



Supplemental Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor

Public Scoping Meeting

October 20, 2011

National Nuclear Security Administration (NNSA)

Department of Energy (DOE)



Background



- NNSA is the federal agency responsible for providing the nation with nuclear weapons and ensuring those weapons remain safe and reliable
- Tritium is a radioactive isotope of hydrogen and is an essential component of every weapon in the current and projected U.S. nuclear weapons stockpile. Because tritium decays at a rate of 5.5 percent per year, it must be replenished periodically
- In March 1999, DOE published the *Final Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor* (CLWR EIS)
- On May 14, 1999, DOE announced the Record of Decision (ROD) for the 1999 CLWR EIS, in which DOE decided to utilize:
 - TVA's Watts Bar Unit 1 and
 - Sequoyah Units 1 and 2 for tritium production



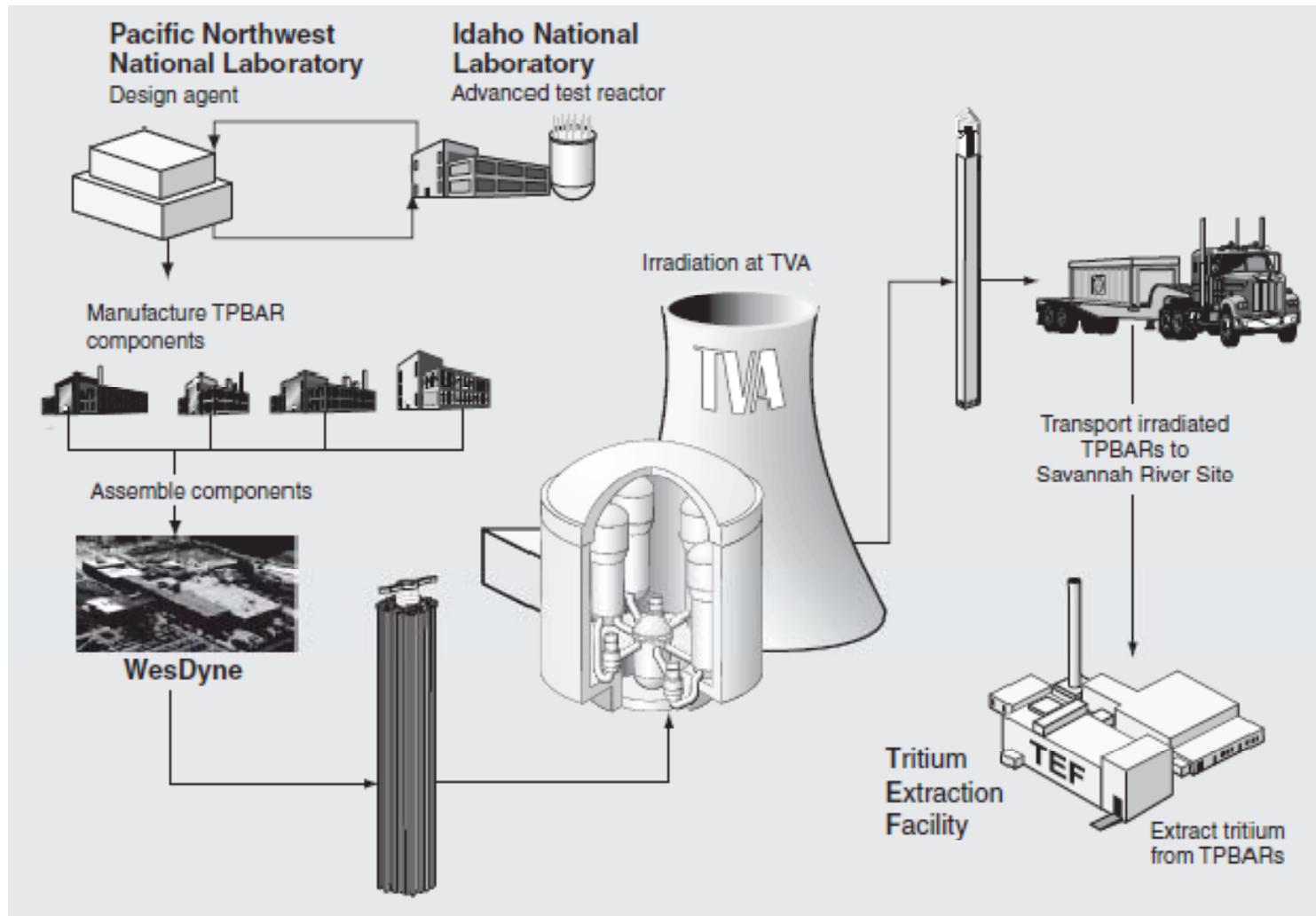
Background (cont.)



- In 2002, TVA received license amendments from the Nuclear Regulatory Commission (NRC) to produce tritium at Watts Bar 1 and Sequoyah 1 and 2
- Since 2003, TVA has been producing tritium for NNSA by irradiating tritium producing burnable absorber rods (TPBARs) at Watts Bar 1
- NNSA expected that permeation of tritium through the TPBAR cladding into the reactor coolant systems would be less than or equal to one curie/TPBAR/year



NNSA's Tritium Production Enterprise





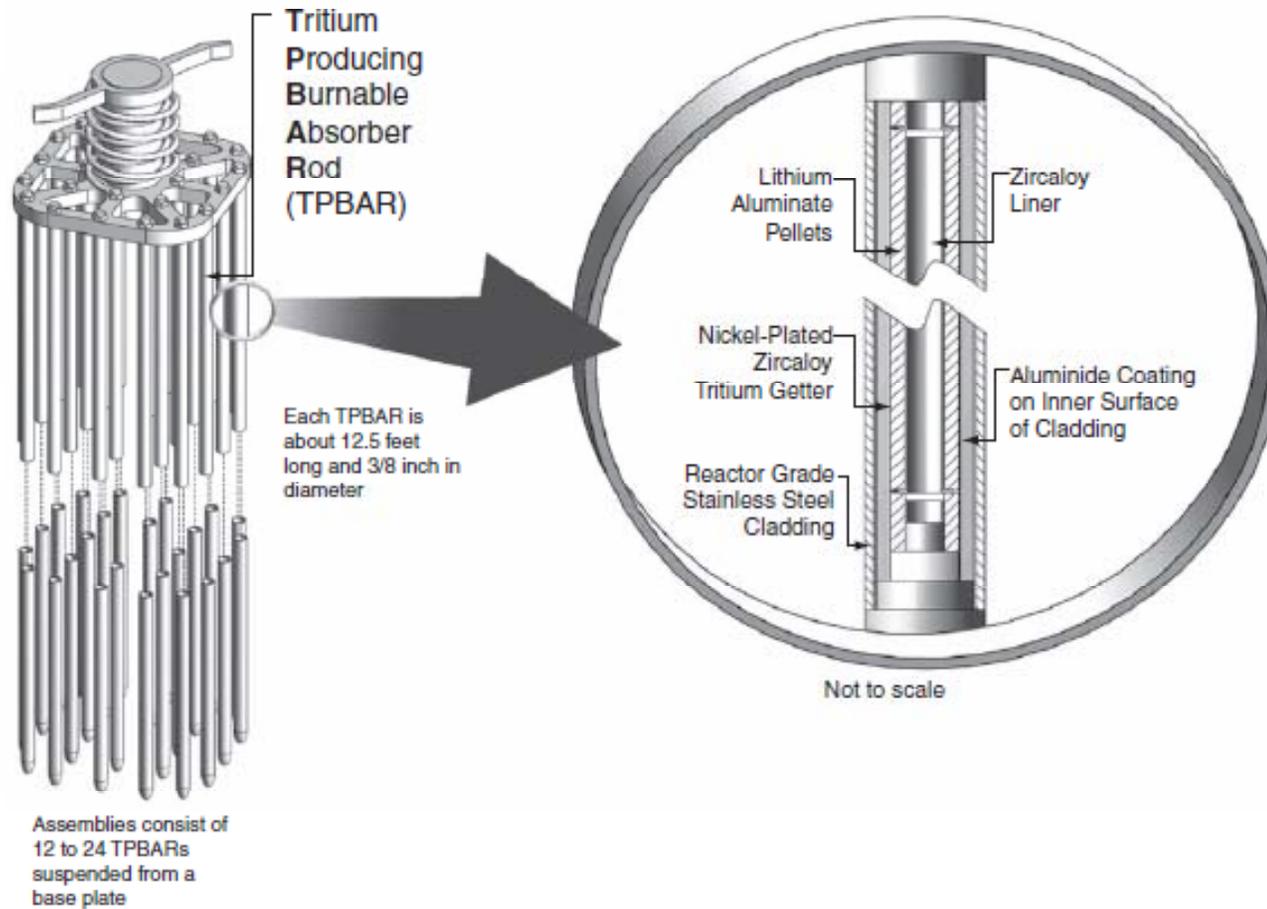
TPBARs and Tritium Permeation



- TPBARs: long, thin tubes that contain lithium-6, a material that produces tritium when exposed to neutrons. TPBARs are placed in the same locations in the reactor core as the standard boron burnable absorber rods
- During the reactor's normal operations cycle (approximately 18 months), TPBARs are irradiated and tritium gas generated is captured in the tritium "getter" (a solid metal nickel-plated zirconium material in the TPBAR)
- After several years of tritium production experience at Watts Bar 1, NNSA has determined that tritium permeation through TPBAR cladding occurs at a higher rate (approximately 4 curies/TPBAR/year) than previously projected and analyzed in the 1999 CLWR EIS
- At the end of the reactor operating cycle, there are approximately 10,000 curies of tritium in each rod
- The amount of tritium released from Watts Bar 1 is below NRC limits



TPBARs (cont.)





Tritium Releases



- All nuclear reactors produce tritium as a normal by-product of their operations
- Tritium (whether from TPBARs or normal reactor operations) enters the reactor coolant system where it is treated as radioactive water
- Processing, storage and disposal of radioactive wastes such as tritium are done safely and in compliance with established NRC and Environmental Protection Agency (EPA) regulations
- Tritium is released under closely controlled and monitored conditions to the Tennessee River in accordance with regulations that protect the health and safety of the public and environment. Releases from Watts Bar to the Tennessee River are carefully managed and reported to the NRC to ensure that downstream concentrations are kept well within drinking water and other standards as applicable



Why is NNSA Preparing this Supplemental EIS (SEIS)?



- NNSA is preparing this SEIS to analyze:
 - the potential environmental impacts associated with increased tritium permeation levels observed since 2004
 - the potential environmental impacts associated with increasing the number of TPBARs irradiated per cycle which is required to supply reasonably foreseeable tritium requirements (maximum of approximately 2,500 TPBARs per fuel cycle, with a projected steady state number of approximately 1,700 TPBARs per fuel cycle)
 - Incorporate into the NEPA analyses changes in the regulatory and operating environment since 1999



NEPA Process and Schedule



- Provide for public involvement and ensure that public officials consider the environmental effects of proposed actions and alternatives in order to foster better decision-making
- Environmental Impact Statement (EIS) is required for any major federal action that may significantly affect the quality of the human environment
- Supplemental EIS is required when there are substantial changes to a proposal or when there are significant new circumstances or information relevant to environmental concerns. This Supplemental EIS builds on the 1999 CLWR EIS and will include a thorough, up-to-date analysis, particularly in areas in which there have been significant changes since the original CLWR EIS was published

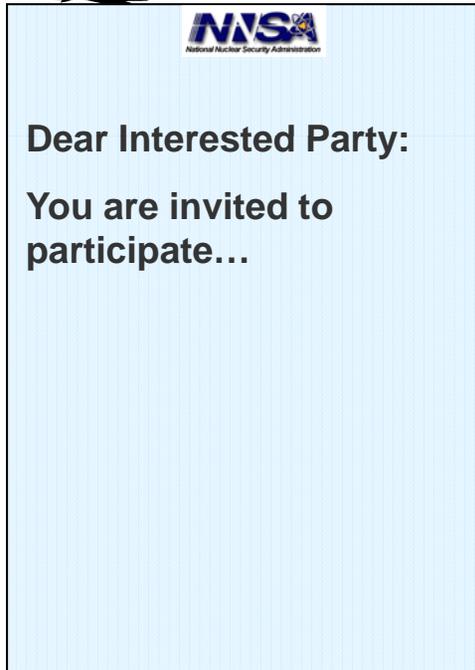




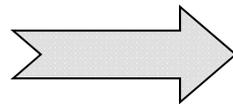
Purpose of Scoping



Identify reasonable alternatives to be analyzed in the SEIS



Identify potentially significant environmental issues to be analyzed in the SEIS



Identify alternatives and issues that do not require detailed analysis in the SEIS



Content of SEIS



Summary
Introduction and Background
Purpose and Need
Alternatives
Affected Environment
Environmental Impacts
Regulatory Compliance
Technical Appendices
Classified Appendix



SEIS Alternatives



Current Alternatives

No Action (“Status Quo”): Produce tritium at currently approved TVA facilities (Watts Bar 1 and Sequoyah 1 and 2) at appropriate levels to keep permeation levels within currently approved NRC license and regulatory limits

Alternative 1: Utilize TVA’s Watts Bar site only to a maximum level of 2,500 TPBARs every reactor fuel cycle (18 months)

Alternative 2: Utilize TVA’s Sequoyah site only to a maximum level of 2,500 TPBARs every reactor fuel cycle (18 months)

Alternative 3: Utilize both the Watts Bar and Sequoyah sites to a maximum total level of 2,500 TPBARs every 18 months



SEIS Assessments



- Land
- Air Quality
- Water Resources
- Biotic Resources
- Cultural Resources
- Waste Management
- Intentional Destructive Acts (classified appendix)
- Infrastructure
- Socioeconomics
- Environmental Justice
- Human Health
- Accidents
- Transportation



Record of Decision (ROD)



NNSA will consider input from:

- SEIS
- Technical
- Policy
- Cost

ROD will announce decisions regarding:

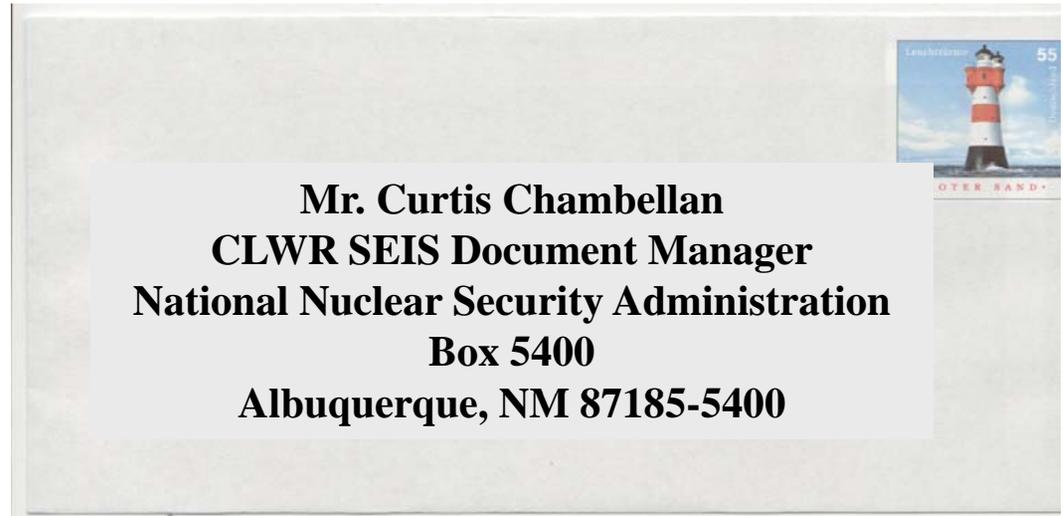
- Number of TPBARs irradiated per fuel cycle
- Which site(s) and how many reactors TVA may use to meet NNSA tritium requirements



How to Provide Comments



- At scoping meeting
 - Oral and written
- By U.S. mail →
- By e-mail:
tritium.readiness.seis@doeal.gov
- By fax:
505-845-5872



Note: Comment period ends November 14, 2011