Summary of Observations and Issues Identified During Environmental Readiness Assessment Visits (March 30-31, 2015 Site Visit, July 7-8 Alternative Site Visit and August 4-6 Readiness Assessment at TVA Headquarters)

This report summarizes the observations, issues and concerns identified during visits by staff from the U.S. Nuclear Regulatory Comission (NRC), Pacific Northwest National Laboratory (PNNL), and the U.S. Army Corps of Engineers (USACE) as part of readiness assessment activities related to the environmental portion of a future early site permit (ESP) application, to be submitted by Tennessee Valley Authority (TVA) for small modular reactors (SMR) at the Clinch River Nuclear (CRN) site. The NRC staff, PNNL staff and staff from the USACE (jointly referred to as the environmental review team) participated in three visits to observe environmental features at the proposed and alternative sites and to examine TVA's draft environmental report (ER) that will be submitted as part of its ESP application. The purpose of the March 30-31, 2015 site visit was to conduct river tours at winter pool elevation to view archaeological sites along the exposed river banks and to observe the river and shoreline during low flow. The purpose of the July 7-8, 2015 activity was to visit the alternative sites that TVA has identified as part of its alternatives analysis in its ER. The purposes of the August 4-6 readiness assessment were to: (1) examine the draft ER in order to identify information gaps between the draft application and the technical content expected to be included in the final application submitted to the NRC; (2) identify major technical or policy issues that may adversely impact the docketing or technical review of the application; and (3) become familiar with the application, particularly in areas where TVA may be proposing new concepts or approaches.

A prior readiness assessment activity was conducted in October 2014. The report summarizing the activities conducted and staff observations regarding application readiness at that time is found in the NRC's Agencywide Documents Access and Management System (ADAMS) under accession number ML14329A151. During the August readiness assessment, the environmental review team noted that significant progress had been made in the development of the ER since the October 2014 visit. However, there remained a number of notable issues and information gaps that warrant attention by TVA. The following sections describe the review team's observations from these three visits and outline the main issues that were discussed with TVA. While the issues associated with a few resource areas were fairly extensive, the review team believes that TVA could appropriately address these issues prior to submitting its application in early 2016.

A list of participants for each visit is provided in Enclosure 2. The agendas for each visit is provided as Enclosure 3.

Site Visit of March 30-31, 2015

The primary purpose of the site visit in March 2015 was to conduct river tours at winter pool elevation to view archaeological sites along the exposed river banks and to observe the river and shoreline during low flow. The environmental review team also examined documents in selected resource areas as part of the staff's ongoing readiness assessment of TVA's application. During their visit, the team was also able to view Melton Hill Dam, the location of a potential bypass being proposed by TVA as part of the project. In addition, new team members

were given a brief tour of the CRN site and proposed reactor location. Below presents a description of the activities and a summary of review team observations.

Clinch River Boat Tour

The review team participated in a boat tour of the Clinch River in the vicinity of the site, traveling from the barge loading location at River Mile (RM) 14 to Grubb Island, just upstream of the intake location at RM 18.2 (Figure 1). The tour included visual observation of stream banks along the entire CRN site boundaries and observation of the barge facility location, transmission line crossings, and the intake and discharge areas. Several archaeological sites along the river were also visited where participants disembarked for closer observation.

Figure 1: Detail from Navigation Chart Showing Extent of Boat Tour from RM 14 to RM 18.

The Clinch River site is upstream from the Watts Bar Dam, on the Clinch River arm of the Watts Bar Reservoir. The reservoir's winter normal operating zone is between 735 and 737 ft elevation. Summer normal operating zone is between 740 and 741 ft. The reservoir elevation was in excess of 739 ft the morning of the tour. TVA staff discussed typical river flow patterns.

During most of the year, flow follows the historical downstream pattern. However, during portions of the year, river flow can be reversed due to changes in reservoir releases.

The tour included several archaeological sites along the river that are potentially eligible for inclusion on the National Register of Historic Places. Several of these sites have the potential to be affected by project activities. Sites visited included 40RE138, 40RE595, 40RE104, 40RE105, 40RE106, 40RE107, 40RE108, 40RE163, 40RE165, 40RE166, 40RE167, and 40RE549. The locations of these sites are not included on Figure 1 to protect the location of the resources. The tour went just beyond the TVA property boundary past Grubb Island to provide the cultural resources subject matter experts (SME) an example of how TVA has stabilized and protected known archaeological sites through their best management practices.

Melton Hill Dam

TVA provided an orientation visit to the Melton Hill Dam. Melton Hill Dam impounds a run-of-the-river reservoir and has two generating units having a net dependable capacity of 79 MW. Discharge from each unit is typically about 5,700 cfs during operation. The minimum daily average discharge from the dam is 400 cfs. The USACE operates a lock system next to the dam. As part of the proposed project, TVA will evaluate the effects from a proposed bypass which would provide up to 400 cfs for the purpose of maintaining the temperature profile in the river. TVA has not developed any specific designs for the bypass structure other than a preliminary plan to install a bypass through the dam structure. TVA noted that the bypass proposed was acceptable to river operations staff since it will not require a change in operations guidelines. Melton Hill Dam could operate with the bypass (without generating) and satisfy the 400 cfs minimum daily average requirement.

Document Examination and Discussions

During the March 2015 readiness assessment visit, portions of the environmental review team met at TVA offices in Knoxville and examined electronic versions of selected sections of TVA's in-progress ER and other supporting studies in order to assess TVA's readiness to file a complete application. The staff was provided access to an online reference portal where available documents for examination were located. The process of staff access and online document examination served as a test for later planned staff remote use of this reference portal.

Preliminary versions of ER sections that were available for examination included: Chapter 1; Chapter 2 sections for geology, groundwater, aquatic ecology and cultural/historic properties; several sections of Chapter 3; and Section 9.1. Supporting documents that were available to the review team included draft reports related to aquatic ecology, hydrology and cultural resources, and the draft siting study. A draft version of TVA's programmatic agreement (PA) with the State Historic Preservation Officer (SHPO) was also examined. Knowledgable staff from TVA and its contractors were available to answer review team questions. Preliminary logistics were discussed for additional pre-application meetings and readiness assessment activities.

Notable items of technical discussion included the plant parameters that were presented in the draft of ER Chapter 3, the review team's eventual need for Geographic Information System (GIS) data, the purpose and need for the federal action, review team observations from the draft siting study, observations from examination of draft hydrology sections and supporting

documents, and the status of TVA's progress on the PA with the Tennessee SHPO. Regarding the plant parameter envelope (PPE), the review team inquired as to whether TVA planned to present more descriptive information in the Chapter 3 PPE table that would better explain how the various values are used in the impact evaluations. TVA staff responded that they believe this descriptive information is appropriately captured in those ER sections where the impact evaluations are presented. Background on the development of PPE values will be available for the review team to examine during the environmental audit after the application has been submitted. For the GIS data, the review team explained that it has been their experience that GIS data from the applicant not only facilitates preparation of figures for use in the environmental impact statement (EIS), but also allows for efficiency in certain aspects of the review and can eliminate the need to request additional information to identify exact location of features. TVA inquired as to NRC procedures for submittal of information that does not meet the requirements for electronic submittals. The NRC staff stated they would provide appropriate submittal procedures for this kind of information.

Regarding TVA's PA with the SHPO, TVA staff stated that they plan to finalize the PA in August and they anticipate execution of the PA by the end of September 2015. The PA will be written in a way to include all project activities that may occur in ESP or COL space, and to be flexible so as to support design and siting changes associated with the proposed project. The TVA National Historic Preservation Act (NHPA) Section 106 undertaking for this project consists of all activities associated with the ESP and COL. TVA will have only one undertaking. NRC will have two NHPA Section 106 undertakings – one for the ESP and one for the COL. The PA will describe the actions that will be taken by TVA in order to meet its responsibilities under NHPA Section 106. NRC and PNNL archaeologists plan to have a teleconference with TVA archaeologists prior to the SHPO meeting in order to be made aware of recent TVA/SHPO conversations regarding the PA.

Based on its examination of information during the March 30-31, 2015 visit, the staff did not find any significant issues that would prevent TVA from completing its ER by early 2016. It was determined that the use of an online reference portal will greatly facilitate staff examination of TVA progress in completing the ER. Regarding previously identified issues, the review team understands TVA's plans for the implementation of the PA with the SHPO and did not identify any issues associated with its use in support of NRC's actions. Having the PA finalized at the time TVA submits the ESP application to NRC will facilitate the environmental review team's assessment, reduce the number of information requests, and assist the team in staying on schedule.

Alternative Sites Visit of July 7-8, 2015

The primary purpose of the July 7-8, 2015 activity was to visit the alternative sites that TVA has identified as part of its alternatives analysis in its ER. The environmental review team also examined documents related to TVA's site selection process to inform their tours of the four alternative sites. These four sites included one at Redstone Arsenal in Alabama and three separate sites on the Oak Ridge Reservation (ORR), designated as ORR Site 2, ORR Site 5 and ORR Site 8.

Tour of Alternative Site at the Redstone Arsenal

Redstone Arsenal is a U.S. Army garrison just west of Huntsville, Alabama. The primary mission of the facility is explosives testing and research. TVA's alternative site is situated in the southwest quadrant of the Redstone Arsenal property. The site is located in a relatively flat and mostly forested, undeveloped area north and west of an active missile range. The staff noted that there would need to be change in some of the mission activities at the site should this become the preferred site.

The site is near the Redstone Arsenal outer boundary, and beyond that is a housing development and a school. The group accessed the site by driving from the east through the range during a scheduled halt in firing. Another access is from the north via an existing road (which would require improvements if it became designated as the primary access.) It is not entirely clear at this time how far the transmission lines would run and by what path. Intake and discharge locations would be on Wheeler Reservoir, an impoundment of the Tennessee River, located at the southern border of the Redstone Arsenal property.

The site supports generally uniform forest cover with a tree canopy dominated by loblolly pine. The loblolly pine appears to be planted, although planting rows were not visibly evident. The dense forest vegetation may serve to buffer nearby urban areas from detonation noise generated by the nearby firing range. No wildlife was observed. The site appears to be generally favorable for most forest wildlife; however, detonation noise from the nearby active range may greatly limit wildlife use of the site.

TVA staff stated that the neighborhood and school would not be affected by the emergency planning zone (EPZ) or low population zone (LPZ) as currently being proposed. If these zones are expanded, the buildings could be purchased by TVA.

Tour of ORR Sites 2, 5 and 8

TVA identified three alternative sites located on the ORR in eastern Tennessee. ORR is within the city limits of Oak Ridge although the actual population center of the city is located to the north of the site. ORR includes three U.S. Department of Energy (DOE) campuses including: Oak Ridge National Laboratory (ORNL), the Y-12 National Security Complex, and the East Tennessee Technology Park (ETTP). The terrain is very hilly, and a majority of the reservation is forested and undeveloped. The Clinch River runs along the southern and eastern borders of the reservation. Existing roads run close to all three alternative sites, although all sites would require new roads and improvments to existing roads to support the project.

Buildings at all three sites would possibly be visible from the river. Other structures are already visible from ORR Site 8 (Melton Hill Dam and the towers of a former test facility). There are a few residents across the river from the sites. All three ORR sites would require an underground transmission line connecting the plant with an ORNL substation. It is assumed that the same discharge requirements for maintaining river temperature conditions at the proposed site would be required for the Oak Ridge alternative sites. Sites 2 and 5 would have intakes and discharges on Clinch River downstream of the Melton Hill Dam. The water intake for Site 8 would be upstream of the Melton Hill Dam, in the pool, and the discharge would be located downstream of the dam.

The following descriptions provide additional information for each of the three sites.

ORR Site 2: This site is situated on a broad east-west trending ridge separating Bear Creek Valley to the south and the ETTP to the north. The terrain included noticeably steep slopes. The ridge slopes are punctuated by multiple steep and narrow swales or hollows containing headwater streams. The site is densely forested throughout with mature deciduous forest dominated by upland oaks and appears to be generally favorable for most forest wildlife. Considering the uniform density of the forest cover and extent of contiguous forest on adjoining ORR lands, portions of the site may be conducive to forest-interior wildlife. The narrow stream channels and associated strips of riparian vegetation may provide small areas of suitable habitat for some amphibians and other wetland-dependent wildlife. Potential wetlands on the site are limited to the narrow stream channels and strips of associated riparian vegetation. The overwhelming majority of the site consists of sloping uplands that are clearly not wetlands. As ORR Site 2 is near an abandoned water treatment plant, the closed facility's intake and discharge locations are potential locations if this site were selected for the project. The group visited a point on the Clinch River near the southwestern corner of the site, where a discharge structure could be built.

ORR Site 5: This site is situated on low lands and slopes north of the Clinch River at the Tennessee State Highway 95 bridge. The highway and bridge bisect the site into two adjacent tracts. The western tract comprises gently rolling lands that include a broad floodplain associated with the Clinch River. The eastern tract comprises steep slopes that abruptly adjoin the north shore of the river just downstream from Melton Hill Dam. The eastern track supports an oak dominated upland deciduous forest resembling that described for ORR Site 2. The slopes in the eastern tract are punctuated by multiple steep and narrow swales or hollows containing headwater streams similar to those observed on ORR Site 2. Both tracts appear to be generally favorable for most forest wildlife. Although the eastern tract comprises low-lying lands adjoining a river, few if any of those lands appear to be wetlands. The river shoreline comprises low but steep banks. However, closer observation of the patterns of vegetation and soil distribution across the tract would be necessary to conclusively determine the extent of wetlands. Potential wetlands in the western tract are limited to the narrow stream channels and strips of associated riparian vegetation.

ORR Site 8: This site is situated on steep sloping lands in a meander on the north side of Melton Hill Lake, just upstream from the dam. The lands tend to slope toward the lake, which is a narrow impoundment of the Clinch River. ORR Site 8 had the steepest topography of the three ORR sites. The slopes terminate abruptly at the north shores of the lake; there are no broad lowlands adjoining the lake. No roads traverse the site. The entire site is densely forested and supports an oak-dominated upland deciduous forest resembling that described for ORR Site 2. The slopes are punctuated by multiple steep and narrow swales or hollows containing headwater streams similar to those observed on ORR Site 2. As on ORR Site 2, the stream channels are lined by narrow zones of riparian vegetation dominated by trees typical of lower, wetter lands. The road to ORR Site 8 passes through a historic settlement called Gravel Hill. There were steps to a residence and a wooden crypt structure visible from the road. TVA stated there was also a foundation to a Methodist church in the area.

Summary of Alternative Site Visit

The team found that the applicant has an overall understanding of the information necessary to allow the staff to assess the alternative sites. Both Redstone Arsenal and ORR have well-established environmental programs, and the information the environmental review team would need to complete their review should be available from those programs. Assuming TVA would

be able to acquire the necessary properties, there were no observable technical flaws to indicate that any of the sites would not be viable alternatives to the proposed site. However, it appeared that it would be necessary to change the mission activities performed at the Redstone Arsenal site should it be decided that this is to be the proposed site.

Readiness Assessment of August 4-6, 2015

The environmental portion of the August readiness assessment was conducted in conjunction with the NRC's safety readiness assessment of the draft Site Safety Analysis Report (SSAR) that TVA is preparing as part of its ESP application. The readiness assessment activities from the August visit were described in the Readiness Assessment Plan sent to TVA on July 17, 2015, which can be found in the NRC's Agencywide Document Access and Management System (ADAMS) under Accession Number ML15190A225. The purposes of this readiness assessment visit were to: (1) examine the draft ER in order to identify information gaps between the draft application and the technical content expected to be included in the final application submitted to the NRC; (2) identify major technical or policy issues that may adversely impact the docketing or technical review of the application; and (3) become familiar with the application, particularly in areas where TVA may be proposing new concepts or approaches.

Beginning on July 27, 2015, the review team was offered an opportunity to examine TVA's online in-progress sections of the ER via an electronic reading room established by TVA. The team's document examination covered the topics outlined in Table 2 of the Readiness Assessment Plan. During their visit to TVA headquarters on August 4-6, the review team asked questions of TVA staff to better understand the issues and the development of the application. The following sections, listed by discipline, describe the observations of the review team, based on examination of the available information and discussions with TVA staff. The team's primary concerns were related to the analysis of alternative sites, the approach for the cumulative analyses, and review areas where other agencies are major stakeholders in the ESP review (e.g., endangered species and cultural resources).

Site and Technical / Regulatory Overview and Project Description

The staff noted that TVA should include a description of the purpose and need for the federal action in Chapter 1 of the ER (10 CFR 51.45(b)). A more complete purpose and need statement would include a description of the federal action, specifically the issuance of the ESP, as well as a discussion of the overall purpose of the project .

Regarding the PPE, the review team noted that there were several parameters which seem to have no nexus to an impact assessment. TVA agreed to revisit the PPE and eliminate parameters with no nexus to an environmental impact. The review team also described the depth of the staff's review of the PPE values in order to help TVA understand the detail they needed to provide in the PPE.

Cumulative Impacts

TVA's assessment of cumulative impacts in the draft ER did not follow guidance in COL/ESP-Interim Staff Guidance (ISG)-26, "Environmental Issues Associated with New Reactors", or recent examples of cumulative impact assessment methodologies in other new reactor EIS. There were no resource-specific cumulative impact discussions either in the cumulative impact section of the ER or in the resource sections, and it appeared that resource-specific SMEs had

not participated in the preparation of the cumulative impacts discussion. Review team members presented an overview of NRC's approach to cumulative impact assessment to TVA staff, which included the following items from the guidance in COL/ESP ISG-26:

- Geographic Area of Interests (GAOIs) should be defined for each resource area.
- A table with all reasonably-foreseeable projects in all GAOIs should be included.
- Resource-specific cumulative impact assessments should focus on those activities that have a reasonable nexus with the resource in the resource-specific GAOIs.

Alternatives:

The review team examined drafts of TVA's siting study and Chapter 9 of the ER. The issues identified regarding alternatives were fairly extensive. To better understand these issues, the review team asked a number of questions of TVA staff. In general, the TVA staff indicated that they understood the issues that led to the questions and would be able to more clearly address the alternatives in the final documents supporting the application.

The most challenging issues identified by the review team included the following:

- The siting study uses a number of criteria at different stages in the process. However, the definitions for specific numeric ratings within the criteria are not defined, and in some cases the criteria appear to have been applied inconsistently. To aid the staff in evaluating the process, the bases for the ratings should be more clearly identified.
- The sites should be compared using cumulative impacts. TVA should develop the cumulative impacts for each of the alternative sites to allow this comparison.
- The sites should be compared using the NRC's SMALL/ MODERATE/ LARGE categories. TVA's current comparison used numerical rating criteria.

There were a number of potential issues of lesser magnitude addressed in questions from the review team. These included:

- The no-action alternative is written more for a COL than an ESP. For example, in explaining what would not happen, the ER focuses on what happens if the SMR is not built. It doesn't discuss the missed benefits of an ESP.
- In the discussion of the various system design alternatives, TVA discusses both environmental and cost issues. In reaching a conclusion, TVA is unclear as to whether the decision was based on environmental factors, cost factors, or both.

Land Use and Transmission LInes

The discussions of land use and transmission lines in Chapters 2, 4, and 5 of the ER were generally complete. The review team identified the following items where additional clarification is requested:

- A baseline description of the potentially affected transmission line corridors is needed in ER Section 2.2.3, including the physical dimensions (width, length, acreage, etc.).
- ER Chapter 4 alludes to the potential to both use offsite borrow as onsite fill and to ship excavated material offsite during construction. Maps of potential borrow sites were provided. No basis was provided for impacts from the use of offsite borrow or the disposition of site excavation spoils offsite. No discussion of the need for river dredging activities and the anticipated disposition of dredging spoils was provided.
- Chapter 2 of the ER did not include discussion of the National Environmental Research Park and related land or operations management and how it might interface with the

Clinch River site. The ER was not clear as to whether TVA lands or ORR lands are subject to any local or regional land use or development plans. Some discussion of the expected development of the Clinch River site in the context of applicable land use or development plans would be expected.

Hydrology

The discussions of water use and water quality in Chapters 2, 4, and 5 of the ER were generally complete. The review team identified a few areas where a more appropriate level of detail would make the staff's review more efficient. The team suggested that Section 5.2 of the ER should include a reference to the thermal plume analysis that is discussed in Section 5.3. This is appropriate since the hydrology SMEs would need to review that analysis to assist the aquatic ecology SMEs with the resulting impact evaluations. The purpose for inclusion of certain topics for example subsidence, which was mentioned but was not discussed as a plausible or relevant impact) was unclear. In addition, the review team discussed the appropriate depth of the geologic environment discussion given that groundwater will not be used for site construction or operation.

Aquatic Ecology

While most of the available information in Chapters 2, 4 and 5 is generally complete, there were items which will require additional information so that the team will be able to complete a timely review during the preparation of the EIS. Information gaps that were noted include the following:

- Compliance with EPA Phase I Section 316(b) proportional flow limitations for rivers at the CRN site should be explained.
- The ER should discuss impact avoidance/minimization/mitigation scenarios for site development activities that could affect aquatic resources and should identify best management practices that would be employed. Potential impacts to aquatic biota associated with the Melton Hill bypass should also be discussed.
- The ER should provide better quantification of impacts such as dredge volumes and footprints and estimates of square footage of in-water/river bottom impacts from in-water activities.
- More details concerning the utility corridors and impacts to streams or other water bodies at the alternative sites should be provided.

Terrestrial Ecology and Wetlands

While no items of major concern were noted during the team's review of terrestrial ecology, there were numerous information gaps that will require additional information so that the team will be able to complete a timely review during the preparation of the EIS. These include the following:

- Habitats and wildlife, including important species and potential impacts, should be characterized at the barge area and the underground transmission line area.
- Additional information will be necessary to determine potential impacts to Federally listed bat species including characterization of onsite habitat use by bats. The ER did not provide distances to offsite caves from sources of project disturbances, nor did it distinguish between offsite caves of cultural/historical significance and those used by bats.

- The ER should provide an overlay of SACTI modeling salt drift concentration isopleths on vegetation.
- The ER should differentiate wetland types and the types of wetland impacts. There are currently discrepancies in upland and wetland acreages in onsite and offsite areas.
- The type of cedar glade found onsite should be characterized including its conservation value relative to its condition.
- Alternative site impact assessments should be developed by overlaying the hypothetical onsite PPE footprint and the footprint of any needed offsite facilities, and deriving habitat type-specific impacts (following examples in recent NRC EISs).

Socioeconomics/Environmental Justice (EJ)

The potential issues identified by NRC and PNNL regarding EJ were minimal. For socioeconomics, the review team did identify information gaps, a few of which were fairly significant. The most challenging potential issues identified by the staff from NRC and PNNL were the following:

- ER Chapter 4 characterizes the potential for large traffic and transportation system impacts from preconstruction activities. The level of discussion provided for the impact to traffic and transportation systems during building activities was not adequate. The ER suggests traffic and transportation impacts would be mitigated, but the discussion of mitigation activities is not adequate for the staff to determine the specific effects of these activities in reducing the impacts.
- No detail was provided in the ER on TVA's payment in lieu of taxes arrangements with local jurisdictions. The staff's analysis would need to rely on TVA information (historical information in Chapter 2 and estimated information in Chapter 4 and/or Chapter 5 based on future activities at the Clinch River site).

Additional issues of lesser magnitude included the use of county level information for EJ populations for the alternative sites (guidance requires Census block level) and the lack of visual renderings of the expected facilities in Chapter 4 (during construction) and chapter 5 (during operations).

Historic and Cultural Resources

Issues/gaps that were identified for historic and cultural resources during the October 2014 visit and the March 2015 visit have not been addressed. Listed below are the primary issues identified by the NRC staff that require additional discussion and/or clarification:

- There is inconsistency between the language in the PA and the draft ER sections for historic and cultural resources. For instance, the Areas of Potential Effect (APE) are different in the two documents. In addition, it is not clear whether the APE includes offsite areas such as the area around Melton Hill Dam associated with the bypass.
- The ER should include a section on compliance status with historic and cultural resource laws and a section on best management practices or cultural resource management plans or procedures.
- The ER should included copies of consultation correspondence with the SHPO and Tribes.
- The ER should include a figure displaying the areas surveyed within the APE and the year the surveys occurred.
- Once the PA has been finalized and executed, the NRC should be provided a copy.

Meteorology and Air Quality

The review team noted the following items where additional clarification would be helpful:

- Greenhouse gas (GHG) emissions should be included according to COL/ESP-ISG-026, which says that an applicant can use NRC's generic GHG footprint or provide their own.
- TVA referenced the V.C. Summer EIS as their data source for the fuel cycle emissions. This does not comply with the ISG-026 because no justification was provided.
- The cumulative assessment should include the Kingston and Bull Run fossil plants.

Nonradiological Health and Waste

The review team noted that the ER should provide estimated amounts of each type of waste that would be generated and a list of facilities used for solid waste disposal. The location of the closest public access area for swimming or fishing on the river downstream of the discharge should also be included.

Radiological Health

The readiness review for this resource was conducted in conjunction with the safety readiness review due to the same analysis methodology and data requirements. A summary of the safety readiness review is provided in the safety trip report. Due to some of the unique features of SMR designs, the staff discussed with TVA specific information related to the effluent release points, multi-unit exposures and waste management, building sequences contribution to construction worker dose including collective dose, development of the PPE effluent source term, application of NRC-approved and non-approved codes, and determination of site-related information or data.

Accidents:

Basic information that the staff expected to see in the ER was not consistently provided or referenced to specific technical reports. For example, the following items were not discussed or presented in the ER and should be addressed:

- Source term and source term fractions applied in the MACCS code package calculations;
- Information on site-specific population data, land usage, watershed index, and economic data for the region applied in the MACCS code package calculations;
- Individual risk values for comparison to the Commission's safety goals; and
- Cumulative impacts from postulated accidents for the proposed site and alternative sites.

Additionally, once the ESP application has been accepted, the NRC staff will need access to the vendor-provided information to further evaluate the MACCS analysis.

Transportation of Radiological Material

TVA has yet to complete all sections involving the environmental impacts from the transportation of radioactive material. This is in part due to the inconsistent availability of the RADTRAN computer code package. The cumulative impacts were not presented in the ER version that was made available to the staff. The staff discussed with TVA technical issues with the expected information to properly compare the transportation impacts from the proposed project in a consistent manner to Table S-4 impacts of 10 CFR 51.52 and how the unique features and technical specifications of SMRs fit within the Table S-4 analysis of WASH-1238,

"Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants."

Assessment of Readiness

The team found that the development of the ER had progressed significantly since prior examinations of individual sections. However, the review team identified numerous areas of concern that remain. TVA's project objectives are unique, and the team cannot draw upon prior experience for the review areas that are driven primarily by the project objectives. The alternatives analysis will require additional attention by TVA. While significant progress has been made in the accident analyses, the efficiency of the review is affected by the progress of the safety review in evaluating vendor data for the PPE values. The review team emphasizes the need for TVA to engage other agencies with which the NRC and the USACE must interact on impact determinations from onsite and offsite activities. While the team did not identify any issues that would indicate TVA would not be able to meet its proposed schedule for submittal of its ESP application, it is possible that additional issues may be identified during the detailed acceptance review.