SUMMARY

S.1 Introduction and Background

The U.S. Department of Energy (DOE) is responsible for ensuring that the nation has a supply of materials sufficient to maintain its nuclear weapons stockpile at levels directed by the President of the United States. One of these materials is tritium – a gaseous isotope of hydrogen that increases the yield of nuclear weapons. None of the weapons in the nuclear arsenal would **be capable of functioning** as designed without tritium. As long as the United States chooses to maintain a nuclear deterrent – of any size – it will need tritium.

There are two factors that dictate the timing regarding the nation's need for tritium. The first is that the U.S. no longer has the operating facilities needed to produce tritium. DOE has shut down the government-owned reactors that previously irradiated the base material from which tritium was derived. The second is that tritium has a relatively short half-life and decays at a rate of about 5.5 percent per year. This means that present supplies will be cut nearly in half before 2010 (Figure S-1). Therefore, it is essential that the U.S. develop a new source of tritium.

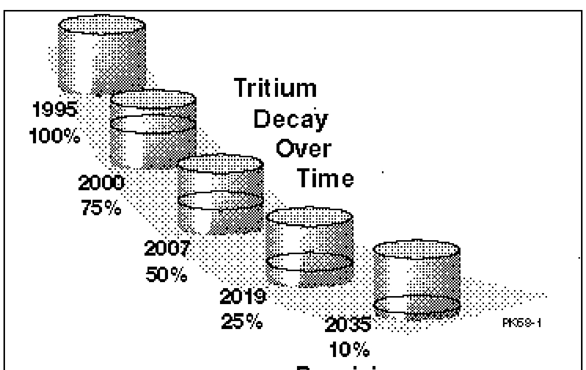

Figure S-1. Tritium decay over time.

For the past several years, DOE has been evaluating ways to produce tritium. Following the requirements of the National Environmental Policy Act (NEPA), the Department took its first step toward a solution with the *Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling* (Tritium Supply PEIS), which evaluated both the need for a new tritium source and the alternatives to provide that source. On December 12, 1995, DOE published a Record of Decision (ROD; 60 FR 63878) following the programmatic environmental impact statement (PEIS), in which it announced that it would pursue a dual-track approach with the two most promising alternatives:

- To design, build, and test critical components of an accelerator system for tritium production.
- To initiate the purchase of an existing commercial reactor (operating or partially complete) for conversion to a defense facility, or the purchase of irradiation services with an option to purchase the reactor.

In the 1995 ROD, DOE committed that by late 1998, it would select one of these approaches as the primary source of tritium. In addition, the Department would, if feasible, continue to develop the other alternative as a backup tritium source. Further, the ROD announced DOE's decision to upgrade and consolidate the existing Savannah River Site (SRS) tritium recycling facilities. Finally, the ROD stated that a tritium extraction facility (TEF) would be constructed at the SRS.

DOE developed the following strategy for compliance with the NEPA process: (1) make decisions on the alternatives described and evaluated in the Tritium Supply PEIS, and (2) follow with site-specific assessments that implement those decisions. Thus, DOE is preparing three EISs tiered to the programmatic EIS: (1) an EIS on the use of specific commercial light water reactors (CLWRs) to produce tritium, (2) an EIS on the construction and operation of APT, and (3) this EIS on the construction and operation of TEF at SRS.

Since issuance of the Draft APT EIS in December 1997, several events have occurred and decisions have been made that influenced

the preparation of the Final EISs for APT, TEF, and CLWR. Most notably, two other EISs related to the tritium supply mission were issued. The Draft TEF EIS was issued in May 1998, and the Draft CLWR EIS was issued in August 1998. These three documents are closely interrelated. The proposed action described in the CLWR EIS is the "no-action" alternative for the APT EIS. Conversely, the APT is the "no-action" alternative for the CLWR.

In December 1998, Secretary of Energy Richardson announced his decision to select the use of commercial light water reactors as the primary tritium supply technology. Because of this decision, the Preferred Alternative of this EIS stays the same. The No-Action Alternative (combined TEF/APT) is kept in the EIS to fulfill the CEQ requirement to have a No-Action alternative.

> Comment M1-05 from the Economic Development Partnership contended that the EIS is deficient because it did not evaluate the impacts from the proposed Federal action to produce tritium for national defense purposes in commercial reactors. DOE believes that it will provide a complete evaluation in the programmatic and three site-specific EISs identified above. DOE has added the following text to the summary after the last paragraph on page S-1.

In response to public comments on the Draft Tritium Supply PEIS, DOE evaluated production of tritium for national defense in commercial reactors more thoroughly. DOE published a Notice in the *Federal Register* (60 FR 44327; August 25, 1995) to include this action as a reasonable alternative. Because of public comments on the Notice, public reviews of the Draft PEIS, and further consideration of nonproliferation issues, use of commercial reactors was evaluated as an additional reasonable alternative. The impacts of using CLWRs to produce tritium are described in the CLWR EIS and not in this TEF EIS. The purpose of this EIS is identified in the next section of this revised summary.

DOE also has prepared an EIS on accelerator production of tritium at SRS to assess the impacts of producing tritium in a DOE-owned accelerator.

On September 5, 1996, the Department published the "Notice of Intent to Prepare an Environmental Impact Statement for the Construction and Operation of a Tritium Extraction Facility at the Savannah River Site" (61 FR 46790). This proposed facility would be able to process tritium from CLWR targets or targets of similar design such as the alternate design targets from the accelerator or targets from the Fast Flux Test Facility. **From the Secretary's decision in December 1998**, the capability to extract tritium from CLWR targets will be required **when** commercial reactors are **used to produce** tritium. This EIS evaluates site options for a new tritium extraction facility at SRS, and assesses the impacts of facility construction and operation.

S.2 Purpose and Need for Action

> In the voice mail comment V1-01, the commenter questioned the need for DOE to produce more tritium and proposed other ways to satisfy the demand for tritium. In its response, the Department indicated that the need for defense nuclear materials is determined by the Department of Defense and the President and documented in the annual Nuclear Weapons Stockpile Plan. DOE, in turn, is charged with the responsibility to produce the tritium and to determine the schedule and means for such production**.** The Presidential Decision Directive accompanying the 1996 Nuclear Weapons Stockpile Plan established the need for new tritium by 2005**.** DOE evaluated reasonable alternatives for producing tritium in the Programmatic Environmental Impact Statement for Tritium Supply and Recycling. Therefore, tritium supply and production technologies are not within the scope of the TEF EIS, and DOE has modified the sections on Purpose and Need to clarify the decision process and the purpose for the proposed action evaluated in this EIS. The description of Purpose and Need for Action on page S-2 of the Draft EIS is replaced by the following text.

The purpose and need for the Department's action is described in the *Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling* and in the *Record of Decision: Tritium Supply and Recycling Programmatic EIS* (60 FR 63878). The Tritium Supply

PEIS identified the 1994 Nuclear Weapons Stockpile Plan as the guidance document the Department must follow. **DOE evaluated reasonable technologies and schedules to meet the need for tritium in the PEIS; the Record of Decision identified the APT and the CLWR as the two most promising alternative sources of tritium. Therefore, the need for tritium and ways to satisfy that demand were established previously and are not within the scope of the TEF EIS.**

Since the issuance of the PEIS, the President has approved the 1996 Nuclear Weapons Stockpile Plan. With regard to the need for tritium, the difference between the 1994 and 1996 Nuclear Weapons Stockpile Plans was to change the projection of when a new tritium source would be needed from approximately 2010, as used in the PEIS, to 2005. However, the need for tritium for the nuclear weapons stockpile, as discussed in the PEIS, remains unchanged.

The purpose of the proposed action and alternatives evaluated in this EIS is to provide tritium extraction capability to support tritium production technology. DOE proposes to provide the capability to extract tritium from CLWR targets, which are tritium-producing burnable absorber rods (TPBARs), and from targets of similar design. A new tritium extraction capability must be in place beginning in 2005.

S.3 Decision to be Based on This EIS

The TEF EIS Record of Decision (ROD) will select the location at the SRS to construct, test, and operate a new TEF.

S.4 Proposed Action and Alternatives

DOE proposes to design, construct, test, and operate TEF at SRS. The Department will use this EIS and the NEPA process to inform the public and decision makers about the potential environmental impacts of the proposed action and alternatives (the estimated impacts of construction and operation are **compared** in **Tables S-1 and S-2 located on pages S-7 to S-12 and page S-15 of this Final EIS**).

S.4.1 Preferred Alternative

The proposed action is to design, construct, test and operate a new TEF at SRS. The purpose of TEF would be to extract tritium-containing gases from targets irradiated in a CLWR or from targets of similar design, and deliver the tritium-containing gases to Building 233-H for final purification. The preferred alternative would be to locate TEF in H Area, immediately adjacent to and west of Building 233-H. The reasons for co-locating TEF close to Building 233-H are: (1) to share common support facilities, services, and some personnel; (2) to facilitate the transfer of tritium between the two facilities; and (3) to use certain gas-handling processes located in H Area. TEF would consist of a concrete industrial facility constructed partly below grade. The facility would be divided into two major areas: (1) a remote handling area (RHA) and (2) a tritium processing building. The tritium processing building would be entirely aboveground; the floor of the RHA would be below grade. Construction of the proposed facility would require approximately 4 to 5 years. Major process and operation systems included within the proposed TEF would be: (1) the Receiving, Handling, and Storage System that would support all functions related to the receipt, handling, preparation, and storage of incoming radioactive sources and outgoing radioactive waste materials; (2) the Tritium Extraction System that would get tritium and other gases from irradiated targets, remove contaminants from the gas stream, and store the hydrogen isotope/helium mixture; (3) the Tritium/ Product Processing Systems that would separate and purify process gases from the irradiated target materials; (4) the Tritium Analysis and Accountability Systems that would support monitoring and tritium accountability; (5) the Solid Waste Management System that would receive solid waste generated by TEF for management and storage prior to disposal in the E-Area vaults; and (6) the Heating, Ventilation, and Air Conditioning System that would provide and distribute conditioned supply air to the underground RHA and the aboveground tritium processing area and also discharge exhaust air to the environment via a 100-foot stack.

S.4.2 Upgrading the Existing Allied General Nuclear Services (AGNS) Facility Alternative

An alternative to constructing a new TEF within H Area would be to refurbish and use the existing Allied General Nuclear Services (AGNS) facility located in Barnwell County, adjacent to the eastern boundary of SRS. AGNS was completed in l976, and portions of the facility were tested with natural uranium in anticipation of obtaining an operating license to process commercial **spent** nuclear fuel. However, due to a change in government policy on reprocessing commercial spent nuclear fuel, the facility never opened. It was cleaned up and placed in standby in l977 and shut down in l983. The AGNS facility was designed and built to Nuclear Regulatory Commission (NRC) standards. It would not meet all applicable DOE Orders without major modifications **as discussed below**. Utilization of AGNS would necessitate some new construction and modification. Extraction furnaces would have to be designed, built, and installed. A drying oven to remove pool water from CLWR target bundles or bundles from targets of similar design unloaded in the wet basin would be required (at AGNS, targets would be stored in existing fuel storage basins). A process gas stripper would have to be added to reduce stack tritium releases. Although rail lines to the existing facility have been removed, the tracks within the facility staging area and into the cask unloading bays are still in place. Roads on the AGNS property need moderate repair; and a short connecting road tying AGNS into the SRS road system would have to be constructed. Other requirements include refurbishing the heating, ventilation, air conditioning (HVAC) fans, motors, high-efficiency particulate air (HEPA) filters and dampers; and replacing the chiller water, fire protection, electrical, security, and personnel protection systems.

S.4.3 Refurbishment of the Existing Tritium Extraction, Concentration and Enrichment Facility (Building 232-H)

Another alternative considered early in the NEPA process but deemed unreasonable was to substantially modify and upgrade the existing Tritium Extraction, Concentration and Enrichment Facility (Building 232-H). This facility is approximately 40 years old; neither its design nor construction meet current industrial standards. The Building 232-H facility is used to extract tritium from legacy targets irradiated in heavy water reactors (HWRs). Once extraction of these legacy HWR targets is completed, the facility is scheduled to be deactivated after all other tritium processing operations are relocated to Building 233-H. The Building 232-H facility cannot safely and efficiently extract tritium from CLWR targets or targets of similar design without first undergoing significant process and safety upgrades. The renovation and utilization of the Building 232-H facility is not considered a reasonable alternative to the proposed action.

S.4.4 No Action

In compliance with the regulations of the Council on Environmental Quality (CEQ) for implementing NEPA (40 CFR Part 1500-1508), this EIS also assesses a no-action alternative. The interpretation of no action varies, depending upon the circumstances. Typically, no action means that the proposed activity would not be initiated. No action may also be defined in terms of no change in a current agency program. **To** provide tritium for the nation's nuclear weapons stockpile, **DOE** has **selected the** CLWR to be the primary new tritium source. The **APT will** continue to be developed as a backup tritium source.

Under the no-action alternative for the TEF EIS, DOE would not construct and operate a TEF either at the preferred location in H Area or at the alternate location at AGNS. **Now that** DOE **has selected** the CLWR as the primary option for tritium production, selection of no action for the TEF would result in the inability to extract tritium from the irradiated targets. Selection of CLWR as the primary source of tritium assumes that an accelerator (with extraction capabilities) would not be built as a backup source. In that case, DOE would not be able to fulfill the purpose and need for the proposed action. Such a decision would be inconsistent with the Record of Decision for the Tritium Supply Programmatic EIS. The environmental impacts projected for the TEF would not occur.

Even though the Secretary selected the APT as backup, the discussion below is retained in this Final EIS until a Record of Decision has been issued.

Describing the effect of selecting no action for the TEF in the event that DOE **had selected** the APT as the primary option for tritium production requires a more complex analysis. **If** APT **were ultimately** selected, DOE would need a tritium extraction capability in order for the CLWR option to be a viable backup tritium source (if that option is determined to be feasible). In addition, a tritium extraction capability would be needed **if** DOE **had decided** to use the APT alternate design targets, which are similar in design to CLWR targets. (The preferred APT **tritium production method is a flowing gas system which does** not require a TEF-type extraction capability.) This capability could be provided either by implementing the TEF as proposed in this EIS, or by incorporating tritium extraction capability in APT. The latter approach would **have required** installing tritium extraction furnaces and related equipment and processes within the APT facility.

If DOE **had selected** no action for the TEF and also **decided** not to incorporate tritium extraction capability in APT, the goals of preserving the CLWR option as a backup and of providing alternate design APT target extraction capability would not **have been** met. Likewise, the environmental impacts of achieving those goals would not **have occurred**. However, DOE could **have selected** no action for TEF and still preserve the CLWR option as a viable backup and **provided** for the alternate design APT targets by incorporating tritium extraction capability in APT. The impacts of that course of action are analyzed in this EIS under the no-action alternative. That analysis is based on **data developed for the Final APT EIS** and information developed since **the Draft TEF** EIS was issued.

S.5 Affected Environment

> Since the Draft TEF EIS was issued, DOE has continued to analyze the operation of the APT with and without extraction capability. This Final EIS incorporates the new analyses. The analyses are based on data developed to support the Final APT EIS. References to this data input rather than the Draft APT EIS are identified immediately below and throughout this Final EIS.

The preferred site for TEF is within H Area, a densely developed, industrialized area near the center of SRS, approximately 6.8 miles from the nearest (western) SRS boundary. There are four existing tritium-related facilities in the immediate vicinity of the proposed TEF site. Operations related to reclaiming previously used tritium reservoirs; receiving, packaging, and shipping reservoirs; recycling and enriching tritium gas; and laboratory and maintenance operations are performed in three of these facilities. The fourth facility, Building 233-H, is located mostly below ground and is dedicated primarily to emptying and refilling tritium reservoirs, mixing gases, and separating and purifying hydrogen isotopes.

Initially, two locations within H Area were identified as potential sites for the proposed TEF (immediately west and north of Building 233-H, respectively). DOE conducted a comprehensive site selection process to determine the best location for TEF. Selection criteria included resource requirements (i.e., land, utilities), security, proximity to Building 233-H, potential for impacting environmentally sensitive wetlands, and geotechnical factors. The location immediately adjacent to and west of Building 233-H was chosen as the preferred TEF site. This site is approximately 4 acres and presently is occupied by three warehouses and numerous office trailers. Advantages to locating TEF within H Area include minimal environmental impacts associated with construction and operation of the proposed TEF due to the developed nature of H Area; availability of site infrastructure (i.e., power, steam, potable water, sewerage); and close proximity to existing tritium-related facilities and processes to support TEF operations.

An alternative to the preferred alternative is to refurbish and use the decommissioned AGNS facility originally built to reprocess commercial spent nuclear fuel. AGNS is located on 1,632 acres adjacent to the eastern boundary of SRS. Of this total acreage, approximately 165 acres are devoted to the AGNS facilities. Existing facilities include a chemical separations building, laboratories, administrative buildings, a waste storage area, a cooling pond (Beacon Pond), road system, and related support infrastructure. The AGNS site is located approximately 9 miles east of the H-Area tritium complex. Aside from SRS, lands adjacent to the AGNS tract are primarily rural and used for agriculture or silviculture.

The no-action alternative could **have involved** incorporation of extraction capability at the preferred APT site which consists of about 250 acres of forested land north of the intersection of Roads F and E. The site, which is crossed by the Aiken-Barnwell County line, is bordered on the southwest by a 115-kilovolt transmission line, a buried super control and relay cable, and Monroe Owens Road. Three other secondary roads, including E-2, cross the site.

S.6 Comparison of Environmental Impacts Among Alternatives

In this section, on page S-5 the Draft EIS presents a comparison of the environmental impacts among the alternatives. In this Final EIS, Table S-1 on pages S-8 to S-13 compares the increment of the impacts of the proposed action and its alternatives to the current conditions at the SRS. Table S-2 on page S-15 compares the impacts of incorporating tritium extraction capabilities into APT to those associated with the construction and operation of APT without the tritium extraction capability. Since the Draft TEF EIS was issued, DOE has updated the information for operating APT in accordance with both the stand-alone APT and the APT with the extraction capability design variation. The following text and tables are revised based on the updated operational information.

This section compares the incremental environmental impacts among the proposed action, the AGNS alternative, and the no-action alternative, which for this EIS is to incorporate TEF into the accelerator for the production of tritium (APT) (Table S-1).

Table S-1 compares the increment of impacts of the proposed action and the alternative to construct and operate TEF at AGNS to the current SRS baseline. Where applicable, impacts from all natural, existing causes or regulatory standards are provided as a perspective on the severity of baseline conditions and incremental impacts of the alternatives. Table S-1 also presents the incremental impacts of incorporating TEF in APT (this EIS's no-action alternative).

In general DOE considers the expected impacts from the proposed action or its alternatives on the physical, biological, and human environment to be minor and consistent with what might be expected for an industrial facility. **Potential impacts to SRS waste treatment, storage, and disposal facilities from construction and operation of the TEF are expected to be small due to existing capacities and the low volumes of waste to be generated. In the comparison of impacts, DOE determined that changes from the baseline of less than 5 percent are within the margin of error and the conservatism inherent in the analyses. Therefore, DOE finds that in those instances there would be no measurable change from the baseline.**

Compared to the proposed action, **for the maximally exposed individual** the AGNS alternative **is projected to have a 0.13 millirem per year higher radiation** (due to its closer proximity to the boundary) but **nearly equal** collective population doses. The estimated radiation doses were used to predict whether any latent cancer fatalities would be associated with either normal operations or with potential accidents. Construction waste at AGNS would be less because putting TEF at AGNS would involve refurbishing existing facilities, rather than the total construction of TEF at H Area. Slightly higher sanitary waste would be generated at AGNS during operations due to a larger workforce.

Many of the incremental impacts of the no-action alternative would be less than those of the proposed action, because the combined tritium extraction and accelerator production of tritium processes would share land, components, and infrastructure that would be duplicated if each were developed as an independent facility. Table S-1 demonstrates reduced impacts from the no-action alternative to geology, surface water, groundwater, nonradiological air emissions, hazardous waste generation, aesthetics, socioeconomics, environmental justice, construction worker injuries, anticipated and unlikely accidents, and ecological resources.

S.6.1 Comparison of Proposed Action and the AGNS Alternative to the SRS Baseline

In Comment M1-02, the commenter stated that there is little or no difference between the AGNS and H-Area alternatives, but that the EIS makes it look like a major difference. DOE did not intend to exaggerate the comparison of the H-Area (proposed action) and the AGNS alternatives. However, it did wish to capture the differences in environmental impacts for the decisionmaker(s) and the public. DOE has revised this section starting on page S-6 of the Draft EIS to clarify the differences between these two alternatives.

Table S-1 compares the incremental environmental impacts associated with the proposed action (construct and operate TEF in H Area) and the alternative to construct and operate TEF at AGNS against the SRS baseline. The environmental baseline describes the current site conditions which are detailed in Chapter 3. Values for CLWR targets and targets of similar design are both included when there is a difference greater than 5 percent. Where applicable, regulatory standards or current impacts from existing causes are provided as a perspective on the severity of baseline conditions and incremental impacts of the alternatives.

One difference between the proposed H Area and alternative AGNS locations is AGNS's close proximity to non-government land and therefore its greater potential for impacting off-site individuals due to releases near the site boundary. **Additional differences include stack height and radionuclides released to the environment. The quantities released at AGNS differ from those emitted at H Area because each rod would be cut three times to be placed in the AGNS furnace while full-height targets would be punctured at H Area. The shearing operation would result in higher emissions than the puncturing operation.**

While processing CLWR targets, the contributions of nonradiological air constituents at AGNS would be 0.13 percent of the applicable standard, **and still lower for the onsite H-Area alternative. Similarly,** the annual radiological dose for the offsite maximally exposed individual would be 0.13 millirem higher for AGNS than H Area, but both would be well below the regulatory annual limit of 10 millirem from airborne releases. Releases from processing targets of similar design would be lower than from processing CLWR targets for either alternative.

Because of the location of AGNS, some minority or low-income communities could be disproportionately affected by radiological and nonradiological air emissions, but again impacts are expected to be minor. At the AGNS site, construction noise and activity could have localized adverse effects on wildlife, but operations would not.

Advantages of AGNS include less land disturbed, less construction waste generation, and lower construction costs. Also, the lower population density in the communities near AGNS would result in a smaller collective dose from potential accidents.

DOE has revised the Draft EIS to include advantages of the proposed H-Area site to provide a comparison to the advantages of AGNS discussed in the previous paragraph.

Advantages of the proposed H-Area site are primarily due to its close proximity to the location of the final tritium purification step in Building 233-H. This enables DOE to share common support facilities, services, and some personnel; to facilitate the transfer of tritium

Table S-1. Comparison of the alternatives for construction and operation of TEF.

Resource	Current SRS Baseline	Increment above baseline of proposed H Area site	Increment above baseline of alternative AGNS site	Increment above baseline of no-action alternative[a,b,c]
Schedule and Operating Parameters				
Construction	TEF is not built	5 years	5 years	No change in the period of construction for APT.
Annual electricity		20,600 Mw-hrs (CLWR targets) <19,570 Mw-hrs (targets of similar design)	Same as H Area	Less than 5 percent of baseline defined for no action. See footnote (b).
Annual sanitary wastewater (gallons)		770,000	1,200,000	No change from APT's baseline.
Annual radioactive process wastewater (gallons)		11,000	Same as H Area	11,000 (8 percent increase in APT's baseline).
Impacts to the Physical and Manmade Environment				
Geology	Existing sites are cleared and graded; grassed, paved or graveled; and used for industrial purposes	Minimal construction impacts through application of best management practices and compliance with Federal and state regulations.	Lower construction impacts than H Area because of less construction at AGNS.	No effects greater than 5 percent above APT's baseline. See footnote (b).
Groundwater		Minor dewatering during construction activities near or below the water table. Design would prevent process water migration into the groundwater during operations.	Facilities near the water table are in place and protected (fuel storage pools are doubled-walled stainless steel tanks with leak-detection systems).	No effects greater than 5 percent above APT's baseline.
		With an immediate response by SRS to contain and remediate spills, it is unlikely that a spill would impact groundwater.	Same as H Area	Same as APT's baseline. Immediate response by SRS would minimize the potential to impact groundwater.

Table S-1. (Continued).

Resource	Current SRS Baseline	Increment above baseline of proposed H Area site	Increment above baseline of alternative AGNS site	Increment above baseline of no-action alternative[a,b,c]
Surface Water	Construction in an industrial area with established stormwater control systems	Minimal construction impacts; construction would not disturb undeveloped areas.	Lower construction impacts than H Area because of less construction at AGNS.	No effects greater than 5 percent above APT's baseline.
	Permitted process wastewater discharges	Effluent treatment would remove radioactive cobalt from process water to safe levels before discharge to Upper Three Runs. Tritium concentration in the effluent would be less than the regulatory limit of 20,000 picoCuries per liter.	Same as H Area	Radioactive process wastewater from extraction facilities would be routed from the APT site, treated, and discharged to Upper Three Runs.
	Permitted sanitary wastewater discharges	Effluent would be treated before release to Fourmile Branch. All discharges would be within permit limits. Minimal impacts expected.	Effluent would be treated before release to Lower Three Runs. All discharges would be within permit limits. Minimal impacts expected.	No effects greater than 5 percent of APT's baseline.
Air Resources				
Nonradiological constituent concentrations at the SRS and AGNS site boundaries	Concentrations vary from approximately 0 to 60 percent of applicable standards and average 25 percent.[d]	Concentrations vary from approximately 0 to 0.19 percent of applicable standards and average 0.02 percent.[e] Ozone concentrations (measured as VOCs) would be 0.19 percent of the regulatory standard of 235 μg/m^3. All other contaminant levels would be less than 0.02 percent of their respective regulatory standards.	Concentrations vary from approximately 0 to 1.7 percent of applicable standards and average 0.2 percent.[e] Ozone concentrations (measured as VOCs) would be 1.7 percent of the regulatory standard of 235 μg/m^3. All other contaminant levels would be less than 0.20 percent of their respective regulatory standards.	Diesel generator backup power would be provided by the APT facility. Therefore, no increase in nonradiological air impacts.

Table S-1. (Continued).

Resource	Current SRS Baseline	Increment above baseline of proposed H Area site	Increment above baseline of alternative AGNS site	Increment above baseline of no-action alternative[a,b,c]
Annual radiological dose to the maximally exposed (offsite) individual (millirem). Dose limit = 10 millirem/yr.	0.05 millirem	0.02 millirem; the emission is 0.2 percent of the dose limit (CLWR targets) 0.014 millirem, 0.14 percent of the dose limit (targets of similar design)	0.15 millirem; the emission is 1.5 percent of the dose limit (CLWR targets) 0.030 millirem; 0.3 percent of the dose limit (targets of similar design)	**0.006** millirem (CLWR targets)
Waste				
Total estimated construction debris (metric tons)	N/A	385	115	No effects greater than 5 percent above APT's baseline.
Total operations waste by type (cubic meters)				
High-level	150,750 (30 years)	0 (40 years)	Same as H Area	0 (40 years)
Low-level	343,710 (30 years)	9,320 (40 years; CLWR targets); 8,720 (40 years; targets of similar design)	Same as H Area	12,800 (40 years; CLWR targets)
Hazardous or mixed	90,450 (30 years	132 (40 years)	Same as H Area	80 (40 years; CLWR targets)
Transuranic	18,090 (30 years)	0 (40 years)	Same as H Area	0 (40 years)
Impacts to Human Environment				
Aesthetics[e]	Area is not visible to and noise is not heard by offsite public. Historic and archaeological resources are not present.	Temporary increase in noise during construction phase, but it would not be heard by the offsite public. No adverse aesthetic impacts during TEF operation. Historic and archaeological resources are not present.	Temporary increase in noise during construction phase. No adverse aesthetic impacts during TEF operation. Historic and archaeological resources are not present.	No effects greater than 5 percent above APT's baseline.

Table S-1. (Continued).

Resource	Current SRS Baseline	Increment above baseline of proposed H Area site	Increment above baseline of alternative AGNS site	Increment above baseline of no-action alternative[a,b,c]
Socioeconomics	SRS employment is assumed to decline to 10,000 employees by 2001[h], and regional growth trends are expected to continue.	Regional temporary increase of 740 jobs during peak year of construction, which is 0.29 percent of projected baseline regional employment of 258,000 jobs. The number of jobs at SRS would decline to 108 for TEF operation. The overall effects would be positive in terms of assisting to stabilize the regional employment base.	Regional temporary increase of 685 jobs during peak year of upgrades and refurbishment, which is 0.27 percent of the projected baseline regional employment of 258,000 jobs. The number of jobs at SRS would decline to 175 for TEF operation. The overall effects would be positive in terms of assisting to stabilize the regional employment base.	Approximately the same construction and operation work force as APT's baseline. No change would occur in socioeconomic impacts.
Environmental Justice	Minorities or low-income communities would not receive disproportionately high and adverse impacts.	Health effects would be minimal. Minority or low-income communities would not be disproportionately affected.	Health effects would be minimal. Because of their proximity to the AGNS site boundary, some minority or low-income communities could be disproportionately affected.	No measurable differences from APT's baseline.
Public Health				
Annual probability of fatal cancer to the maximally exposed (offsite) individual (annual fatal cancer risk from all natural causes is 3.4×10^{-3}).	9.5×10^{-8}	1.0×10^{-8} (CLWR targets) 6.8×10^{-9} (targets of similar design)	7.5×10^{-8} (CLWR targets) 1.5×10^{-8} (targets of similar design)	**3×10^{-9}** (CLWR targets)
Occupational Health				
Total estimated number of additional latent cancer fatalities (LCFs) to all involved workers from an annual dose.	0.066	1.6×10^{-3}	Same as H Area	No increase above APT's baseline.

Table S-1. (Continued).

Resource	Current SRS Baseline	Increment above baseline of proposed H Area site	Increment above baseline of alternative AGNS site	Increment above baseline of no-action alternative[a,b,c]
Number of construction worker injuries resulting in lost work time.	NA	11	10	No increase above APT's baseline
Accidents[f,g]				
Additional LCFs in offsite population	NA			
Annual frequency / Bounding accident				
$>10^{-2}$ / Hood or room fire		0.4	0.3	0
$>10^{-4}$ to $<10^{-2}$ / Area fire		0.4	0.4	0
$>10^{-6}$ to $<10^{-4}$ / Design-basis seismic event with fire		0.7	0.7	0.3
Impacts to Ecological Resources				
Terrestrial Ecology	The affected environment is within developed areas consisting of paved lots, graveled surfaces, buildings and trailers, providing minimal terrestrial wildlife habitat.	No physical alterations to the landscape outside of H Area but limited potential to disturb any nearby resident wildlife as a result of construction and operations noise.	Because the AGNS facility has been inactive since 1983, it may contain more wildlife than the H Area site. Construction and operations noise and human activity would have localized adverse effects on wildlife.	No additional impacts above APT's baseline.
Aquatic Ecology	No aquatic habitat within H Area boundaries; aquatic habitat adjacent to H Area boundaries (Crouch Branch and Fourmile Branch).	Construction activities would occur under best management practices to limit sedimentation in detention basins and protect streams from non-point source pollution. Operations wastewater would be discharged through NPDES-permitted outfalls. DOE would continue to comply with the permit requirements and regulatory standards to ensure maintenance of water quality in receiving streams.	Same as H Area	No additional impacts above APT's baseline.

Table S-1. (Continued).

Resource	Current SRS Baseline	Increment above baseline of proposed H Area site	Increment above baseline of alternative AGNS site	Increment above baseline of no-action alternative[a,b,c]
Wetland Ecology	No wetland habitat within H Area boundaries; wetland habitat in the vicinity of H Area boundaries (Crouch Branch, Fourmile Branch, Upper Three Runs).	Wetlands in the Upper Three Runs watershed, including Crouch Branch, or the Fourmile Branch watershed would not be adversely affected by the construction and operation of the TEF.	Wetlands associated with Lower Three Runs would not be adversely affected by construction or operation.	No additional impacts above APT's baseline.
Threatened and Endangered Species	No threatened and endangered species within H Area boundaries.	No threatened or endangered species live or forage in H Area. There would be no adverse impact.	Same as H Area	No additional impacts above APT's baseline.

a. DOE determined that changes from the baseline of less than 5 percent are within the margin of error and **the conservatism inherent in the analyses. DOE finds that in those instances there is no measurable change from baseline and has not evaluated the impacts further.**

b. Baseline for no action includes an accelerator for production of tritium (APT) constructed on its preferred site and operated with its preferred helium-3 feedstock. The increment above baseline for no action incorporates extracting tritium from CLWR targets in the APT facility.

c. Source: **England (1998a); Willison (1998)**.

d. Concentration increments that would be less than 0.1 percent of standard for both locations are not listed.

e. Includes land use, visual resources and noise, and historical and archeological resources.

f. Events with the most additional latent fatalities in offsite public are a full-facility fire and a design-basis earthquake with a secondary fire.

g. Accidents involving targets of similar design would have substantially lower impacts.

h. The employment of 10,000 is based on actual reductions in 1995, 1996, and 1997 and a continuation of that trend through 2000. The 1998 SRS workforce was 14,130 and is expected to remain stable through at least 1999. As such, the estimate serves as a conservative lower bound assumed to ensure that the workforces associated with the construction and operation of the TEF are not underestimated relative to the SRS workforce.

between the two facilities; and to use certain gas-handling processes located in H Area. Consequently the life-cycle cost of operating the TEF at this location is substantially less than AGNS.

S.6.2 Comparison of the TEF No-Action Alternative to the Base Case Proposed Action for the Accelerator for Production of Tritium (APT Without Extraction Capability)

Even though the Secretary selected the APT as backup, the discussion below is retained in this Final EIS until a Record of Decision has been issued.

For purposes of this document the no-action alternative **involved** providing tritium extraction capacity within APT as described in the No Action section above. Therefore, the impacts of incorporating TEF with APT **were** compared against the base case impacts of constructing and operating only APT **based on data input prepared for the Final APT EIS.** Differences between constructing APT with and without TEF capabilities are identified in Table S-2 (at the end of this section). Alternative targets were not evaluated for the no-action alternative; only CLWR targets were evaluated in the no-action alternative.

Under the no-action alternative for the TEF EIS, DOE would not **have constructed** and **operated** a TEF in H Area or the alternate location at AGNS, APT would be built and no action would be selected for the TEF EIS. DOE would **have incorporated** extraction capability within the APT facility. These impacts are compared to those associated with construction and operation of the APT without the tritium extraction capability.

The main additions required to combine TEF and APT would **have been** the addition of the Remote Handling Area, target preparation area, storage area, and the TEF furnaces to APT. These furnaces would **have heated** CLWR targets to drive tritium from them. In addition, the TEF furnaces could **have been** used to extract the tritium from targets of similar design. The furnaces would **have been** accommodated by the construction of a 48-foot addition along the length of one building in the APT facility. This addition would **have added** a total of 28,800 square feet on five levels, for an increase of approximately 10 percent in one APT building. Some system expansions and relocations within the building would **have been** necessary as a result of the combination of functions. However, these modifications would **have been** relatively minor in comparison with the entire APT project.

TEF at APT **was** assumed to store up to a maximum design capacity of 4,200 CLWR targets. These targets would **have been** kept in dry storage in one of the APT facility buildings. For accident analysis purposes, it **was** assumed that each CLWR rod contains a maximum of 1.5 grams of tritium. It **was** also conservatively assumed that all of the tritium in the extraction furnace and 1 percent of the tritium in the stored CLWR targets would be oxidized and released in the event of either a design-basis or beyond-design-basis seismic event.

The facility would **have been** designed so that both the tritium-extraction furnaces and the accelerator could **have operated** simultaneously. Operators in the APT facility would **have been** cross-trained in both TEF and APT functions. As a result, no additional personnel would **have been** expected for the combined facility.

<u>Impacts of Construction of the Combined TEF/APT</u>

The additional construction required for the combined facility would not **have required** any changes either to the construction start date or the period of construction. The additional construction necessary to build the combined extraction facility would **have added** less than 5 percent to the construction effort of building APT in both materials and workforce.

Construction of the combined facility **would have involved** expansion of one building and some additional equipment. The additional land required for the building footprint **was** adjacent to a planned building and already included in the

Table S-2. Comparison of operation of APT with and without extraction capability.

Resource	APT without extraction capability (base case)	No action (APT with extraction capability)
Annual **Air** Releases (curies)		
Tritium **oxide**[a]	**30,000**	**35,000**
Carbon-11	**250**	**250**
Expelled pellet material[b]	NA	4.2×10^{-5}
Argon-41	**2,000**	**2,000**
Cobalt-60	NA	4.2×10^{-4}
Beryllium-7	**0.02**	**0.02**
Iodine-125	$\mathbf{2.7 \times 10^{-3}}$	$\mathbf{2.7 \times 10^{-3}}$
Public and Worker Health		
Maximally exposed (offsite) individual (MEI) dose (mrem/yr)	**0.052**	**0.058**
Annual probability of fatal cancer to MEI from normal operations	$\mathbf{2.6 \times 10^{-8}}$	$\mathbf{2.9 \times 10^{-8}}$
Total dose to population (person-rem/yr)	**2.0**	**2.2**
Annual population latent cancer fatalities (LCFs) **from air and aqueous releases**[c]	$\mathbf{1.0 \times 10^{-3}}$	$\mathbf{1.1 \times 10^{-3}}$
Uninvolved worker dose (rem/yr)	$\mathbf{1.7 \times 10^{-3}}$	$\mathbf{2.0 \times 10^{-3}}$
Involved worker dose (rem/yr)	1.0	1.0
Collective involved worker dose (person-rem/yr)	**88**	**92**
Annual collective involved worker LCFs	**0.04**	**0.04**
Accidents		
Maximally exposed (offsite) individual (rem)		
Design-basis seismic event	2.9	3.3
Beyond design-basis seismic event	3.0	5.8
Total dose to population (person-rem)		
Design-basis seismic event	5,100	5,857
Beyond design-basis seismic event	5,500	10,577
Total LCFs to population		
Design-basis seismic event	2.6	2.9
Beyond design-basis seismic event	2.7	5.3
Uninvolved worker dose (rem)		
Design-basis seismic event	150	152
Beyond design-basis seismic event	168	180

a. **The dose effects of elemental tritium are negligible compared to tritium oxide and are not included in this analysis.**

b. **Expelled pellet material resulting from puncturing CLWR targets. Source term radionuclides (with percent annual Curie content) include Se-75 (33%), Cr-51 (23%), Co-58 (13%), Fe-55 (12%), Ca-45 (10%), Ar-37 (3%), Mn-54 (2%), Ni-63 (1%), C-14 (1%), Ar-39 (1%), and trace isotopes (<1%) (Milgiore, 1998).**

c. **Aqueous releases from APT are 3,000 Ci/yr of tritium, 1×10^{-4} Ci/yr of cobalt-60, 2×10^{-3} Ci/yr of chromium, and 1×10^{-3} Ci/yr of sodium-22. The tritium extraction process has aqueous releases that are less than reportable levels.**

APT footprint. As a result, no effects greater than five percent above APT's baseline would **have been** expected to the physical environment (landforms soils, geology, hydrology, surface water, air emissions, infrastructure, waste management, cultural resources, visual resources, or noise).

Construction of the combination facility would **have involved** no new hazards to workers beyond those already considered for the construction of the entire APT. As a result of design efficiencies, the combination facility would **have been** constructed with approximately the same workforce and no change expected in the number of additional traffic accident fatalities or occupational injuries during construction. In addition, no change would **have occurred** in socioeconomic impacts compared to the entire APT project.

As the combination facility would **have been** a small addition to the entire APT project, no impacts beyond those already considered would **have taken** place in the biological environment (terrestrial ecology, aquatic ecology, wetland ecology, threatened and endangered species).

<u>Impacts of Operation of the Combined TEF/APT</u>

Operation of the combined facility would not **have required** large changes in the operational characteristics of APT. No additional land use would **have been** required and additional water use would **have been** less than 5 percent of that already identified for separate APT and tritium extraction facilities. No effects on the landforms, soils, visual resources or noise from the facility beyond those already envisioned for APT would **have occurred**. Emissions of nonradiological gases to the environment would **have been** equivalent to the emissions already analyzed for APT as a whole.

This document identifies the impacts of the bounding case of storing CLWR targets per year in TEF, processing CLWR targets in TEF, and operating APT with the preferred helium-3 feedstock alternative. Operation of the combined facility would **have increased** emissions of radioactive gases and particulates compared to the APT baseline. The combined facility could **have been** expected to have annual air releases no greater than **35,000 curies of tritium oxide, 250 curies of carbon-11, 2,000 curies of argon-41, 0.02 curies of beryllium, 0.0077 curies of iodine-125,** 4.2×10^{-5} curies **attributable to pellet material emissions**, and 4.2×10^{-4} curies of cobalt-60. Of these annual totals, extraction capability would **have accounted** for **5,000** curies of tritium and all the releases **from pellet material emissions** and cobalt-60. These releases would **have** bound all operational combinations of TEF and APT production, but in no case would the operation of the combined facilities **have produced** more than 3 kilograms of tritium per year.

Waste streams from the combined facility would **have been** very similar to those from the APT baseline with the exception of job control waste from TEF. The combined facility would **have produced** an additional 320 cubic meters annually of low-level solid radioactive waste and an additional 2 cubic meters annually of hazardous waste.

Cross-training of the workforce would **have resulted** in no additional workers required for the combined facility. Therefore, the estimates for occupational injuries, traffic accident fatalities, and impacts on the regional economy would be unchanged from the APT baseline. While emissions would **have increased** over the APT baseline, the relative effects of each element on the surrounding population would **have been** unchanged and the environmental justice conclusion of the Draft APT EIS would remain valid.

The diesel generator and storage tank necessary for backup power for TEF at H Area would not **have been** needed for the combined facility. The TEF furnaces **did** not require backup power and other backup power needs would **have been** provided by the APT facility generators. Therefore, there **was** no difference between the nonradiological air impacts for the combined facility and the APT baseline alternative.

Public health impacts would **have been** higher for the combined facility than those for the baseline APT alternative due to the higher radiological source term associated with extracting tritium from CLWR targets. Extraction capability would **have increased** the doses to the maximally exposed offsite individual and population **to 0.058 millirem per year and 2.2 person-rem per year,** respectively. The estimated number of annual latent cancer fatalities to the general population from the combined facility **is 0.0011 compared to 0.0010 for the baseline APT.**

Because worker radiological dose is an administratively controlled limit, the maximum worker dose allowed at the combined TEF/APT facility would **have been** unchanged from the APT baseline facility. As shown in Table S-2, the collective radiation exposure for workers at the combined facility would not be increased substantially from the baseline APT. The uninvolved worker dose (640 meters from the facility) would **have been** higher for the combined facility due to cobalt-60 emissions from extracting CLWR targets and a doubling of tritium emissions as a result of the additional TEF operations. The uninvolved worker dose would **have increased** from **1.7×10^{-3} millirem per year for baseline APT to 2.0×10^{-3} millirem per year** for the combined facility.

Consequences of potential accidents at facilities that produce or process radioactive materials **were** driven by the amount of source material available for release to the environment. The combination facility **differed** from the baseline APT in that there **was** an increase in the amount of tritium stored in the form of CLWR targets. This additional fixed source term **resulted** in greater accident consequences for the combined facility over the APT baseline. The limiting accident scenarios for the APT facility **were** a large fire in the combined facility and design-basis and beyond-design-basis seismic events.

S.7 Cumulative Impacts

The counties surrounding SRS have numerous existing and planned industrial facilities with permitted air emissions and discharges to surface waters. Because of the distances between the SRS and the private industrial facilities, there is little opportunity for interactions of plant emissions, and no major cumulative impact on air or water quality. Construction and operation of planned off site facilities could affect the regional socioeconomic cumulative impacts. DOE also has evaluated the impact from its own proposed future actions by examining impacts to resources and the human environment as described in NEPA documents related to SRS. Additional NEPA documents related to SRS that were considered in the cumulative impacts include:

•Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling.

•Final Environmental Impact Statement Accelerator Production of Tritium at Savannah River Site.

•Final Environmental Impact Statement Commercial Light Water Reactor.

•Draft Savannah River Site Spent Nuclear Fuel Management Draft Environmental Impact Statement.

•Final Environmental Impact Statement Interim Management of Nuclear Materials.

•Final Environmental Impact Statement Interim Management of Nuclear Materials.

•Disposition of Surplus Highly Enriched Uranium Final Environmental Impact Statement.

•Defense Waste Processing Facility Supplemental Environmental Impact Statement.

•Draft Surplus Plutonium Disposition Environmental Impact Statement.

•Environmental Assessment for the Tritium Facility Modernization and Consolidation Project at the Savannah River Site.

•Final Environmental Impact Statement on Management of Certain Plutonium Residues and Scrub Alloy Stored at the Rocky Flats Environmental Technology Site.

Cumulative impacts analysis also includes the impacts from actions proposed in this EIS. Risks to members of the public and site workers from radiological and nonradiological releases are based on the proposed action to extract tritium from commercial light water reactor (CLWR) targets. Impacts associated with extracting tritium from targets of similar design are not discussed here because in all cases they are less than the impacts of CLWR targets.

Air Resources.

The SRS maximum values are the maximum modeled concentrations that could occur at ground level at the Site boundary. The data demonstrate that total estimated concentrations of nonradiological air pollutants from the SRS, including the contributions from TEF, would be below the regulatory standards at the Site boundary. The cumulative concentrations range from less than one percent to 59 percent of the applicable standards. The higher percentages (54-59 percent) are for the shorter interval sulfur dioxide concentrations and the particulate concentrations and are still well within regulatory standards. The cumulative dose to the maximally exposed member of the public would be 1.1 x 10^{-3} rem (1.1 millirem) per year, equivalent to 11 percent of the regulatory standard of 10 millirem per year. The approach of summing the doses to a maximally exposed individual for the seven actions that contribute to the radiological dose, non-Federal contributions, and baseline SRS operations is an extremely conservative one because it assumes that the maximally exposed individual would occupy simultaneously the four locations that would receive the maximum doses from activities described in each EIS at the same time, a physical impossibility.

Water Resources.

Studies of water quality and biota downstream of existing outfalls suggest that discharges from these facilities have not degraded the water quality of Upper Three Runs or Fourmile Branch. Even with the addition of TEF wastewaters, ETF and the Central Sanitary Wastewater Treatment Facility would continue to meet the requirements of the SRS permit. Liquid effluents from the Site could contain small qualities of radionuclides that would be released to SRS streams that are tributaries of the Savannah River. The exposure pathways considered in this analysis included drinking water, fish ingestion, shoreline exposure, swimming, and boating. The preferred TEF configuration would result in minimal radiological dose to the maximally exposed individual at the SRS boundary from liquid releases. The dose from TEF liquid emissions would be minimal because effluent from TEF would be treated at ETF. ETF processes would remove non-tritium radiological components of the waste stream. The tritium in the TEF liquid effluent sent to ETF is expected to be well below the U.S. Environmental Protection Agency's (EPA's) drinking water limit of less than 20,000 picoCuries per liter.

Public and Worker Health.

The radiation dose to the maximally exposed offsite individual from air and liquid pathways is estimated to be 1.4 x 10^{-3} rem (1.4 mrem) per year, which is well below the applicable DOE regulatory limits (10 mrem per year from the air pathway, 4 mrem per year from the liquid pathway, and 100 mrem per year for all pathways). The total population dose for current and projected activities of 50 person-rem translates into 0.025 additional latent cancer fatality for each year of exposure for the population living within a 50-mile radius of the SRS. For comparison, 145,700 deaths from cancer due to all causes would be likely in the same population over their lifetimes. The annual radiation dose to the involved worker population would be 1,138 person-rem. The largest contributor to the dose is Alternative 3B in the Surplus Plutonium Disposition EIS. Specifically, the dose is associated with the operation of a plutonium disassembly and conversion facility that could be sited at SRS. It also should be noted that dose to the individual worker will be kept below the regulatory limit of 5,000 mrem

per year. In addition, as low as reasonably achievable (ALARA) practices help maintain worker doses below DOE's administrative control level of 2,000 mrem per year. SRS-specific administrative control levels are as low as 700 mrem per year.

Waste generation.

The estimated quantity in this forecast of waste from operations during the next 30 years is 603,000 cubic meters. In addition, environmental restoration and decontamination and decommissioning activities identified in the 30-year forecast would produce an additional 712,000 cubic meters. Other proposed activities that were not included in the 30-year expected waste forecast (exclusive of decontamination and decommissioning) would add 211,705 cubic meters. Therefore, the total amount of waste from SRS activities exclusive of TEF is estimated to be 1,526,705 cubic meters. It is anticipated that SRS will have the capacity to handle the total amount of projected waste. Low-level waste would be generated from TEF operations activities. Mixed and hazardous wastes would be generated from TEF maintenance activities. High-level and transuranic waste would not be generated at TEF. The total waste volume associated with TEF activities (excluding decontamination and decommissioning) would be 9,430 cubic meters. The TEF post-treatment waste volume would require less than one percent of the low-activity waste and intermediate-level tritium waste vault disposal capacities per year. TEF hazardous and mixed waste also would require less than one percent of their respective storage capacities at SRS.

Utilities and Energy.

The cumulative consumption values for existing and planned activities (based on annual consumption estimates) would be a significant increase in electricity usage at SRS. Because the source of this electricity would be dispersed across the electric grid that serves SRS, DOE cannot estimate site-specific impacts from increased electricity requirements. The estimated annual electricity consumption by TEF (20,600 megawatt-hours) would be small compared to existing site electricity usage.

S.8 Public Comments and DOE Responses

During public review of the Draft EIS, submissions were received from 12 individuals and organizations. Of those, 9 were from individuals, 2 were from Federal agencies, and 1 was from a citizens group. Major comments and DOE responses are summarized below and are organized according to key issue areas.

Costs

***Comment*: The EIS should include costs for the various alternatives.**

***Response*: DOE is not required by the National Environmental Policy Act (NEPA) to include project-related cost in an EIS. DOE has fully characterized and documented the socioeconomic impacts (e.g., the number of jobs created and the resultant effect of income generated on the local economy) of implementing each of the alternatives in the evaluation of socioeconomic impacts in Chapter 4 of the DEIS. DOE did not perform a cost-benefit analysis for construction and operation of TEF at H Area or AGNS.**

Alternatives

***Comment*: There are little or no differences between AGNS and the H-Area alternatives, but the EIS makes these differences look like major differences.**

***Response*: DOE did not intend to make qualitative judgements about differences in impacts between the two sites, but presented the data necessary for the reader to make those judgements. DOE did wish to capture the differences in environmental impacts for the decision maker(s) and the public. DOE has revised Section 2.4.1 starting on page 2-8 of the draft EIS to clarify the differences in**

these two alternatives. The revision is in Section 2 of the Final EIS.

Nonproliferation

***Commen*t: The EIS action would change U.S. Policy mixing commercial and military uses.**

***Response*: The purpose of the proposed action and alternatives evaluated in this EIS is to provide tritium extraction capability to support a new tritium source for continuing the nuclear weapons stockpile of the U.S. The production of tritium in commercial reactor facilities, the conformity of such production with national policy on nonproliferation, or the impact of such a policy on the United States position internationally in regard to nonproliferation, are not within the scope of this EIS. However, the Statement of Administration Policy, dated May 20, 1998, from the Executive Office of the President, Office of Management and Budget, reads "Tritium production in commercial reactors is not inconsistent with U.S. nonproliferation policy. There have been several instances of cooperation between U.S. military and civilian nuclear programs, including dual use of uranium enrichment facilities and commercial sale of electricity originating from a weapons material production reactor."" This conclusion was confirmed in the Interagency Review of July 1998 Report to Congress by DOE which further reinforced the position that the dual track strategy for tritium production should be maintained.**

Impacts

***Comment 1*: Involved workers as well as uninvolved workers should be included in the EIS.**

***Response*: DOE evaluated the impacts of normal operations on involved workers in the Draft EIS. See Section 4.1.2.5 (page 4-16), Table 4-13 (page 4-18), Section 4.2.2.5 (page 4-44), and Table 4-27 (page 4-46) of the Draft EIS. A quantitative analysis of the impact of accident conditions on involved workers was not performed because the large number of assumptions required in the consequence modeling would make the prediction unreliable. To protect involved workers, a qualitative evaluation of accident-relate hazards is performed and reported in the hazards section of the Safety Analysis Report. This analysis is used to identify required administrative controls/safety features.**

***Comment 2*: Cobalt does not appear to be addressed.**

***Response*: As indicated in Sections 4.1.1.2 (page 4-3), 4.1.1.4 (page 4-8), and 4.2.1.4 (page 4-37) of the DEIS, cobalt-60 is used to represent worst-case liquid discharges and atmospheric emissions from CLWR target residues. Coablt-60 imparts the highest atmospheric dose per curie amount of all the radionuclides in the target residues. As shown in Table 4-5 of the DEIS, DOE estimates that about 4.2 x 10^{-4} curies of cobalt-60 would be released annually. This release is included in the source term used to calculate radiological doses to the public and workers that would result from TEF operation.**

Purpose and Need Section

***Comment 1*: This Section should state why existing DOE reactors were not used.**

***Response*: DOE conducted an exhaustive review of technologies for supplying tritium, including using the five reactors on SRS, and documented it in the *Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling*. The study revealed that only one of the reactors at SRS (K Reactor) was capable of returning to operation. DOE determined that operation of a first-generation reactor designed in the 1940s is not a reasonable alternative for a new, long-term, assured tritium supply. The purpose and need for this EIS is for the capability to extract tritium after tritium has been produced.**

***Comment 2*: This Section should state why the existing tritium facility was not recommended for use.**

***Response*: Unlike using the production reactors, refurbishing the existing tritium extraction facility is an alternative means to respond to the purpose and need for the actions evaluated in this EIS. Although this alternative was determined to be unreasonable, DOE believes that it is correct to present it in the Proposed Action and Alternatives section of the Summary rather than earlier in the Summary.**

Dose and Risks

***Comment 1*: Report risks in percentage increase.**

Response: DOE has revised Table 4-6 on page 4-9 of the Draft EIS in response to the suggestion. The revision is in Section 2 of the Final EIS.

***Comment 2*: "Determining" emissions are actually estimates.**

***Response*: The commenter is correct. The sentence on page 4-8 of the Draft EIS (and in Section 2 of the Final EIS) was revised.**

***Comment 3*: Requests were made for several terms to be defined and references added.**

***Response*: These changes were made and are given in Section 2 of the Final EIS.**

***Comment 4*: More information is needed on measures to mitigate occupational injuries or traffic fatalities.**

***Response*: Positive measures are taken to minimize an increase in occupational injuries during any construction activities at the Savannah River Site. These include the adherence to agreements, safety plans, and safety procedures by all contractors, subcontractors, and Site forces. In addition to meeting OSHA requirements, Site workforces must adhere to Site safety procedures documented in Site Safety Manuals.**

The potential risk for increase of traffic fatalities during construction is minimized through traffic law enforcement by the Site security force. Although an increase in actual numbers of accidents or fatalities could occur as a result of additional construction activities and the additional workers required, DOE does not expect the accident or fatality rate to increase. Therefore, DOE has not modified the Draft EIS.

Other (Miscellaneous)

***Comment 1*: TEF should be legally designated a DOE defense nuclear facility.**

***Response*: The Defense Nuclear Facilities Safety Board (DNFSB) has the authority, under legislation establishing the DNFSB and its mission, to provide independent safety oversight to DOE in regard to the operation of defense nuclear facilities. The DNFSB from time to time provides recommendations to the Department. Ambiguities may exist in the Board's authority to provide oversight to TEF and other DOE tritium programs because tritium is not a special nuclear material as defined by the Atomic Energy Act of 1954. DOE cooperates fully with the Board on matters concerning existing and proposed DOE tritium facilities. As indicated in the draft EIS, because of its radiological characteristics, DOE has chosen to apply to tritium operations a number of regulations and standards that also apply to special nuclear material operations. DOE believes this is a conservative approach to safety management for tritium facilities. DOE has a rigorous regulatory system in place for tritium facilities. Because of this, it is not likely that changes in the definition of DOE nuclear facilities or the designation of tritium as a special nuclear material would change the safety posture of these facilities or of the TEF. Therefore, DOE has not modified the Draft EIS in this regard.**

***Comment 2*: The EIS should state that no commercial sales of tritium will be allowed.**

***Response*: The purpose of the proposed action and alternatives evaluated in the TEF EIS is to provide the capability to extract**

tritium from tritium producing burnable absorber rods irradiated in a commercial nuclear reactor, or targets of similar design, for the sole purpose of supplying tritium to the Department of Defense to support the nuclear weapons stockpile of the United States. Commercial sale of tritium extracted in the TEF is not contemplated at this time.

***Comment 3*: Add more information about emergency response plans.**

***Response*: Emergency response-related factors were considered first during the formal site selection process conducted for TEF. As part of the SRS emergency preparedness process and prior to becoming operational, the TEF would be incorporated into the Site and H Area Emergency Plans. These plans would consider the potential impacts of TEF accidents on personnel in nearby facilities, and the potential impacts of existing operations on personnel assigned to the TEF. DOE prepares and implements Site- and facility-specific plans for responses to potential emergencies such as chemical spills and accidents. DOE has integrated these SRS plans with state and local offsite plans to enable coordination of a total response to SRS incidents.**

***Comment 4*: The TEF needs separate independent inspections.**

***Response*: One or more regulatory bodies, including EPA and the South Carolina Department of Health and Environmental Control oversee all Site activities. Other agencies, including the Defense Nuclear Facilities Safety Board, oversee particular facets of SRS operations. For example, the DOE industrial hygiene program complies with the Occupational Safety and Health Administration's regulatory requirements for tracking the incidence and type of injuries and illnesses and the resulting days lost from work. These agencies would exercise the same responsibilities for TEF operations.**

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