

downblending will be performed at other facilities, but NFS plans to perform some downblending at its facility. The BPF operations will be located within the older facility because that facility is already authorized to handle high-enriched uranium. After the high-enriched uranium is downblended and converted to a low-enriched uranium liquid, it will be transferred from the BPF to the new complex.

NFS plans to submit a third amendment request to authorize manufacturing operations in the new complex. Only storage of low-enriched uranium is authorized in the new complex at this time.

#### *Review Purpose*

The purpose of this EA is to assess the environmental impacts of the proposed license amendment. It does not approve the request. This EA is limited to the proposed BPF operations at the Erwin Plant and any cumulative impacts on existing plant operations. The existing conditions and operations for the Erwin facility were evaluated by NRC for environmental impacts in a 1999 EA related to the renewal of the NFS license (Ref. 1) and a 2002 EA related to the first amendment for the BLEU Project (Ref. 2). Some of the operations proposed for the BPF were previously authorized in the 200 Complex and the impact of those operations was assessed in the 1999 EA. In addition, the 2002 EA assessed the impact of the entire BLEU Project (including BPF operations) using information available at that time. This assessment presents the up-to-date information and analysis the staff used to determine that issuance of a FONSI is appropriate and that an EIS will not be prepared.

#### *Proposed Action*

The proposed action is to amend NRC Materials License SNM-124 to authorize processing operations in the BPF. The BPF is being constructed within Building 333 in the protected area of the NFS site (formerly Building 301). The operations will convert high-enriched uranium materials to high-enriched uranyl nitrate (UN) solutions. The high-enriched UN solutions will be blended with natural UN solutions to produce low-enriched UN solutions. Blending of natural uranium and high-enriched uranium was previously authorized in the 200 Complex and some of the operations proposed for the BPF were assessed during the 1999 license renewal.

However, some of the operations are new and require a license amendment. The 200 Complex is being

decommissioned and the blending operation is being moved to Building 333. The building is already in place and most construction activities are associated with renovating the building. The duration of the project will be five years from the time material is delivered to the site.

The BPF operations are composed of five processes—the Uranium Metal Process, Uranium Aluminum Alloy Process, Solvent Extraction Process, Enrichment Downblending Process, and Uranium Recovery Process.

- The Uranium Metal Process involves the conversion of uranium metal to uranium oxide in a furnace, and the dissolution of the uranium oxide in nitric acid.

- The Uranium Aluminum Alloy Process involves: (1) Dissolution of the aluminum with a caustic solution (sodium hydroxide); (2) separation of uranium solid; (3) dissolution of the uranium in nitric acid; (4) measurement of the special nuclear material (SNM) in the UN solution; and (5) measurement of the SNM in the used caustic solution.

- The Solvent Extraction Process involves: (1) Extracting the uranium from the impure UN solution with an organic solvent solution; (2) extracting the uranium from the organic solvent solution to produce a pure UN solution; (3) boiling the UN solution to adjust the concentration; and (4) treatment of the stripped solvent for reuse, and (5) processing of waste solutions.

- The Enrichment Downblending Process involves blending high-enriched UN solution with natural UN solution to produce low-enriched UN solution.

- The Uranium Recovery Process involves taking items contaminated with high-enriched uranium and rinsing them with nitric acid to remove the uranium. The resulting solution is transferred to the Solvent Extraction Process.

#### *Need for Proposed Action*

Framatome ANP Inc. has contracted with NFS to downblend surplus high-enriched uranium material to a low-enriched uranium product. The NFS product is expected to be converted to commercial reactor fuel for a Tennessee Valley Authority (TVA) nuclear power reactor; however, the NFS proposed action is limited to the production of low-enriched UN solutions as feed material to the new BLEU Complex. The BLEU Project is part of a U.S. Department of Energy (DOE) program to reduce stockpiles of surplus high-enriched uranium through re-use or disposal as radioactive waste. Re-use is considered the favorable option by the DOE because: (1) Weapons grade

material is converted to a form unsuitable for nuclear weapons (addressing a proliferation concern); (2) the product can be used for peaceful purposes; and (3) the commercial value of the surplus material can be recovered (Ref. 3). An additional benefit of re-use is to avoid unnecessary use of limited radioactive waste disposal space.

#### *Alternatives to the Proposed Action*

The only alternative available to the NRC is no action (*i.e.*, deny the amendment request). Other alternatives to the proposed action are addressed in the DOE Environmental Impact Statement (Ref. 3) and are not re-analyzed in this EA.

#### *Affected Environment*

The affected environment for the proposed action and the alternative is the NFS site. A full description of the site and its characteristics is given in the 1999 EA related to the renewal of the NFS license (Ref. 1) and a 2002 EA related to the first amendment for the BLEU Project (Ref. 2). The NFS facility is located in Unicoi County, Tennessee, about 32 km (20 mi) southwest of Johnson City, Tennessee. The plant is about 0.8 km (0.5 mi) southwest of the Erwin city limits. The site occupies about 28 hectares (70 acres). The site is bounded to the northwest by the CSX Corporation (CSX) railroad property and the Nolichucky River, and by Martin Creek to the northeast. The plant elevation is about 9 m (30 ft) above the nearest point on the Nolichucky River.

The area adjacent to the site consists primarily of residential, industrial, and commercial areas, with a limited amount of farming to the northwest. Privately owned residences are located to the east and south of the facility. Tract size is relatively large, leading to a low housing density in the areas adjacent to the facility. The CSX railroad right-of-way is parallel to the western boundary of the site. Industrial development is located adjacent to the railroad on the opposite side of the right-of-way. The site is bounded by Martin Creek to the north, with privately owned, vacant property and low-density residences.

#### *Effluent Releases and Monitoring*

A full description of the effluent monitoring program at the site is provided in the 1999 EA related to the renewal of the NFS license (Ref. 1) and a 2002 EA related to the first amendment for the BLEU Project (Ref. 2). The NFS Erwin Plant conducts effluent and environmental monitoring programs to evaluate potential public health impacts and comply with the