How many years will it take to complete the disposition process? | 1

When will the decision [*by DOE*] be made? | 2

I support the hybrid approach for plutonium disposition. I support 33 metric tons going to MOX fuel. For immobilization of the 17 metric tons, I suggest that 7 metric tons be immobilized, and the decision on the rest (10 metric tons) be delayed until the two processes are demonstrated. | 3

PORTLD–1 **Alternatives**

Appendix E includes schedules for the proposed surplus plutonium disposition facilities. Under the hybrid approach, the proposed facilities would cease operation by 2019. Section 4.30.2 includes a discussion and analysis of a slightly extended period of operation to account for potential delays due to issues such as negotiations with other countries and facility startup experiences. By 2016, the immobilization effort would be complete, and the HLW canisters containing the immobilized plutonium would be in storage awaiting disposition at the potential geologic repository. However, some of the MOX fuel assemblies might still be in reactors or awaiting insertion; DOE's *RFP for MOX Fuel Fabrication and Reactor Irradiation Services* (May 1998) specified a timetable that included a date for last insertion of MOX fuel into a reactor of no later than 2019. If the last insertion occurs in 2019, these assemblies could be undergoing irradiation until 2022. If all the surplus plutonium were dispositioned through immobilization, that effort would be completed by 2016.

PORTLD–2 **General SPD EIS and NEPA Process**

DOE will announce its decision regarding the surplus plutonium disposition program in the SPD EIS ROD. The ROD will be issued no sooner than 30 days after publication of this EIS.

PORTLD–3 **Alternatives**

DOE acknowledges the commentor's support of the hybrid approach to surplus plutonium disposition. The amount of surplus plutonium directed to each option is related to the suitability of the plutonium for use as MOX fuel. In the ROD for the *Storage and Disposition PEIS*, DOE decided that approximately 8 t (9 tons) of the current surplus plutonium were not suitable for use in MOX fuel, and would therefore be immobilized. As described in this SPD EIS, an additional 9 t (10 tons) were identified as unsuitable for MOX fuel fabrication. The 17 t (19 tons) of surplus plutonium are not suitable for fabrication due to the complexity, timing, and cost that would be involved in purifying the material. The remaining 33 t (36 tons) of the 50 t (55 tons) of surplus plutonium would be fabricated into MOX fuel. Both immobilization and MOX technologies are sufficiently mature and demonstrated. Therefore,

I support the can-in-canister technology/approach. What is the difference between the can-in-canister technology and regular vitrification? Is the canister made of steel? When will the container dissolve? Will it last for 10,000 years? When things disintegrate is a primary question when dealing with hot materials. DOE needs to go high-quality, not cut costs at the expense of safety. 4

Where will the vitrification occur? 5

decisions on the amount of plutonium to be dispositioned by each method can be made. In fact, MOX fuel is routinely fabricated and used in Western Europe. This experience would be used for disposition of the U.S. surplus plutonium. Any R&D currently underway or planned for the near future would only contribute to fine-tuning and increasing the efficiency of the processes, but would not affect disposition technology decisions.

PORTLD–4 **Immobilization**

DOE acknowledges the commentor's support of the can-in-canister immobilization approach to surplus plutonium disposition. In the "regular" vitrification approach, the surplus plutonium would be blended directly with molten glass and HLW to form a homogenous mixture that would then be poured into large, stainless steel canisters. In the can-in-canister approach, however, the plutonium would first be immobilized in ceramic or glass, and loaded into smaller individual stainless steel cans. A number of these cans would then be placed inside the stainless steel canister, which in turn would be filled with HLW glass. The can-in-canister approach is described further in Section 2.4.2, and the potential environmental impacts associated with the homogenous vitrification and can-in-canister immobilization approaches are compared in Section 4.29. The waste canister used in either approach would be the same as those currently used in DOE's HLW vitrification program, and as such would meet all repository acceptance and performance criteria.

PORTLD–5 **Alternatives**

Immobilization in either glass or ceramic form could take place at either Hanford or SRS. As indicated in Section 1.6, SRS is preferred for the immobilization facility. The preferred can-in-canister approach at SRS complements existing missions, takes advantage of existing infrastructure and staff expertise, and enables DOE to use an existing facility (DWPF). DOE is presently considering a replacement process for the in-tank precipitation (ITP) process at SRS. The ITP process was intended to separate soluble high-activity radionuclides (i.e., cesium, strontium, uranium, and plutonium) from liquid HLW before vitrifying the high-activity fraction of the waste in DWPF. The ITP process as presently configured cannot achieve production goals and safety requirements for processing HLW. Three alternative processes are being evaluated by DOE: ion exchange, small tank precipitation, and direct grout.

I support the SPD EIS, but would like to see full immobilization and no MOX. | 6

I'm opposed to the MOX option. There are safety concerns, more waste will be generated, and it will incur cost overruns. | 7

DOE's preferred immobilization technology (can-in-canister) and immobilization site (SRS) are dependent upon DWPF providing vitrified HLW with sufficient radioactivity. DOE is confident that the technical solution will be available at SRS by using radioactive cesium from the ion exchange or small tank precipitation process. A supplemental EIS (DOE/EIS-0082-S2) on the operation of DWPF and associated ITP alternatives is being prepared. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PORTLD–6 **Alternatives**

DOE acknowledges the commentor's support for the immobilization-only approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–7 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach based on safety, waste, and cost concerns. DOE continually evaluates equipment performance to identify potential health and safety problems. New design features can be incorporated and operational procedures modified, as necessary, to reduce or even eliminate these problems. As stated in Section 2.4, the designs of the plutonium disposition facilities are not final. They are subject to modification during the design and construction process. Modifications, as appropriate, may be made to reduce radiation exposures

The National Academy of Science is opposed to MOX; they say it is too costly. | 8

and optimize equipment placement and process flow. The proposed surplus plutonium disposition facilities would incorporate design features and be operated in a manner that reduces doses to workers and the public to levels that are as low as is reasonably achievable.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–8 **MOX Approach**

DOE acknowledges the commentor's concern regarding cost of the MOX approach. An NAS panel of investigators found the MOX approach promising for the timely disposition of surplus plutonium. In the report, *Management and Disposition of Excess Weapons Plutonium, Reactor-Related Options* (1995), NAS compared the costs of the immobilization and MOX approaches. Both approaches were comparable in cost for most of the MOX fuel options discussed.

If the Department goes to commercial burn, who owns the fuel? | 9

Will the commercial reactors need to be modified for MOX fuel? | 10

DOE stated that MOX fuel fabrication has to be performed on DOE land. Siemens Nuclear Fuels, Inc., is located across the street from FMEF on public land. Siemens is a missed opportunity because it is located on commercial land, but is located adjacent to FMEF. Siemens Nuclear Fuels would be a good choice as a pilot test plant at Hanford. | 11

The MOX mission puts the economy at risk. The Washington Public Power Supply System (WPPSS) is putting out an RFP for MOX. WPPSS has a history of cost overruns. | 12

PORTLD–9 **DOE Policy**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. DOE would own the unirradiated fuel until it was received at the reactor site, at which time the reactor licensee would take ownership.

PORTLD–10 **MOX RFP**

Commercial reactors in the United States are capable of safely using MOX fuel. An amendment to a reactor's NRC operating license would be required before MOX fuel could be used. For this amendment, the licensee would have to demonstrate that all safety, testing, and environmental impacts had been addressed.

PORTLD–11 **Lead Assemblies**

DOE acknowledges the commentor's suggestion that lead assemblies be fabricated at the Siemens Nuclear Fuels facilities adjacent to FMEF at Hanford. Existing facilities at five candidate DOE sites were evaluated in this SPD EIS. As discussed in the revised Section 1.6, based on consideration of capabilities of the candidate sites and input from the DCS on the MOX approach, DOE prefers LANL for lead assembly fabrication. LANL is preferred because it already has fuel fabrication facilities that would not require major modifications, and takes advantage of existing infrastructure and staff expertise. Additionally, the surplus plutonium dioxide that would be used to fabricate the lead assemblies would already be in inventory at the site. Decisions on lead assembly fabrication will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PORTLD–12 **MOX RFP**

DOE conducted a competitive procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well

Commercial reactors are approaching their life expectancy. | 13

Cost savings are a mirage; the project savings are bull. There is a history of cost overruns in commercial reactors, as well as within DOE. The general public assumption is that there will be cost overruns. | 14

Regarding the $2 billion program costs, is the money appropriated? | 15

as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. Selection criteria employed ensured that the reactors chosen were capable of safe and successful surplus plutonium disposition. The criteria included, among other factors, recent facility operating history. WPPSS is not one of the reactors chosen to use MOX fuel.

PORTLD–13 **DOE Policy**

Qualification criteria used to select the domestic, commercial reactors included the ability of the reactors to complete the surplus plutonium disposition program within their operational lives as dictated by their licenses. The operating licenses for Catawba Units 1 and 2 expire in 2024 and 2026, respectively; those for McGuire Units 1 and 2, in 2021 and 2023, respectively; and those for North Anna Units 1 and 2, in 2018 and 2020, respectively. Section 4.28 was revised to discuss the potential environmental impacts of operating these reactors.

PORTLD–14 **Cost**

DOE acknowledges the commentor's position. Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–15 **Cost**

Since the estimates span the lifetime of the surplus plutonium disposition program, which is upwards of 20 years, the money has not yet been appropriated. For fiscal year 1999, money has been appropriated; for near-term out-years (the next 2 years), a budget request will be submitted to the U.S. Congress; for out-years (5 years), a projection is provided to Congress with the fiscal year 2000 budget request of what the program's liability or mortgage will be. More information on the Federal Budget Process may be obtained at http://arc.org.tw/law/majorlaws/96-912.htm.

How much will MOX cost? | 16

Is MOX fuel less expensive than fuel made with highly enriched uranium? | 17

MOX subsidizes commercial utilities; the program should not be used to subsidize commercial utilities. | 18

"Waste produced at commercial reactors" assumes that commercial reactors will continue to operate. Who pays? | 19

PORTLD–16 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–17 **Cost**

LEU, not HEU, fuel is used in the U.S. commercial nuclear industry. If the effective value of MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

PORTLD–18 **DOE Policy**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. The remainder of this comment is addressed in response PORTLD–17.

PORTLD–19 **Cost**

The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. These reactors would be operational even if they were not selected to irradiate MOX fuel. As described in

Hanford has facilities, such as FMEF, which lend themselves to reducing plutonium disposition costs. FMEF reduces costs by $50 million; other independent estimates are higher at $200 million to $900 million. 20

Currently, infrastructure costs at Hanford are paid out of cleanup dollars; an additional mission such as MOX could share the infrastructure and overhead expense, and leave more money for cleanup. 21

Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Therefore, DCS would pay for the disposal of MOX spent fuel in the same manner as it would that of LEU spent fuel. Ultimately, the consumer pays the cost of operating the commercial reactor. However, DCS would not have to continue to use MOX fuel if it determined that it was uneconomical to operate the reactor. This would preclude the continuation of reactor operations solely for purposes of the surplus plutonium disposition program. Furthermore, DCS would only be reimbursed for costs solely and exclusively related to the MOX fuel irradiation. This would ensure that the taxpayers were not underwriting otherwise uneconomical electricity-generating assets.

PORTLD–20 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–21 **Cost**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

The Kremlin determines the amount of money spent on defense. It seems that Russia is still in the driver's seat for reducing weapons. | 22

Russia's economy is crumbling. The MOX option is a slow process and could possibly slow the declassification of pit materials. | 23

PORTLD–22 **DOE Policy**

The United States and Russia recently made progress in the management and disposition of plutonium. In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. The United States does not currently plan to implement a unilateral program; however, it will retain the option to begin certain surplus plutonium disposition activities in order to encourage the Russians and set an international example.

PORTLD–23 **DOE Policy**

In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Further, selection of the disposition technology (immobilization and/or MOX approach) should not impact the pace of pit declassification. Pit declassification would more likely depend on the agreements reached with Russia.

MOX creates a new plutonium infrastructure that is counter to the nonproliferation treaty. The Atoms for Peace program advocates keeping military nuclear materials separate from commercial nuclear materials. In addition, back in the Eisenhower administration, it was agreed that weapons plutonium could not be used for civilian purposes. 24

Is the program creating plutonium (MOX fuel) that could be used to make a weapon? 25

Hanford should be considered for MOX and immobilization. FMEF is designed for MOX fuel fabrication and meets NRC and other requirements (i.e., National Quality Assurance Standard). FMEF could handle two of the three options; pit disassembly and conversion at Pantex requires a new facility. Pits should remain at Pantex and oxide should be shipped to Hanford. 26

PORTLD–24 **DOE Policy**

DOE acknowledges the commentor's opposition to the commercial use of weapons-usable plutonium. The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

PORTLD–25 **DOE Policy**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. The purpose of the MOX approach is to convert the surplus plutonium to a form that meets the Spent Fuel Standard, thereby providing evidence of irreversible disarmament and establishing a model of proliferation resistance. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

MOX fuel fabrication involves blending the plutonium dioxide with uranium dioxide, forming the mixed oxide into pellets, loading the pellets into fuel rods, and assembling the fuel rods into fuel assemblies. The fuel assemblies would be transported to the commercial reactors selected to irradiate the MOX fuel. Following irradiation, the MOX fuel would be removed from the reactor and managed at the reactor site as spent fuel. Final disposition would be at a potential geologic repository pursuant to the NWPA, as amended.

PORTLD–26 **Alternatives**

DOE acknowledges the commentor's support for siting the immobilization and MOX facilities in FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying

It's logical that FMEF be considered since [*plutonium*] materials reside at Hanford. 27

By using FMEF at Hanford, the timetable for bringing the mission online could be shortened. 28

Original research for MOX fuel was performed at Hanford; the original concept used plutonium. The MOX pilot plant in Richland was the original breeder reactor. Hanford is experienced in handling MOX fuel. 29

preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–27 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program using FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–28 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program using FMEF at Hanford. Use of FMEF for disposition activities would not shorten the timetable for bringing the proposed surplus plutonium disposition facilities online. FMEF would require extensive renovation for use as a surplus plutonium disposition facility, and would also require construction of annexes for both the immobilization and MOX facilities. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–29 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus

Hanford has about 4 metric tons of scrap plutonium in the Plutonium Finishing Plant, and the new Hanford vitrification facility could handle scrap plutonium disposition. 30

DOE has proclaimed cleanup as Hanford's No. 1 mission. Congressman Hastings and U.S. Senator Gorton agree with the cleanup mission, but also support FMEF for plutonium disposition mission. SRS has a cleanup mission as well. If SRS can handle it in addition to a plutonium disposition mission, so can Hanford. Other missions at the site will keep federal funds flowing to Hanford. 31

Not every company at Hanford needs to be involved with cleanup. Other companies can be brought in to perform the MOX mission. 32

plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–30 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program at Hanford. The 4 t (4.4 tons) of surplus nonpit plutonium referred to in this comment is part of the 17 t (19 tons) of surplus plutonium destined for immobilization under all alternatives analyzed in this SPD EIS except the No Action Alternative. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–31 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities using FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–32 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

How much waste will be produced by MOX? | 33

Regarding the comment [*refers to DOE's response at the meeting to another comment*] about accidents and latent cancer fatalities, the tone is too flippant. Citizens have serious concerns about any deaths occurring. | 34

Cancer risk projections are a myth. DOE cannot substantiate numbers that say the program does not cause deaths. | 35

PORTLD–33 **Waste Management**

Estimates of the amounts of TRU, LLW, mixed LLW, hazardous and nonhazardous wastes that would be generated by construction and operation of the MOX facility are presented in Appendix H. Appendixes H.1.2.3, H.2.2.2, H.3.2.2, and H.4.2.3 describe the wastes that would be generated by the MOX facility at Hanford, INEEL, Pantex, and SRS, respectively.

PORTLD–34 **Facility Accidents**

DOE is committed to public and worker safety during construction, operation, and deactivation of the proposed surplus plutonium disposition facilities, and would implement appropriate controls and procedures to ensure compliance with all applicable Federal, State, and local laws, regulations, and requirements. DOE would also establish an effective ALARA program to ensure that radiological and hazardous chemical doses are reduced to levels that are as low as is reasonably achievable.

PORTLD–35 **Human Health Risk**

The cancer risk projections used in this SPD EIS (see Appendix K.1.4.3) are based on the latest risk estimators available to the scientific community. These estimators are given in Section 3.4.2 of *1990 Recommendations of the International Commission on Radiological Protection* (ICRP Publication 60, November 1991). They are based on updated information on the probability of radiation-induced cancer deaths from the continuing assessment of the more than 90,000 survivors of the atomic bombings of Japan and from other cancer studies. A detailed discussion of all the pertinent sources of information is provided as Annex B of the ICRP publication. The risk estimators were used to project the LCF values given for normal operations and postulated accidents in Chapter 4 of Volume I.

DOE does not claim that its surplus plutonium disposition program would cause no adverse health effects, but rather demonstrates that the risk of fatal cancers among workers and the general public is minimal.

Any new waste generated at Hanford is too much.	36
Northwest citizens are concerned about health and safety for workers and the public; the health of the Columbia River and fish must be preserved.	37
The proper weight was not given to the analysis of dose reconstruction. We're not convinced of the argument to give new missions to Hanford.	38

PORTLD–36 **Waste Management**

Estimates of the amounts of TRU, LLW, mixed LLW, hazardous and nonhazardous wastes that would be generated by construction and operation of the proposed surplus plutonium disposition facilities are presented in Appendix H. Appendix H.1.2.3 describes the wastes that would be generated by the MOX facility at Hanford.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–37 **Human Health Risk**

DOE is committed to protecting the safety and health of the public and its workers, which includes designing, constructing, and operating its facilities in such a way as to provide a level of safety and reliability that meets or exceeds that characterized by modern commercial standards.

In regard to any concerns that may be associated with the Columbia River and the aquatic life therein, as described in Section 4.26.1.2, surface water would not be used in construction and operation of the proposed surplus plutonium disposition facilities at Hanford. Due to the dilution capability of the Columbia River, as well as FMEF's location relative to the Columbia River, there would be no discernible contamination of aquatic biota (fish) or drinking water resulting from the proposed facilities at Hanford, either from minute quantities of air deposition into the river or from any other potential wastewater releases. Therefore, no discernible impacts on the Columbia River would be expected.

PORTLD–38 **Human Health Risk**

Potential health impacts (i.e., doses and associated cancer risks) of the different alternatives that involve Hanford are elaborated in the Human Health Risk and Facility Accident sections in Chapter 4 of Volume I, as well as Appendixes J and K. The depth of the dose analyses is in compliance with NEPA (42 U.S.C. 4321 et seq.) and with *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements* (DOE Office of NEPA Oversight, May 1993).

I represent organic farmers in the Columbia Basin striving for environmentally responsible farming. There is a challenge that continued activities from the nuclear and agricultural industries not impact the land. Friends and family members in the Tri-Cities area experienced health problems. They consumed game and river products.

39

PORTLD–39 **Human Health Risk**

DOE acknowledges the commentor's concern regarding potential health effects of historical releases at Hanford. Section 3.2.4 presents information on past and existing human health risk characteristics. Included are discussions of radiation exposure, chemical exposure, and health effects studies, as well as an accident history.

The Atomic Energy Act of 1954 authorizes DOE to establish standards to protect health and minimize dangers to life. DOE designs, locates, constructs, and operates its facilities in such a way as to provide a level of public safety that meets or exceeds the standards of modern commercial plants. Radiation protection standards are based on keeping radioactive releases at ALARA levels in recognition of the potential risk of radiation exposure. All alternatives proposed in this EIS would conform to those radiation protection standards.

As described in Appendix J.1.1.3, agricultural Census food production data established via DOC were used in the radiological dose assessments for this SPD EIS. These data were separated into eight individual categories: leafy vegetables, root vegetables, fruits, grains, beef (livestock), poultry, milk, and eggs. Analysis of per-county production provided for a high degree of accuracy in the assessment of dose via the ingestion pathway.

As shown in Appendix J.1.2.7.2, if the proposed surplus plutonium disposition facilities were located at Hanford, a very small incremental annual dose to the surrounding public from normal operations would result via radiological emission deposition on agricultural products. This dose (about 6.9 person-rem/yr) would be 0.006 percent of the radiation dose that would be incurred annually from natural background radiation.

Due to the dilution capability of the Columbia River, as well as FMEF's location relative to the Columbia River, there would be no discernible contamination of aquatic biota (fish) or drinking water resulting from surplus plutonium disposition activities at Hanford, either from minute quantities of air deposition into the river or from any potential wastewater releases. Thus, it is estimated that no component of the public dose would be attributable to liquid pathways.

DOE needs to consider the effects of an accident on surrounding communities. Columbia Basin farmers bring their agricultural products to Portland. There is a lot of farmland within the impact zone/sphere of influence of Hanford. It's time that Hanford is removed from service. Optics of a closed site are better for farmers. 40

What kind of security is proposed when moving materials from site to site? Will it be as tight and secure as Navy transports? 41

What will happen to Hanford's plutonium? Will it be transported offsite? 42

Is special handling required to transport the spent fuel once the MOX burn is complete? 43

PORTLD–40 **Facility Accidents**

The effects of hypothetical accidents are analyzed in this SPD EIS in terms of the estimated population dose within 80 km (50 mi). Doses are conservatively estimated. Economic costs such as those associated with crop loss due to potential accidents have not been estimated; most of the potential contamination would occur on the Hanford site.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–41 **Transportation**

All intersite shipments of plutonium for the surplus plutonium disposition program would be made using DOE's SST/SGT system. This involves having couriers that are armed Federal officers, an armored tractor to protect the crew from attack, and specially designed escort vehicles containing advanced communications and additional couriers. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Details of the security systems are described in Appendix L.3.2. Special nuclear material shipments would be carried out in much the same manner in which the Navy transports HEU.

PORTLD–42 **Transportation**

Depending on the decision made by DOE, the surplus plutonium could be either (1) placed in long-term storage at Hanford (i.e., the No Action Alternative) or (2) immobilized at Hanford or shipped to SRS for immobilization, and subsequently shipped to a potential geologic repository for disposition.

PORTLD–43 **Transportation**

The licensee irradiating the MOX fuel for DOE would handle the MOX spent fuel in the same basic manner as it does the normal LEU spent fuel. There would be no need for new or separate facilities (spent fuel pool), storage containers, or shipping containers.

I disliked receiving 5 pounds of materials that I could not understand. The Department should provide a one page summary of what the EIS is about. 44

The SRS decision is politically motivated (Strom Thurmond, Newt Gingrich). SRS is important to that region politically. 45

Any EIS being produced is driven by politics. The decisions are politically based, not technically based. 46

Why is it so difficult to get adequate funding for cleanup if funding is so readily available for this project? 47

Funding for cleanup is inadequate at Hanford. Cost savings are critical to future cleanup success. If a weapons mission starts up again, it will take away funding for cleanup. I'm skeptical that Hanford will get adequate funding for cleanup, which drives how stakeholders approach getting new missions. Hanford's waste legacy must be dealt with. 48

PORTLD–44 **General SPD EIS and NEPA Process**

The size of this SPD EIS is attributable in part to the level of information required for compliance with NEPA. Other factors are the complexity of the proposed action and the need to include a range of reasonable alternatives. Because of the document's size, DOE has prepared a fact sheet for the purpose of directing readers to information of specific interest, and, also in accordance with NEPA, a short summary of the information.

PORTLD–45 **General SPD EIS and NEPA Process**

Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–46 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's views on the basis for EIS decisionmaking. This SPD EIS contains the best information and analyses available to allow for a fair comparison among the candidate sites for the proposed surplus plutonium disposition facilities. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–47 **DOE Policy**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably. Further, since Hanford's cleanup mission and funding are not part of the surplus plutonium disposition program, they should not be impacted by decisions made in connection with this SPD EIS.

PORTLD–48 **DOE Policy**

DOE acknowledges the commentor's concern for adequate funding for cleanup. Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably. Further,

It's time to get the Tri-Cities off of the public dole. Recruiting new missions is contrary to moving the Tri-Cities away from government missions. The public supports Hanford cleanup, not new missions. 49

The current history of DOE privatization efforts, such as for the Tank Waste Remediation System, proves that privatization is more expensive than if managed by the government. 50

Once the MOX fuel rods are passed through the reactor, where will the spent fuel be stored? 51

I am concerned about the waste. There is spent fuel in temporary storage all over the country with no place available (repository) for permanent storage. The United States is not making any real progress in handling the waste. We should not be generating new waste until the first problem is solved. 52

since Hanford's cleanup mission and funding are not part of the surplus plutonium disposition program, they should not be impacted by decisions made in this SPD EIS.

PORTLD–49 **DOE Policy**

DOE acknowledges the commentor's opposition to new missions at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–50 **DOE Policy**

DOE's proposed action for surplus plutonium disposition is not a privatization effort, even though the acquisition of MOX fuel fabrication and irradiation services has some similarities to the TWRS privatization efforts.

PORTLD–51 **MOX Approach**

Following irradiation, the MOX spent fuel would be removed from the reactor and stored in the spent fuel pond or in dry storage casks at the reactor site until final disposal at a potential geologic repository pursuant to the NWPA, as amended. Additional information on MOX spent fuel management is provided in Section 4.28.2.8.

PORTLD–52 **Repositories**

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository. The characteristics of the MOX spent fuel would be similar to those of normal spent LEU fuel. This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the

Geologic problems at Yucca Mountain have not been solved yet, so we can't depend on Yucca Mountain for permanent storage. It has a water problem. 53

The nuclear industry is out of control and is struggling to meet current requirements. There should be no new nuclear reactors; the nuclear industry has outlived its worth. 54

U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository.

PORTLD–53 **Repositories**

As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain, Nevada, is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. Thus, this SPD EIS assumes, for the purposes of analysis, that Yucca Mountain would be the final disposal site for all immobilized plutonium and MOX spent fuel. The suitability of Yucca Mountain as a potential geologic repository for HLW and spent nuclear fuel is beyond the scope of this EIS. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. DOE submitted the *Viability Assessment for a Repository at Yucca Mountain* (DOE/RW-0508, December 1998) to the President and Congress. Based on the results of the viability assessment, DOE believes that scientific and technical work at Yucca Mountain should proceed to support a decision by the Secretary of Energy in 2001 on whether to recommend the site to the President for development as a potential geologic repository.

PORTLD–54 **Other**

DOE acknowledges the commentor's concern regarding the nuclear industry. DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are

Who makes the decision [*refers to preferred alternative*]? | 55

How did DOE arrive at its preferred alternative? How much influence has the nuclear industry had on the decision? | 56

subject to the completion of the NEPA process. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program; no new reactors would be built to support the surplus plutonium disposition program. Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel.

PORTLD–55 General SPD EIS and NEPA Process

The Secretary of Energy will make the decision on surplus plutonium disposition. This decision will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–56 Purpose and Need

A preferred alternative is the alternative that an agency believes best accomplishes the proposed action, giving consideration to environmental, technical, economic, and other information available at the time. In accordance with CEQ implementing regulations (40 CFR 1502.14(e)), the agency shall identify its preferred alternative, if one or more exists, in the draft EIS and identify such alternative in the final EIS. While DOE has identified its preferences in this SPD EIS, it is open to any new information that may become available and will use this information in making a decision, which will be published in a ROD.

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

As indicated in the revised Section 1.6, SRS is preferred for the proposed surplus plutonium disposition facilities because the site has extensive experience with plutonium processing, and these facilities complement existing

I agree with the preferred alternative to not site missions at Hanford. | 57

Are there problems in converting plutonium metals to oxides? | 58

DOE should go to 100 percent immobilization of plutonium because it is safer, requires less handling, and is cheaper with fewer hidden costs. Vitrification is the best form for dispositioning surplus plutonium. | 59

missions and take advantage of existing infrastructure. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. Nuclear industry comments will be given the same consideration as any other public input.

PORTLD–57 **Alternatives**

DOE acknowledges the commentor's support for the preferred alternative. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–58 **Pit Disassembly and Conversion**

Conversion of plutonium metals to oxides is made through a hydride-oxidation process in which the plutonium metal reacts with hydrogen, nitrogen, and oxygen at controlled temperatures and pressures to produce plutonium dioxide. This process is rather straightforward and would produce plutonium dioxide that can be used for immobilization or fabrication into MOX fuel. A description of the conversion process is provided in Section 2.4.1.2.

PORTLD–59 **Alternatives**

DOE acknowledges the commentor's support for the immobilization-only approach. DOE is committed to public and worker safety during the construction, operation, and deactivation of the proposed surplus plutonium disposition facilities and would implement appropriate controls and procedures to ensure compliance with all applicable Federal, State, and DOE rules, regulations, and requirements.

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against any uncertainties of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for

I am a retired Hanford worker; working on cleanup was my priority. I support the hybrid approach for plutonium disposition, specifically Alternative 4B. I support 33 metric tons of plutonium converted to MOX. Scrap plutonium should be immobilized (7 metric tons). The decision on immobilizing the other 10 metric tons should be delayed until it is better understood. I support the can-in-canister approach. 60

DOE has a history of working with glass for immobilization. Why are we considering shifting to ceramic forms now? 61

reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–60 Alternatives

DOE acknowledges the commentor's support of Alternative 4B, which would use the hybrid approach to surplus plutonium disposition. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–61 Immobilization

This SPD EIS considers the immobilization of surplus plutonium in two forms, ceramic and glass; both would be produced using similar processes based on a can-in-canister approach. In order to establish a preferred alternative for the immobilized form and focus research efforts, DOE conducted a series of evaluations to determine whether the properties associated with ceramic or glass would be better suited for immobilizing surplus plutonium. Although

Why is DOE considering MOX? MOX waste is more deadly, more radioactive than before. I do not want to see the MOX burn option. MOX is the worst method for disposing of surplus plutonium. It generates additional waste, costs more, and slows the overall disposition process. I oppose plutonium use in commercial reactors. The MOX option should be rejected because of the increased instability of commercial reactors.

62

past analyses have indicated that both ceramic and glass would be acceptable for immobilizing plutonium, these recent studies indicate that the use of ceramic may present certain advantages over glass. The ceramic form was found: to be more resistant to the threat of theft, diversion, or reuse due to the greater difficulty associated with trying to extract plutonium from the ceramic; likely be more durable over a long period of time under geologic repository conditions; to offer reduced exposure risks to workers; and to potentially provide significant cost savings. In addition, the ceramic technology was found to be more flexible in accommodating potential changes in programmatic or technical requirements.

PORTLD–62 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach to surplus plutonium disposition. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program**.** For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

The MOX argument as the only way to make surplus plutonium unavailable is faulty. You can immobilize plutonium, mix it with ceramic, and surround it with high-level waste. It would make the material difficult to get to. 63

Will the [*MOX*] fuel be run through a full cycle, or will it be an "in and out" proposition? 64

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–63 **Alternatives**

DOE acknowledges the commentor's support for immobilization of the surplus plutonium using the ceramic can-in-canister approach. That approach is accorded full consideration in this SPD EIS; DOE has not characterized MOX fuel fabrication and irradiation as the only way to make plutonium unavailable. In fact, DOE has identified as its preferred alternative the hybrid approach of using both immobilization (ceramic form) and MOX fuel fabrication. Pursuing this approach provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

PORTLD–64 **MOX Approach**

As discussed in Chapter 2 of Volume I, MOX fuel would be left in the reactor for a full cycle. Under the current reactor options, there are no plans to leave it there only long enough to meet the Spent Fuel Standard.

Will taxpayer dollars be used to convert materials? Taxpayers will bear the cost of plutonium regardless of where the mission is sited. Taxpayers will be subsidizing nuclear utilities. How much money will be made by private corporations? 65

Why does the United States feel bound to go forward with the most expensive process [*refers to MOX*]? 66

PORTLD–65 **Cost**

The conversion of various plutonium forms to plutonium-oxides suitable for immobilization or use in MOX fuel would be accomplished solely by U.S. Government funds. For plutonium immobilization, the Government pays the entire sum for the disposition, which includes all capital construction and operating costs. For the MOX fuel option, the government is only responsible for the capital costs for the mission. DOE is proceeding on the basis that DCS will pay for operations of the MOX facility and the reactors without significant federal support. It is assumed the private sector will realize its return on investment in the operating phase by securing a lower cost fuel supply. The amount of money to be made by industry would be determined by its business decisions and the terms and conditions it negotiates with DOE for the contract. DOE is entering into a mutually beneficial situation where a competitively bid private company would make a fair profit, gain a useful product, and the U.S. Government dispositions it's surplus plutonium into a form unattractive to terrorist diversion.

PORTLD–66 **Cost**

As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The cost report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at

Taxpayer dollars are supporting MOX when they should support cleanup instead. | 67

FMEF saves about $200 million over any other facility at any other site. The high range of savings is $500 million saved if FMEF is used. | 68

FMEF value is relative. Retrofitting a building to fit in a different missions is so expensive that any cost savings is lost. | 69

http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–67 **Cost**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

PORTLD–68 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–69 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

I am grateful for the United States/Russian decision to reduce nuclear weapons and that the government is pursuing disoposal of surplus plutonium. | 70

Is Russia still producing plutonium? Does the United States have a deal with Russia to stop new plutonium production? | 71

DOE is splitting hairs on what can actually be produced. Russia has committed to using plutonium. What is the United States gaining? | 72

PORTLD–70 **DOE Policy**

DOE acknowledges the commentor's support of DOE and its surplus plutonium disposition program. The United States and Russia are working hard to achieve the objectives of nonproliferation and arms reduction and to ensure secure management of nuclear weapons materials.

PORTLD–71 **Nonproliferation**

Russia is still producing weapons-usable plutonium in the reactors at Tomsk and Krasnoyarsk. The United States is working with Russia to convert those reactors to nonplutonium production reactors.

PORTLD–72 **DOE Policy**

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provided general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

Russian cooperation is not the only reason DOE has identified the hybrid approach for the disposition of U.S. surplus plutonium. Pursuing both the immobilization and MOX approaches provides important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

If the United States is truly going to set an example, then it needs to recognize its mistake in using the MOX option. The MOX option violates the long-standing U.S. policy to not use military materials in commercial reactors (nuclear proliferation). A mixed message is sent if the United States expands infrastructure while urging other countries to reduce theirs. The United States needs to take leadership role seriously. Lead by example, no MOX. 73

DOE is committing to a single pass with no reprocessing. Russia has not committed to stopping after one time. What assurance does the United States have that Russia's use will be a one-time passthrough only? Would plutonium be civilian plutonium in Russia after process? 74

PORTLD–73 **DOE Policy**

DOE acknowledges the commentor's opposition to the MOX approach. U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. In keeping with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

PORTLD–74 **Nonproliferation**

Close cooperation between the United States and Russia is essential to achieve the objectives of nonproliferation and arms reduction, and to ensure secure management of nuclear weapons materials. To that end, in late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. Because each country is responsible for separately dispositioning its own stockpile of surplus plutonium, this statement contains provisions for developing methods and technology for verification. This includes appropriate international verification measures and stringent standards of physical protection, control, and accounting for the management of plutonium. As discussed in Section 2.4, there are provisions for international inspections of each of the proposed

Oregon and Washington and Congress are opposed to MOX. The support is because of the pressure of jobs at Hanford. Is Russia just a bone to get the American public on board with the program? 75

I see a collusion between the nuclear industry, Russia, and the United States. MOX is an attempt by the nuclear industry to subsidize nuclear power. MOX is a bad idea. 76

surplus plutonium disposition facilities. Russia is not committed to a once-through cycle; it has only agreed that it would not reprocess MOX spent fuel until all surplus plutonium was in the form of spent fuel. By that time, it will have verified that the surplus plutonium had been removed from the weapons-usable plutonium stockpile and committed to civilian use.

PORTLD–75 **DOE Policy**

DOE acknowledges the commentor's opposition to the MOX approach. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

Because the Russians have expressed concern that immobilization would not destroy any plutonium, it is conceivable that the Russians would not eliminate their plutonium stockpile if the United States were to implement an immobilization-only approach. Therefore, the hybrid approach provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

PORTLD–76 **DOE Policy**

DOE acknowledges the commentor's opposition to the MOX approach. The use of MOX fuel in commercial, domestic reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by

Can plutonium be extracted from spent fuel and can it be refined into weapons? Is plutonium 241, 242, and 243 included? Which plutonium can be used for a bomb?	77
A weapon was made using reactor-grade plutonium. It was inefficient and hard to make, but proved that it could be done.	78
It's insignificantly more difficult to build a weapon from reactor plutonium than weapons plutonium. Given today's technology with lasers, it is no more difficult.	79

meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

PORTLD–77 **Nonproliferation**

Plutonium has 15 isotopes with mass numbers ranging from 232 to 246. Weapons-usable plutonium contains mainly plutonium 239, with less than 7 percent plutonium 240. Spent fuel contains plutonium 239, 240, 241, and 242. It is possible to extract plutonium 239 from spent fuel, but the process is extremely dangerous, time consuming, and costly because the plutonium is an integral part of massive spent fuel assemblies that emit large doses of radiation.

PORTLD–78 **Nonproliferation**

DOE has no knowledge of a weapon made with reactor-grade plutonium. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. The purpose of the MOX approach is to convert surplus plutonium to a form that meets the Spent Fuel Standard, thereby providing evidence of irreversible disarmament and establishing a model for proliferation resistance. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. While it is possible to extract plutonium from this spent nuclear fuel, the process is extremely dangerous, time consuming, and costly because the plutonium is an integral part of massive spent fuel assemblies that emit large doses of radiation.

PORTLD–79 **Nonproliferation**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. The purpose of the MOX approach is to convert surplus plutonium

House legislature reaffirmed direction in House Bill 3640. DOE should follow the provisions in [*Oregon*] House Bill 3640. | 80

Pits classified in weapons is the same type of classification and security in the pit disassembly and conversion facility. I don't think it's safe. We don't need a plutonium bomb, just radioactive materials and a big bomb to kill people. | 81

to a form that meets the Spent Fuel Standard, thereby providing evidence of irreversible disarmament and establishing a model for proliferation resistance. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. While it is possible to extract plutonium from this spent nuclear fuel, the process is extremely dangerous, time consuming, and costly because the plutonium is an integral part of massive spent fuel assemblies that emit large doses of radiation. Any discussion of the processes required to build a nuclear weapon is classified and is beyond the scope of this SPD EIS.

PORTLD–80 **DOE Policy**

DOE acknowledges Enacted Oregon House Bill 3640 relating to nuclear facilities. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–81 **DOE Policy**

DOE acknowledges the commentor's concern regarding the safety and security of classified nuclear materials. The proposed DOE surplus plutonium disposition facilities are all at locations where plutonium would have the levels of protection and control required by applicable DOE safeguards and security directives. Safeguards and security programs would be integrated programs of physical protection, information security, nuclear material control and accountability, and personnel assurance. Security for the facilities would be implemented commensurate with the usability of the material in a nuclear weapon or improvised nuclear device. Physical barriers; access control systems; detection and alarm systems; procedures, including the two-person rule (which requires at least two people to be present when working with special nuclear materials in the facility); and personnel security measures, including security clearance investigations and access authorization levels, would be used to ensure that special nuclear materials stored and processed

The nuclear premise was that it was helpful to humankind; nuclear is harmful, not helpful. DOE has not accepted or developed a new premise. DOE needs to clean house and bring in people that agree with the new premise. There is a blatant disrespect for life in using nuclear weapons. Nuclear weapons are about power. Nuclear weapons/power is evil. 82

Hanford should be used for MOX fuel fabrication, pit disassembly and conversion, and immobilization. Any new facility for pit disassembly and conversion will contaminate a clean facility. FMEF is built specifically to NRC standards for plutonium work and has a nearly completed MOX fuel line in it. Its use would reduce the timetable. Hanford has the most MOX fuel fabrication experience because the process was developed at Hanford. Hanford has a lower population density than the south and has more distance than SRS between the source and the groundwater. A site infrastructure for plutonium disposition already exists at Hanford. 83

Cleanup is the primary/only mission at Hanford. SRS has a cleanup mission as well as a tritium mission. Hanford can handle more than one mission at a time. 84

inside are adequately protected. Closed-circuit television, intrusion detection, motion detection, and other automated materials-monitoring methods would be employed. Furthermore, the physical protection, safeguards, and security for the MOX facility and domestic, commercial reactors would be in compliance with NRC regulations.

PORTLD–82 **DOE Policy**

DOE acknowledges the commentor's opposition to nuclear weapons. The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. In keeping with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing. The resulting MOX spent fuel would then be placed in a potential geologic repository pursuant to the NWPA, as amended.

PORTLD–83 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities using FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–84 **Alternatives**

DOE acknowledges the commentor's support for new missions at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was

Hanford employment levels dropped by thousands. MOX would create new jobs. We have a right to be concerned about jobs. | 85

The decision to not use FMEF is based on "not in my back yard," not technology. | 86

Oregon opposes MOX. I am grateful that Oregon represents a sane perspective for disposal and that the SPD EIS does not consider Hanford for the preferred alternative. | 87

taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–85 **Alternatives**

DOE acknowledges the commentor's concern about future employment in the Hanford area. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–86 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's concern regarding the decision to not use FMEF at Hanford. The preferred alternative was chosen based on the best information and analyses available to allow for a fair comparison among the candidate sites for the surplus plutonium disposition facilities. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–87 **Alternatives**

DOE acknowledges the commentor's opposition to the MOX approach and support of DOE's decision not to include Hanford as a preferred location for the proposed surplus plutonium disposition facilities. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

My dad worked at Hanford and died of cancer. A friend lives in Idaho near INEEL and most of his family is dead. 88

What is the total spent fuel tonnage? What is the generated waste stream, and how will it be disposed of? How much waste will be created from the MOX process? 89

PORTLD–88 **Human Health Risk**

As discussed in Section 3.2.4.3, epidemiological studies have been carried out on Hanford workers over the years. These studies have consistently shown a statistically significant elevated risk of death from multiple myeloma associated with radiation exposure among male workers. However, the elevated risk was observed only among workers exposed to 10 rads (approximately 10 rem) or more. The studies have also identified an apparent elevated risk of death from pancreatic cancer, but a recent analysis concluded that the risk was not elevated.

As discussed in Section 3.3.4.3, epidemiological studies were also conducted on communities surrounding INEEL to determine whether there are excess cancers in the general population. No excess cancer mortality was reported, and although an excess cancer incidence was observed, no association thereof with INEEL was established. Another study found excess brain cancers in the six counties surrounding INEEL, but a follow-up survey concluded that there was nothing that clearly linked all these cases to one another or to any one thing.

According to the detailed impact assessment presented in Chapter 4 of Volume I, no LCFs are expected as the result of the operations assessed in this SPD EIS. Whatever the alternative, site surveillance and health effects studies would continue throughout the operational period in order to provide a full assessment of impacts on human health.

PORTLD–89 **Waste Management**

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

Estimates of the amounts of TRU, LLW, mixed LLW, hazardous, and nonhazardous wastes that would be generated by construction and operation of the MOX facility are presented in Appendix H.

The Institute for Environmental Research has stated that reprocessing adds more waste, liquid waste. This flies in the face of answers given at this meeting. 90

MOX creates new wastes with no plan for long-term storage; it is not replacement waste. I resent additional input of poison into the environment without any place or way to handle the waste. There are 120 countries asking the United States not to go forward with MOX. 91

Appendixes H.1.2.3, H.2.2.2, H.3.2.2, and H.4.2.3 describe the wastes that would be generated by the MOX facility at Hanford, INEEL, Pantex, and SRS, respectively. These sections also describe facilities that may be used to treat, store, and dispose of these wastes.

PORTLD–90 **Waste Management**

U.S policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

PORTLD–91 **Waste Management**

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of

DOE has not informed people of all risks and uncertainties in processing plutonium; the SPD EIS does not include necessary impacts and risks. The latest EIS does not contain air quality concerns.

92

implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

PORTLD–92 **Human Health Risk**

Chapter 4 of Volume I provides the results of detailed impact analyses of plutonium processing in the proposed surplus plutonium disposition facilities. Risks and consequences are addressed as appropriate. The impacts on workers and the general population associated with normal operations and postulated accidents are included in these analyses. Included for separate assessment are the potential impacts on air quality and noise, geology and soils, water resources, ecological resources, cultural and paleontological resources, land use and visual resources, infrastructure, waste management, socioeconomics, human health, and transportation. Issues such as environmental justice are also assessed. Detailed analyses of the resources are provided in the appendixes.

Appendix F describes the methods used to perform the evaluations. More detail on facility accident and transportation assessment methods is provided in Appendixes K and L, respectively. These two appendixes also feature discussions of the calculational uncertainties inherent in accident and transportation assessments. All of the assessments for this SPD EIS involved the use of models and techniques that are accepted in the scientific community and have been used in the preparation of numerous other NEPA documents.

Potential air quality impacts associated with each of the alternatives assessed are included in Chapter 4 and discussed in more detail in Appendixes G and J. The incremental concentrations of nonradiological air pollutants were calculated using the ISCST3 computer code. These concentrations are below the appropriate Federal and State ambient air quality standards, indicating that no adverse effects on the environment would be attributable to the surplus plutonium disposition program.

I am concerned about any action that impacts the Columbia River. Will there be groundwater contamination? What's happening to Hanford groundwater with relation to the Columbia River? There are contaminants in the river. There were recent initiatives to coordinate the groundwater program through Bechtel. A report will be coming out to the public by the end of the year. It's the first time a consolidated study will be available. Successful initiatives are underway and there is still a lot of work to do. Hanford, INEEL, and Pantex have about 100 feet of vadose zone above groundwater, and SRS has none. 93

I oppose contaminating any clean land or facility at Hanford. 94

What will the Department do if a MOX reactor explodes? What is the worst case scenario of a reactor accident at a DOE facility? Placing plutonium in the hands of the commercial nuclear industry increases risks, increases transportation, etc. 95

PORTLD–93 **Water Resources**

DOE acknowledges the commentor's concerns regarding groundwater and surface water contamination at Hanford, although the impacts of existing contamination at Hanford are beyond the scope of this SPD EIS. Activities to remediate existing contamination at Hanford are ongoing.

As discussed in Sections 4.26.1.2, 4.26.2.2, 4.26.3.2, and 4.26.4.2, there would be no discernible impacts on surface water or groundwater quality at Hanford, INEEL, Pantex, or SRS from construction and operation of the proposed surplus plutonium disposition facilities.

PORTLD–94 **Alternatives**

DOE acknowledges the commentor's concern regarding potential contamination at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–95 **Facility Accidents**

Design basis and beyond–design basis accidents at the proposed reactors have been evaluated in Section 4.28 of this SPD EIS. As discussed in Section 4.28.2.5, studies by NAS have led it to the following conclusion: "no important overall adverse impact of MOX use on the accident probabilities of the LWRs involved will occur; if there are adequate reactivity and thermal margins in the fuel, as licensing review should ensure, the main remaining determinants of accident probabilities will involve factors not related to fuel composition and hence unaffected by the use of MOX rather than LEU fuel." The analysis reflected in Section 4.28 indicates that the change in risk to the population within 80 km (50 m) of the reactors for the beyond-design-basis accidents involving MOX fuel would range from minus 4 to plus 14 percent. For the design basis accidents, the incremental change in risk from MOX fuel would range from minus 6 to plus 3 percent.

How will materials be transported? How will safety be ensured? What are the transportation accident scenarios? | 96

Will Russian plutonium be coming through Oregon? Will Hanford plutonium be coming through Oregon? | 97

Will the public know how, when, and where materials will be transported? I oppose transporting materials. | 98

PORTLD–96 **Transportation**

Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. Safety is ensured by compliance with stringent DOE, NRC, and DOT standards for containers, vehicles, and driving. The accident scenarios range from minor accidents that release no hazardous materials to hypothetical, extremely severe accidents. A quantification of the risks associated with these scenarios is presented in Appendix L.

PORTLD–97 **Transportation**

The disposition of Russian plutonium in the United States is not being considered by DOE and is therefore beyond the scope of this SPD EIS. DOE is considering alternatives that include immobilization at SRS, under which the Hanford plutonium would pass through Oregon, as well as alternatives that include immobilization of the surplus plutonium at Hanford, in which it is possible that plutonium from several DOE sites would pass through Oregon. The impacts of transporting nuclear materials to disposition 50 t (55 tons) of surplus plutonium are summarized in Chapter 4 of Volume I and Appendix L. As indicated in Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposures or vehicle emissions are expected.

PORTLD–98 **Transportation**

DOE acknowledges the commentor's opposition to transporting materials. The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be stipulated. These plans would be coordinated with State, tribal, and local officials. The shipment of waste would be done in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). Transportation of

There is an increased risk of accidents from transporting materials for the MOX option. | 99

I am grateful that DOE decided to hold a meeting in Oregon. I am grateful for citizen participation and the opportunity to testify. Oregon needs the opportunity to fully participate. | 100

What is DOE doing to inform the American public about what's going on with this program? | 101

special nuclear materials would use DOE's SST/SGT system. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, was included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

PORTLD–99 **Transportation**

Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. The transportation requirements for the surplus plutonium disposition program are evaluated in this SPD EIS. The risk of transporting plutonium materials is presented in Table L–6.

PORTLD–100 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's support of the public outreach program regarding the surplus plutonium disposition program. In compliance with NEPA, DOE provided appropriate opportunities and means for public comment on the program, and gave equal consideration to all comments, regardless of how they were submitted.

PORTLD–101 **General SPD EIS and NEPA Process**

DOE provides information on the disposition of fissile materials to the public in various forms. These include public hearing presentations, fact sheets, exhibits, technical reports, visual aids, and a video. Information is distributed by such mechanisms as mail, email, fax, the MD Web site, telephone, and press interviews. It is important to note that DOE uses most of these same mechanisms to obtain comments from the public as part of its decisionmaking process.

Regarding national security of pit configuration—what does information security mean? I am concerned about making nuclear weapons without a communication process; the Department is bringing down the veil of secrecy again. How will this affect the public process? Will the auxiliary process also be classified? How can the public ensure that the process scope is actually what's proposed in the EIS if information is classified? 102

I object to the structure of the meeting. DOE is taking up comment time. 103

Environmentalists should be allowed on the program. 104

The heart of the issue is that DOE has been lying to the public for 50 years. There are more issues, and the DOE is hurting people no matter what it's talking about. Taxpayers will pay the price of the MOX program. What is DOE going to do for the U.S. public? 105

PORTLD–102 General SPD EIS and NEPA Process

Information security refers to a national security program whereby access to specific information is restricted to individuals who need that information to perform their official duties. DOE has for a number of years been engaged in a formal process to ensure that only information meeting this criterion remains classified. This process should allow for improved public knowledge of the actions being proposed by DOE for surplus plutonium disposition. Two types of information involved in the disposition of surplus plutonium are typically classified: (1) pit information (e.g., the design, construction, and disassembly of individual pit types), and (2) special nuclear material transportation information (e.g., shipping routes and times). It is expected that no other disposition-related processes would be classified, and that, in fact, unclassified processes in the pit conversion, immobilization, and MOX facilities would be subject to international inspection.

PORTLD–103 General SPD EIS and NEPA Process

DOE used an interactive hearing format so that participants could obtain immediate answers to their questions and provide DOE with comments that truly represented their concerns. Written comments were also accepted at these hearings from participants who preferred not to speak. The hearings continued until all participants desiring to speak had the opportunity.

PORTLD–104 General SPD EIS and NEPA Process

NEPA compliance is DOE's responsibility. Environmentalists are encouraged to participate through the comment process.

PORTLD–105 General SPD EIS and NEPA Process

DOE acknowledges the commentor's views on DOE policy and programs. DOE is committed to providing the public with comprehensive environmental reviews of its proposed actions in accordance with NEPA.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost

The most significant fact in the universe is the existence of life; preservation of life is important. We cannot preserve life while endangering others. The nuclear situation began with a lie, and it remains a lie. Biological weapons deterrence is a lie, nuclear weapons deterrence is a lie. All public meetings are a lie. 106

WPPSS is responding to the procurement. 107

Hanford's sole mission should be cleanup, and the mission must remain on schedule. Keep the focus on safety and cleanup at Hanford. Hanford's cleanup job is so large that it requires the undivided attention of the workforce focused on the job. 108

It is pointless to discuss cleaning up wastes if the nuclear industry keeps generating wastes. I would like DOE to comment on the Waste Isolation Pilot Plant (WIPP) site shutdown. What happens to the waste resulting from plutonium disposition? What if Yucca Mountain does not open? There is no long-term storage available. Material needs to be stored in a safe location where no one can get to it. 109

estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–106 General SPD EIS and NEPA Process

DOE acknowledges the commentor's views on the importance of the preservation of life. DOE is committed to providing the public with comprehensive environmental reviews of its proposed actions in accordance with NEPA, and to providing ample opportunity for public comment on those actions.

PORTLD–107 MOX RFP

DOE acknowledges the commentor's observation. Information on the procurement is provided in the revised Section 4.28. WPPSS is not one of the reactors chosen to use MOX fuel.

PORTLD–108 DOE Policy

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–109 Repositories

The management of TRU wastes generated by the proposed surplus plutonium disposition facilities is evaluated in this SPD EIS. DOE alternatives for TRU waste management are evaluated in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS*

There is a large amount of waste in the ground [*refers to Hanford*]; 450 billion gallons went into the ground; over 1 million gallons/ curies leaked from tanks to the soil. The timeframe to handle materials equals 750 generations; it is too vast of a time to think in. 110

I protest PUREX [*refers to the Plutonium-Uranium Extraction Facility*] and uranium tailings. DOE needs to recognize impacts to Native Americans. Tailings went into the fill below their high school. The Navaho recycle and they use items on their houses that came from the plant. 111

(DOE/EIS-0026-S-2, September 1997). WIPP began receiving shipments of TRU waste for permanent disposal on March 26, 1999. As for MOX spent fuel, following irradiation, the MOX fuel would be removed from the reactor and managed at the reactor site as spent fuel in accordance with the site's normal spent-fuel-handling procedures. This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. If at some future time it were determined that Yucca Mountain was not a suitable location for these activities, Congress would have to decide on an alternative path forward for the disposal of spent nuclear fuel and other HLW slated for the repository. The immobilized plutonium and MOX spent fuel would be included in any such decision and managed in the same fashion.

PORTLD–110 **DOE Policy**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–111 **Environmental Justice**

DOE acknowledges the commentor's concern regarding impacts of the surplus plutonium disposition program on Native Americans. However, the PUREX facility and uranium tailings are beyond the scope of this SPD EIS. Impacts on minorities resulting from the surplus plutonium disposition program are analyzed in the Environmental Justice sections of Chapter 4 of Volume I. DOE consulted with Native American groups in the environs of all candidate sites considered in this SPD EIS.

Shut all commercial reactors down. Get rid of nuclear industry. 112

What the government has done to the environment is wrong. The Mesabe Range is completely trashed. Turn away from military-focused missions. Don't bring new materials to the Northwest. We have only one world—don't destroy what we have. It's time to stop the military complex. 113

PORTLD–112 **Other**

DOE acknowledges the commentor's opposition to nuclear power.

PORTLD–113 **Alternatives**

DOE acknowledges the commentor's concern regarding the contamination of the environment resulting from military-focused missions. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.