



Tennessee Valley Authority, 1101 Market Street, Chattanooga, TN 37402

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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Clinch River Nuclear Site
NRC Project No. 785

Subject: Submittal of Supplemental Information Regarding Cumulative Radiological Health Impacts in Support of Early Site Permit Application for Clinch River Nuclear Site

- References:
1. Letter from TVA to NRC, CNL-16-081, "Application for Early Site Permit for Clinch River Nuclear Site," dated May 12, 2016
 2. Letter from TVA to NRC, CNL-16-134, "Schedule for Submittal of Supplemental Information in Support of Early Site Permit Application for Clinch River Nuclear Site," dated August 11, 2016

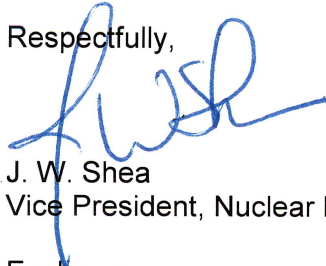
By letter dated May 12, 2016 (Reference 1), Tennessee Valley Authority (TVA) submitted an application for an early site permit for the Clinch River Nuclear Site in Oak Ridge, TN. Subsequent to the submittal of the application, and consistent with interactions with NRC staff, TVA identified certain aspects of the application that it intends to supplement. By letter dated August 11, 2016 (Reference 2), TVA provided a plan for submitting the identified supplemental information.

The enclosure to this letter contains a description of the supplemental information related to cumulative radiological health impacts during construction and operation of the Clinch River Small Modular Reactor Project, including a markup of the affected Environmental Report sections. These changes will be incorporated in a future revision of the early site permit application.

There are no new regulatory commitments associated with this submittal. If any additional information is needed, please contact Dan Stout at (423) 751-7642.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 2nd day of December 2016.

Respectfully,



J. W. Shea
Vice President, Nuclear Licensing

Enclosure:

Supplemental Information Regarding Cumulative Radiological Health Impacts

cc (with enclosures):

P. Vokoun, Project Manager, Division of New Reactor Licensing, USNRC

cc (without enclosures):

V. McCree, Executive Director of Operations, USNRC
C. Haney, Regional Administrator, Region II, USNRC
M. Johnson, Deputy Executive Director for Reactor and Preparedness Programs,
USNRC
V. Ordaz, Acting Director, Office of New Reactors, USNRC
F. Akstulewicz, Director, Division of New Reactor Licensing, USNRC
J. Donahue, Branch Chief, Division of New Reactor Licensing, USNRC
A. Fetter, Project Manager, Division of New Reactor Licensing, USNRC
T. Dozier, Project Manager, Division of New Reactor Licensing, USNRC
T. Beville, SMR Licensing Technical Support Program, DOE
M. Shields, SMR Licensing Technical Support Program, DOE
M. M. McIntosh, Regulatory Specialist, Eastern Regulatory Field Office, Nashville
District, USACE

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

By letter dated May 12, 2016 (Reference 1), Tennessee Valley Authority (TVA) submitted an application for an early site permit for the Clinch River Nuclear (CRN) Site in Oak Ridge, TN. Subsequent to the submittal of the application, and consistent with interactions with NRC staff, TVA identified certain aspects of the application that it intends to supplement. By letter dated August 11, 2016 (Reference 2), TVA provided a plan for submitting the identified supplemental information.

This enclosure provides supplemental information related to cumulative radiological health impacts to support the NRC staff's review. This enclosure also includes proposed changes to the affected Environmental Report (ER) sections. These changes will be incorporated in a future revision of the early site permit application (ESPA).

Supplement Item (from Reference 2)

TVA will provide markups of the applicable Early Site Permit Application (ESPA) sections to clarify the cumulative radiological health impacts, including an appropriate cumulative environmental impact finding that clearly discusses contributions from nearby U.S. Department of Energy nuclear facilities, as well as other nearby facilities that may use radiological materials. Reference material applied in the determination of the environmental impact finding will also be provided.

The ESPA markups will also provide a discussion of the potential cumulative radiological health impacts from past, present and reasonably foreseeable future radiological releases from nearby nuclear facilities from all pathways with a finding from these releases when combined with CRN impacts.

Supplemental Information

Environmental Report (ER) Subsection 4.7.6, "Radiological Health Impacts," is being added to address the cumulative radiological health impacts associated with construction in the geographic area of interest. ER Subsection 5.11.8, "Radiological Health Impacts," is being added to address the cumulative radiological health impacts associated with operation in the geographic area of interest. Other ER subsections are renumbered to account for the new subsections. Conforming changes to ER Table 5.11-1 are also being made to account for the new and re-sequenced ER subsections.

In addition, the following changes to ER Section 4.7 and 5.11 are included in the markups below:

- Subsection 4.7.2 - The radius of the cumulative land use impacts area of interest is being corrected from 30 miles to 50 miles and the description of the area is being updated to be consistent with Subsection 2.2.2. The impact assessment was based on the projects listed in Table 4.7-1, which includes projects within a 50-mile radius of the CRN Site. Therefore, no changes to this subsection were necessary to reflect the 50-mi area of interest.

ENCLOSURE 1
Supplemental Information Regarding Cumulative Radiological Health Impacts

- Subsections 4.7.6 (new 4.7.7) and 5.11.8 (new 5.11.9) - The radius of the nonradiological health impacts area of interest is being corrected from 30 miles to 50 miles. The description of the area of interest in Subsection 4.7.6 (new 4.7.7) is being removed, as the description already exists in Subsection 4.7.2. The change in the radius did not impact the assessment provided.
- Table 5.11-1 - The radius of the geographic area of interest for rows 4.7.2 / 5.11.2 and 4.7.6 (new 4.7.7) is being corrected from 30 miles to 50 miles.
- Several editorial and clarifying changes are also being made throughout the provided ER markup to improve readability and consistency with similar discussions in the ER.

References:

1. Letter from TVA to NRC, CNL-16-081, "Application for Early Site Permit for Clinch River Nuclear Site," dated May 12, 2016
2. Letter from TVA to NRC, CNL-16-134, "Schedule for Submittal of Supplemental Information in Support of Early Site Permit Application for Clinch River Nuclear Site," dated August 11, 2016

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

In addition to correcting the radius of the cumulative land use impacts area of interest in ER Subsection 4.7.2, the following editorial and clarifying changes are being made. Strikethroughs indicate text to be deleted. Underlines indicate text to be added.

4.7.2 Cumulative Land Use Impacts

This subsection addresses the land use impacts from the proposed CR SMR Project along with past, present and reasonably foreseeable future projects. Section 2.2 describes the land affected by the proposed CR SMR Project. Section 4.1 describes impacts to ~~the~~that land during preconstruction and construction activities at the CRN Site. As described in Section 4.1, overall the impacts of preconstruction and construction activities on land use would be SMALL and no mitigation beyond standard best management practices (BMPs) and compliance with federal regulations would be warranted.

The geographic area of interest for land-use impacts is a ~~30~~50-mile (mi) radius around the CRN Site, ~~including parts of Roane, Anderson, Knox, and Loudon Counties along with population centers Kingston, Lenoir City, Oak Ridge, Athens, Maryville/Alcoa, and Knoxville. There are 33 counties at least partially within 50-mi of the center point of the CRN Site. Three of these counties are in North Carolina, two are in Kentucky, and the rest are in Tennessee. The largest city in the 50-mi radius is Knoxville, Tennessee. Other population centers with populations of over 20,000 include Oak Ridge, Maryville, and Farragut, Tennessee.~~ The geographic area of interest includes the primary counties, communities, and recreational areas (such as campgrounds) where the construction workforce and their families would reside and, therefore, are most likely to experience land use effects as a result of the proposed project.

...

As discussed in Subsection 4.1.1.1, Tennessee Valley Authority (TVA) expects to construct and operate an onsite landfill for construction, site clearing, and grading debris. Construction debris and associated waste not placed in the onsite disposal landfill would be shipped from the CRN Site via road, rail, and/or barge. Associated road, rail, and barge improvements within vicinity of the CRN Site are discussed in Subsection 4.1.1.2. Nonhazardous solid waste would be managed by a TVA-approved solid waste disposal vendor and disposed in a state-approved sanitary landfill such as the Sanitary Chestnut Ridge Landfill. Hazardous wastes, including oil wastes, paint wastes, solvent wastes, laboratory wastes, and universal wastes, as well as radioactive and mixed (hazardous and radioactive) waste, would be managed by TVA-approved vendors and disposed in accordance with TVA management procedures.

Because the majority of the preconstruction and construction waste would be disposed of in an on-site landfill, the volume of waste sent to an offsite sanitary landfill would be minimal and the duration of waste generation and disposal during preconstruction and construction would be brief. The Chestnut Ridge Landfill has a 50 year capacity to accept 1000 tons per day. Therefore, the impact of the minimal volume of nonhazardous waste disposed offsite during the brief duration of the preconstruction and construction activities to the cumulative impact of nonhazardous waste disposal would be SMALL. ~~Similarly, because TVA's would follow use of hazardous waste management and minimization practices would also minimize the volume of hazardous waste generated and disposed of during the CRN Site preconstruction and construction activities would also be minimal.~~ The volume of hazardous waste generated and disposed of in the immediate vicinity of the CRN Site in 2014 included contributions from the

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

ORR and exceeded 81 metric tons; ~~therefore, by comparison,~~ the incremental increase of hazardous waste disposal associated with the CRN Site would be SMALL.

Cumulative impacts associated with the operational facilities listed in Table 4.7-1, including continued operation of ORNL's Spallation Neutron Source and High Flux Isotope Reactor along with Y-12's ongoing mercury cleanup activities, have already occurred in the form of land use and land cover changes. These cumulative impacts would be considered LARGE. These changes are reflected in the existing conditions described in Section 2.2 and in the impact analysis presented in Section 4.1. Cumulative impacts from preconstruction and construction activities at the CRN Site, the Barge/Traffic Area, and from other past, present, and future projects within the land use geographic area of interest could occur as a result of land use/land cover changes.

The future projects most likely to result in cumulative impacts in conjunction with the CR SMR Project are the land use and land cover changes in the geographic area of interest associated with new facilities including: the Sludge Build-Out Project at the Transuranic (TRU) Waste Processing Center, the proposed new Uranium Processing Facility (UPF) at the Y-12 Complex, the potential ETP property transfer, and the Environmental Management Disposal Facility on the ORR. These projects involve potential land use and land cover changes from current conditions. Land use and land cover changes would occur such as conversion of non-developed land use types (forested areas, grasslands, etc.) to developed land use types (including facilities, parking lots, and roadways). These projects occur on land currently designated for the respective projects; therefore, these land use changes would not constitute significant impacts individually or cumulatively. The Sludge Buildout Project, new UPF, and ETP property transfer would occur in already developed areas and are expected to involve limited, if any, land clearing activities. Substantial impacts to wetlands or changes to land cover from these projects are unlikely because the sites ~~comprise areas of existing development~~ are developed. ~~Therefore, significant land cover changes associated with these projects are not expected.~~ The Environmental Management Disposal Facility may involve clearing of forested land, adjacent to a developed area. However, the change in land cover would be negligible within the geographic area of interest. The combined change in land use and land cover resulting from these projects could contribute to cumulative impacts to land use in association with the CR SMR Project preconstruction and construction activities. However, overall, these incremental cumulative impacts would be SMALL and no mitigation is warranted.

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

The following text is being added to the ER as Subsection 4.7.6. Subsequent subsections will be renumbered to reflect the addition of this subsection.

4.7.6 Radiological Health Impacts

As described in Section 4.5, the radiological impacts on the construction worker from construction of the CR SMR Project would be SMALL. During the construction period, operating reactors may also have an impact on the public. Details of the evaluation of the potential dose to the public from all operating reactors are provided in Section 5.4. Specifically, as described in Subsection 5.4.3, the total body dose to a hypothetical maximally exposed individual (MEI) member of the public from the operation of all SMRs at the CRN Site is estimated to be 11 mrem/yr.

For this analysis of cumulative radiological impacts, the geographic area of interest was considered to be the area within a 50-mi radius of the CRN Site. The NRC historically has used 50 mi as the radius bounding the geographic area for evaluating doses to the public from routine releases from nuclear power plants. Table 4.7-1 summarizes past, present, and reasonably foreseeable future projects and actions that could contribute to cumulative effects. Among these are several radiological projects or facilities. Within the geographic area of interest, planned federal projects on the ORR, including the Transuranic (TRU) Waste Processing Center, Uranium Processing Facility (UPF) at Y-12 complex, and Environmental Management Waste Management Facility (EMWMF), have the potential to contribute to cumulative radiation exposures in conjunction with the CR SMR Project. In addition, currently operating facilities on the ORR include the High Flux Isotope Reactor (HFIR), a nuclear research reactor located at Oak Ridge National Laboratory (ORNL), and the ORNL Spallation Neutron Source. Off the ORR, TVA's Watts Bar Nuclear (WBN) Units 1 and 2 and American Nuclear Corporation will continue to operate. These four facilities identified in Table 4.7-1 have the potential to contribute to cumulative radiation exposures in conjunction with the CR SMR Project. Each of these facilities would be constructed and operated or continue to operate in accordance with environmental regulations that limit the radiation exposures received by members of the public, as discussed in Subsection 4.5.5.

Ongoing activities within the ORR likely will continue to release small quantities of radionuclides to the environment in the future. The ORR *Annual Site Environmental Report* provides results from a detailed analysis of radiation doses to a hypothetical MEI from all pathways of exposure to radionuclides released from all DOE facilities on the ORR. The maximum radiation dose that a hypothetical MEI could have received from DOE activities on the ORR in 2014 was estimated to include approximately 0.6 millirem (mrem) from air pathways, 1 mrem from water pathways (i.e., drinking, consuming fish, swimming, and other recreational uses of the water and shoreline), and 1 mrem from consumption of wildlife (e.g., deer, geese, and turkey) harvested on ORR. The annual dose to an MEI from the combination of all these potential exposure pathways was estimated to be approximately 3 mrem. (Reference 4.7-23)

There are several non-DOE facilities on or near the ORR that could also contribute to radiation doses to the public. DOE requested information from these facilities regarding their potential radiation doses to members of the public, and nine facilities responded with information about their dose contributions. DOE estimated that maximum annual doses to members of the public from air and water emissions and external radiation from both non-DOE and DOE sources on and near the ORR were less than 100 mrem. Of the less than 100 mrem total dose, 45 mrem is

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

from direct radiation reported from on-site dose monitors at one of the nine responding facilities. (Reference 4.7-23) The CRN Site MEI would be outside the physical range of this direct radiation. Therefore, the dose to an MEI from the non-DOE facilities on or near ORR is estimated at a maximum of 55 mrem/yr.

The WBN Units 1 and 2 are located within the 50-mi geographic area of interest. According to NUREG-0498, *Supplement 2 – Final Environmental Statement: Related to the Operation of Watts Bar Nuclear Plant*, the combination of potential doses from the ongoing operation of WBN Unit 1 with estimated doses from the operation of the new WBN Unit 2 result in a total body dose of 2.6 mrem/yr for an MEI at the WBN site.

Other facilities in the geographic area of interest, such as industrial facilities and hospitals, may use radiological materials, but their potential contributions to the cumulative dose received by the CRN Site MEI during the construction period would be negligible. Because radiation dose is highly location dependent and an individual in one location cannot receive the maximum possible dose from all of the multiple sources, the sum of the doses estimated above is conservative. Summing the doses of 11 mrem/yr from the CRN Site, 3 mrem/yr from DOE facilities, 55 mrem/yr from non-DOE facilities, and 2.6 mrem/yr from WBN Units 1 and 2, provides an estimate of the cumulative dose impact from radiation sources in the geographic area of interest during construction. The CRN Site contribution to this total is well below the annual dose limit of 100 mrem/yr from 10 CFR Part 20.1301, and the total cumulative impact is significantly less than the approximately 300 mrem average annual dose to individuals from natural or background radiation in the United States (Reference 4.7-23). Therefore, the cumulative dose impact will be SMALL.

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

In addition to correcting the radius of the cumulative land use impacts area of interest in ER Subsection 4.7.6 (new 4.7.7), the second paragraph is being removed, as the geographic area of interest is described in Subsection 4.7.2. Strikethroughs indicate text to be deleted. Underlines indicate text to be added.

4.7.64.7.7Nonradiological Health Impacts

Sections 2.2, 2.3, and 2.7 describe the land, water, and air affected by the proposed SMR project at the CRN Site. Sections 4.1, 4.2, and 4.4 describe impacts to health and the physical environment during preconstruction and construction activities at the CRN Site. Compliance with the site permits coupled with BMPs, would result in SMALL impacts from the proposed SMR project to nonradiological health from preconstruction and construction activities.

~~The geographic area of interest for impacts to nonradiological health is a 30-mi radius around the CRN Site, including parts of Roane, Anderson, Knox, and Loudon Counties along with population centers Kingston, Lenoir City, Oak Ridge, Athens, Maryville/Alcoa, and Knoxville.~~

Nonradioactive health impacts from preconstruction and construction at the CRN Site include localized impacts from noise, vibrations, and dust along with occupational injuries to the construction workers. Cumulative noise and vibration impacts from preconstruction and construction activities would include current ongoing and planned developments at ETTP and at Bull Run Fossil Plant. Future cumulative noise and vibration impacts would include possible roadway improvements and urbanization within 10 mi of the CRN Site. Cumulative dust impacts would behave similarly.

Cumulative health impacts to construction workers also include occupational injuries coupled with noise, vibration, and emission impacts from current and future activities within the worker's commute region. Current and future activities within a ~~30~~50-mi radius of the CRN Site including road, airport, and building construction along with decommissioning and demolition activities at ORR would contribute to cumulative health impacts to construction workers.

As a result of adding ER Subsection 4.7.6, the following reference is being added to ER Subsection 4.7.7 (new 4.7.8):

4.7.74.7.8 References

Reference 4.7-23. Oak Ridge National Laboratory, "Oak Ridge Reservation Annual Site Environmental Report," DOE/ORO-2502, September, 2015.

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

The following text is being added to the ER as Subsection 5.11.8. Subsequent subsections will be renumbered to reflect the addition of this subsection.

5.11.8 Radiological Health Impacts

As described in Section 5.4, the radiological impacts from operation of the CR SMR Project would be SMALL. Specifically, Subsection 5.4.3, estimates that the total body dose to a hypothetical maximally exposed individual (MEI) from the operation of all four SMRs at the CRN Site would be 11 mrem/yr. For this analysis of cumulative radiological impacts, the geographic area of interest was considered to be the area within a 50-mi radius of the CRN Site. The NRC historically has used 50 mi as the radius bounding the geographic area for evaluating doses to the public from routine releases from nuclear power plants. Table 4.7-1 summarizes past, present, and reasonably foreseeable future projects and actions that could contribute to cumulative effects. Among these are several radiological projects or facilities. Within the geographic area of interest, planned federal projects on the ORR, including the Transuranic (TRU) Waste Processing Center, Uranium Processing Facility (UPF) at Y-12 complex, and Environmental Management Waste Management Facility (EMWMF), have the potential to contribute to cumulative radiation exposures in conjunction with the CR SMR Project. In addition, currently operating facilities on the ORR include the High Flux Isotope Reactor (HFIR), a nuclear research reactor located at Oak Ridge National Laboratory (ORNL), and the ORNL Spallation Neutron Source. Off the ORR, TVA's Watts Bar Nuclear (WBN) Units 1 and 2 and American Nuclear Corporation will continue to operate. These four facilities also have the potential to contribute to cumulative radiation exposures in conjunction with the CR SMR Project. Each of these facilities would be constructed and operated or continue to operate in accordance with environmental regulations that limit the radiation exposures received by members of the public, as discussed in Subsection 5.4.3.

Ongoing activities within the ORR likely will continue to release small quantities of radionuclides to the environment in the future. The ORR *Annual Site Environmental Report* provides results from a detailed analysis of radiation doses to the MEI from all pathways of exposure to radionuclides released from all DOE facilities on the ORR. The maximum radiation dose that a hypothetical MEI could have received from DOE activities on the ORR in 2014 was estimated to include approximately 0.6 millirem (mrem) from air pathways, 1 mrem from water pathways (i.e., drinking, consuming fish, swimming, and other recreational uses of the water and shoreline), and 1 mrem from consumption of wildlife (e.g., deer, geese, and turkey) harvested on ORR. The annual dose to an MEI from the combination of all these potential exposure pathways was estimated to be approximately 3 mrem. (Reference 5.11-13)

There are several non-DOE facilities on or near the ORR that could also contribute to radiation doses to the public. DOE requested information from these facilities regarding their potential radiation doses to members of the public, and nine facilities responded with information about their dose contributions. DOE estimated that annual doses to members of the public from air and water emissions and external radiation from both non-DOE and DOE sources on and near the ORR were less than 100 mrem. Of the less than 100 mrem total dose, 45 mrem is from direct radiation reported from on-site dose monitors at one of the nine responding facilities. The CRN Site MEI would be outside the physical range of this direct radiation. Therefore, the dose from the non-DOE facilities on or near ORR is estimated at maximum of 55 mrem/yr. (Reference 5.11-13)

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

This cumulative impact analysis also considers other potential sources of radiological exposures within the geographic area of interest. According to NUREG-0498, *Supplement 2 – Final Environmental Statement: Related to the Operation of Watts Bar Nuclear Plant*, the combination of potential doses from the ongoing operation of WBN Unit 1 with estimated doses from the operation of the new WBN Unit 2 result in a total body dose of 2.6 mrem/yr for an MEI at the WBN site.

Other facilities in the geographic area of interest, such as industrial facilities and hospitals, may use radiological materials but their potential contributions to the cumulative dose received by the CRN Site MEI would be negligible. Because radiation dose is highly location dependent and any one person cannot receive the maximum possible dose from all of the multiple sources, the sum of the doses estimated above is conservative. Summing the doses of 11 mrem/yr from the CRN Site reactors, 3 mrem/yr from DOE facilities, 55 mrem/yr from non-DOE facilities, and 2.6 mrem/yr from WBN Units 1 and 2, provides an estimate of the cumulative dose impact from radiation sources in the geographic area of interest during operation. The CRN Site contribution to this total is well below the annual dose limit of 100 mrem/yr from 10 CFR Part 20.1301, and the total cumulative impact is significantly less than the approximately 300 mrem average annual dose to individuals from natural or background radiation in the United States (Reference 5.11-13). Therefore, the cumulative dose impact will be SMALL.

Radiation doses to aquatic and terrestrial biota were evaluated for the CRN Site in Subsection 5.4.4. The conservative evaluation in Subsection 5.4.4 concluded that the highest dose (0.021 millirad per day [mrad/day]) to aquatic biota from the operation of the CR SMR Project would be significantly lower than the DOE criterion of 1 rad/day, and the highest dose to terrestrial biota (0.3 mrad/day) would be much lower than the DOE criterion of 0.1 rad/day. The evaluation by DOE of doses to aquatic and terrestrial biota on the ORR in the *Annual Site Environmental Report* also concluded that dose rates to aquatic biota were below levels that could have an adverse impact on plant or animal populations (Reference 5.11-14). Thus, estimated doses were less than levels for the protection of biota when the CR SMRs and ORR were evaluated separately. Even if it is conservatively assumed that an organism could be exposed to a total dose based on adding the CR SMR Project dose to doses at locations on the ORR, the CR SMR dose would contribute negligibly to the total. Cumulative doses to biota would be lower than protective levels, indicating a negligible risk to either aquatic or terrestrial organisms. Accordingly, cumulative radiological impacts to biota other than members of the public during operation will be SMALL.

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

The second paragraph of Subsection 5.11.8 (new 5.11.9) is being removed, as the geographic area of interest is described in Section 4.7. Strikethroughs indicate text to be deleted. Underlines indicate text to be added.

~~5.11.8~~5.11.9 Nonradiological Health Impacts

Sections 2.2, 2.3, and 2.7 describe the land, water, and air affected by the proposed SMR Project at the CRN Site. Sections 5.1, 5.2, and 5.5 describe impacts to health and the physical environment during operational activities at the CRN Site. Compliance with the site permits coupled with best management practices (BMPs), would result in SMALL impacts from the proposed CR SMR Project to nonradiological health from operational activities.

~~The geographic area of interest for impacts to nonradiological health is a 50-mi radius around the CRN site, including parts of Roane, Anderson, Knox, and Loudon Counties along with population centers Kingston, Lenoir City, Oak Ridge, Athens, Maryville/Alcoa, and Knoxville.~~

Nonradioactive health impacts from operation of the CRN SMR Project include localized impacts from noise, vibrations, and dust along with occupational injuries to the workers. Cumulative nonradiological health impacts would include contributions from current developments (ETTP and Bull Run Fossil Plant), future developments (roadway improvements and urbanization), ORR activities (industrialization, decommissioning, and demolition), and other projects listed in Table 4.7-1.

As a result of adding ER Subsection 5.11.8, the following references are being added to ER Subsection 5.11.9 (new 5.11.10):

~~5.11.9~~5.11.10 References

Reference 5.11-13. Oak Ridge National Laboratory, "Oak Ridge Reservation Annual Site Environmental Report," DOE/ORO-2502, September, 2015.

Reference 5.11-14. Oak Ridge National Laboratory, "Oak Ridge Reservation Annual Site Environmental Report," DOE/ORO-2473, September, 2014.

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

The following changes to ER Table 5.11-1 are being made to reflect the addition of ER Subsection 4.7.6 and Subsection 5.11.8, including the renumbering of subsequent subsections. Strikethroughs indicate text to be deleted. Underlines indicate text to be added.

Table 5.11-1
Geographic Areas of Interest Defined for the Analyzed Resource Areas

ER Section	Analyzed Resource	Geographic Area of Interest
4.7.2 / 5.11.2	Land Use	Within a 30 <u>50</u> -mi radius of the CRN Site
4.7.3.1 / 5.11.3.1	Surface Water Hydrology	Clinch River arm of the Watts Bar Reservoir
4.7.3.2.1 / 5.11.3.2.1	Surface Water Use	Anderson, Knox, Loudon, Meigs, Morgan, Rhea, and Roane counties, Tennessee
4.7.3.2.2 / 5.11.3.2.2	Groundwater Use	Lower Clinch River Watershed from Melton Hill Reservoir downstream to the confluence of the Clinch, Emory, and Tennessee Rivers
4.7.3.3.1 / 5.11.3.3.1	Surface Water Quality	Clinch River arm of the Watts Bar Reservoir
4.7.3.3.2 / 5.11.3.3.2	Groundwater Quality	Lower Clinch River Watershed from Melton Hill Reservoir downstream to the confluence of the Clinch, Emory, and Tennessee Rivers
4.7.4.1 / 5.11.4.1	Terrestrial Ecology and Wetlands	Within a 6-mi radius of the CRN Site
4.7.4.2 / 5.11.4.2	Aquatic Ecology	CRN Site, Barge/Traffic Area, and 69-kV underground transmission line ROW, and Clinch River arm of the Watts Bar Reservoir in the vicinity (within approximately a 6-mi radius) of the CRN Site. This portion of the Clinch River arm of the Watts Bar Reservoir generally includes the area of the reservoir downstream to the confluence with the Emory River arm of the Watts Bar Reservoir and upstream to Melton Hill Dam (approximately Clinch River Mile 5 to 23).
4.7.5.1.1	Socioeconomic/Physical - Air Quality	Within a 6-mi radius of the CRN Site (nationwide, for GHG emissions)
5.11.5.1.1	Socioeconomic/Physical - Air Quality	Roane, Loudon, Knox, Anderson, and Morgan counties, Tennessee (State of Tennessee and nationwide, for GHG emissions)

ENCLOSURE 1

Supplemental Information Regarding Cumulative Radiological Health Impacts

ER Section	Analyzed Resource	Geographic Area of Interest
4.7.5.1.1 / 5.11.5.1.1	Socioeconomic/Physical - Noise	CRN Site and the areas within a 5-mi radius of the CRN Site
5.11.5.1.1	Socioeconomic/Physical – Thermal Emissions (Air)	CRN Site and the areas within a 1-mi radius of the CRN Site
5.11.5.1.1	Socioeconomic/Physical – Thermal Emissions (Water)	Clinch River arm of the Watts Bar Reservoir
5.11.5.1.1	Socioeconomic/Physical – Visual Intrusions	Within a 2-mi radius of the CRN Site
4.7.5.1.2 / 5.11.5.1.2	Social and Economic	Roane, Anderson, Knox, and Loudon counties, Tennessee
4.7.5.2 / 5.11.5.2	Environmental Justice	Within a 50-mi radius of the CRN Site
4.7.5.3 / 5.11.6	Archaeological Resources	The approximate 1305-ac area that includes the CRN Site and the Barge/Traffic Area (Area of Potential Effect)
4.7.5.3 / 5.11.6	Historic Architectural Resources	Within a 0.5-mi radius surrounding the proposed cleared areas
4.7.5.3 / 5.11.6	Historic Properties	Within a 10-mi radius of the center of the CRN Site
<u>4.7.6</u>	<u>Radiological Health</u>	<u>Within a 50-mi radius of the CRN Site</u>
4.7.6 <u>4.7.7</u>	Nonradiological Health	Within a 30 <u>50</u> -mi radius of the CRN Site
<u>5.11.8</u>	<u>Radiological Health</u>	<u>Within a 50-mi radius of the CRN Site</u>
5.11.8 <u>5.11.9</u>	Nonradiological Health	Within a 50-mi radius of the CRN Site
5.11.7	Postulated Accidents	Within a 50-mi radius of the CRN Site
5.11.7.1.1	Postulated Accidents/Fuel Cycle	Nationwide (worldwide, for imported uranium)
5.11.7.1.2	Postulated Accidents/Transportation	Nationwide
5.11.7.1.3	Postulated Accidents/Decommissioning	Within a 50-mi radius, for socioeconomic; nationwide, for radioactive waste disposal