2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 BACKGROUND

Uranium is a radioactive element that occurs naturally as an oxide ore (U_3O_8) in the Earth's crust. In order to make the uranium useful for nuclear fuel or military applications, the ore is usually concentrated and then fluorinated to yield UF_6, which is further processed to achieve an end-use product. End-use products are typically in the chemical form of uranium metal or the oxide. UF_6 is not included in this PEA.

In its natural state, uranium consists of several different isotopes, notably ^{238}U and ^{235}U, which make up ~99.3% and 0.711%, respectively, of the total uranium mass. (Man-made uranium materials have been created that achieve the same ^{235}U% as the natural uranium. In this PEA, NU refers to 0.711% ^{235}U materials created through synthetic processes as well as to natural uranium.) NU is, thus, referred to as "normal" uranium, a term widely used in the uranium industry. In most nuclear reactors, the ability to use uranium for controlled fission in nuclear chain reactions depends on increasing the proportion of ^{235}U in the material relative to ^{238}U. This isotopic separation process is called "enrichment." In this process, a stream of UF_6 containing both ^{235}U and ^{238}U is divided into separate streams. One is increased, or enriched, in its percentage of ^{235}U (typically to 3.5%) and is commonly referred to as LEU. The other is reduced, or depleted, in its percentage of ^{235}U (typically to 0.25%) and is commonly referred to as DU. (When the ^{235}U is increased by 20% or more, the material is commonly referred to as highly enriched uranium (HEU), which is not in the scope of this PEA.)

During World War II, the Manhattan Project established a system of nuclear weapons sites that came to be known as the nuclear weapons complex. During the Cold War, this complex was expanded and maintained by DOE and its predecessor agencies. The mission of many sites was the processing of uranium in different chemical forms, followed by the fabrication of weapons components. With the end of the Cold War, a number of DOE sites were left with large uranium inventories in various chemical forms that are now excess to national security needs. The mission of some of the former nuclear weapons complex sites is environmental remediation, and DOE is now dispositioning uranium from these sites in support of agreements with state and federal regulatory agencies.

In addition to defense missions, some of the DOE sites processed uranium for use in commercial nuclear power plants and for research and development programs. Under these programs, many colleges and universities and other government agencies possess DOE-owned uranium materials obtained through contractual or loan/lease agreements. Some of this loaned or leased material is now being returned to the DOE inventory.

DOE's inventories of excess LEU, NU, and DU, within the scope of this PEA, total approximately 14,200 MTU and reside at more than 150 different sites as shown in Table 2-1. Large inventories, however, are found at only a few sites. These sites have different missions and different types of uranium material. All of the approximately 14,200 MTU at the various sites is anticipated to move to an interim storage location prior to final disposition.

The data summarized in Table 2-1 and included within the scope of this PEA are taken from a 2000 DOE Nuclear Material Inventory Assessment (NMIA). It includes LEU, NU, and DU considered "excess" (i.e., no longer required for the national defense mission) but potentially reusable in the future. The data from the NMIA were increased by 10% to reflect ongoing uranium material transfer activities (i.e., amounts of uranium materials currently stored at a specific location may be higher than those indicated by these data).

Table 2.1. Uranium management inventory

Site	Amount, MTU
Potential interim storage locations	
INEEL	1,521
PGDP	1
PORTS	4,393
SRS	2,995
Oak Ridge (Y-12 Complex, ETTP, and ORNL)[a]	1,445
Total	10,355
Other DOE Sites	
Sandia National Laboratories	18
Los Alamos National Laboratory	12
Fermi National Accelerator Laboratory	287
Argonne National Laboratory, Illinois	19
Argonne National Laboratory, Idaho	228
Brookhaven National Laboratory	22
Fernald	691
Hanford	1,325
Pacific Northwest Laboratory	7
Lawrence Livermore	38
Miscellaneous (9 sites total)	~1
Total	2,648
Other locations	
Foreign (3 ports of entry)	600
Non-DOE sites (45 sites total)	51
Universities (79 sites total)	560
Total	1,211
Total for all locations (158 sites total)	**14,215**

[a]ORNL is not a potential interim storage location.
DOE = U.S. Department of Energy.
ETTP = East Tennessee Technology Park.
INEEL = Idaho National Engineering and Environmental Laboratory.
MTU = metric tons of uranium.
ORNL = Oak Ridge National Laboratory.
PGDP = Paducah Gaseous Diffusion Plant.
PORTS = Portsmouth Gaseous Diffusion Plant.
SRS = Savannah River Site.
Y-12 Complex = Y-12 National Security Complex.

The mission of the Y-12 Complex has been and continues to be the refining, fabrication, and stockpiling of uranium.

The mission of ETTP, PGDP, and PORTS has historically been to enrich uranium in the chemical form of UF_6. PGDP continues this mission today, while ETTP is undergoing reindustrialization, decontamination and decommissioning, and environmental restoration. The largest inventory of uranium at each of the three sites is DU in the form of UF_6, which is not within the scope of this PEA. However, PORTS received uranium from the Fernald site in Ohio and the Hanford Site in Washington per two environmental assessments (EAs) [DOE 1999 and 2000]. The Fernald and Hanford uranium materials are discussed in the next paragraph. Neither ETTP nor Paducah has appreciable quantities of uranium that fall within the scope of this PEA. However, each site does have a continuing uranium mission or facilities.

PORTS has received and is storing almost all of the uranium materials evaluated in the two environmental assessments mentioned above. The Fernald and Hanford sites desire to disposition their remaining stored uranium, including their potentially reusable quantities of LEU, NU, and DU that fall within the scope of this PEA. Fernald's primary mission today is environmental restoration. Historically, it conducted uranium refining and fabrication operations. The largest inventories of uranium at Fernald that fall within the scope of this PEA are DU in the form of metal and uranium tetrafluoride (UF_4), NU in the form of metal, and LEU in the form of metal and oxide. Most of this uranium has already been sent to the Portsmouth Site. Hanford's primary mission today is also environmental restoration. Historically, it conducted fuel fabrication, reactor operations, and chemical separation activities. The largest inventory of uranium at Hanford that falls within the scope of this PEA is LEU in the form of metal and oxide.

SRS has historically conducted fuel fabrication, reactor operations, and chemical separation activities. In addition, DOE recently decided to locate one key plutonium disposition facility at SRS. The majority of the approximately 19,500 MTU of uranium trioxide at SRS is likely to remain there for the foreseeable future and is not considered within the scope of this PEA. These oxides are not part of the UMG inventory. The largest inventory of uranium at SRS that falls within the scope of this PEA is DU in the form of metal.

INEEL has conducted chemical separation activities for spent fuels from the U.S. Navy and research reactors. The largest inventory of uranium at INEEL that falls within the scope of this PEA is DU in the form of metal.

Table 2.2 provides a summary of the various interim storage alternatives to be considered in the PEA, the amount of uranium indicated in the 2000 NMIA data as stored at each of the major DOE sites, and the amount of uranium product potentially to be moved (including the estimated number of trucks or railcars needed for shipment). These amounts are 10% higher than the actual 2000 NMIA data. Tables 2.3, 2.4, and 2.5 show the packaging assumptions and transportation assumptions used to derive the number of containers, trucks, and railcars shown in Table 2.2. Estimates of storage space requirements at each site are shown in Table 2.7.

It should be noted that the NMIA data used for this study did not identify numbers of containers or container types for the various types of uranium material included in the PEA. This information is necessary to determine transportation impacts and storage requirements. Therefore, the number of containers shown in Table 2.2 may not reflect current storage conditions; rather, the assumptions outlined in Tables 2.3 and 2.4 and described below were used in order to evaluate all materials consistently. For example, SRS indicates the site has 3,861 wooden and cardboard boxes containing uranium metal (DU, NU and LEU) and 381 drums of LEU oxide. However, if these materials were repackaged for shipment to a different interim storage location, using the assumption in Tables 2.3 and 2.4, the number of containers would be reduced. In addition, the storage requirements shown in Table 2.6 may not reflect current storage configurations, but rather assume that all materials at a site are stored in a consistent storage array under similar conditions. The following assumptions were used to derive the number of containers either currently in storage, or anticipated to be moved, and the storage space requirements for each alternative:

- Two types of containers were considered: (1) 55-gal drums and (2) full-size ($7 \times 4 \times 4$ ft), strong, tight metal boxes (Fig. 2.1). Table 2.3 indicates the capacity of each type of container and the types of material assumed to be placed in those containers. Each line item of data in the NMIA database provided for this study was considered separately in order to determine which type of container it would be placed in (i.e., items were not combined in order to reduce the number of containers).

- Amounts of material that can be packaged in single containers are shown in Table 2.4. These values are based on container capacity for DU and NU fissile material limits for ^{235}U (10 *Code of Federal Regulations* 71.24) for Type A containers for LEU. Material types (DU, LEU, and NU) are not mixed in a single container.

Table 2.2. Uranium management PEA interim storage alternatives

Interim storage alternative	Description	Site/form	Assumed storage[a] Amount (10^3 MTU)	Assumed storage[a] Number of containers	Additional materials to be moved Amount (10^3 MTU)	Additional materials to be moved Number of containers	Additional materials to be moved Number of sites	Additional materials to be moved Number of trucks	Additional materials to be moved Number of railcars
No Action	Continued storage at current sites. Total material included in the PEA is ~14,200 MTU	INEEL	1.5	639	N/A	N/A	N/A	N/A	N/A
		PGDP	<0.1	8					
		PORTS	4.4	24,765					
		SRS	3.0	2,867					
		Oak Ridge	1.4	6,431					
		All others	3.9	37,124					
Interim centralized storage at a single DOE site	All material transferred to a single, centralized DOE storage location	INEEL	1.5	639	12.7	71,195	157	5,425	4,857
		PGDP	<0.1	8	14.2	71,826	157	5,525	4,884
		PORTS	4.4	24,765	9.8	47,069	157	3,899	3,417
		SRS	3.0	2,867	11.2	68,967	157	5,195	4,693
		Oak Ridge	1.4	6,431	12.8	65,403	157	4,958	4,369
Interim centralized storage at a single commercial site	All material transferred to a single, centralized commercial storage location (east or west)	East, West	N/A	N/A	14.2	71,834	158	5,526	4,884
Interim partially consolidated storage at several DOE sites	Material moved to the closest consolidated storage location	INEEL	1.5	639	1.7	21,391	46	1,814	1,757
		PGDP	<0.1	8	0.4	400	24	49	14
		PORTS	4.4	24,765	1.4	13,458	66	995	904
		SRS	3.0	2,867	<0.1	63	7	7	0
		Oak Ridge	1.4	6,431	0.4	1,812	10	33	9
Interim partially consolidated storage at two DOE sites	Material consolidated at PORTS and INEEL	PORTS	4.4	24,765	6.6	24,940	92	1,966	1,633
		INEEL	1.5	639	1.7	21,490	64	1,832	1,757
Interim partially consolidated storage at two commercial sites	Material consolidated at one Eastern and one Western commercial site	East, West	N/A	N/A	11.0	49,705	93	3,593	3,100
			N/A	N/A	3.2	22,129	65	1,933	1,784

Table 2.2. Uranium management PEA interim storage alternatives (continued)

Interim storage alternative	Description	Site/form	Assumed storage[a]		Additional materials to be moved				
			Amount (10^3 MTU)	Number of containers	Amount (10^3 MTU)	Number of containers	Number of sites	Number of trucks	Number of railcars
Interim partially consolidated storage based on physical form	Material consolidated by physical form (i.e., the site with the largest quantity of a specific physical form is the preferred storage location for all materials of that form)	Compound (PORTS)	1.7	7,221	<0.1	1,034	12	106	78
		Metal (SRS)	2.9	1,088	6.0	32,918	21	2,903	2,676
		Misc. (PORTS)	0	0	1.2	4,998	121	220	25
		Oxide (PORTS)	0.9	15,333	0.5	7,807	17	676	648
		Reactor fuel (INEEL)	0.5	184	0.4	827	25	111	65
		Residue (INEEL)	<0.1	55	<0.1	174	7	17	5
		Source (INEEL)	<0.1	8	<0.1	187	21	42	9

DOE = U.S. Department of Energy.
INEEL = Idaho National Engineering and Environmental Laboratory.
MTU = metric tons of uranium.
PEA = programmatic environmental assessment.
PGDP = Paducah Gaseous Diffusion Plant.
PORTS = Portsmouth Gaseous Diffusion Plant.
N/A = not applicable.
SRS = Savannah River Site.

[a]It should be noted that the Nuclear Material Inventory Assessment data used for this study did not identify numbers of containers or container types for the various types of uranium material included in the programmatic environmental assessment. This information is necessary to determine transportation impacts and storage requirements. Therefore, the number of containers shown in Table 2.2 may not reflect current storage conditions; rather, the assumptions outlined in Tables 2.3 and 2.4 were used in order to evaluate all materials consistently. For example, Savannah River Site indicates the site has 3,861 wooden and cardboard boxes containing uranium metal (depleted uranium, normal uranium, and low enriched uranium) and 381 drums of LEU oxide. However, if these materials were repackaged for shipment to a different interim storage location, using the assumptions in Tables 2.3 and 2.4, the number of containers would be reduced.

Table 2.3. Packaging assumptions for uranium management PEA

Physical form(s)	Assumed container type[a]
Compound	Drum
Metal (>540 lb)	Metal box
Metal (<540 lb)	Drum
Miscellaneous	Drum
Oxide (>540 lb)	Metal box
Oxide (<540 lb)	Drum
Reactor fuel (>540 lb)	Metal box
Reactor fuel (<540 lb)	Drum
Residue	Drum
Source	Drum

[a]Assumes no mixing of material type and physical form in a single container. All low-enriched uranium (LEU) materials, regardless of amount or physical form, are packaged in drums.

PEA = programmatic environmental assessment.

Table 2.4. Container assumptions for uranium management PEA

Material type(s)	Assumed container type	Amount per container (lb)
DU, NU	Drum	540
	Metal box	5,850
LEU[a]	Drum	130

[a]Based on fissile material limits of 800 g/container at 1.35% ^{235}U (10 *Code of Federal Regulations* 71.20 for Type A containers).

DU = depleted uranium.

LEU = low-enriched uranium.

NU = normal uranium.

PEA = programmatic environmental assessment.

Table 2.5. Transportation assumptions for uranium management PEA

Transport vehicle	Material type(s)	Container type	Maximum number[a]
Truck	DU, NU	Drums	64
	LEU[b]	Drums	12
	DU, NU	Metal boxes	6
Railcar	DU, NU	Drums	240
	LEU[b]	Drums	12
	DU, NU	Metal boxes	26

[a]Maximum number based on weight and/or ^{235}U limits. Assumes no stacking for trucks or any LEU containers; railcar pallets and boxes stacked two high for DU, NU.

[b]Based on fissile material limits of 10,000 g/consignment (i.e., single truck or railcar) at 1.35% ^{235}U (10 *Code of Federal Regulations* 71.20 for Type A containers).

DU = depleted uranium.

LEU = low-enriched uranium.

NU = normal uranium.

PEA = programmatic environmental assessment.

Table 2.6. Uranium management PEA interim storage requirements

Alternative	Site	Amount (10^3 MTU)	Number of containers	Estimated storage requirement (ft^2)
No Action	INEEL	1.5	639	7,000
	PGDP	<0.1	8	100
	PORTS	4.4	24,765	75,000
	SRS	3.0	2,867	19,000
	Oak Ridge	1.4	6,431	25,000
Interim centralized storage at a single DOE or commercial site	Any	14.2	71,834	243,000
Interim partially consolidated storage at several DOE sites	INEEL	3.2	22,030	79,000
	PGDP	0.4	408	2,000
	PORTS	5.8	38,223	116,000
	SRS	3.0	2,930	19,000
	Oak Ridge	1.9	8,243	28,000
Interim partially consolidated storage at two DOE or two commercial sites	PORTS/East	11.0	49,705	165,000
	INEEL/West	3.2	22,129	79,000
Interim partially consolidated storage based on physical form	PORTS	4.4	36,393	100,000
	SRS	8.9	34,006	136,000
	INEEL	0.9	1,435	7,000

DOE = U.S. Department of Energy.
INEEL = Idaho National Engineering and Environmental Laboratory.
MTU = metric tons of uranium.
PEA = programmatic environmental assessment.
PGDP = Paducah Gaseous Diffusion Plant.
PORTS = Portsmouth Gaseous Diffusion Plant.
SRS = Savannah River Site.

Table 2.7. Uranium management PEA disposition options

Disposition option	Description	Material type(s)	Amount (10^3 MTU)	Number of containers	Number of trucks	Number of railcars
Commercial processing/domestic sales	All material transferred from interim storage to a single commercial processing facility or single sales distribution point (east or west)	All	14.2	71,834	5,529	4,882
Transfer to research facilities	Transfer ~50 MTU from interim storage to the furthest DOE or other research location	DU, NU	0.05	204	4	1
		LEU	0.05	844	71	71
Transfer to other government agencies	Transfer ~2,500 MTU from interim storage to unspecified location (use furthest distance already evaluated)	DU, NU	2.5	10,186	160	43
		LEU	2.5	42,188	3,516	3,516
Foreign sales	All LEU/NU (~4,050 MTU) transferred to eastern or western port for overseas shipment	LEU	3.3	56,408	4,701	4,701
		NU	0.7	1.432	49	13

DOE = U.S. Department of Energy.
DU = depleted uranium.
LEU = low-enriched uranium.
MTU = metric tons of uranium.
NU = normal uranium.
PEA = programmatic environmental assessment

Fig. 2.1. Example of the 55-gallon drums and metal storage containers used at PORTS.

- Shipments were based on truck and railcar capacities as shown in Table 2.5. Storage alternatives were evaluated using both rail and truck transport, except in those instances in which the amount of material to be shipped was small enough to fit into a single truck, in which case only truck shipment was evaluated. However, containers and material types are not mixed in a single shipment (i.e., if there are not enough drums to fill an entire truck, metal boxes are not added). This assumption also tends to result in a conservative estimation of the number of trucks and railcars.

- Storage requirements (Table 2.6) are based on an assumed storage configuration that includes four drums per pallet, with pallets stacked four high and metal boxes stacked four high for DU and NU. Containers with LEU are stacked two high. Stacks of drums and boxes are arranged two deep so that access by material handling equipment is ensured. Also, aisle space is allowed every 40 ft and around the perimeter.

2.2 NO ACTION ALTERNATIVE

The No Action alternative would continue ongoing storage activities at all existing facilities. This alternative includes the continued storage of uranium materials in existing facilities (DOE and private). Monitoring and surveillance of the uranium materials at each site would continue, as would the handling necessary to continue proper management of these materials, including repackaging if needed. The uranium inventory would not be dispositioned (see Section 2.3.8).

2.3 PROPOSED ACTION

DOE proposes to implement a long-term (greater than 20 years) management plan for its inventory of potentially reusable LEU, NU, and DU. Uranium materials, which are presently located at multiple sites, are to be consolidated by transporting the materials to one or several storage locations, to facilitate ultimate disposition. The management plan will address the packaging and transport of potentially reusable uranium materials from DOE sites and university loan/lease returns and their receipt and storage at a site under cognizance of the UMG. This action will also cover material shipment from the UMG and disposition. A Secretarial Determination is required, under certain circumstances, for uranium in the UMG inventory to be sold. Twenty years will provide time for additional reviews required for any future related actions that may be desirable to help accomplish ultimate disposition. Impacts evaluated in Chapter 4 cover the 20-year period of this management plan.

The management plan will cover uranium materials that are currently in the form of oxides, metals, and other stable compounds such as UF_4. The quantity of uranium within the scope of this PEA is estimated to be 14,200 MTU and is primarily located at a few DOE locations (INEEL, PORTS, SRS, and Oak Ridge). These DOE locations have other uranium materials which are not part of the UMG inventory and not part of the 14,200 MTU addressed in the proposed action. This number is based on the 2000 NMIA data increased by approximately 10% to reflect uncertainties in material shipment. The plan will not include irradiated material, UF_6, enrichment of 20% or greater ^{235}U, or ^{233}U.

DOE must determine the safest, most effective, and most efficient approach for the consolidation and storage of this material. Consideration will be given only to those locations (DOE and commercial) within the continental United States that have a long-term mission for the handling and storage of uranium material. This material would be stored in either one (centralized) location or several (consolidated) locations. Approximately 14,200 MTU may be consolidated into one or more storage locations. This material is the primary focus of this PEA.

Since disposition of this material is currently undefined, a "bounding" analysis is performed to estimate the potential impacts from commercial processing of this material, use of this material in research activities, provision of this material to other Government agencies, and/or the sale (international/domestic) of this material upon expiration of the current moratorium. Disposition is a component of each of the action alternatives and impacts would differ based only on differences in transportation. Some wastes would be produced during this disposition process.

2.3.1 Interim Centralized Storage at a Single DOE Site

This alternative would consolidate all 14,200 MTU uranium materials at one DOE location. The potential storage sites are as follows:

- PORTS, in Pike County, Ohio;
- PGDP, near Paducah, Kentucky;
- INEEL, near Idaho Falls, Idaho;
- the Y-12 Complex and ETTP, in Oak Ridge, Tennessee; and
- SRS, near Aiken, South Carolina.

These six DOE sites have an existing inventory totaling approximately 10,300 MTU of LEU, NU, and DU in the scope of this EA. In addition, there is a relatively small amount (3,900 MTU) at 152 other sites located around the United States. The DOE preferred alternative would be to locate all these materials at the PORTS. PORTS is preferred because of its combination of characteristics:

- successful on-going receipt and storage of the uranium materials from Fernald and Hanford and universities,
- the existence of a uranium management infrastructure,
- personnel experienced in all relevant aspects of uranium operations,
- the availability of buildings with requisite floor space and nuclear safety alarm systems, and
- an ongoing uranium mission or facilities.

2.3.2 Interim Centralized Storage at a Single Commercial Site

This alternative assumes that all 14,200 MTU within the scope of this EA at existing DOE sites would be consolidated at a single commercial site. A commercial site in either the western or eastern United States would receive all the uranium materials. DOE has not identified specific commercial sites at this time. However, DOE must consider this possibility in the event that a commercial site is identified in the future. Therefore, for analysis purposes, especially transportation which requires definitive travel routes, a generic western (Utah) site and an eastern (South Carolina) site have been assumed. These sites should provide a reasonable bound for the transportation impacts.

2.3.3 Interim Partially Consolidated Storage at Several DOE Sites

Under this alternative, the six major DOE sites considered as single, consolidated storage sites will retain their existing uranium material inventory. In addition, the 3,900 MTU of uranium materials at the other 152 sites will be moved to these six sites based on proximity (closest distance).

2.3.4 Interim Partially Consolidated Storage at One Western and One Eastern DOE Site

Under this alternative two DOE sites, one in the western United States (INEEL) and one in the eastern Untied States (PORTS), will retain their existing uranium material inventories. The remaining inventory in

the three major DOE sites, plus the 3,900 MTU of uranium materials at the other 157 sites, will be moved to these two sites based on proximity.

2.3.5 Interim Partially Consolidated Storage at One Western and One Eastern Commercial Site

This alternative assumes that all 14,200 MTU at existing DOE sites would be consolidated at two commercial sites, one in the western United States and one in the eastern United States. Materials would be shipped to these two sites based on closest distance. DOE has not identified specific commercial sites at this time.

2.3.6 Interim Partially Consolidated Storage by Physical Form

Under this alternative, the 14,200 MTU of uranium materials would be consolidated at three DOE sites (PORTS, SRS, and INEEL) based on physical form. It is assumed that PORTS would receive all the compounds, miscellaneous, and oxide uranium materials (about 4,400 MTU), while SRS would receive the metals (more than 8,900 MTU) and INEEL would receive the reactor fuel, residue, and sources (about 900 MTU). The sites with the largest inventory of a particular form (such as metals at SRS) would receive all of that form from every site.

2.3.7 Transfer of Small Quantities

DOE must be able to transfer small quantities (less than 0.1 MTU) from any one of the potential consolidated or centralized storage sites to a second location (such as a university). This option will be considered as a component of each alternative under the proposed action. It is not itself a stand-alone alternative. The impacts are bounded under the disposition option discussed below.

2.3.8 Disposition Options

Disposition is a component of each of the interim storage alternatives and not a separate alternative. DOE may dispose of all, or part, of the uranium materials in one of several ways. These reuse scenarios are speculative at this time, especially in regard to the quantities of uranium and timing of movement for a particular disposition path. Table 2.7 indicates the final disposition options and the amounts of uranium materials that are expected to be sent to each of these options from their respective interim storage locations. Any material not included in a specific disposition option can be included with any of the other disposition options. The disposition options are an integral constituent of each alternative, and all four options are included with each alternative when impacts are analyzed.

2.3.8.1 Commercial Processing/Domestic Sales

One option is the sale of some of the uranium materials to the domestic commercial nuclear fuel market after the sales moratorium on certain uranium materials has expired in 2008. Metals and oxides could be sold to commercial nuclear vendors for the manufacture of nuclear fuel for commercial nuclear power plants. Another scenario is the use of the uranium materials to down-blend HEU in conjunction with arms reduction treaties; the resulting LEU could be readily used in commercial nuclear power plants. The total quantity of 14,200 MTU may be reprocessed commercially or sold domestically. A generic eastern and a generic western processing site, or sales distribution point, will be assumed for analysis purposes.

2.3.8.2 Transfer to Research Facilities

Approximately 50 MTU would be potentially received by research facilities. This is based on material that is stored by the UMG that is in an acceptable form to be received by these facilities. The total 50 MTU

would be transferred to a single site assumed to be the greatest distance from one of the six proposed DOE interim storage locations.

2.3.8.3 Transfer to Other Government Agencies

There would be approximately 2,500 MTU that could be provided to other government agencies. The uranium materials would be the Fernald Environmental Management Project (FEMP) DU and FEMP and Hanford uranium trioxide (UO_3). The military could use uranium metal in the armoring of military vehicles and in the manufacture of military vehicle penetrators. The total 2,500 MTU would be transferred to a single, unspecified location assumed to be the greatest distance from one of the six proposed DOE interim storage locations.

2.3.8.4 Foreign Sales

One option is the sale of some of the uranium materials to the international commercial nuclear fuel market after the sales moratorium on certain uranium materials has expired in 2008. The total LEU and NU would be approximately 4,050 MTU for international sales. This assumes that DU would not be a desired commodity internationally. The LEU and NU would be transferred from their interim storage locations to the closest international port (assumed to be Hampton Roads as an eastern port or San Diego for a western port) and shipped via cargo vessel to the farthest port in Asia or the Far East.

2.4 ALTERNATIVES CONSIDERED BUT NOT PROPOSED FOR ANALYSIS

An alternative DOE considered is to declare all of the uranium materials (14,200 MTU) included in the PEA scope as waste and dispose of them. DOE believes there is an essential need (current and ongoing) to effectively manage its existing uranium materials inventory as a government asset. Therefore, DOE believes an alternative involving the disposition of the uranium materials as waste is not reasonable. However, prior to transport and storage, the uranium material inventory addressed in this proposed action would be evaluated to ensure that none of these materials is waste. DOE has additional uranium inventories which are not reusable and might be declared waste. Also, DOE has other inventories which are not waste but, for various Department reasons, are not addressed in this EA.