sufficient electrical service available for the proposed action. If the available electrical service at Hammond Depot proves to be insufficient for the proposed action, generators would be used with noise reduction equipment and only during working hours.

Because there would be no extraordinarily noisy equipment used, the type and number of vehicles would be relatively small, and the duration of the project would be short, work at the depots and transportation of the stockpile would be expected to produce no significant adverse noise impacts.

3.3.3 Potential Impacts of the No-action Alternative

Operations at the depots would continue with occasional trucks and trains and their typical noise levels. Noise would be expected to produce no significant adverse impacts.

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3.4 TRANSPORTATION

3.4.1 Existing Environment

Both Curtis Bay and Hammond Depots are served by roads and railways. The roads provide ready access to the interstate highway system or to off-site railway terminals and switchyards. Both depots are located in industrial areas where normal highway and rail traffic is many times greater than the traffic entering and exiting the depots.

3.4.2 Accident Analysis

For the proposed action, accidents during transportation would produce the greatest potential for adverse impacts. This analysis addresses potential impacts only to individuals because all credible accidents are small enough that they would not produce large or permanent impacts on a greater scale in the human environment.

During calendar year 2004, large trucks, [i.e. trucks with a gross vehicle weight rating greater than 10,000 pounds (4,500 kilograms)] traveled approximately 226,504 million miles (364,524 million kilometers) in the United States (FMCSA 2006). Accidents that involved large trucks resulted in 5,190 fatalities, a rate of approximately 2.29 fatalities per 100 million miles (160 million kilometers).

During calendar year 2004, trains traveled approximately 770 million miles (1,239 million kilometers) in the United States (FRA 2005). Accidents that involved trains at highway crossings resulted in 368 fatalities, a rate of approximately 47.8 fatalities per 100 million miles (160 million kilometers).

The expected (calculated) fatalities resulting from transportation of the low-activity radioactively contaminated materials are presented in Table 6. The number of expected fatalities resulting from injuries received in truck accidents was computed from DOT data for highway accident fatalities (FMCSA 2006) as

$$(2.29 \text{ fatalities}/100 \text{ million miles}) \times (0.606 \text{ million miles}) < 0.014 \text{ fatalities.}$$

The comparable number of expected fatalities resulting from injuries received in train accidents was computed from DOT data for rail crossing-highway accident fatalities (FRA 2005) as

$$(47.8 \text{ fatalities}/100 \text{ million miles}) \times (0.036 \text{ million miles}) < 0.018 \text{ fatalities.}$$

Table 7 presents DOT data for transportation-related accident injuries that did not result in fatalities during calendar year 2004 (FMCSA 2006 and FRA 2005). The expected injuries

Table 6. Recorded and potential transportation-related fatalities

	Shipment miles (millions)	Number of fatalities resulting from transportation accidents
Recorded fatalities from transportation accidents occurring during calendar year 2004		
Total national truck transport	226,504	5,190[a]
Total national rail transport	770	368[b]
Potential fatalities from transporting residual contamination from DNSC's Curtis Bay and Hammond Depots		
Truck transport of soils and building materials to USEI[c]	0.606	< 0.014

Rail transport of soils and building materials to USEI	0.036	< 0.018

[a]The data for fatalities resulting from accidents involving large trucks [> 10,000 pounds (4,500 kilograms)] are reported by the U.S. Department of Transportation, "Large Truck Crash Facts 2004."

[b]The data for fatalities resulting from accidents involving trains at rail crossings during 2004 are reported by the U.S. Department of Transportation, Federal Railroad Administration, "Railroad Safety Statistics-Annual Report 2004."

[c]USEI = US Ecology Idaho, Grandview, Idaho; USEI is used as a surrogate disposal site for the radioactively contaminated wastes removed from Curtis Bay and Hammond Depots

Table 7. Recorded and potential transportation-related injuries

	Shipment miles (millions)	Number of injuries resulting from transportation accidents
Recorded injuries from transportation accidents occurring during calendar year 2004		
Total national truck transport	226,504	116,000[a]
Total national rail transport	770	1081[b]
Potential injuries from transporting residual contamination from DNSC's Curtis Bay and Hammond Depots		
Truck transport of soils and building materials to USEI[c]	0.606	< 0.32
Rail transport of soils and building materials to USEI	0.036	< 0.06

[a]The data for fatalities resulting from accidents involving large trucks [> 10,000 pounds (4,500 kilograms)] are reported by the U.S. Department of Transportation, "Large Truck Crash Facts 2004."

[b]The data for fatalities resulting from accidents involving trains at rail crossings during 2004 are reported by the U.S. Department of Transportation, Federal Railroad Administration, "Railroad Safety Statistics-Annual Report 2004."

[c]USEI = US Ecology Idaho, Grandview, Idaho; USEI is used as a surrogate disposal site for the radioactively contaminated wastes removed from Curtis Bay and Hammond Depots

resulting from accidents during transportation of the low-activity contaminated building materials, soil, and slag to USEI were computed and the results are given in Table 7. Less than one injury would be expected from transporting the low-activity radioactively contaminated materials to USEI regardless of the transport mode (see Table 7).

3.4.3 Potential Impacts of the Proposed Action

Both DNSC depots are located within industrial areas; only vehicles or equipment types that are routinely used in such areas would be used during the proposed action. The number of trucks per week (10-12) would be small compared to normal highway traffic near either depot. Similarly the number of trains entering either depot per week (1-2) would be small compared to normal rail traffic near either depot. Delivery and removal of the rail cars would likely be implemented as part of routine freight movement and would not be expected to create additional highway traffic delays. Hence, transportation of the low-activity radioactively contaminated materials from the depots to the primary transportation routes and along the routes to USEI would be expected to produce no significant adverse impacts.

For purposes of analysis, the contaminated soils and building materials from Curtis Bay and Hammond Depots and the contaminated slags from Hammond Depot would be transported to USEI solely on trucks or solely on trains. Only conventional tractor/trailer rigs would be used to transport the contaminated soils, slags, and building materials on the highways. Also, only conventional railcars would be used to transport the contaminated soils, slags, and building

materials. Mixed highway and rail transport would be expected to produce no more fatalities or injuries than the worst sole use case.

Anecdotal evidence of the small likelihood of accidents, injuries, and fatalities comes from transporting the thorium nitrate stockpile from Curtis Bay and Hammond Depots to the Nevada Test Site, a DOE facility in Nevada, for transfer of ownership and subsequent disposal. There were zero accidents during 267 truck trips to the Nevada Test Site.

There would be much less than one expected fatality and less than one expected injury resulting from traffic accidents involving truck transport. Rail transport of the low-activity radioactively contaminated materials would be expected to result in much less than one fatality and much less than one injury. Transportation of the contaminated soils, slags, and building materials to USEI would be expected to produce no significant adverse impacts.

3.4.4 Potential Impacts of the No-action Alternative

The depots would continue operations at approximately the current levels of traffic. There would be no expected significant adverse impacts to traffic near either depot.

3.5 AIR QUALITY

3.5.1 Existing Environment

Air quality at the Curtis Bay and Hammond Depots is characteristic of the large industrial areas surrounding them. For ground level ozone, the area around Curtis Bay Depot is designated as attainment by the Environmental Protection Agency (EPA 2006a) and the area around Hammond Depot is designated nonattainment (EPA 2006b). The areas around both depots are designated nonattainment for fine particle pollution. As detailed in the Thorium Nitrate EA (DNSC 2003), extreme meteorological events may be expected infrequently in the Baltimore and Chicago areas.

3.5.2 Potential Impacts of the Proposed Action

The operation of generators plus the weekly truck traffic (10-12) or train traffic (1-2) would contribute to ground-level ozone production and fine particle pollution. However the quantities produced would be inconsequential for an industrial area (extremely unlikely to change the ground-level ozone attainment status for the area around Curtis Bay Depot) and for the national highway or rail systems. Hence, the proposed action would be expected to produce no significant adverse impacts to air quality.

3.5.3 Potential Impacts of the No-action Alternative

Under the no-action alternative, current levels of depot activities would continue, and no significant adverse impacts would be anticipated to air quality.

3.6 CUMULATIVE IMPACTS

3.6.1 Curtis Bay Maryland Depot

While the proposed action is being performed, there would be increased transportation activity on the depot. Presently the depot is operating only for brief periods while ores from the dwindling stockpile are being loaded for transport to the buyer. During 2005, the average number of tractor/trailer rigs entering and leaving the depot was about 61 per week (12.2 per day). During the period of operations for the proposed action, the traffic on Curtis Bay Depot that is unrelated to the proposed action would be expected to remain the same. Cumulatively, there may be 71-73 total tractor/trailer rigs entering and leaving the depot weekly, an increase of 16-20%. This relatively modest increase in traffic would not be expected to present significant adverse impacts to the local transportation infrastructure that is sized for an active industrial area. Rail activities could be much larger than during 2005 when only 5-10 gondola cars entered the depot. The project-related activities at the depot would be intermittent, and the duration of those activities would be brief. Closing Curtis Bay Depot would make the land available for commercial use with the potential for significant beneficial impacts. Hence, no significant adverse cumulative impacts would be expected to human health or the human environment, and there could be significant beneficial cumulative impacts.

3.6.2 Hammond Indiana Depot

During the proposed action, other transportation activities on the depot would continue. During 2005, the average number of tractor/trailer rigs entering and leaving the depot was about seven per week (1.4 per day). During the period of operations for the proposed action, the traffic on Hammond Depot that is unrelated to the proposed action would be expected to remain the same. Cumulatively, there may be 17-19 total tractor/trailer rigs per week; an increase of 143-171%. At least one train passes through the depot daily to gain access to the facilities north of the depot. Adding one to two trains per week may be required to support the proposed action. The added rail traffic would represent a 17-28% increase. Either potential increase in traffic would be expected to produce no significant adverse impacts to the local transportation infrastructure that supports an active industrial area. The depot is scheduled for closure; hence, any activities there would be transitory and would not continue indefinitely. Closing Hammond Depot would make the land available for commercial use with the potential for significant positive impacts. Hence, no significant adverse cumulative impacts would be expected to human health or the human environment, and there could be significant positive cumulative impacts.

3.6.3 Transport Routes

The total truck transport distance for the proposed action, 0.606 million miles (0.975 million kilometers), would be less than 0.0003% of the total large truck miles driven in the United States in calendar year 2004 (FMCSA 2006). The total rail transport for the proposed action, 0.036 million miles (0.058 million kilometers), would be less than 0.005% of the total rail miles traveled in the United States in calendar year 2004 (FRA 2005). All project-related transportation activities are short in duration. During the proposed action, an approximately 8-month period ending in calendar year 2007, no extraordinary uses would be expected for those local roads or portions of the interstate highway system that connect Curtis Bay Depot and Hammond Depot to USEI. Additionally no extraordinary uses would be expected for rail routes connecting Curtis Bay Depot and Hammond Depot to USEI. Based on the information given above, no significant adverse cumulative adverse impacts would be expected along the transportation routes.

3.7 REFERENCES

DNSC (Defense National Stockpile Center) 2003. *Environmental Assessment: Disposition of Thorium Nitrate*, Defense Logistics Agency, DNSC, Fort Belvoir, Va., Oct.

EPA (Environmental Protection Agency) 2006a. "Clean Air Interstate Rule: Maryland," 21 April 2006, <http://www.epa.gov/CAIR/md.html> (20 October 2006).

EPA (Environmental Protection Agency) 2006b. "Clean Air Interstate Rule: Indiana," 21 April 2006, <http://www.epa.gov/CAIR/in.html> (20 October 2006).

FMCSA (Federal Motor Carrier Safety Administration) 2006. *Large Truck Crash Facts 2004*, FMCSA-RI-06-040, Department of Transportation, FMCSA, Analysis Division, Washington, D.C., Mar.

FRA (Federal Railroad Administration) 2005. *Railroad Safety Statistics: 2004 Annual Report*, Department of Transportation, FRA, Washington, D.C., Nov.

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4. CONCLUSIONS

The proposed action would result in no significant adverse impacts—including cumulative impacts—related to land use; ecological resources, including threatened and endangered species; water resources; waste disposal; socioeconomics; human health and safety; environmental justice; archaeological and historic resources; noise; transportation; and air quality. Transportation accidents were also examined because they have the highest potential for adverse impacts under the proposed action. The proposed action would be expected to produce no significant adverse impacts resulting from accidents. *The results of these evaluations indicate that an EIS is not necessary; and, therefore, a finding of no significant impact is recommended.*

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5. LIST OF AGENCIES AND PERSONS CONTACTED

Surrogate disposal site

Jim Hancock, Customer Service Manager and Waste Acceptance Manager, US Ecology Idaho, (800) 274-1516

No additional agencies or persons were contacted in the preparation of this EA because the project is similar in potential activities and impacts to the those described in the thorium nitrate EA, and the time between the two projects is less than five years.

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APPENDIX A

DNSC RADIOACTIVE MATERIALS LICENSE

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Amendment No. 26

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	In accordance with the letter dated October 19, 2005,
1. Defense Logistics Agency Defense National Stockpile Center	3. License number STC-133 is amended in its entirety to read as follows:
2. 8725 John J. Kingman Road Suite 3229 Fort Belvoir, Virginia 22060-6223	4. Expiration date February 28, 2010 5. Docket No. 040-00341 Reference No.

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Uranium and Thorium	A. Natural uranium and thorium mixtures as ores, concentrates and solids	A. 2,000,000 kilograms

9. Authorized use:

A. Storage, sampling, repackaging and transfer as necessary for the activities of the National Defense Stockpile.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at DNSC Hammond Depot, 3200 Sheffield Avenue, Hammond, Indiana; DNSC New Haven Depot, State Route 14, New Haven, Indiana; DNSC Curtis Bay Depot, 710 Ordnance Road, Baltimore, Maryland; DNSC Somerville Depot, 152 US Highway Route 206 South, Somerville, New Jersey; DNSC Binghamton Depot, Hoyt Avenue, Binghamton, New York; and DNSC Scotia Depot, Route 5, Scotia, New York.

11. A. Licensed material shall be used by, or under the supervision of, Michael J. Pecullan or individuals who have completed the training described in the application dated September 10, 1999, and the letter dated January 7, 2000.

    B. The Radiation Safety Officer for this license is Michael J. Pecullan.

12. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

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MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
STC-133

Docket or Reference Number
040-00341

Amendment No. 26

13. The licensee may use the following Derived Concentration Guideline Level (DCGL) for decommissioning of the licensee's facilities at the DNSC Binghamton Depot, Hoyt Avenue, Binghamton, New York, with the intention of release of the facility for unrestricted use: not more than 37.3 disintegrations per minute per 100 square centimeters (37.3 dpm/100 cm^2) of natural thorium and 110 dpm/100 cm^2 of natural uranium.

14. Not withstanding 10 CFR Section 20.1003, definition of weighting factor, the licensee may utilize the adult conversion factors from Federal Guidance Report Number 13 for the decommissioning of the licensee's facilities at the DNSC Binghamton Depot, Hoyt Avenue, Binghamton, New York.

15. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

    A. Letter dated November 3, 1998
    B. Letter and application dated September 10, 1999 [ML013380601]
    C. Letter dated January 7, 2000 (Lepage) [ML003678037]
    D. Letter dated January 7, 2000 (Reilly) [ML013380553]
    E. Letter dated April 14, 2003 [ML031210042]

For the U.S. Nuclear Regulatory Commission

Date August 23, 2006

By

Elizabeth Ullrich
Commercial and R&D Branch
Division of Nuclear Materials Safety
Region I
King of Prussia, Pennsylvania 19406
Wednesday, August 23, 2006 6:33:59 AM

APPENDIX B

REPRESENTATIVE LIST OF REGULATIONS RELEVANT TO CLEANUP AND DISPOSAL OF RESIDUAL CONTAMINATION AT CURTIS BAY AND HAMMOND DEPOTS

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B.1 LAWS, REGULATIONS, AND EXECUTIVE ORDERS

The major federal laws, Executive Orders, Department of Defense (DoD), and Defense Logistics Agency (DLA) directives, instructions, and manuals and other compliance requirements that may apply to cleanup and disposal of residual contamination are identified in Table B-1. These compliance requirements are briefly described in Sections B.1.1–B.1.8. Federal regulations that implement statutes and Executive Orders are identified and discussed in these sections where applicable.[1]

There are a number of federal environmental statutes dealing with protection, compliance, or consultation that affect actions at the Curtis Bay Depot and the Hammond Depot. In addition, certain environmental requirements have been delegated to state authorities for enforcement and implementation. Although this appendix does not list specific state requirements in Table C-1, state-administered programs are discussed where applicable. It is DNSC policy to conduct operations in an environmentally safe manner in compliance with all applicable federal, state, and local statutes, regulations, and standards. Although this appendix does not address pending legislation or future regulations, DNSC recognizes that the regulatory environment is subject to many changes, and that the transportation and disposal must be conducted in compliance with the regulations and standards applicable at the time the action is taken.

This appendix presents the laws, regulations, and other requirements that apply to the proposed action and alternatives. No new legislation or exemptions or waivers from any existing regulatory requirements would be required to implement any of the alternatives presented in Section 2 of this record of environmental consideration. The proposed action would be implemented in a manner that complies with DoD, DLA, DNSC, and other federal environmental, safety, and health laws, regulations, Executive Orders, and environmental permitting requirements. Informal consultations are being undertaken with appropriate federal and state agencies as part of the National Environmental Policy Act process.

B.1.1 Air Quality and Noise

Clean Air Act of 1970, as amended (42 U.S.C. 7401 et seq.) The Clean Air Act is intended to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." Section 118 of the Clean Air Act (42 U.S.C. 7418) requires that each Federal agency with jurisdiction over any property or facility engaged in any activity that might result in the discharge of air pollutants comply with "all Federal, state, interstate, and local requirements" with regard to the control and abatement of air pollution. The Clean Air Act requires: (1) the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards as necessary to protect the public health, with an adequate margin of safety, from any known or anticipated adverse effects of a regulated pollutant (42 U.S.C. 7409 et seq.); (2) establishment of national standards of performance for new or modified stationary sources of atmospheric pollutants (42 U.S.C. 7411); (3) specific emission increases to be evaluated so as to prevent a significant deterioration in air quality (42 U.S.C. 7470 et seq.); and (4) specific standards for releases of hazardous air pollutants (42 U.S.C. 7412). These standards are implemented through state implementation plans developed by each state with EPA approval. The Clean Air Act requires sources to meet standards and obtain permits to satisfy these standards. Emissions of air pollutants are regulated by EPA under Title 40 of the Code of Federal Regulations (CFR) Parts 50 through 99. No amendments to current air permits or applications for new permits are expected for any alternatives.

[1]A number of these documents are available on the World Wide Web.
Executive Orders: http://www.archives.gov/federal_register/executive_orders/disposition_tables.htm
DoD directives, instructions, and manuals: http://www.dtic.mil/whs/directives
DLA directives, instructions, and manuals: http://www.dlaps.hq.dla.mil/SR2B.htm
U.S. Code of Federal Regulations: http://www.access.gpo.gov/nara/cfr/index.html
DLA regulations: http://www.dlaps.hq.dla.mil/SR2B.htm

Table B-1. Federal environmental statutes, Executive Orders, and guidance[a]

Statutes, Executive Orders, guidance citations

Air quality and noise
- Clean Air Act of 1970 (42 U.S.C. 7401 et seq.)
- Noise Control Act of 1972 (42 U.S.C. 4901 et seq.)

Water resources
- Clean Water Act (33 U.S.C. 1251 et seq.)
- Safe Drinking Water Act of 1974 (42 U.S.C. 300f et seq.)
- Protection of Wetlands (EO 11990, May 25, 1977))

Waste management, pollution prevention, and conservation
- Solid Waste Disposal Act of 1965, as amended by the Resource Conservation and Recovery Act of 1976 and the Hazardous and Solid Waste Amendments of 1984 (42 U.S.C. 6901 et seq.)
- Pollution Prevention Act of 1990 (42 U.S.C. 13101 et seq.)
- Federal Compliance with Pollution Control Standards, as amended by EO 12580 (EO 12088, October 17, 1978). Sections 1–4, "Pollution Control Plan," were revoked by EO 13148, April 26, 2000 (see 65 FR 24595).
- Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (EO 13101, September 14, 1998)
- Pollution Prevention (DoDI 4715.4)
- Hazardous Material Pollution Prevention (DLAD 4210.4)
- Defense Logistics Agency Environmental Protection Manual (DLAM 6050.1)

Biotic resources
- Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661 et seq.)
- Bald and Golden Eagle Protection Act of 1972 (16 U.S.C. 668 to 668d)
- Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)
- Natural Resources Management Program (DoDD 4700.4)

Environmental regulations, permits, and consultations

Cultural Resources
- American Antiquities Act of 1906 (16 U.S.C. 431 et seq.)
- National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.)
- Archaeological and Historical Preservation Act of 1974 (16 U.S.C. 469 to 469c)
- Protection and Enhancement of Cultural Environment (EO 11593, May 13, 1971)
- Archaeological and Historic Resources Management (DoDD 4710.1)
- Measures of Merit (DoDI 4715.3)

Table B-1. (*continued*)

Worker Safety and Health

- Occupational Safety and Health Act of 1970 (29 U.S.C. 651 et seq.)
- Safety and Occupational Health Policy for the Department of Defense (DoDD 1000.3)
- Occupational Radiation Protection (10 CFR §835)
- Notices, Instructions, and Reports to Workers: Inspection and Investigation (10 CFR §19)
- Standards for Protection Against Radiation (10 CFR §20)
- Nuclear Safety Management (10 CFR §830, Subpart A)
- Recording and Reporting Occupational Injuries and Illness (29 CFR §1904)

Transportation

- Packaging and Transportation of Radioactive Material (10 CFR §71)
- Hazardous Materials Transportation Act of 1975 (49 U.S.C. 5105 et seq.)
- Transportation and Traffic Management (DoDD 4500.9)
- Packaging of Hazardous Material (DLAD 4145.41)
- Defense Logistics Agency Transportation and Traffic Management (DLAD 4500.14)

Other

- Reporting of Defects and Non Compliance (10 CFR §21)
- Domestic Licensing of Source Material (10 CFR §40)
- Fees for Facilities, Materials, Import and Export Licenses and Other Regulatory NRC Information (10 CFR §170)
- Incomplete or Inaccurate Information (NRC Information Notice 2002-36)
- General Policy and Procedure for NRC Enforcement Actions (NUREG-1600)
- Strategic and Critical Materials Stock Piling Act (50 U.S.C. 98 et seq.)
- National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.)
- Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.)
- Protection and Enhancement of Environmental Quality, as amended by EO 11991 (EO 11514, March 5, 1970)
- Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (EO 12898, February 11, 1994)
- Protection of Children from Environmental Health Risks and Safety Risks (EO 13045, April 27, 1997)
- Trade Security Controls on Department of Defense Excess and Surplus Personal Property (DoDD 2030.8)
- Environmental Security (DoDD 4715.1)
- Environmental Compliance (DoDI 4715.6)
- Procedural Rules for DOE Nuclear Activities (10 CFR §820)
- Defense National Stockpile Operations Manual (DNSCM 4145.1)

[a]Abbreviations used: DLAD = DLA Directive; DLAM = DLA Manual; DNSCM = DNSC Manual; DoDD = DoD Directive; DoDI = DoD Instructions; EO = Executive Order; U.S.C. = U.S. Code.

Noise Control Act of 1972, as amended (42 U.S.C. 4901 et seq.) Section 4 of the Noise Control Act of 1972, as amended, directs all Federal agencies to carry out "to the fullest extent within their authority" programs within their jurisdictions in a manner that furthers a national policy of promoting an environment free from noise jeopardizing health and welfare. All alternatives would require compliance with this act.or modified stationary sources of atmospheric pollutants (42 U.S.C. 7411); (3) specific emission increases to be evaluated so as to prevent a significant deterioration in air quality (42 U.S.C. 7470 et seq.); and (4) specific standards for releases of hazardous air pollutants (42 U.S.C. 7412). These standards are implemented through state implementation plans developed by each state with EPA approval. The Clean Air Act requires sources to meet standards and obtain permits to satisfy these standards. Emissions of air pollutants are regulated by EPA under Title 40 of the Code of Federal Regulations (CFR) Parts 50 through 99. No amendments to current air permits or applications for new permits are expected for any alternatives.

Noise Control Act of 1972, as amended (42 U.S.C. 4901 et seq.) Section 4 of the Noise Control Act of 1972, as amended, directs all Federal agencies to carry out "to the fullest extent within their authority" programs within their jurisdictions in a manner that furthers a national policy of promoting an environment free from noise jeopardizing health and welfare. All alternatives would require compliance with this act.

B.1.2 Water Resou rces

Clean Water Act of 1972, as amended (33 U.S.C. 1251 et seq.) The Clean Water Act, which amended the Federal Water Pollution Control Act, was enacted to "restore and maintain the chemical, physical, and biological integrity of the Nation's water." The Clean Water Act prohibits the discharge of toxic pollutants in toxic amounts to navigable waters of the United States. Section 13 of the Clean Water Act requires all branches of the Federal Government engaged in any activity that might result in a discharge or runoff of pollutants to surface waters to comply with Federal, state, interstate, and local requirements. States are responsible for establishing, reviewing, and revising water quality standards pursuant to Section 303 and for submitting them to the EPA Administrator for review and concurrence. Water quality standards consider the designated uses of the navigable waters involved and the water quality criteria for such waters are based on the designated uses. Whenever a state revises or adopts a new standard, the state must also adopt criteria for all toxic pollutants listed pursuant to Section 307(a)(1) of the Clean Water Act (40 CFR §131). The Clean Water Act also provides guidelines and limitations for effluent discharges from point-source discharges and establishes the National Pollutant Discharge Elimination System (NPDES) permit program, which is administered by EPA, pursuant to regulations in 40 CFR §122 et seq., and may be delegated to states. Sections 401 through 405 of the Water Quality Act of 1987 added Section 402(p) to the Clean Water Act requiring that EPA establish regulations for permits for storm water discharges associated with industrial activities. Storm water provisions of the NPDES program are set forth at 40 CFR §Section 122.26. Permit modifications are required if discharge effluent is altered. No amendments to current NPDES permits or applications for new permits are expected for any of the alternatives.

Safe Drinking Water Act of 1974, as amended (42 U.S.C. 300(f) et seq.) The primary objective of the Safe Drinking Water Act is to protect the quality of public drinking water supplies and sources of drinking water. The implementing regulations, administered by EPA unless delegated to states, establish standards applicable to public water systems. These regulations include maximum contaminant levels in public water systems, which are defined as water systems that have at least 15 service connections used by year-round residents or regularly serve at least 25 year-round residents. The EPA regulations implementing the Safe Drinking Water Act are found under 40 CFR §100 through 149. Other programs established by the Safe Drinking Water Act include the Sole Source Aquifer Program, the Wellhead

Protection Program, and the Underground Injection Control Program. Activities conducted under all of the alternatives must be in compliance with the standards specified under the Safe Drinking Water Act.

Protection of Wetlands (Executive Order 11990) This order requires Federal agencies to avoid any short- or long-term adverse impacts on wetlands wherever there is a practicable alternative. Each agency must also provide opportunity for early public review of any plans or proposals for new construction in wetlands.

B.1.3 Waste Management, Pollution Prevention, and Conservation

Solid Waste Disposal Act of 1965, as amended by the Resource Conservation and Recovery Act of 1976 and the Hazardous and Solid Waste Amendments of 1984 (42 U.S.C. 6901 et seq.) The Solid Waste Disposal Act of 1965, as amended, governs the transportation, treatment, storage, and disposal of hazardous and nonhazardous waste. Under the Resource Conservation and Recovery Act of 1976 (RCRA), which amended the Solid Waste Disposal Act of 1965, EPA defines and identifies hazardous waste; establishes standards for its transportation, treatment, storage, and disposal; and requires permits for persons engaged in hazardous waste activities. Section 3006 of the act (42 U.S.C. 6926) allows states to establish and administer these permit programs with EPA approval. EPA regulations implementing RCRA are found in 40 CFR §260 through 283. The Waste Management section of Chap. 3, Environmental Consequences, provides information on the generation and management of hazardous wastes for each of the alternatives.

Pollution Prevention Act of 1990 (42 U.S.C. 13101 et seq.) The Pollution Prevention Act establishes a national policy for waste management and pollution control. Source reduction is given first preference, followed by environmentally safe recycling, with disposal or releases to the environment as a last resort. Activities under all of the alternatives would need to be in compliance with the Pollution Prevention Act and implementing regulations.

Federal Compliance with Pollution Control Standards (Executive Order 12088), as amended by Executive Order 12580, Federal Compliance with Pollution Control Standards, January 23, 1987 This order directs Federal agencies to comply with applicable administrative and procedural pollution control standards established by, but not limited to, the Clean Air Act, the Noise Control Act, the Clean Water Act, the Safe Drinking Water Act, the Toxic Substances Control Act, and RCRA.

Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (Executive Order 13101) This order requires each Federal agency to incorporate waste prevention and recycling in its daily operations and work to increase and expand markets for recovered materials. This order states that it is national policy to prefer pollution prevention, whenever feasible. Pollution that cannot be prevented should be recycled; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner. Disposal should be employed only as a last resort.

Pollution Prevention (DoDI 4715.4) This instruction implements policy, assigns responsibility, and prescribes procedures for implementing pollution prevention programs throughout DoD. This instruction also authorizes the publication of the "Guide for Qualified Recycling Programs."

Hazardous Material Pollution Prevention (DLAD 4210.4) This directive establishes the DLA Comprehensive Hazardous Material Management Program and the Hazardous Material Minimization Program, which includes DLA's source reduction program directed through the management of product/process specifications and standards documents/programs. This directive further establishes the Hazardous Material Management Council as the vehicle to address and resolve issues in hazardous material logistics management.

DLA Environmental Protection Manual (DLAM 6050.1) This manual summarizes and highlights regulatory requirements that are of primary concern to DLA activities and provides compliance guidance and direction. The manual serves as DLA implementation of Executive Order 12088, Federal Compliance with Pollution Control Standards. It also identifies requirements, policies, and procedures for (1) preventing, controlling and responding to spills of oils and hazardous substances; (2) the protection of drinking water quality at DLA installations; (3) the permitting and control of wastewater discharges at DLA installations; (4) the control of air pollution; (5) hazardous waste management; (6) resource recovery and recycling; (7) polychlorinated biphenyls management; and (8) the defense environmental restoration program. Instructions on the preparation and submission of the Federal Agency Pollution Abatement Project Report are also provided in the manual.

B.1.4 Biotic Resources

Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661 et seq.) The Fish and Wildlife Coordination Act promotes more effective planning and cooperation between Federal, state, public, and private agencies for the conservation and rehabilitation of the Nation's fish and wildlife and authorizes the U.S. Department of the Interior to provide assistance. This act requires, among other things, consultation with the U.S. Fish and Wildlife Service on the possible effects on wildlife if there is construction, modification, or control of bodies of water in excess of 10 acres (4 ha) in surface area.

Bald and Golden Eagle Protection Act of 1972, as amended (16 U.S.C. 668 through 668d) The Bald and Golden Eagle Protection Act, as amended, makes it unlawful to take, pursue, molest, or disturb bald (American) and golden eagles, their nests, or their eggs anywhere in the United States (Section 668, 668c). A permit must be obtained from the U.S. Department of the Interior to relocate a nest that interferes with resource development or recovery operations.

Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) The act is intended to prevent the further decline of endangered and threatened species and to restore these species and habitats. Section 7 of the act requires Federal agencies having reason to believe that a prospective action may affect an endangered or threatened species or its habitat to consult with the U.S. Fish and Wildlife Service of the U.S. Department of the Interior or the National Marine Fisheries Service of the U.S. Department of Commerce to ensure that the action does not jeopardize the species or destroy its habitat (50 CFR §17). If, despite reasonable and prudent measures to avoid or minimize such impacts, the species or its habitat would be jeopardized by the action, a review process is specified to determine whether the action may proceed.

Natural Resources Management Program (DoDD 4700.4) This directive prescribes policies and procedures for an integrated program for multiple-use management of natural resources on property under DoD control. This directive states that DoD will act responsibly in the public interest in managing its lands and natural resources and will have a conscious and active concern for the inherent value of natural resources in all DoD plans, actions, and programs.

B.1.5 Cultural Resources

American Antiquities Act of 1906, as amended (16 U.S.C. 431 to 433) This act protects historic and prehistoric ruins, monuments, and antiquities, including paleontological resources, on federally controlled lands from appropriation, excavation, injury, and destruction without permission. Under this act, the President of the United States is authorized to declare historic landmarks, prehistoric and historic structures, and other objects of historic or scientific interest situated on lands controlled or owned by the Federal Government to be national monuments.

National Historic Preservation Act of 1996, as amended (16 U.S.C. 470 et seq.) The National Historic Preservation Act provides that sites with significant national historic value be placed on the National Register of Historic Places, which is maintained by the Secretary of the Interior. The major provisions of the act for DLA are Sections 106 and 110. Both sections aim to ensure that historic properties are appropriately considered in planning Federal initiatives and actions. Section 106 is a specific, issue-related mandate to which Federal agencies must adhere. It is a reactive mechanism that is driven by a Federal action. Section 110, in contrast, sets out broad Federal agency responsibilities with respect to historic properties. It is a proactive mechanism with emphasis on ongoing management of historic preservation sites and activities at Federal facilities. No permits or certifications are required under the act. Section 106 requires the head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking to ensure compliance with the provisions of the act. It compels Federal agencies to "take into account" the effect of their projects on historical and archaeological resources and to give the Advisory Council on Historic Preservation the opportunity to comment on such effects. Section 106 mandates consultation during Federal actions if the undertaking has the potential to have an effect on a historic property. This consultation normally involves the State Historic Preservation Officer and may include other organizations and individuals, such as local governments and Native American tribes. If an adverse effect is found, the consultation often ends with the execution of a memorandum of agreement that states how the adverse effects will be resolved. The regulations implementing Section 106, found in 30 CFR §800, were revised on May 18, 1999 (64 FR 27043), effective June 17, 1999. This revision introduced new flexibility and options for agencies to use to meet their obligations to comply with the act.

Archaeological and Historic Preservation Act of 1974, as amended (16 U.S.C. 469 to 469c) This act protects sites that have prehistoric and historic importance. It provides for the preservation of historical and archeological data, including relics and specimens, which might otherwise be irreplaceably lost as a result of any Federal construction project or federally licensed activity or program. The management of any future findings of prehistoric or historic resources during archaeological surveys or other activities would be required to comply with this act.

Protection and Enhancement of the Cultural Environment (Executive Order 11593) This order directs Federal agencies to locate, inventory, and nominate properties under their jurisdiction or control to the National Register of Historic Places, if those properties qualify. This process requires DLA to provide the Advisory Council on Historic Preservation the opportunity to comment on the possible impacts of the proposed activity on any potential eligible or listed resources. (See the *National Historic Preservation Act of 1996, as amended.*)

Archaeological and Historic Resources Management (DoDD 4710.1) This directive prescribes procedures and assigns responsibilities for the management of archaeological and historic resources located on lands under DoD control. This directive states that it is DoD policy to integrate the archaeological and historic preservation requirements of applicable laws with the planning and management of activities under DoD control, to minimize expenditures through judicious application of options available in complying with applicable laws, and to encourage practical, economically feasible rehabilitation and adaptive use of significant historical resources.

Measures of Merit DoDI 4715.3 This instruction contains cultural resources management requirements for all DoD installations.

B.1.6 Worker Safety and Health

Occupational Safety and Health Act of 1970 (29 U.S.C. 651 et seq.) The Occupational Safety and Health Act establishes standards for safe and healthful working conditions in places of employment throughout the United States. The act is administered and enforced by the Occupational Safety and Health Administration (OSHA), a U.S. Department of Labor agency. Although OSHA and EPA both have a mandate to reduce exposures to toxic substances, OSHA's jurisdiction is limited to safety and health conditions that exist in the workplace environment. Under the act, it is the duty of each employer to furnish employees a place of employment free of recognized hazards likely to cause death or serious physical harm. Employees have a duty to comply with the occupational safety and health standards and rules, regulations, and orders issued under the act. OSHA regulations (29 CFR §1910) establish specific standards telling employers what must be done to achieve a safe and healthful working environment. Government agencies, including DLA, are not technically subject to OSHA regulations, but are required under 29 U.S.C. 668 to establish their own occupational safety and health programs for their places of employment that are consistent with OSHA standards. Activities under all the alternatives would need to be conducted in compliance with this act.

Safety and Occupational Health Policy for the Department of Defense (DoDD 1000.3) This directive requires DoD to implement comprehensive programs to protect DoD personnel from accidental death, injury, or occupational illness and the public from death, injury, and illness, or property damage as a result of DoD operations.

Occupational Radiation Protection (10 CFR §835). These regulations establish radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities.

Notices, Instructions, and Reports to Workers: Inspection and Investigation (10 CFR §19). These regulations establish requirements for notices, instructions, and reports by licensees to individuals participating in licensed activities and options available to these individuals in connection with Commission inspections of licensees to ascertain compliance with the provisions of the Atomic Energy Act of 1954, as amended, Title II of the Energy Reorganization Act of 1974, and regulations, orders, and licenses thereunder regarding radiological working conditions.

Standards for Protection Against Radiation (10 CFR §20). These regulations establish standards for protection against ionizing radiation resulting from activities conducted under licenses issued by the Nuclear Regulatory Commission. The purpose of the regulations is to control the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual (including doses resulting from licensed and unlicensed radioactive material and from radiation sources other than background radiation) does not exceed the standards for protection against radiation prescribed in the regulations in this part.

Recording and Reporting Occupational Injuries and Illness (29 CFR §1904). Under OSHA regulations, companies of the size and type associated with the proposed action must record and report OSHA injury and illness statistics.

Nuclear Safety Management (10 CFR §830 Subpart A). This part governs the conduct of DOE contractors, DOE personnel, and other persons conducting activities (including providing items and services) that affect, or may affect, the safety of DOE nuclear facilities. Subpart A establishes quality

assurance requirements for contractors conducting activities, including providing items or services, that affect, or may affect, nuclear safety of DOE nuclear facilities.

B.1.7 Transportation

Packaging and Transportation of Radioactive Material (10 CFR §71). This part establishes the (1) requirements for packaging, preparation for shipment, and transportation of licensed material and (2) procedures and standards for NRC approval of packaging and shipping procedures for fissile material and for a quantity of other licensed material in excess of a Type A quantity. The packaging and transport of licensed material are also subject to other parts of this chapter (e.g., 10 CFR §parts 20, 21, 30, 40, 70, and 73) and to the regulations of other agencies (e.g., the U.S. Department of Transportation) having jurisdiction over means of transport. The requirements of this part are in addition to, and not in substitution for, other requirements. The regulations in this part apply to any licensee authorized by specific or general license issued by the Commission to receive, possess, use, or transfer licensed material, if the licensee delivers that material to a carrier for transport, transports the material outside the site of usage as specified in the NRC license, or transports that material on public highways. The transport of licensed material or delivery of licensed material to a carrier for transport is subject to the operating controls and procedures requirements of subpart G of this part, to the quality assurance requirements of subpart H of this part, and to the general provisions of subpart A of this part, including DOT regulations referenced in Section 71.5.

Hazardous Materials Transportation Act of 1975 (49 U.S.C. 5105 et seq.) Transportation of hazardous materials and substances is regulated by the U.S. Department of Transportation (DOT). The Hazardous Material Transportation Act of 1975 requires DOT to prescribe uniform national regulations for transportation of hazardous materials. Most state and local regulations regarding such transportation that are not substantively the same as DOT regulations are preempted (i.e., rendered void) (49 U.S.C. 5125). This, in effect, allows state and local governments to only enforce the Federal regulations, not to change or expand upon them. This program is administered by the Research and Special Programs Administration of DOT, which coordinates its regulations with those of EPA (under RCRA) when covering the same activities. DOT regulations (49 CFR §171 through 178, and 49 CFR §383 through 397) contain requirements for identifying a material as hazardous. DOT hazardous material regulations establish standards for packaging, marking and labeling, placarding, monitoring, routes, accident reporting and manifesting. Requirements for transport by rail, air, and public highway are included. All alternatives requiring the transportation of thorium nitrate would need to be in compliance with these regulations.

Transportation and Traffic Management (DoD 4500.9) This directive prescribes general DoD transportation and traffic management policies. This directive requires that DoD transportation resources be organized and managed to ensure optimum responsiveness, efficiency, and economy to support the DoD mission.

Packaging of Hazardous Material (DLAD 4145.41) This directive establishes uniform policy for the Military Services and DLA for packaging hazardous materials for safe, efficient, and legal storage, handling, and transportation.

DLA Transportation and Traffic Management (DLAD 4500.14) This directive establishes transportation and traffic management policy, assigns responsibilities, and provides guidance; it is applicable to all modes of transportation.

B.1.8 Other Statutes, Executives Orders, and Guidance

Reporting of Defects and Non Compliance (10 CFR §21). These regulations establish procedures and requirements for implementation of section 206 of the Energy Reorganization Act of 1974. That section requires any individual director or responsible officer of a firm constructing, owning, operating or supplying the components of any facility or activity which is licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended, or the Energy Reorganization Act of 1974, who obtains information reasonably indicating (a) that the facility, activity or basic component supplied to such facility or activity fails to comply with the Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order, or license of the Commission relating to substantial safety hazards or (b) that the facility, activity, or basic component supplied to such facility or activity contains defects, which could create a substantial safety hazard, to immediately notify the Commission of such failure to comply or such defect, unless he has actual knowledge that the Commission has been adequately informed of such defect or failure to comply.

Domestic Licensing of Source Material (10 CFR §40). These regulations establish procedures and criteria for the issuance of licenses to receive title to, receive, possess, use, transfer, or deliver source and byproduct materials, as defined in this part, and establish and provide for the terms and conditions upon which the Commission will issue such licenses. The regulations also provide for the disposal of byproduct material and for the long-term care and custody of byproduct material and residual radioactive material.

Fees for Facilities, Materials, Import and Export Licenses and Other Regulatory NRC Information (10 CFR §170). These regulations set out fees charged for licensing services rendered by the Nuclear Regulatory Commission as authorized under title V of the Independent Offices Appropriation Act of 1952 (65 Stat. 290; 31 U.S.C. 483a) and provisions regarding their payment.

Incomplete or Inaccurate Information (NRC Information Notice 2002-36). The NRC issued this Information Notice (IN) to remind addressees of the importance of diligently ascertaining the accuracy of educational background and professional qualifications of any contractor or subcontractor employees subject to such qualification requirements. Th IN also alerts addressees of the potential penalties that could result from intentionally providing incomplete or inaccurate information to NRC. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems.

General Policy and Procedure for NRC Enforcement Actions (NUREG-1600). The Commission has developed an enforcement program and enforcement policy to support the NRC's overall safety mission in protecting the public and the environment. Consistent with that purpose, enforcement action is used as a deterrent to emphasize the importance of compliance with regulatory requirements, and to encourage prompt identification and prompt, comprehensive correction of violations. Consistent with the primary purpose of supporting the NRC's overall safety mission in protecting the public health and safety, the policy endeavors to deter noncompliance by emphasizing the importance of compliance with NRC requirements and encourage prompt identification and prompt, comprehensive correction of violations of NRC requirements. Therefore, licensees, contractors, and their employees who do not achieve the high standard of compliance which the NRC expects will be subject to enforcement sanctions. Each enforcement action is dependent on the circumstances of the case. However, in no case will licensees who cannot achieve and maintain adequate levels of safety be permitted to continue to conduct licensed activities.

Violations are identified through inspections and investigations. All violations are subject to civil enforcement action and may also be subject to criminal prosecution. After an apparent violation is identified, it is assessed in accordance with the Commission's Enforcement Policy (NUREG-1600). Because it is a policy statement and not a regulation, the Commission may deviate from this statement of policy and procedure as appropriate under the circumstances of a particular case.

There are three primary enforcement sanctions available: Notices of Violation, civil penalties, and orders. A Notice of Violation (NOV) identifies a requirement and how it was violated, and formalizes a violation pursuant to 10 CFR §2.201. A civil penalty is a monetary fine issued under authority of Section 234 of the Atomic Energy Act (AEA) or Section 206 of the Energy Reorganization Act (ERA). Section 234 of the AEA provides for penalties of up to $100,000 per violation per day; but that amount has been adjusted by the Debt Collection Improvement Act of 1996 to be $120,000. The Commission's order issuing authority under Section 161 of the AEA is broad and extends to any area of licensed activity that affects the public health and safety. Orders modify, suspend, or revoke licenses or require specific actions by licensees or persons. NOVs and civil penalties are issued based on violations. Orders may be issued for violations, or in the absence of a violation, because of a public health or safety issue.

Strategic and Critical Materials Stock Piling Act (50 U.S.C. 98 et seq.) The Strategic and Critical Materials Stock Piling Act regulates DLA disposal of material from the National Defense Stockpile. Under this act, DLA is required to submit an Annual Materials Plan to Congress that includes a request for disposal of materials that are excess to stockpile needs for each fiscal year, for a total of four years. Each of the alternatives would be affected by this act.

National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.) The National Environmental Policy Act (NEPA) establishes a national policy promoting awareness of the environmental consequences of human activity on the environment and consideration of environmental impacts during the planning and decision-making stages of a project. It requires Federal agencies to prepare a detailed environmental impact statement (EIS) for any major Federal action with potentially significant environmental impact. Federal Agencies are regulated under the Council on Environmental Quality regulations (40 CFR §Part 1500 et seq.) for implementing the procedural requirements of NEPA. Environmental Considerations in DLA Actions in the United States (DLAR 1000.22) establishes policy, assigns responsibilities, provides guidance, and establishes procedures for the integration of environmental considerations into DLA planning and decision-making in accordance with the Council on Environmental Quality NEPA regulations. The provisions of the regulations apply to proposed plans, decisions, and actions of DLA headquarters and field activities that could have an impact on the human environment. This thorium nitrate EA has been prepared in accordance with the Council on Environmental Quality and DLA regulations. It discusses reasonable alternatives and their potential environmental consequences.

Protection and Enhancement of Environmental Quality (Executive Order 11514) This order (regulated by 40 CFR §1500 through 1508) requires Federal agencies to continually monitor and control their activities to: (1) protect and enhance the quality of the environment, and (2) develop procedures to ensure the fullest practicable provision of timely public information and understanding of the Federal plans and programs that may have potential environmental impact so that views of interested parties can be obtained. DLA has issued regulations (DLAR 1000.22) for compliance with this Executive Order.

Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898) This order requires each Federal agency to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

Protection of Children from Environmental Health Risks and Safety Risks (Executive Order 13045)—This order requires each Federal agency to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Trade Security Controls on DoD Excess and Surplus Personal Property (DoDD 2030.8) This directive ensures that all DoD excess and surplus personal property is transferred in accordance with applicable U.S. laws, regulations, and policies. The Director of DLA is required to act as the program manager for policy implementation of trade security control policy and procedures for transfers of DoD excess and surplus personal property.

Environmental Security (DoDD 4715.1) This directive establishes policy for environmental security within DoD. The directive states that it is DoD policy to display environmental security leadership within DoD activities worldwide and support the national defense mission by: (1) ensuring that environmental factors are integrated into DoD decision-making processes that may have an impact on the environment and are given appropriate consideration along with other relevant factors; (2) preventing pollution and minimizing adverse environmental impacts; and (3) protecting, preserving, and restoring and enhancing the quality of the environment.

Environmental Compliance (DoDI 4715.6) This instruction implements policy and prescribes procedures for achieving compliance with applicable Executive Orders and Federal, state, interstate, regional, and local statutory and regulatory environmental requirements. This instruction states that it is DoD policy to: (1) reduce compliance costs and simplify requirements to the extent possible, with pollution prevention being the preferred means for attaining compliance; (2) participate in the development of Federal, state, and local plans and programs for achieving, maintaining, and enhancing environmental quality; (3) use commercially proven solutions, including available technology, to achieve, maintain, and monitor compliance, where possible, and (4) conduct internal and external compliance self-assessments at installations.

Defense National Stockpile Operations Manual (DNSCM 4145.1) This manual applies to the storage and handling of Defense National Stockpile commodities at all storage locations. It includes general storage procedures, as well as policy, procedures, and instructions on packaging, commodity maintenance, health and safety, security, shipping and receiving, and accountability. It also provides general requirements, procedures, instructions, and information required for the acquisition, disposal, upgrading, and quality maintenance of strategic and critical materials in DNSC. Instructions on environmental and occupational health and safety monitoring and reporting are included in the manual.

ATTACHMENT B

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WORLD ENVIRONMENTAL TECHNICAL APPROACH SHEETS FOR HAMMOND DEPOT

World Environmental
Remediation Work Instructions
Project: Hammond

DATE:	AOC 1 Burn Cage

Remediation Activities:		Schedule:	12 days
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Excavation of contaminated materials and soil		
5.	Perform survey of the excavation floor.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Frontend Loader	5.	Water Truck	1	RSO	1	Decon Tech(s)
2.	Excavator	6.		1	HP Supervisor	1	H&S
3.	Railtruck (Intermodals)	7.		1	Waste Broker		
4.	Mower	8.		2	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Dig Permit No underground utilities
	Air Sampling		Water Diversion Materials
	Postings		

Waste Generated, Storage, and Disposition

Concrete	Contaminated concrete will be removed and staged or direct loaded into transport container	Non impacted concrete will be staged for verification survey and unconditional release.
Soil	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal		

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Soil	540	1.21	710				9.2
Slag							
Debris							

RSO: **Operations:** **Date:**

WCPS031104

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	AOC 1 Burn Cage

Remediation Activities:		Schedule:	12 days

1	Move the rubble pile ~ 50ft as specified by the Hammond representative. Survey the area under the rubble pile for radiological
	contamination. If required, remediate during the activities described in # 5 below.
2	Assess the potential for groundwater to enter the excavation and implement water diversion techniques or position a
	containment system to handle water.
3	Setup the staging area for the contaminated soil and debris.
4	Assess the burn cage, determine if it is contaminated, and disposition appropriately.
5	The excavation of this area will be performed in a manner where all of the contaminated materials will be excavated and
	staged in an ongoing manner. As materials are being excavted HP's will perform continual monitoring using a 2" NaI
	instrument and by collecting and analyzing soil samples with the on-site gamma spec system. As the sample results
	are analyzed, the materials will be staged and/or direct loaded based on the concentration levels.
6	Once the base of the contamination is identified, World will perform a walkover survey and collect soil samples to ensure
	the remediation area will meet the DCGL's of 2.9 pCi/g Th-232 and 2.5 pCi/g U-238. If there is contamination on the slag
	remediation will continue using similar techniques for decontaminating concrete. The slag must meet the surface DCGL's of
	400 dpm/100cm^2 for Th-232 and 800 dpm/100cm^2 for U-238.

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Waste Handling:	
1	Contaminated soils/materials would be direct loaded into a transport container and taken to the railcar loading area or staged. The staged soil would be loaded into a transport container and taken to the railcar loading area prior to completion of activities at Hammond Depot. All materials at the railcar loading area would be loaded and shipped to the receiving disposal site prior to completion of activities at Hammond Depot.
2	Soils will be segeregated based on the following concentration levels:
	Th-232 < 2.9 pCi/g and Th-232 > 2.9 pCi/g
	U-238 < 2.2 pCi/g and U-238 > 2.5 pCi/g
	A determination will be made during the project if any further segregation should be made for soils > 55 pCi/g for Th-232
	and >141 pCi/g for u-238. This will be based on the volumes of material in each category.

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.
(2)	There is a concern about ground water and rain filling up the excavation during remediation activities. Preplanning, including
	checking the groundwater level and rain water is vitally important. The use of water diversion techniques and containment
	will be utilized.
(3)	As the soil is being excavated it will be stockpiled at the edge of the excavation. The frontend loader will transfer the material
	and direct load into an intermodal container. During the loading samples of the material will be taken for gamma
	spectroscopy analysis. This data will be used to quantify the concentration levels.

World Environmental

Remediation Work Instructions

Project: Hammond

DATE:	AOC 2 (South of Ferrochrome Pile 6)

Remediation Activities:		Schedule:	12 days
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Excavation of contaminated materials and soil		
5.	Perform survey of the excavation floor.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Frontend Loader	5.	Water Truck	1	RSO	1	Decon Tech(s)
2.	Excavator	6.		1	HP Supervisor	1	H&S
3.	Railtruck (Intermodals)	7.		1	Waste Broker		
4.	Mower	8.		2	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Dig Permit No underground utilities
	Air Sampling		Water Diversion Materials
	Postings		

Waste Generated, Storage, and Disposition

Concrete		
Soil	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal		

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Soil	28,000	1.64	28,000				115
Slag							
Debris							

RSO: Operations: Date:

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	AOC 2 (South of Ferrochrome Pile 6)

Remediation Activities:		Schedule:	12 days
1	Setup the staging area for the contaminated soil and debris.		
2	Assess the potential for groundwater to enter the excavation and implement water diversion techniques or position a containment system to handle water.		
3	The excavation of this area will be performed in a manner where all of the contaminated materials will be excavated and staged in an ongoing manner. As materials are being excavted HP's will perform continual monitoring using a 2" NaI instrument and by collecting and analyzing soil samples with the on-site gamma spec system. As the sample results are analyzed, the materials will be staged and/or direct loaded based on the concentration levels.		
4	Once the base of the contamination is identified, World will perform a walkover survey and collect soil samples to ensure the remediation area will meet the DCGL's of 2.9 pCi/g Th-232 and 2.5 pCi/g U-238. If there is contamination on the slag remediation will continue using similar techniques for decontaminating concrete. The slag must meet the surface DCGL's of 400 dpm/100cm^2 for Th-232 and 800 dpm/100cm^2 for U-238.		
5	Hammond Depot personnel have requested that the excavation be left to serve as a retention pond thus no filling will be required.		

DRAFT

Waste Handling:	
1	Contaminated soils/materials would be direct loaded into a transport container and taken to the railcar loading area or staged. The staged soil would be loaded into a transport container and taken to the railcar loading area prior to completion of activities at Hammond Depot. All materials at the railcar loading area would be loaded and shipped to the receiving disposal site prior to completion of activities at Hammond Depot.
2	Soils will be segeregated based on the following concentration levels: Th-232 < 2.9 pCi/g and Th-232 > 2.9 pCi/g U-238 < 2.2 pCi/g and U-238 > 2.5 pCi/g A determination will be made during the project if any further segregation should be made for soils > 55 pCi/g for Th-232 and >141 pCi/g for u-238. This will be based on the volumes of material in each category.

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.
(2)	There is a concern about ground water and rain filling up the excavation during remediation activities. Preplanning, including checking the groundwater level and rain water is vitally important. The use of water diversion techniques and containment will be utilized.
(3)	As the soil is being excavated it will be stockpiled at the edge of the excavation. The frontend loader will transfer the material and direct load into an intermodal container. During the loading samples of the material will be taken for gamma spectroscopy analysis. This data will be used to quantify the concentration levels.

World Environmental
Remediation Work Instructions
Project: Hammond

DATE:	AOC 3 (Western Site Boundary)

Remediation Activities:		Schedule:	2 days
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Excavation of contaminated materials and soil		
5.	Perform survey of the excavation floor.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Frontend Loader	5.	Water Truck	0	RSO	1	Decon Tech(s)
2.	Excavator	6.		1	HP Supervisor	1	H&S
3.	Railtruck (Intermodals)	7.		1	Waste Broker		
4.	Mower	8.		1	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Dig Permit No underground utilities
	Air Sampling		Water Diversion Materials
	Postings		

Waste Generated, Storage, and Disposition

Concrete		
Soil	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal		

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Soil	110	0.72	53				28
Slag							
Debris							

RSO: Operations: Date:

World Environmental

Remediation Technical Approach

Project: Hammond

DATE:	LOCATION:	AOC 3 (Western Site Boundary)

Remediation Activities:		Schedule:	2 days

1	Setup the staging area for the contaminated soil and debris.
2	The excavation of this area will be performed in a manner where all of the contaminated materials will be excavated and
	staged in an ongoing manner. As materials are being excavted HP's will perform continual monitoring using a 2" NaI
	instrument and by collecting and analyzing soil samples with the on-site gamma spec system. As the sample results
	are analyzed, the materials will be staged and/or direct loaded based on the concentration levels.
3	Once the base of the contamination is identified, World will perform a walkover survey and collect soil samples to ensure
	the remediation area will meet the DCGL's of 2.9 pCi/g Th-232 and 2.5 pCi/g U-238. If there is contamination on the slag
	remediation will continue using similar techniques for decontaminating concrete. The slag must meet the surface DCGL's of
	400 dpm/100cm^2 for Th-232 and 800 dpm/100cm^2 for U-238.
4	World will perform gamma spectroscopy measurements on fill material prior to placement in the excavation.

DRAFT

Waste Handling:	
1	Contaminated soils/materials would be direct loaded into a transport container and taken to the railcar loading area or staged. The staged soil would be loaded into a transport container and taken to the railcar loading area prior to completion of activities at Hammond Depot. All materials at the railcar loading area would be loaded and shipped to the receiving disposal site prior to completion of activities at Hammond Depot.
2	Soils will be segeregated based on the following concentration levels:
	Th-232 < 2.9 pCi/g and Th-232 > 2.9 pCi/g
	U-238 < 2.2 pCi/g and U-238 > 2.5 pCi/g
	A determination will be made during the project if any further segregation should be made for soils > 55 pCi/g for Th-232
	and >141 pCi/g for u-238. This will be based on the volumes of material in each category.

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.
(2)	As the soil is being excavated it will be stockpiled at the edge of the excavation. The frontend loader will transfer the material
	and direct load into an intermodal container. During the loading samples of the material will be taken for gamma
	spectroscopy analysis. This data will be used to quantify the concentration levels.

World Environmental

Remediation Work Instructions

Project: Hammond

DATE:	AOC 4 (Area V - Near Scale House)

Remediation Activities:		Schedule:	1 day
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Excavation of contaminated materials and soil		
5.	Perform survey of the excavation floor.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Frontend Loader	5.	Water Truck	0	RSO	1	Decon Tech(s)
2.	Excavator	6.		1	HP Supervisor	1	H&S
3.	Railtruck (Intermodals)	7.		1	Waste Broker		
4.	Mower	8.		1	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Dig Permit No underground utilities
	Air Sampling		Water Diversion Materials
	Postings		

Waste Generated, Storage, and Disposition

Concrete		
Soil	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal		

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Soil	110	0.98	106				150
Slag							
Debris							

RSO: Operations: Date:

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	AOC 4 (Area V - Near Scale House)

Remediation Activities:		Schedule:	1 day

1	Setup the staging area for the contaminated soil and debris.
2	The excavation of this area will be performed in a manner where all of the contaminated materials will be excavated and
	staged in an ongoing manner. As materials are being excavted HP's will perform continual monitoring using a 2" NaI
	instrument and by collecting and analyzing soil samples with the on-site gamma spec system. As the sample results
	are analyzed, the materials will be staged and/or direct loaded based on the concentration levels.
3	Once the base of the contamination is identified, World will perform a walkover survey and collect soil samples to ensure
	the remediation area will meet the DCGL's of 2.9 pCi/g Th-232 and 2.5 pCi/g U-238. If there is contamination on the slag
	remediation will continue using similar techniques for decontaminating concrete. The slag must meet the surface DCGL's of
	400 dpm/100cm^2 for Th-232 and 800 dpm/100cm^2 for U-238.
4	World will perform gamma spectroscopy measurements on fill material prior to placement in the excavation.

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Waste Handling:	
1	Contaminated soils/materials would be direct loaded into a transport container and taken to the railcar loading area or staged. The staged soil would be loaded into a transport container and taken to the railcar loading area prior to completion of activities at Hammond Depot. All materials at the railcar loading area would be loaded and shipped to the receiving disposal site prior to completion of activities at Hammond Depot.
2	Soils will be segeregated based on the following concentration levels:
	Th-232 < 2.9 pCi/g and Th-232 > 2.9 pCi/g
	U-238 < 2.2 pCi/g and U-238 > 2.5 pCi/g
	A determination will be made during the project if any further segregation should be made for soils > 55 pCi/g for Th-232
	and >141 pCi/g for u-238. This will be based on the volumes of material in each category.

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.
(2)	As the soil is being excavated it will be stockpiled at the edge of the excavation. The frontend loader will transfer the material
	and direct load into an intermodal container. During the loading samples of the material will be taken for gamma
	spectroscopy analysis. This data will be used to quantify the concentration levels.

World Environmental

Remediation Work Instructions

Project: Hammond

DATE:	**AOC 5 (Southern End of Site)**

Remediation Activities:		Schedule:	1 day
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Excavation of contaminated materials and soil		
5.	Perform survey of the excavation floor.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Frontend Loader	5.	Water Truck	0	RSO	1	Decon Tech(s)
2.	Excavator	6.		1	HP Supervisor	1	H&S
3.	Railtruck (Intermodals)	7.		1	Waste Broker		
4.	Mower	8.		1	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Dig Permit No underground utilities
	Air Sampling		Water Diversion Materials
	Postings		

Waste Generated, Storage, and Disposition

Concrete		
Soil	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal		

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Soil	22	0.98	22				32
Slag							
Debris							

RSO: **Operations:** **Date:**

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	AOC 5 (Southern End of Site)

Remediation Activities:		Schedule:	1 day

1	Setup the staging area for the contaminated soil and debris.
2	The excavation of this area will be performed in a manner where all of the contaminated materials will be excavated and
	staged in an ongoing manner. As materials are being excavted HP's will perform continual monitoring using a 2" NaI
	instrument and by collecting and analyzing soil samples with the on-site gamma spec system. As the sample results
	are analyzed, the materials will be staged and/or direct loaded based on the concentration levels.
3	Once the base of the contamination is identified, World will perform a walkover survey and collect soil samples to ensure
	the remediation area will meet the DCGL's of 2.9 pCi/g Th-232 and 2.5 pCi/g U-238. If there is contamination on the slag
	remediation will continue using similar techniques for decontaminating concrete. The slag must meet the surface DCGL's of
	400 dpm/100cm^2 for Th-232 and 800 dpm/100cm^2 for U-238.
4	World will perform gamma spectroscopy measurements on fill material prior to placement in the excavation.

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Waste Handling:	
1	Contaminated soils/materials would be direct loaded into a transport container and taken to the railcar loading area or staged. The staged soil would be loaded into a transport container and taken to the railcar loading area prior to completion of activities at Hammond Depot. All materials at the railcar loading area would be loaded and shipped to the receiving disposal site prior to completion of activities at Hammond Depot.
2	Soils will be segeregated based on the following concentration levels:
	Th-232 < 2.9 pCi/g and Th-232 > 2.9 pCi/g
	U-238 < 2.2 pCi/g and U-238 > 2.5 pCi/g
	A determination will be made during the project if any further segregation should be made for soils > 55 pCi/g for Th-232
	and >141 pCi/g for u-238. This will be based on the volumes of material in each category.

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.
(2)	As the soil is being excavated it will be stockpiled at the edge of the excavation. The frontend loader will transfer the material
	and direct load into an intermodal container. During the loading samples of the material will be taken for gamma
	spectroscopy analysis. This data will be used to quantify the concentration levels.

World Environmental
Remediation Work Instructions
Project: Hammond

DATE:	AOC 6 (Area D)

Remediation Activities:		Schedule:	1 day
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Excavation of contaminated materials and soil		
5.	Perform survey of the excavation floor.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Frontend Loader / Backhoe	5.	Water Truck	0	RSO	0	Decon Tech(s)
2.	Excavator	6.		1	HP Supervisor	1	H&S
3.	Railtruck (Intermodals)	7.		1	Waste Broker		
4.	Mower	8.		1	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Dig Permit No underground utilities
	Air Sampling		Water Diversion Materials
	Postings		

Waste Generated, Storage, and Disposition

Concrete		
Soil	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal		

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Soil	3	0.49	1				0
Slag							
Debris							

RSO: Operations: Date:

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	AOC 6 (Area D)

Remediation Activities:		Schedule:	1 day
1	Setup the staging area for the contaminated soil and debris.		
2	The excavation of this area will be performed in a manner where all of the contaminated materials will be excavated and		
	staged in an ongoing manner. As materials are being excavted HP's will perform continual monitoring using a 2" NaI		
	instrument and by collecting and analyzing soil samples with the on-site gamma spec system. As the sample results		
	are analyzed, the materials will be staged and/or direct loaded based on the concentration levels.		
3	Once the base of the contamination is identified, World will perform a walkover survey and collect soil samples to ensure		
	the remediation area will meet the DCGL's of 2.9 pCi/g Th-232 and 2.5 pCi/g U-238.		
4	World will perform gamma spectroscopy measurements on fill material prior to placement in the excavation.		

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Waste Handling:	
1	Contaminated soils/materials would be direct loaded into a transport container and taken to the railcar loading area or staged. The staged soil would be loaded into a transport container and taken to the railcar loading area prior to completion of activities at Hammond Depot. All materials at the railcar loading area would be loaded and shipped to the receiving disposal site prior to completion of activities at Hammond Depot.
2	Soils will be segeregated based on the following concentration levels:
	Th-232 < 2.9 pCi/g and Th-232 > 2.9 pCi/g
	U-238 < 2.2 pCi/g and U-238 > 2.5 pCi/g
	A determination will be made during the project if any further segregation should be made for soils > 55 pCi/g for Th-232
	and >141 pCi/g for u-238. This will be based on the volumes of material in each category.

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.
(2)	As the soil is being excavated it will be stockpiled at the edge of the excavation. The frontend loader will transfer the material
	and direct load into an intermodal container. During the loading samples of the material will be taken for gamma
	spectroscopy analysis. This data will be used to quantify the concentration levels.

World Environmental
Remediation Work Instructions
Project: Hammond

DATE:	AOC 7 (Area V - Near Railroad Track)

Remediation Activities:		Schedule:	1 day
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Excavation of contaminated materials and soil		
5.	Perform survey of the excavation floor.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Frontend Loader	5.	Water Truck	0	RSO	0	Decon Tech(s)
2.	Excavator	6.		1	HP Supervisor	1	H&S
3.	Railtruck (Intermodals)	7.		1	Waste Broker		
4.	Mower	8.		1	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Dig Permit No underground utilities
	Air Sampling		Water Diversion Materials
	Postings		

Waste Generated, Storage, and Disposition

Concrete		
Soil	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal		

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Soil	22	0.49	11				0
Slag							
Debris							

RSO: Operations: Date:

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	AOC 7 (Area V - Near Railroad Track)

Remediation Activities:		Schedule:	1 day

1	Setup the staging area for the contaminated soil and debris.
2	The excavation of this area will be performed in a manner where all of the contaminated materials will be excavated and
	staged in an ongoing manner. As materials are being excavted HP's will perform continual monitoring using a 2" NaI
	instrument and by collecting and analyzing soil samples with the on-site gamma spec system. As the sample results
	are analyzed, the materials will be staged and/or direct loaded based on the concentration levels.
3	Once the base of the contamination is identified, World will perform a walkover survey and collect soil samples to ensure
	the remediation area will meet the DCGL's of 2.9 pCi/g Th-232 and 2.5 pCi/g U-238. If there is contamination on the slag
	remediation will continue using similar techniques for decontaminating concrete. The slag must meet the surface DCGL's of
	400 dpm/100cm^2 for Th-232 and 800 dpm/100cm^2 for U-238.

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Waste Handling:

1	Contaminated soils/materials would be direct loaded into a transport container and taken to the railcar loading area or staged. The staged soil would be loaded into a transport container and taken to the railcar loading area prior to completion of activities at Hammond Depot. All materials at the railcar loading area would be loaded and shipped to the receiving disposal site prior to completion of activities at Hammond Depot.
2	Soils will be segeregated based on the following concentration levels:
	Th-232 < 2.9 pCi/g and Th-232 > 2.9 pCi/g
	U-238 < 2.2 pCi/g and U-238 > 2.5 pCi/g
	A determination will be made during the project if any further segregation should be made for soils > 55 pCi/g for Th-232
	and >141 pCi/g for u-238. This will be based on the volumes of material in each category.

Rationale for Remediation Activities: The number to the left of the rationale relates to the remediation activities above.

(2)	As the soil is being excavated it will be stockpiled at the edge of the excavation. The frontend loader will transfer the material
	and direct load into an intermodal container. During the loading samples of the material will be taken for gamma
	spectroscopy analysis. This data will be used to quantify the concentration levels.

World Environmental

Remediation Work Instructions

Project: Hammond

DATE:	Building 100E

Remediation Activities:		Schedule:	1day
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Decontaminate the concrete.		
4.	Perform remediation activities / package waste.		
5.	Perform survey to ensure DCGL's are met.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Scarifier	5.	Bobcat / Frontend loader	0	RSO	1	Decon Tech(s)
2.	Manlift	6.	Jack hammers	1	HP Supervisor	1	H&S
3.	Vacuum System	7.	Air compressor	0	Waste Broker		
4.	Concrete Saw	8.	Generator	1	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Safety
	Personnel air sampling		Hot Work Permit
	Environmental air sampling		Structual Integrity Inspection
	Respiratory Protection		

Waste Generated, Storage, and Disposition

Concrete	Contaminated concrete will be removed and staged or direct loaded into transport container	Non impacted concrete will be staged for verification survey and unconditional release.
Soil	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal	N/A	N/A

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Soil							
Concrete	0.82		0.41				
Debris							

RSO: **Operations:** **Date:**

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	Building 100E

Remediation Activities:		Schedule:	1day
1	Write RWP for remediation activities.		
2	Perform a walkdown of the building and discuss activities.		
3	Site / equipment set up - generators, compressors, decon equipment, air samplers, and control lines.		
4	Vacuum the area and determine if contamination removal using scarifying is required.		
5	All waste materials will be staged and or direct loaded based on the contamination levels and material flow at that time.		
6	Complete surveys for concrete and slag, if applicable, and ensure the bottom meets the DCGL's of 400 dpm/100cm^2 for		
	Th-232 and 800dpm/100cm^2 for U-238.		

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Waste Handling:	
1	Establish material flow and staging area(s) for the generated waste.
2	Intermodals will be positioned for loading.
3	Concrete will be assessed for contamination levels as it is being stockpiled.
4	Other materials such as metal and scarifier dust will be staged within the building for characterization prior to loading.

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.

World Environmental

Remediation Work Instructions

Project: Hammond

DATE:	Building 200E

Remediation Activities:		Schedule:	20 days
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Perform remediation activities / package waste.		
5.	Perform survey to ensure DCGL's are met.		

Equipment Required:				Health Physics / Safety Personnel			
1.	Scarifier/ ARMS	5.	Bobcat / Frontend loader	1	RSO	1	Decon Tech(s)
2.	Manlift	6.	Jack hammers	1	HP Supervisor	1	H&S
3.	Vacuum System	7.	Air compressor / generator	1	Waste Broker		
4.	Concrete Saw	8.	Modular tent	3	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Safety
	Personnel air sampling		Hot Work Permit
	Environmental air sampling		Structural Integrity Inspection
	Respiratory Protection		

Waste Generated, Storage, and Disposition

Concrete/aspha	Contaminated concrete will be removed and staged or direct loaded into transport container	Non impacted concrete will be staged for verification survey and unconditional release.
Soil/Slag	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Asphalt	Contaminated asphalt will be removed and staged or direct loaded into transport container	Non impacted asphalt will be removed and staged or direct loaded into transport container for disposal at subtitle D landfill

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	Area Ft^2	Depth (Ft)	Volumes Ft^3	Activity Th-232 ($dpm/100cm^2$)		Concentration Th-232 (pCi/g)	
				Average	Max	Range	Max
Slag	9700		3200				
Asphalt	9700	0.17	812				
Concrete	9700		4945				

RSO: Operations: Date:

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	Building 200E

Remediation Activities:		Schedule:	20 days
1	Write RWP for remediation activities.		
2	Perform a walkdown of the building and discuss activities.		
3	Site / equipment set up - generators, compressors, decon equipment, air samplers, and control lines.		
4	Remove asphalt and stockpiled.		
5	Scarify contaminated concrete and cut out contaminated expansion joints.		
6	Remove contaminated concete.		
7	Assess the slag layer and decontaminate as necessary.		
8	Assess contamination and determine migration into base of walls / footers.		
9	Decontaminate columns, bases and walls.		
10	Remove over head duct work and dispose. Perform any required decontamination of the remaining overhead surfaces.		
11	All waste materials will be staged and or direct loaded based on the contamination levels and material flow at that time.		
12	Complete surveys for concrete and slag and ensure the floors, walls, and overhead surfaces meets the DCGL's of		
	400dpm/100cm^2 for Th-232 and 800dpm/100cm^2 for U-238.		

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Waste Handling:	
1	Establish material flow and staging area(s) for the generated waste.
2	Intermodals will be positioned for loading.
3	Concrete will be assessed for contamination levels as it is being stockpiled.
4	Asphalt will assessed for contamination as it is being stockpiled. Contaminated asphalt will transferred to the rail loading
	station and off loaded in the stockpile or direct loaded for shipment. Clean asphalt will be segregated and shipped off site for dis
5	Other materials such as metal and scarifier dust will be staged within the building for characterization prior to loading in a subtitl

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.
(7)	Contamination on the slag will be assessed as the concrete is removed. The most efficient decontamination techniques will
	be determined onsite. Scarifying, jack hammering and other aggressive techniques will be available.
(8)	The depths of the radiological contamination in the column bases are not known but it is likely the surface contamination can be removed with no impact to structural integrity. Although it is likely that the amount of material to be removed will be small, there is no guarantee that this will be the case. A qualified structural engineer will make the field determination where the physical situation encountered warrants that degree of expertise.
(9)	A handheld scarifier or the ARMS unit will be used. If the contamination is such that removal will affect the integrity of the
	column base, the work will stop until a structural engineer can perform an assessment and subsequebnt recommendations.

World Environmental

Remediation Work Instructions

Project: Hammond

DATE:	**Building 200E (Northwest Closet)**

Remediation Activities:		**Schedule:**	2 days
1.	Setup monitoring equipment and write the RWP.		
2.	Delineate the boundaries for the AOC and post.		
3.	Setup the staging area for the contaminated soil and debris.		
4.	Perform remediation activities / package waste.		
5.	Perform survey to ensure DCGL's are met.		

Equipment Required:				**Health Physics / Safety Personnel**			
1.	Scarifier	5.	Bobcat / Frontend loader	1	RSO	1	Decon Tech(s)
2.	Manlift	6.	Jack hammers	1	HP Supervisor	1	H&S
3.	Vacuum System	7.	Air compressor	1	Waste Broker		
4.	Concrete Saw	8.	Generator	1	HP Tech(s)		

Picture of Area

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Health Physics / Safety Checklist			
	RWP		Safety
	Personnel air sampling		Hot Work Permit
	Environmental air sampling		Structual Integrity Inspection
	Respiratory Protection		

Waste Generated, Storage, and Disposition

Concrete/asphault	Contaminated concrete will be removed and staged or direct loaded into transport container	Non impacted concrete will be staged for verification survey and unconditional release.
Soil/Slag	Contaminated soil will be staged or direct loaded into transport container	Non impacted soil will be staged for verification sampling and released to be used as backfill.
Metal	N/A	N/A

Depths, Volumes, Area, Radiation Levels, and Concentrations

Media	**Area Ft^2**	**Depth (Ft)**	**Volumes Ft^3**	**Activity Th-232 ($dpm/100cm^2$)**		**Concentration Th-232 (pCi/g)**	
				Average	**Max**	**Range**	**Max**
Soil/Slag							
Concrete/Asphalt	**25**	**0.17**	**12**				
Debris/Metal							

RSO: **Operations:** **Date:**

World Environmental
Remediation Technical Approach
Project: Hammond

DATE:	LOCATION:	Building 200E (Northwest Closet)

Remediation Activities:		Schedule:	2 days
1	Write RWP for remediation activities		
2	Perform a walkdown of the building and discuss activities.		
3	Site / equipment set up - generators, compressors, decon equipment, air samplers, and control lines.		
4	Assess contamination and determine migration into base of walls / footers.		
5	Scarify contaminated concrete.		
6	Remove any contaminated concrete that cannot be successfully scarified.		
7	All waste materials will be staged and or direct loaded based on the contamination levels and material flow at that time.		
8	Complete surveys for concrete and ensure the floors, walls, and overhead surfaces meets the DCGL's of 400 dpm/100cm^2 for		
	Th-232 and 800dpm/100cm^2 for U-238.		

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Waste Handling:	
1	Establish material flow and staging area(s) for the generated waste.
2	Intermodals will be positioned for loading.
3	Concrete will be assessed for contamination levels as it is being stockpiled.
4	Other materials such as metal and scarifier dust will be staged within the building for characterization prior to loading.
5	Soils will be segeregated based on the following concentration levels:
	Th-232 < 2.9 pCi/g and Th-232 > 2.9 pCi/g
	U-238 < 2.2 pCi/g and U-238 > 2.5 pCi/g

Rationale for Remediation Activities:	The number to the left of the rationale relates to the remediation activities above.
(4)	For contamination on walls and floors near walls / footers, an assessment will be made concerning how intrusive decontaminatio
	and remediation my affect the structural integrity. If required a structural engineer will be utilized to ensure all remediation
	activities are performed safely.

ATTACHMENT C

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HEADING CHANGES
IN DECOMMISSIONING/REMEDIATION PLAN

is administered in compliance with 10 CFR 20, Subpart H. Details on the engineering controls and precautionary measures can be found in Sections 5, 6 and 17 of the ORPP.

The Contractor shall submit a safety and health plan for review and approval by DNSC with review and concurrence provided by ORNL and ORISE. The safety and health plan shall include a radiation protection plan.

9.2. MONITORING FOR WORKERS

9.2.1. External Exposure

The RSO has evaluated the potential for external exposures in excess of 500 mrem in one year. Such doses are not possible because the licensable source material has been removed. Therefore, DNSC is not providing monitoring devices for external radiation exposure.

9.2.2. Internal Exposure (Bioassay)

For selected contaminated buildings, the contractor may incorporate air sampling in their detailed work plans and procedures as a conservative measure to assess airborne conditions and verify assumptions. Care is required for specifying the filter count duration to assure Rn-220 (thoron) and its progeny are distinguished from actual airborne contamination. For most, if not all areas, monitoring for internal exposures of radioactivity is not expected to be required since personnel involved in decommissioning related activities are not expected to receive an annual intake in excess of 10 percent of the applicable annual limit on intakes (ALI(s)) in Table 1, Columns 1 and 2, of Appendix B to 10 CFR Parts 20.1001 and 20.2402.

9.3. SURVEY INSTRUMENTATION

The SOW states that the Contractor shall furnish radiological instruments and calibration sources for those instruments. The SOW also specifies that the Contractor shall submit a detailed calibration program and requires the use of calibration sources traceable to the National Institute of Standards and Technology (NIST).

9.4. SURVEYS FOR RELEASE OF SURFACE-CONTAMINATED MATERIALS

9.4.1. Supplies & Equipment

As described in Section 12.2 of the ORPP, residual radioactivity for supplies and equipment that will be removed from a site for unrestricted release will be surveyed to ensure that residual surface radioactivity present does not exceed the limits established in the NRC document "Guidelines for Decommissioning of Facilities and Equipment Prior to Release for Unrestricted Use or the Termination of Licenses for By-Product, Source, or Special Nuclear Material," July 1982.