U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
DIVISION OF FUEL CYCLE SAFETY, SAFEGUARDS, AND ENVIRONMENTAL REVIEW

FINAL ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED RENEWAL OF THE U.S. NUCLEAR REGULATORY COMMISSION LICENSE NUMBER SNM-2509 FOR THE TROJAN INDEPENDENT SPENT FUEL STORAGE INSTALLATION IN COLUMBIA COUNTY, OREGON

DOCKET NO. 72-17

June 2019

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ABBREVIATIONS AND ACRONYMS

ALARA	As Low As Reasonably Achievable
BNFL	British Nuclear Fuel Limited
CAB	Controlled Area Boundary
CFR	Code of Federal Regulations
CTGR	Confederated Tribes of Grand Ronde
DTS	Dry Transfer System
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
ER	Environmental Report
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FR	*Federal Register*
ft	feet
FWS	U.S. Fish and Wildlife Service
GTCC	Greater Than Class C
ha	hectare
in	inch
ISFSI	Independent Spent Fuel Storage Installation
mi	mile
MPC	Multipurpose Canisters
mrem	millirem
mSv	milliSievert
MTU	Metric Ton of Uranium
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation act
NRC	Nuclear Regulatory Commission
PGE	Portland General Electric Company
SAR	Safety Analysis Report
SHPO	State Historic Preservation Office/Officer
SNM	special nuclear material
TNP	Trojan Nuclear Plant

1 INTRODUCTION

By letter dated March 23, 2017, Portland General Electric Company (PGE) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) requesting renewal of Special Nuclear Materials (SNM) License Number SNM-2509 (license SNM-2509) for the Trojan Nuclear Plant (TNP) Independent Spent Fuel Storage Installation (ISFSI) for an additional 40 years (PGE 2017a). The Trojan ISFSI stores spent nuclear fuel from the TNP. On May 31, 2017, the NRC staff accepted PGE's application for detailed technical review (NRC 2017a). The NRC issued a notice in the *Federal Register* (FR) providing an opportunity to request a hearing and petition for leave to intervene (82 FR 39463).

In accordance with Title 10 of the Code of Federal Regulation Part 51 (10 CFR 51), "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," that implements the National Environmental Policy Act of 1969, as amended, (NEPA),[1] the NRC staff's environmental review of the proposed license renewal for the Trojan ISFSI is documented in this final environmental assessment (EA). The purpose of this document is to assess the potential environmental impacts of the proposed 40-year license renewal. The NRC is also conducting a safety evaluation of this license renewal request, which will be documented in a separate Safety Evaluation Report.

1.1 Trojan ISFSI History

The NRC authorizes construction and operation of ISFSIs by issuance of general and specific licenses. A specifically licensed ISFSI is licensed separately from the nuclear power plant license and requires an application to perform the licensed activities. In 1996, PGE submitted an application for an ISFSI to store spent nuclear fuel on the Trojan site. In support of PGE's application to construct and operate the ISFSI, the NRC staff prepared a final EA (NRC 1996) and determined that the construction and operation of the ISFSI would not have a significant impact on the quality of the environment and published the finding of no significant impact (FONSI) on December 4, 1996 (61 FR 64378). On March 31, 1999, the NRC issued a 20-year license to PGE to receive, possess, store, and transfer the TNP spent nuclear fuel, as well as damaged fuel assemblies, fuel debris contained in failed fuel cans or damaged fuel containers, and greater than Class C (GTCC) waste, which were generated at the TNP during its operation to an ISFSI located on the Trojan site. GTCC waste is a classification of radioactive waste defined in 10 CFR 61.55 and consists of activated core components composed mainly of segmented reactor vessel internals. The GTCC waste at the Trojan site consists of the reactor vessel internals comprised of the structural supports for the fuel, guide structures for control rods and instruments, core support plates and baffles, and other internal components that were located close to the fuel during reactor operations. Because of the presence of activation products, the internals are highly radioactive, which means that the steel components themselves have become radioactive as a result of neutron irradiation during reactor operations. The radioactivity is in the steel itself and is not in a form that can be easily dispersed (Oregon Office of Energy 1999). License SNM-2509 was issued to facilitate decommissioning of the TNP and allows PGE to store up to 344.5 metric tons of intact spent fuel assemblies, damaged fuel assemblies, and fuel debris from TNP.

[1] 42 U.S.C. 4321 et seq.

The Trojan ISFSI is a fenced reinforced concrete storage pad used to store 34 vertically ventilated type casks made up of British Nuclear Fuel Limited (BNFL) Fuel Solutions TranStor™ concrete casks. These casks use seal-welded, stainless steel Holtec International Multipurpose Canisters (type Multipurpose Canister (MPC)-24E or MPC-24EF) designed to accommodate 24 pressurized water reactor fuel assemblies (PGE 2017a). The canisters can store fuel assemblies, fuel debris, and GTCC waste generated at TNP during operations (NRC 1996). During a single continuous loading campaign between January and September 2003, 34 casks with 791 spent fuel assemblies were placed on the storage pad. Since that time, no additional waste has been placed in the ISFSI, and no alterations to the storage configuration of the existing waste have occurred (PGE 2017a, Oregon Department of Energy 2017).

PGE requested and was granted an exemption (PGE 2005a and NRC 2005, respectively) from the requirement to submit an annual radioactive effluent release report. Specifically, 10 CFR 72.44(d)(3) requires an annual report be submitted to the NRC specifying the quantity of each of the principal radionuclides released to the environment in liquid and in gaseous effluents during the previous 12 months of ISFSI operation. The exemption was granted because the NRC staff found in its Safety Evaluation Report for the exemption request that there were no credible scenarios by which liquid or gaseous effluents could be released from the sealed MPC). No effluents are produced during cask loading and transfer decontamination activities because all spent fuel has been transferred to the ISFSI. The Holtec MPC is a passive system that, by design, produces no gaseous or liquid effluent. The staff further determined that the exemption would not endanger life or property, or have significant radiological impacts on the environment, and that there is reasonable assurance that the proposed exemption will have no impact on offsite doses. The staff also determined that no increase in occupational or public radiation exposure would result from continued operation of the ISFSI.

In March 2005, PGE requested and was granted a license amendment (PGE 2005a and NRC 2006, respectively) proposing a revised methodology to determine the Controlled Area Boundary (CAB) for the Trojan ISFSI, that reduced the controlled area from 300 m (984 ft) from the edge of the ISFSI pad to 200 m (656 ft) from the edge of the pad. The purpose of that request was to facilitate long-term management and security of the spent nuclear fuel and fuel- related materials stored in the ISFSI while allowing PGE flexibility for future use of the site. The NRC staff concluded that there is reasonable assurance that the methodology used to determine the dose rate for a CAB of 200 m (656 ft) is appropriate and that dose rates at the new CAB will be within the regulatory limits in 10 CFR Part 72. Also, the staff had reasonable assurance that moving the CAB from 300 m (984 ft) to 200 m (656 ft) would not negatively impact public health and safety and would have no impact on offsite doses (NRC 2006). The amendment did not result in significant increase in individual or cumulative occupational radioactive exposure and did not result in significant increase in potential for or consequences from radioactive accidents. The amendment also did not result in significant change in types or significant increase in amounts of any effluents that may be released offsite.

1.2 Proposed Action

License SNM-2509 allows PGE to store spent nuclear fuel, damaged fuel assemblies, fuel debris contained in failed fuel cans or damaged fuel containers, and GTCC waste from the decommissioned TNP. In accordance with license SNM-2509, PGE uses the Holtec MPCs within concrete casks to store the spent fuel. PGE is requesting to renew license SNM-2509 for the Trojan ISFSI for a 40-year period. The current license will expire on March 31, 2019. The NRC's Federal major action is the decision whether to renew the license for up to an additional 40 years. If approved, PGE would be able to continue to possess and store the spent nuclear

fuel and the other radioactive waste at the Trojan specifically licensed ISFSI in accordance with the requirements in 10 CFR Part 72 for up to an additional 40 years.

1.2.1 Site Location and Description

The Trojan site is located in Columbia County, Oregon approximately 68 km (42 mi) north of Portland, in northwest Oregon (see Figure 1.1 and Figure 1.2). The site is located on the western bank of the Columbia River at river mile 72.5 from the river's mouth on the Pacific Ocean. Bonneville Dam is located in the Columbia River approximately 129 km (80 mi) upstream and southeast of the site. At the site location, the Columbia River is the boundary between the states of Oregon and Washington. The Trojan ISFSI is a reinforced concrete pad and is approximately 32 m (105 ft) by 52 m (170 ft). It is located inside the ISFSI Protected Area fence occupying less than 0.4 ha (1 ac) near the eastern edge of the former TNP site. The former TNP site occupies approximately 12 ha (30 ac) of the 257 ha (634 ac) Trojan site (PGE 2017). The property consists of three general areas: (1) the former electrical power generation area, (2) a recreational area, and (3) a natural area. The three areas of the site are defined by natural barriers, such as the Columbia River bank and basalt outcrops with natural berms and existing manmade barriers, such as a railway and highway (NRC 1996). The Trojan cooling tower was demolished in 2006 (Oregon Department of Energy 2017).

The nearest Oregon communities to the Trojan ISFSI are the towns of Prescott, approximately 0.8 km (0.5 mi) north and Goble approximately 2.4 km (1.5 mi) south-southeast. The city of Rainer is approximately 6 km (4 mi) north-northwest. In the state of Washington, the nearest communities are Carrolls (approximately 4 km [2.5 mi] north-northwest) and Kalama (approximately 5 km [3 mi] southeast of the site).

Figure 1.1. View of the Trojan ISFSI Looking North-Northwest

Figure 1.2. Trojan ISFSI Site (Google Maps 2017)

1.2.2 Current ISFSI and Dry Cask Storage Description

The Trojan ISFSI is a vertical dry fuel storage system that includes a reinforced concrete pad and sealed vertical cylindrical canisters within steel-lined concrete casks to store spent nuclear fuel assemblies, fuel debris, and GTCC waste (see Figure 1.3). GTCC waste consists of activated core components composed mainly of segmented reactor vessel internal components. The concrete cask provides radiation shielding and is designed to passively dissipate decay heat generated by the stored spent fuel, which means the cask provides adequate heat removal capacity to maintain safe fuel clad temperatures without needing active cooling systems (PGE 2017a, NRC 1996).

The specific license allows for storage of up to 344.5 MTU (760,000 lb) of uranium as intact spent fuel assemblies, damaged fuel assemblies, and fuel debris (PGE 2017a). While the reinforced concrete pad was designed to hold a maximum 36 casks, a total of 34 casks were placed on the storage pad in 2003 in a single continuous loading campaign. No additions or alterations to the storage configuration have occurred since that time (PGE 2017a, NRC 1996).

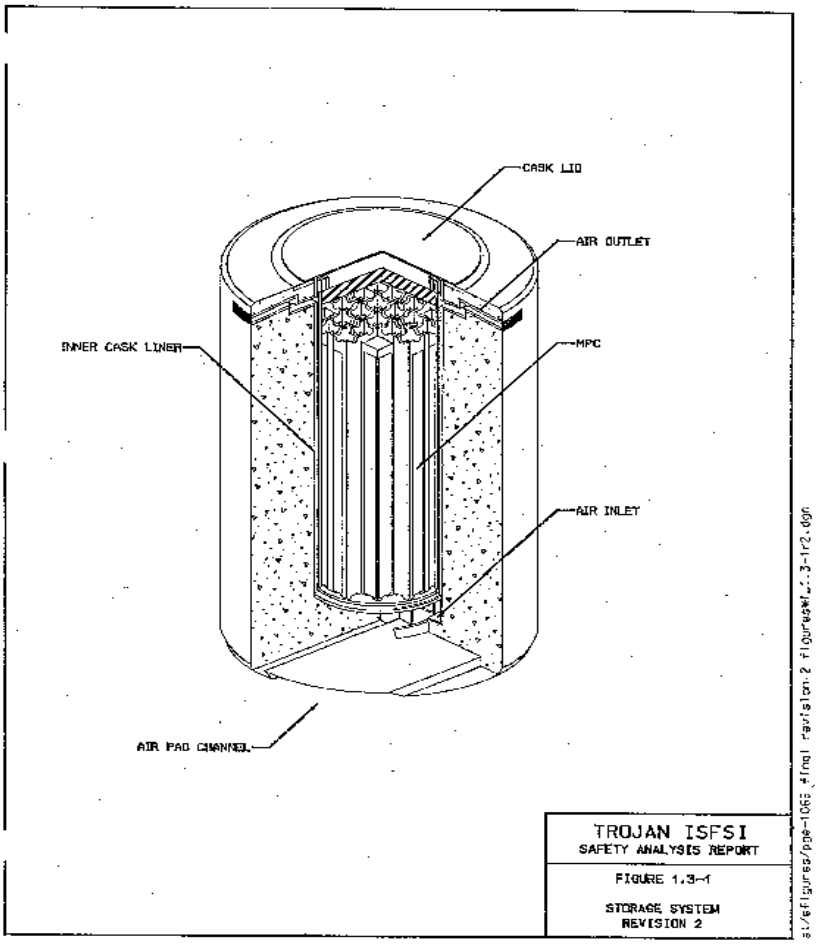

Figure 1.3. Trojan Transfer Cask (PGE 2017b)

1.2.3 Waste Management

Operation of the ISFSI generates no gaseous or liquid wastes, and there are no ventilation or off-gas systems. Operations do not generate nonradioactive wastes, and no sanitary or other wastes are generated (PGE 2017a).

1.2.4 Decommissioning

10 CFR Section 72.54, “Expiration and Termination of Licenses and Decommissioning of Sites and Separate Buildings or Outdoor Areas,” identifies the provisions for termination of specific licenses and for decommissioning of ISFSIs. In accordance with 10 CFR 72.54(d), each licensee must notify the NRC in writing, and submit within 12 months of this notification, a final decommissioning plan if (1) the licensee has decided to permanently cease principal activities at the entire site or any separate building or outdoor area that contains residual radioactivity such that the building or outdoor area is unsuitable for release in accordance with NRC requirements, or (2) no principal activities under the license have been conducted for a period of 24 months, or (3) no principal activities have been conducted for a period of 24 months in any separate building or outdoor area that contains residual radioactivity such that the building or outdoor area is unsuitable for release in accordance with NRC requirements.

When any of the events in 10 CFR 72.54(d)(1)-(3) occurs, the licensee is required to notify and submit within 12 months a final decommissioning plan and begin decommissioning upon approval. The required content of the decommissioning plan is provided in 10 CFR 72.54(g). Pursuant to 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," the NRC would conduct a separate environmental review associated with the review of the decommissioning plan. Decommissioning of the ISFSI was discussed in the 1996 EA (NRC 1996) that the NRC prepared as part of the original ISFSI license application review.

1.3 Purpose and Need for the Proposed Action

PGE began decommissioning and dismantling the TNP in 1993; the process took 10 years to complete (Oregon DOE 2017). The Trojan ISFSI was built to store spent fuel that had been stored in the TNP spent fuel pool. This was done to provide interim storage for all of the fuel stored in the spent fuel pool and to facilitate the decommissioning of TNP and its associated spent fuel pool. The ISFSI has stored TNP spent fuel since that time and is needed until a permanent facility (or facilities) is available for offsite final disposition of the spent nuclear fuel. If the NRC renews the Trojan ISFSI as requested, PGE would be able to continue to maintain safe storage of the spent nuclear fuel generated from TNP operations for an additional 40 years at the ISFSI.

1.4 Scope of the Environmental Analysis

The NRC staff has evaluated the potential environmental impacts associated with the proposed action of license renewal of SNM-2509 and alternatives to the proposed action, and has documented the results of the assessment in this final EA. The staff performed this review in accordance with the requirements of 10 CFR 51 and staff guidance found in NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS* [*Office of Nuclear Material Safety and Safeguards*] *Programs* (NRC 2003).

The following documents were reviewed and considered in the development of this final EA:

- Information contained in PGE's License Amendment Request, which included the environmental report (ER), dated March 2017 (PGE 2017a)
- Information contained in PGE's and License Change Application to reduce the Trojan ISFSI controlled area (PGE 2005a)
- Information contained in previous NRC environmental review documents for the Trojan site (NRC 1996).

On September 19, 2014, the NRC published a revised rule at 10 CFR 51.23, "Environmental Impacts of Continued Storage of Spent Nuclear Fuel Beyond the Licensed Life for Operations of a Reactor" (79 FR 56238). The rule codifies the NRC's generic determinations in NUREG-2157, "Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel," regarding the environmental impacts of the continued storage of spent nuclear fuel beyond a reactor's operating license. In the NRC Memorandum and Order CLI-14-08, the Commission held that the revised 10 CFR 51.23 and associated NUREG-2157 cured the deficiencies identified by the court in *New York v. NRC*, 681 F.3d 471 (D.C. Circuit 2012) and stated that the rule satisfied the NRC's NEPA obligations with respect to continued storage. The revised rule requires that EAs prepared for future reactor and spent fuel storage facility licensing actions consider the environmental impacts of continued storage, if the impacts of continued storage of

spent fuel are relevant to the proposed action (see 10 CFR 51.23(b)). In this case, the proposed action, if approved, will extend the term of the license and therefore the impacts of continued storage of spent fuel would be relevant to the proposed action. Section 4.13 of this EA provides the NRC staff's consideration of the generic environmental impacts of NUREG–2157 for the proposed renewal of the Trojan ISFSI.

2 ALTERNATIVES TO THE PROPPOSED ACTION

2.1 No Action

The no-action alternative would consist of denial of PGE's request to renew Trojan ISFSI license SNM-2509. The license, however, would continue to be in effect with respect to possession of licensed material per 10 CFR 72.54(c) until the NRC notifies the licensee in writing that the license is terminated. PGE would continue to maintain the stored spent fuel at the ISFSI in a safe and secure condition.

Impacts from the no-action alternative would only result from activities performed to ensure the continued safe and secure operations of the ISFSI. The NRC staff finds that impacts from these activities would be similar in nature and scope to the current maintenance, monitoring, and inspection activities and, thus, would be SMALL and not significant.

Pursuant to 10 CFR 72.54, if NRC approves the final decommissioning plan, decommissioning of the Trojan ISFSI could commence. NRC approval of the decommissioning plan would constitute a major Federal action under the NEPA and would be subject to a site-specific environmental review.

2.2 License Renewal for an Additional 20-Year Term Alternative

The Trojan ISFSI was originally licensed for a 20-year period of operation. For this alternative, the ISFSI license would be renewed for an additional 20-year period consistent with the current license term. The NRC staff considered as an alternative the continued operation of the Trojan ISFSI for an additional 20 years to understand whether the environmental impacts of continued operations for an additional 20 years would differ from those of continued operation for an additional 40 years (i.e., the proposed action).

For the 20-year alternative, only the potential radiological impacts to public and occupational health are discussed in this EA in Section 4.9. The NRC staff did not separately address the 20-year alternative for the other resource areas, because the staff determined that for those resource areas, the site operations and the types of potential environmental impacts associated with operation activities during the 20-year interval would be the same as those activities for the proposed action (i.e., the 40-year license renewal).

2.3 Shipment of Spent Fuel to an Offsite Facility

Shipment of the spent fuel to a commercial reprocessing facility, Federal repository, or interim storage facility is not a reasonable alternative, because these facilities currently do not exist in the United States. However, the NRC has received license applications for consolidated interim storage facilities. If approved by the NRC, such a facility could become available during the proposed license renewal period.

3 AFFECTED ENVIRONMENT

3.1 Land Use

The Trojan ISFSI is located within the Protected Area fence on less than 0.4 ha (1 ac) in the northeastern portion of the former TNP site. The former TNP site occupied approximately 12 ha (30 ac) of the 257 ha (634 ac) Trojan site. Approximately 57 ha (140 ac) of this property have been set aside for recreational uses, such as picnic areas, hiking and bicycling paths, a disc golf course, parking areas, a 10.5 ha (26 ac) reflecting lake, and an 11 ha (28 ac) recreational lake. Fishing activity on the recreational lake peaks in the spring when the lake is stocked with fish by the State of Oregon (PGA 2017a).

Land use in the vicinity of the site primarily involves manufacturing, agriculture, fishing, and forestry. The area is heavily timbered and suited primarily to logging and other forestry operations (PGE 2017a).

Continued operation of the Trojan ISFSI does not require any additional permits, licenses, or approvals other than the renewal of the NRC operating license (PGE 2017a).

3.2 Transportation

Two-lane U.S. Highway 30 parallels the western boundary of the Trojan site, connecting communities along the Columbia River from Portland to Astoria, and carrying moderate passenger and freight traffic (NRC 1996). Interstate Highway 5 parallels the eastern boundary and is about 1.6 km (1 mi) from the Trojan site (PGE 2017a).

A railroad operated by the Portland and Western Railroad crosses through the Trojan site (Port of Portland 2016), while the Burlington Northern Santa Fe rail line is approximately 1.6 km (1 mi) east of the site, across the Columbia River in Washington State (Washington State Transportation Commission 2017). Both of these serve freight traffic to/from shippers in Oregon along the Columbia River. The Columbia River is a major route for waterborne commerce (Washington State Legislature 2017).

Based on the EA conducted by the NRC in 1996, it is not anticipated that any additional work will be done at the facility; thus, there would be no additional workers and associated vehicles necessary to run the ISFSI during the license renewal period. The movement of the spent fuel from the storage site for final disposal is projected in the future. Transportation plans, including the number of additional workers, number of additional vehicles, and the period of time the work would take place for that event will be developed when needed (NRC 1996).

3.3 Geology and Soils

The Trojan ISFSI site lies between the Oregon Coast and the Cascade Mountain Ranges in the Portland Basin (USGS 2004). The Cascade Range to the east of the site includes numerous active volcanos. Mt. Saint Helens is the nearest (approximately 34 mi northeast) and was the most recently active volcano (May 18, 1980). The geology and volcanic hazards in the area were reviewed in support of the ISFSI licensing ER. For their supplement to the ER the licensee did not complete additional investigations of the site geology or volcanic hazards. The licensee's review of available information for this license renewal did not identify new information warranting an update to the information provided in the licensing ER (PGE 2017a).

The ISFSI is located in an area with moderate seismic activity. With the majority of the seismic activity at distances ranging from 40 to 193 km (25 to 120 mi) distances (NRC 1996). More recent research of the Cascadia subduction zone found that the simulated intensity and ground acceleration were within the range of the estimated maximum ground acceleration used in the design of the ISFSI (PGE 2017a).

3.4 Water Resources

The Trojan site is located on a rocky ridge with the elevation of the lowest bank at 14 m (45 ft) (NRC 1996). At this point the Columbia River is approximately 0.8 km (0.5 mi) wide. The 1996 Columbia River flood had an estimated flow of between 24,000 and 25,000 m^3/s (850,000 and 900,000 ft^3/s) near the Trojan site. At this time the maximum crest of the river was 9 m (22.5 ft). This flood was caused by warm rains and snow melt (NRC 1996).

The Columbia River and its tributaries have been central to the region's culture for thousands of years, as well as the economy. They have been used for transportation since ancient times, linking the region's many cultural groups. It offers premiere opportunities to fish for salmon, steelhead, sturgeon, shad, and a variety of warm water species. Located at the TNP site is the Trojan Pond, one of more than 350 water bodies in Oregon that Oregon Department of Fish and Wildlife regularly stocks with trout. The 6 ha (15 ac) pond is located approximately 7 km (4.5 mi) southeast of Rainier on the north side of Highway 30 (ODFW 2017).

Bonneville Lock and Dam consists of several run-of-the-river dam structures that together complete a span of the Columbia River between Oregon and Washington. The dam is located 64 km (40 mi) east of Portland, Oregon, in the Columbia River Gorge. Every spring, young fish follow the flow of the Columbia River downstream to the ocean. The U.S. Army Corps of Engineers at Bonneville Lock and Dam provides passageways for these fish to swim through or around the dam, with the goal of keeping as many fish alive as possible. Bonneville's total output of over 1,200 megawatts is enough to supply the power needs of 900,000 homes (USACE 2013).

3.5 Threatened and Endangered Species

Under Section 7 of the Endangered Species Act (ESA), prior to taking a proposed action, a Federal agency must determine whether (1) endangered and threatened species or their critical habitats are known to be in the vicinity of the proposed action and, if so, whether (2) the proposed Federal action may affect listed species or critical habitats.

In the ER supplement submitted for license renewal, PGE provided a current list of the Federal and state listed species with a potential to occur within or near the Trojan site. None of the species is currently known to occupy the Trojan site (PGE 2017a). PGE, however, did indicate that the federally threatened grizzly bear once inhabited Columbia County but currently is considered to have been removed from the area (PGE 2017a). Also, PGE indicated that the federally listed bald eagle and peregrine falcon have been known to breed on the Trojan site. In recent years, both the bald eagle and peregrine falcon have been documented as nesting in the vicinity, and the bald eagle has been seen nesting on the larger Trojan property approximately 610 m (2,000 ft) from the Trojan ISFSI. The distance of the nesting site from the ISFSI and the lack of change in daily activities at the ISFSI make it unlikely that continued operation of the storage facility would impact the breeding behavior of either the bald eagle or the peregrine falcon (PGE 2017a).

In response to contact made by the NRC (NRC 2017b), the U.S. Fish and Wildlife Service (FWS), Portland Field Office indicated that the endangered and threatened species potentially impacted are unlikely to be present within the boundaries of the Trojan ISFSI, as it is a developed site. The details of this consultation are provided in Section 4.5 of this EA.

3.6 Climate, Meteorology, and Air Quality

The regional climate of the Trojan site is typical of the marine climate of the Pacific coast. It is characterized by wet winters and dry summers with mild temperatures year round (PGE 2017a). The ISFSI Safety Analysis Report (SAR) states that the regional mean temperatures for summer is 18°C (65°F) and for winter is 4°C (40°F) (PGE 2017a). These figures are consistent with National Weather Service data for 1981 to 2000 for Portland, Oregon (NOAA 2017), which indicate the lowest monthly mean temperature is 5°C (41.2°F) in January and the highest mean temperature is 20°C (68.7°F) in August. The daily mean temperature minimum was 2°C (35.3°F) in December and the maximum was 27°C (80.9°F) in August.

As described in the EA for the construction and operation of the Trojan ISFSI (NRC 1996), the region receives substantial annual rainfall. The rain showers are usually of light or moderate intensity and continuous, rather than heavy downpours for brief periods. Severe storms, tornadoes, and major hail storms rarely occur. Thunderstorms occur during the spring and summer months with a frequency of about one per month. Surface winds seldom exceed gale force and rarely reach higher than 121 km/hr (75 mph). Severe storms and thunderstorms are infrequent and tornadoes rarely occur (PGE 2017a).

Onsite meteorological data are not being collected during ISFSI operation because the ISFSI does not produce gaseous effluents that require monitoring (PGE 2017a). As described in the EA for the construction and operation of the ISFSI (NRC 1996), winds at the Trojan site are from the north in the summer and from the south during the winter months. During the spring and fall, the wind may blow from either direction depending on the location of the major high and low-pressure areas. The north-south wind patterns at the site correspond to the north-south orientation of the Columbia River valley in this area.

The Trojan ISFSI is in the Portland Interstate Air Quality Control Region. The air quality near the ISFSI is in attainment (unclassifiable/attainment) for all criteria pollutants (40 CFR 81.338). Attainment areas are areas where the ambient air quality levels are better than the levels designated by the U.S. Environmental Protection Agency.

3.7 Demography, Socioeconomics, and Environmental Justice

The population distribution and projections for Columbia County are based on information from the U.S. Census Bureau website, which is based on 2010 census data and updated 2015 data where available (USCB 2016). Columbia County experienced a 2.8 percent population growth between the years of 2010 and 2016. Employment decreased from 2010 to 2015 by 9 percent. Columbia County has five different school districts covering the 1,700 km^2 (657 mi^2) of land within its borders (Columbia County 2017). The nearest permanent resident is located approximately 660 m (2,200 ft) from the Trojan ISFSI (PGE 2017a). Table 3.1 shows the ethnicity breakdown and median income level for both Columbia County and the State of Oregon. Table 3.2 provides information for Columbia County and other geographic areas for comparison regarding the percentage of minority and low-income populations.

Table 3.1. Ethnicity and Median Income Levels for Columbia County and State of Oregon

Ethnicity Percent, 2016	Columbia County	State of Oregon
White[a]	92.9	87.4
Black[a]	0.6	2.1
American Indian and Alaska Native[a]	1.5	1.8
Asian[a]	1.1	4.5
Native Hawaiian and other Pacific Islander[a]	0.2	0.4
Persons reporting two or more races	3.6	3.7
Persons of Hispanic or Latino origin[b]	4.9	12.8
White persons not Hispanic	88.9	76.4
Median Household Income, 2011-2015 (in $2015)	$53,179	$51,243

Source: U.S. Census website https://www.census.gov/quickfacts/table/RHI125215/41009,41
(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, thus are also included in applicable race categories.

Table 3.2. Percentage of Minority and Low-income Populations by Geographic Comparison Area

Geographic Area of Comparison	Black or African American	Asian	American Indian and Alaska Native	Native Hawaiian and Other Pacific Islander	Multi-Racial	Hispanic or Latino Ethnicity	Low-Income Households/ Persons in Poverty
State of Oregon	2%	5%	2%	0%	4%	13%	15%
Columbia County, OR	1%	1%	2%	0%	4%	5%	13%
State of Washington	4%	9%	2%	1%	5%	12%	12%
Cowlitz County, WA	1%	2%	2%	0%	4%	9%	16%

Source: QuickFacts at www.census.gov

The socioeconomic region of influence is defined as the area in which the Trojan employees and their families reside, spend their income, and use their benefits, thereby affecting economic conditions in the region. The region of influence consists of Columbia County, Oregon, which has a population of approximately 49,351 (USCB 2010, Demographic Profile). There is a limited influx of people into the 16 km (10 mi) radius around the site during the summer months, when river conditions are conducive to fishing and recreation. This influx is primarily on the Columbia, Kalama, and Cowlitz Rivers. There are no Federal or state parks or campgrounds within 16 km (10 mi) of the site. Operation of the ISFSI will require minimal staff and will not contribute to any socioeconomic impacts in the region (NRC 1996).

For environmental justice considerations, a 6 km (4 mi) radius could reasonably be expected to contain the area of potential effect and that the state and county consider the appropriate geographic areas for comparative analysis. Specifically, the area of potential effect was defined as the states of Oregon and Washington and the counties of Columbia County, Oregon, and Cowlitz County, Washington. Block groups in each state were analyzed separately against their respective state's and county's data. The results of the analysis indicate that no census block groups within the 6 km (4 mi) radius have significant percentages of minority populations, nor do they have significant percentages of low-income households (PGE 2017a).

3.8 Historic and Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) requires NRC staff to take into account the effects of the proposed licensing action on historic properties. The area of potential effect for this proposed action consists of the Trojan ISFSI site. In the EA previously prepared by NRC, the staff acknowledged that there was an area adjacent to the Trojan barge slip that had been identified as having archaeological significance because of the presence of Native American artifacts. No building, excavating, or disturbance in that area would be conducted during the renewed license term, and the ISFSI is not located on or near the barge slip. The EA also stated that there are no historical sites or cultural resources that would be impacted by operation of the Trojan ISFSI (NRC 1996).

The NRC staff contacted the Oregon State Historic Preservation Officer (SHPO) and the Chehalis, Grand Ronde and Yakama Native American Tribes. A record of these consultations can be found in Section 4.8 of this EA. Based on past NRC EAs, there are no known historic and cultural properties within the Trojan ISFSI.

3.9 Public and Occupational Health and Safety

Risks to occupational health and safety can include exposure to radiological and nonradiological hazards. The Trojan ISFSI does not generate any liquid or gaseous effluents that would be released to the environment during operations (PGE 2017a). External radiation from the sealed MPCs could potentially affect workers and members of the public; however, the cask is a passive system designed to limit exposure to radiation. In its SAR, PGE calculated the annual collective doses to workers performing surveys, inspections, surveillance, and maintenance activities at the ISFSI to be 1.6 person-rem per year (PGE 2017b).

In the SAR, Table 7.4-4 presents the licensee's calculation of the total annual dose rate from ISFSI external radiation to the nearest permanent resident as 0.0227 mSv/yr (2.27 mrem/yr), which is below the 0.25 mSv/yr (25 mrem/yr) regulatory limit in 10 CFR 72.104(a) (PGE 2017b). For a U.S. resident, the average annual estimated total effective dose equivalent from natural background and anthropogenic (i.e., manmade) radiation sources is about 6.2 mSv (620 mrem) (NRC 2017c). The source of this dose includes cosmic radiation, background radiation (radon and thoron), radiation sources in the Earth (terrestrial sources), naturally occurring radionuclides that exist in the body, medical and occupational sources, industrial sources, and radionuclides present in consumer products.

3.10 Visual and Scenic Resources

There is limited or no visibility of the Trojan ISFSI from areas accessible to the public. A berm on the north and east sides and natural terrain to the south block the ISFSI from view. From the west and southwest, views are partially obstructed by switchyard structures. Therefore, it presents minimal visual or aesthetic impact on the surrounding area.

3.11 Noise

Less than a mile north of the Trojan site, the community of Prescott with 28 housing units and an estimated population of 55 residents represents the closest potential noise receptors (USCB 2016). Users of Trojan Park and the adjacent natural area within the Trojan property are other potential noise receptors. The NRC's EA developed as part of the Trojan ISFSI licensing process determined that there would be no significant noise generated by the operation of the ISFSI (NRC 1996). There have been no changes to the facility or its surrounding environment since the last licensing action.

4 ENVIRONMENTAL IMPACTS

The NRC staff reviewed the applicant's ER, collected information from Federal and State agencies, and evaluated the environmental impacts to the various resources of the affected environment from the proposed action. The staff used the guidelines outlined in NUREG-1748 (NRC 2003) in its evaluation. In accordance with this guidance, the staff evaluated the environmental impacts that each resource may encounter from the proposed action. The staff categorizes the impacts in terms of small, moderate, or large. The definitions of these categories follow:

- SMALL – environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- MODERATE – environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.
- LARGE – environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

4.1 Land Use

Approval of the proposed action will not result in any construction or expansion of the existing ISFSI footprint or operations. Routine operation of the ISFSI is largely passive. Typical activities include maintenance and monitoring that primarily involve security monitoring and periodic surveillance and inspection walk-downs (PGE 2017a). Because there would be no new land use as a result of the proposed action, the NRC staff concludes that the impacts to land use would be SMALL, and would not result in significant environmental impact.

4.2 Transportation

The NRC staff expects that the proposed action would not change the volume of traffic at the Trojan site and surrounding environs. The licensee is not requesting any construction or expansion of the existing ISFSI footprint beyond that previously approved, and no new radioactive waste shipments or related activities are expected. Based on this information, the NRC staff concludes that the impacts on transportation from the proposed action would be SMALL and would not result in a significant impact.

4.3 Geology and Soils

The NRC staff does not expect the continued operation of the Trojan ISFSI to impact the underlying geology because the ISFSI has no moving parts that would impact the subsurface. In its license renewal application, PGE indicated that no additional impacts to geology or soils are expected from continued operation beyond those described in the NRC's EA (NRC 1996) for the construction and operation of the Trojan ISFSI (PGE 2017a). The proposed action does not include any physical modification to the ISFSI. In addition, the ISFSI does not generate any liquid or solid effluents that might impact the geology or soils. Therefore, the NRC staff concludes that the impacts to geology and soils from the proposed action would be SMALL and would not result in a significant impact to such resources.

4.4 Water Resources

The Trojan ISFSI does not require water or otherwise generate liquid effluents during normal operation and minimal sanitary waste is generated (PGE 2017a). Water consumption at the ISFSI is not anticipated to change, and no additional workers beyond the current workforce would be needed to operate the ISFSI during the proposed license renewal period (PGE 2016).

Because there would be no changes in water consumption or impacts to water quality as a result of the proposed action, the NRC staff concludes that the impacts on water resources from the proposed action would be SMALL and would not be significant.

4.5 Threatened and Endangered Species

The proposed renewal of the Trojan ISFSI does not involve activities that would disturb any new land or include any physical modification. As mentioned above, routine operation of the ISFSI is largely passive. Typical activities include maintenance and monitoring that primarily involve security monitoring and periodic surveillance and inspection walk-downs (PGE 2017a). These activities would be the only activities that would continue if the license is renewed.

The NRC staff reached out to the Oregon FWS regarding the potential effects that the proposed action could have on the ecology, particularly on endangered and threatened species (NRC 2017b). In its renewal application, PGE indicated that there are no species listed as threatened or endangered that are known to be present at the Trojan site. Further, the licensee indicated that the proposed action would not alter any wildlife or plant habitat and is not expected to affect listed species or critical habitat in the vicinity of the Trojan site (PGE 2017a). Oregon FWS responded that because the Trojan ISFSI is a developed site, the species potentially impacted are unlikely to be present within the boundaries of the ISFSI. The Oregon FWS also stated that if the ISFSI boundaries are expanded at any point or any effluents are released into the environment, targeted surveys of the affected areas may be needed to determine potential impacts (Oregon Department Fish and Wildlife 2017). Therefore, the NRC concludes that the proposed action would not adversely affect federally listed threatened and endangered species or state-identified rare species or species of special concern.

4.6 Climate, Meteorology, and Air Quality

The operation of the Trojan ISFSI will have no adverse impact to the local or regional climate. The maximum decay heat per assembly is 725 Joules/sec (0.725 kW) (PGE 2017a), and the amount of heat released in the air in the vicinity of the ISFSI would be relatively small (NRC 1996). There would be minimal impact to the air quality of the area (NRC 1996). Therefore, the NRC staff concludes that impacts on air quality from the proposed action would be SMALL and would not result in a significant impact.

4.7 Demography and Socioeconomics

In its license renewal application, PGE indicated that no significant changes in staffing are anticipated to manage the ISFSI during the term of the renewed license (PGE 2017a). Therefore, as a result of the proposed action the NRC does not anticipate a need for additional housing as there would be no influx of people to the area. There also would be no expected related changes or impacts to the local economy. Therefore, the NRC staff does not expect any direct or indirect socioeconomic impacts and concludes that the socioeconomic impacts from the proposed action would be SMALL.

4.8 Historic and Cultural Resources

As discussed in Section 3.8, there are no known historic or cultural properties within the Trojan ISFSI. Oregon SHPO responded to NRC's consultation letter and agreed with the NRC staff's determination that the proposed license renewal does not have the potential to negatively affect historic properties because operation of the Trojan ISFSI is an ongoing activity and there are no properties within the project area that are 50 years of age or older (Oregon SHPO 2017). The Confederated Tribes of Grand Ronde (CTGR) responded and stated, "There are numerous ethnographically and archaeologically recorded cultural resources in the immediate vicinity of the Trojan ISFSI that are of significance to the CTGR" (CTGR 2017). As stated in Section 4.1, PGE has no plans for construction activities; therefore, there would be no impact to cultural resources around the immediate vicinity of the ISFSI. Routine operations are largely passive with the exception of inspections and maintenance that would be the only continuing activities if the license is renewed (PGE 2017a). Therefore, the NRC staff concludes that the impacts on historic and cultural resources from the proposed action would be SMALL and would not result in a significant impact to such resources.

4.9 Public and Occupational Health and Safety

4.9.1 Nonradiological Impacts

The proposed action does not include any physical modification to the ISFSI. There are no planned refurbishments beyond normal maintenance or aging management activities. No liquid or gaseous effluents are generated or released during ISFSI operations. Therefore, the NRC staff finds that there would be no nonradiological impacts to resources, including land use, geology and soils, water resources, ecology, threatened and endangered species, meteorology, climate, air quality, noise, historic and cultural resources, visual and scenic resources, socioeconomic resources, transportation, and waste management. Accordingly, the staff concludes that the impacts from the proposed action would be SMALL and would result in no nonradiological impacts to these resources.

4.9.2 Radiological Impacts

The Trojan ISFSI is located inside the radiologically controlled Protected Area fence within the CAB, a secure area on the former TNP site. The designated controlled area of the ISFSI is 200 m (656 ft) from the edge of the storage pad (PGE 2017a). The concrete cask has a steel-lined central cavity; it provides structural support and shielding and natural circulation cooling removes decay heat. There are no radiological liquid or gaseous effluents released to the environment; therefore, external exposure to direct and scattered radiation is the primary pathway of radiation exposure from the sealed MPCs to workers and the public (PGE 2017a). There are currently 34 casks stored on the ISFSI, and no additional casks will be added. PGE has indicated that there will be no change in routine operations, and no new construction or land disturbance is being requested as part of this license renewal application. Operations during the proposed renewal license period would include storage and routine inspections and monitoring of the ISFSI site in accordance with the requirements in 10 CFR Part 72.

4.9.2.1 Occupational Dose

PGE maintains a radiation protection program for the Trojan ISFSI in accordance with 10 CFR Part 20 to ensure that radiation doses are maintained as low as reasonably achievable (ALARA) (PGE 2017a). Under this program, PGE routinely monitors and evaluates the ISFSI (PGE 2017b). The last power operations at TNP occurred in November 1992; therefore, the fuel stored at the ISFSI has cooled for a minimum of 25 years. No additional casks will be placed at the ISFSI. Therefore, the only occupational dose received would occur during weekly surveillance, quarterly surveys and regular maintenance activities. The calculated collective dose per year for these activities is 1.6 person-rem per year (PGE 2017a). This occupational dose is within the required occupational dose limits specified in 10 CFR Part 20. Based on actual operating experience at the ISFSI, Trojan personnel have not recorded any dose on individual personnel dosimetry in the past 10 years (PGE 2017a). As stated in their ER, this is documented in annual PGE submittals to the NRC (PGE 2017a). Licensees are required to conduct authorized operational, inspection, and maintenance activities in accordance with the occupational dose limits specified in 10 CFR 20.1201 and to have and follow a radiation protection program consistent with 10 CFR 20.1101. Therefore, the NRC staff concludes that the proposed action would result in SMALL and not significant radiological impacts to workers.

For the 20-year alternative, spent fuel would continue to be stored at the ISFSI for an additional 20 years. Operational inspection and maintenance of the Trojan ISFSI would be conducted in the same manner as for the proposed action. Annual radiological doses to workers during the 20-year alternative would be similar to those presented above for the requested 40-year ISFSI renewal term, but for a shorter, 20-year, duration. Therefore, potential annual radiological doses to workers from the 20-year renewal alternative would be SMALL and would not be significant.

4.9.2.2 Dose to the Public

No gaseous or liquid effluents are discharged from operation of the Trojan ISFSI. Therefore, only external direct and air-scattered radiation from the 34 sealed MPCs contribute to potential radiological dose exposure to an offsite member of the public (NRC 1996). In the 2006 EA, the NRC staff concluded that the exemption from the requirement to submit an annual radioactive effluent monitoring report would not endanger life or property. Further, the staff concluded that there is reasonable assurance that the exemption will have no impact on offsite doses. The ISFSI emits direct radiation that is monitored in the environment by posting thermoluminescent dosimeters at the perimeter of and in the controlled area near the concrete casks. These dosimeters are read quarterly to monitor radiation levels in the vicinity of the ISFSI (PGE 2017b).

In March 2005, PGE requested and was granted a license amendment (PGE 2005a and NRC 2006, respectively) that reduced the controlled area from 300 m (984 ft) from the edge of the ISFSI pad to 200 m (656 ft) from the edge of the pad. The NRC staff concluded that there is reasonable assurance that the methodology used to determine the dose rate for a CAB of 200 m (656 ft) is appropriate and that dose rates at the new CAB will be within the regulatory limits in 10 CFR Part 72. Annual whole body dose rates at the 200m (656 ft) boundary were calculated and found to be 0.036 mSv (3.6 mrem) (PGE 2017a), which is below the annual limit defined in 10 CFR Part 20. Also, the staff had reasonable assurance that moving the CAB from 300 m (984 ft) to 200 m (656 ft) would not negatively impact public health and safety and would have no impact on offsite doses (NRC 2006).

To provide a bounding value, PGE built a number of conservatisms into their dose calculations, such as the length of time an individual would spend at the specified location and the atmospheric dispersion factor used in the calculations. The CAB and the nearest residence were selected as the two locations at which doses to members of the public were estimated. The calculated annual whole body dose at the 200 m (656 ft) CAB is 0.036 mSv (3.6 mrem) and at the nearest residence, a 660 m (2,165 ft) distance from the ISFSI, is 0.023 mSv (2.3 mrem) (PGE 2017a). Field measurements are used for the direct radiation component of these values (PGE 2017a). These operational values are below the annual limits in 10 CFR 20.1301, which states that the total effective dose equivalent to individual members of the public from the licensed operation should not exceed 1 mSv (100 mrem) in a year. Therefore, potential annual radiological doses to public from the proposed action would be SMALL and would not be significant.

For the 20-year alternative, spent fuel would continue to be stored at the ISFSI for an additional 20 years. The current direct dose rate to the public has been measured and is in compliance with Federal regulations (NRC 2015). Therefore, the NRC staff concludes that annual radiological doses to members of the public from the ISFSI would be below those expected from the proposed action and be below the annual limits in 10 CFR 20.1301. Therefore, potential radiological impacts to members of the public from the 20-year renewal alternative would be SMALL and would not be significant.

4.9.2.3 Accidents

PGE evaluated potential radiological impacts resulting from postulated accident events during off-normal conditions in Section 8.2 of its SAR for the Trojan ISFSI (PGE 2017b). Of the 14 design-basis and beyond-design-basis accidents discussed in the original EA for the ISFSI (NRC 1996), 2 are no longer possible because the TNP is no longer operating. Of the 12 remaining accidents, only 3 have radiological consequences—Failure of Fuel Pins with Subsequent Breach of Multipurpose Canister, Earthquake Event, and Lightning

PGE has stated that the casks at Trojan are designed to withstand a major earthquake; however, if spent fuel rods became exposed, it would be a localized problem (Evans 2016). In 1999, the Oregon Department of Energy concluded that PGE selected appropriate design criteria in considering the potential effects of earthquake and tornado hazards on the ISFSI (Oregon Office of Energy 1999). In the event of an earthquake or lightning, the result could be a degradation in shielding, causing dose to workers involved in repairing the damage, but no release of radioactive effluents. Only the accident scenario involving Failure of Fuel Pins with Subsequent Breach of MPC has the potential to release radioactive effluents to the environment.

Calculated doses for this scenario are below the dose limits in 10 CFR 72.106 (PGE 2017a). The earthquake hazard was analyzed in the 1996 EA prepared by NRC. In that EA, staff concluded that the risk of an earthquake in the Trojan region had been taken into consideration for the design of the Trojan ISFSI (NRC 1996).

4.10 Environmental Justice

Under Executive Order 12898 (59 FR 7629), Federal agencies are responsible for identifying and addressing potential disproportionately high and adverse human health and environmental impacts on minority and low-income populations. In 2004, the Commission issued “Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing

Actions" (69 FR 52040). Regarding EAs, the NRC's policy statement on environmental justice (EJ) states:

> "If there will be no significant impact as a result of the proposed action, it follows that an EJ review would not be necessary. However, the agency must be mindful of special circumstances that might warrant not making a FONSI. In most EAs, the Commission expects that there will be little or no offsite impacts and, consequently, impacts would not occur to people outside the facility. However, if there is a clear potential for significant offsite impacts from the proposed action then an appropriate EJ review might be needed to provide a basis for concluding that there are no unique impacts that would be significant. If the impacts are significant because of the uniqueness of the communities, then a FONSI may not be possible and mitigation or an environmental impact statement (EIS) should be considered." (69 FR 52047).

In the section "Guidelines for Implementation of NEPA as to EJ Issues" (69 FR 52048), the NRC explains that special circumstances arise only where the proposed action has a clear potential for offsite impacts to minority and low-income communities associated with the proposed action.

In its ER, PGE explained that the closest minority population is more than 6.4 km (4 mi) away from the Trojan ISFSI (PGE 2017a). As discussed in Section 4.9.2 in this final EA, offsite radiation doses from the Trojan ISFSI would remain unchanged for both the proposed action and the no-action alternatives. There would be no nonradiological impacts associated with the proposed action and impacts would be SMALL and not significant for the no-action alternative. The NRC staff does not expect that the proposed action or the alternatives would adversely affect any offsite population.

4.11 Noise

The NRC staff expects that because storage of irradiated fuel and associated materials at the ISFSI is a largely passive system and no additional casks will be added during the license renewal period, there will be no significant noise generated by the continued operation of the ISFSI. Based on this information, the NRC staff concludes that the impacts on noise from the proposed action would be SMALL and would not result in a significant impact.

4.12 Impacts from a Hypothetical Terrorist Attack

4.12.1 NRC Security Requirements for Independent Spent Fuel Storage Installations

The NRC has established requirements and has initiated several actions designed to provide high assurance that a terrorist attack would not lead to a significant radiological event at an ISFSI. These include (1) the continual evaluation of the threat environment by the NRC, in coordination with the intelligence and law enforcement communities, which provides, in part, the basis for the protective measures currently required; (2) the protective measures that are in place to reduce the chance of an attack that leads to a significant release of radiation; (3) the robust design of storage casks, which provides substantial resistance to penetration; and (4) NRC security assessments of the potential consequences of terrorist attacks against ISFSIs, that inform the decisions made regarding the types and level of protective measures. Over the past 25 years, there have been no known or suspected attempts to sabotage, or to steal, radioactive material from storage casks at ISFSIs, or to directly attack an ISFSI. Nevertheless, the NRC is continually evaluating the threat environment, to determine whether any specific threat to ISFSIs exists.

4.12.2 General Security Considerations

In response to the terrorist attacks of September 11, 2001, and intelligence information subsequently obtained, the Federal government initiated nationwide measures to reduce the threat of terrorism, and it continues to improve the sharing of intelligence information and the coordination of response actions among Federal, State, and local agencies. The NRC is an active participant in these efforts; it has regular and frequent communications with other Federal, State, and local government agencies and industry representatives, to discuss and evaluate the current threat environment, to assess the adequacy of security measures implemented at licensed facilities, and, when necessary, to recommend additional actions.

The NRC expanded its system for notifying licensees of possible threats to their facilities, after the September 11, 2001, terrorist attacks, to include a broader range of licensees, including ISFSI licensees. The NRC has incorporated the threat condition levels used in the U.S. Department of Homeland Security's (DHS) National Terrorism Advisory System (previously the Homeland Security Advisory System) into its own threat advisory system. The NRC's Office of Nuclear Reactor Regulation issued (OUO-SRI) Regulatory Issue Summary (RIS) 2018-03, "National Terrorism Advisory System and Protective Measures for the Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material (OUO-SRI)," dated June 1, 2018. The NRC revised its threat alerts and recommended specific actions in RIS 2018-03, which provides recommended actions that licensees and Agreement States may wish to consider in the event that DHS issues a National Terrorism Advisory System alert.

The NRC Intelligence Liaison and Threat Assessment Branch, within the Office of Nuclear Security and Incident Response reviews, analyzes, coordinates, and disseminates threat and intelligence information relevant to NRC licensees and Agreement States, at both strategic and tactical levels. Branch staff also liaise and coordinate with staff from other organizations and agencies, including the intelligence and law enforcement communities. Through these improved coordination and communication functions, the NRC is able to efficiently develop and transmit advisories to the appropriate licensees, who are then able to take prompt action. Thus, the broad actions taken by the Federal government and the specific actions taken by the NRC since September 11, 2001, have helped to reduce the potential for terrorist attacks against NRC-regulated facilities.

4.12.3 Requirements for ISFSIs

The NRC considered the potential impacts of terrorist acts in the development and implementation of its 10 CFR Part 73, "Physical Protection of Plants and Materials," security requirements (72 FR 12705). The NRC's strategy for protecting public health and safety, the common defense and security, and the environment focuses on ensuring that its requirements, in combination with the design features of storage casks, are effective in protecting against the potential effects of terrorist attacks on ISFSIs.

NRC security requirements provide high assurance that terrorist attacks cannot endanger the public's health and safety by intentionally releasing radiation from an ISFSI. The NRC reviews and approves facility security plans, in evaluating the adequacy of these onsite measures. The Trojan ISFSI is also inspected to ensure complete and correct implementation of the features of the site security plan as well as the applicable regulations and orders. The NRC staff has determined through recent inspections that the facility meets the requirements of 10 CFR Part 73 and applicable orders (NRC 2010).

The details of specific security measures for each facility are designated as Safeguards Information, in accordance with Section 147 of the Atomic Energy Act and 10 CFR 73.21, and, for that reason, cannot be released to the public. However, key features of the security programs for ISFSIs include (1) physical barriers, (2) surveillance, (3) intrusion detection, (4) intrusion response, and (5) offsite assistance from local law enforcement agencies, as necessary. After the September 11 terrorist attacks, the Commission initiated prompt and comprehensive actions to address both immediate and longer-term security measures for NRC-regulated facilities. In the months immediately after the attacks, the Commission issued numerous safeguards and threat advisories to its licensees to strengthen the capabilities and readiness of NRC licensees to respond to a potential attack on a nuclear facility. As part of longer-term efforts, the NRC conducted a comprehensive review of the NRC's safeguards and security program. This review examined specific threats, including a land-based vehicle bomb, a ground assault using an insider, and waterborne assaults. The findings of that review led to the imposition of additional requirements, through orders and rules that apply to ISFSI licensees.

The Commission ordered all licensees of operating ISFSIs to implement the additional security enhancements identified in the NRC's ongoing comprehensive review. These orders imposed additional security measures that were issued to PGE for the Trojan ISFSI on October 16, 2002, and August 18, 2004 (NRC 2002, 2004). These measures, which NRC inspections demonstrate to have been fully implemented, include (1) increased security patrols, (2) augmented security forces and weapons, (3) additional security posts, (4) heightened coordination with local law enforcement and military authorities, (5) enhanced screening of personnel, and (6) additional limitations on vehicular access. Collectively, these measures further reduce the already low probability of a successful terrorist attack on an ISFSI, by providing high assurance that an attempted attack would be detected and by mitigating the extent of damage and the potential radiological consequences if an attack were successful.

Based on its ongoing consideration of safeguards and security requirements, its review of information provided by the intelligence community, and the implementation of additional security measures at the nation's ISFSIs, the NRC has high assurance that public health and safety and the environment, and the common defense and security, continue to be adequately protected in the current threat environment.

4.12.4 Consideration of Environmental (Radiological) Impacts from Terrorist Acts

The NRC staff considered the potential radiological impacts of terrorist acts on ISFSIs, even though the staff considers the probability of a malevolent act against an ISFSI that could result in a significant radiological event to be very low. Storage casks are designed to be highly resistant to penetration. To be licensed or certified by the NRC, these casks must meet stringent regulatory requirements for structural, thermal, shielding, and criticality performance, for confinement integrity, and for normal and accident events. Consequently, storage casks are extremely robust structures, specifically designed to withstand severe accidents, including the impact of tornado-generated missiles.

The robust design and construction of the Trojan ISFSI provides multiple layers of protection. It is an approximately 32 m (105 ft) by 52 m (170 ft) reinforced concrete storage pad. It is located inside the ISFSI Protected Area fence and occupies less than 0.4 ha (1 ac) near the eastern edge of the former TNP site. The storage pad is used to store 34 vertically ventilated type casks made up of BNFL Fuel Solutions TranStor™ Concrete Casks. These casks are seal-welded, stainless steel Holtec International Multipurpose Canisters (type MPC-24E or MPC-

24EF) designed to accommodate 24 pressurized water reactor fuel assemblies (PGE 2017a). The canisters can store fuel assemblies, fuel debris, and GTCC waste generated at TNP during operations (NRC 1996).

The Trojan ISFSI is a vertical dry fuel storage system that consists of the reinforced concrete pad and sealed vertical cylindrical canisters that hold steel-lined concrete casks for the storage of spent nuclear fuel assemblies, fuel debris, and GTCC waste. GTCC waste consists of activated core components composed mainly of segmented reactor vessel internal components. The concrete cask provides radiation shielding and is designed to passively dissipate decay heat generated by the stored spent fuel, which means the cask provides adequate heat removal capacity to maintain safe fuel clad temperatures without active cooling systems (PGE 2017a, NRC 1996).

Based on these facts, and the results of the security assessments of ISFSIs (discussed below), the NRC has determined that the current design features and additional security measures in place provide high assurance that the Trojan ISFSI, and the GTCC process waste that is proposed to be stored there, will be adequately protected.

Because of the uncertainty inherent in assessing the likelihood of a terrorist attack, the NRC recognizes that under general credible threat conditions, although the probability of such an attack is believed to be low, it cannot be reliably quantified. The NRC has adopted an approach that focuses on ensuring that the safety and security requirements are adequate and effective in countering and mitigating the effects of terrorist attacks against storage casks. To provide high assurance that a terrorist act will not lead to significant radiological consequences, the NRC analyzed plausible threat scenarios and the enhanced security measures in place to protect against the threats, and developed emergency planning requirements, to mitigate potential consequences. As stated above, all these actions have been taken without regard to the probability of an attack. This protective strategy reduces the risk from a terrorist attack to an acceptable level.

4.12.5 Development of the Generic Security Assessments

Following issuance of the 2002 security orders for ISFSIs, the NRC used a security assessment framework as a screening and assessment tool to determine whether additional security measures, beyond those required by regulation and the security orders, were warranted for NRC-regulated facilities, including ISFSIs (Kipp 2004, Smith 2004, Yoshimura et al. 2004). Initially, the NRC screened threat scenarios to determine plausibility. This screening was informed by information gathered through the NRC's regular interactions with the law enforcement and intelligence communities. For scenarios deemed plausible, the NRC assessed the attractiveness of the facility to attack by taking into account factors such as iconic value, complexity of planning required, resources needed, execution risk, and public protective measures. Separately, the NRC made conservative assessments of consequences, to assess the potential for prompt fatalities from radiological impacts from those plausible scenarios. The NRC then looked at the combined effect of the attractiveness and the consequence analyses, to determine whether additional security measures for ISFSIs were necessary.

In conducting the security assessments for ISFSIs, the NRC chose several storage cask designs that were representative of currently NRC-certified designs. Plausible threat scenarios considered in the generic security assessments for ISFSIs included (1) a large aircraft impact similar in magnitude to the attacks of September 11, 2001, and (2) ground assaults using expanded adversary characteristics consistent with the design basis threat for radiological

sabotage for nuclear power plants. The resulting generic assessments formed the basis for NRC's conclusion that there was no need for further security measures at ISFSIs beyond those currently required by regulation and imposed by orders issued after September 11, 2001.

4.12.6 Comparison of the Generic Security Assessment to Trojan

The NRC staff reviewed the ISFSI security assessments and compared the assumptions in the generic security assessments, with the relevant features of the Trojan Storage System, including storage cask design and atmospheric dispersion. Each Trojan Storage System is made up of the concrete cask and stored MPC (Figure 1.3). The NRC staff determined that the assumptions used in the generic ISFSI security assessments for storage cask design and atmospheric dispersion are representative of the actual conditions at the Trojan ISFSI. The NRC staff compared the wind speeds and atmospheric stability class with those in the generic assessment and determined the conditions at the Trojan ISFSI promote more mixing and tend to be less stable than the conditions in the generic assessment. The results demonstrate radiological consequences to an individual from a release will be lower than the dose in the generic assessment. For these reasons, the staff finds reasonable assurance that the atmospheric influences on dose to a given individual is likely to be bounded by the assumptions in the generic assessment. Specifically, the same magnitude of radiological release will result in lower consequences given the actual conditions at the Trojan ISFSI.

The NRC staff compared the radioactive material in the Trojan Storage System with the source term (i.e., the amount of radioactive material stored) used in the generic assessments to assess whether the dose consequences of the generic assessment bound those of the waste stored at the Trojan ISFSI. The SAR states that GTCC waste will not be stored in the vacant locations in the Trojan Storage System, because Trojan's GTCC waste was disposed of elsewhere. For these reasons, the NRC staff assumed all material stored in the Trojan Storage System will be spent fuel. The NRC staff also used the generic assumption that all the spent fuel is burned to 42,000 megawatt days per metric ton of uranium (MWD/MTU), which is a higher burnup than for any of the spent fuel in the Trojan Storage System. The actual burnup of fuel in the Trojan Storage System is less than that used in the generic assessment. Because spent fuel radioactivity increases with burnup, the staff's use of the conservative assumption over-predicts the source term in the Trojan Storage System. The higher burnup in the generic assessment also over-predicts the activity of the stored fuel because the Trojan Storage System casks contains less source material than casks evaluated in the generic assessment.

The NRC staff also concludes the projected dose to the maximally exposed individual would be well below 0.05 Sv (5 rem), which is the design basis accident dose limit in 10 CFR 72.106. Emergency planning and response actions by onsite personnel and law enforcement agencies could also provide additional protections and mitigate consequences, in the unlikely event that an attack were attempted on the Trojan ISFSI. Therefore, the staff concludes that the consequences (dose) of a radiological release from the Trojan Storage System is bounded by the dose reported in the generic security assessments.

For the reasons discussed above, the staff concludes that the potential radiological dose to the public associated with a hypothetical attack on the Trojan ISFSI would be less than the dose calculated in the generic security assessments. The generic security assessments support the NRC's conclusion that the agency's security regulations and orders for the ISFSIs provide adequate protection for the public health and safety, the common defense and security, and the environment. Therefore, additional security measures at ISFSIs are not required.

The NRC staff finds the robust structure of storage casks, specifically designed to withstand severe accidents, in conjunction with existing security regulations and orders, provide adequate protection that a terrorist attack on the Trojan canisters would not result in a significant release of radiation. For these reasons, the NRC staff concludes the impact from a hypothetical terrorist attack would be SMALL and would not result in a significant impact to the environment.

4.13 Cumulative Impacts

The NRC staff considered the impacts of the proposed action, as described in Section 4.0 of this EA, combined with other past, present, and reasonably foreseeable future actions that could affect the same resources impacted by the proposed action. Because there are no expected offsite environmental impacts associated with the proposed action, the geographic area considered in this cumulative impacts discussion is the Trojan ISFSI site. The timeframe considered for future actions extends through 2059, the expiration year of the site-specific license SNM-2509 for the Trojan ISFSI, if the license is renewed. Because there are no nonradiological impacts expected from the proposed action, this discussion focuses only on radiological impacts

PGE performs routine radiological monitoring of the ISFSI. The direct exposure pathway measures environmental radiation doses by use of dosimeters placed at eight locations on the 200 m (656 ft) CAB. These dosimeters continually monitor radiation outside the ISFSI fence. According to NRC's 2015 Inspection Report, perimeter dose rates measured since the fuel was loaded into the ISFSI have continued to drop as the fuel radiologically decays (NRC 2015). PGE's calculated annual total whole body dose equivalent, which includes field measurements for the direct radiation component, to a hypothetical individual at the CAB was 0.036 mSv (3.6 mrem) and the nearest permanent resident was 0.023mSv (2.3 mrem) (PGE 2017b). Therefore, normal operations of the Trojan ISFSI result in radiological doses to members of the public that are well below regulatory limits. Because the proposed action would result in negligible radiological impacts, and PGE performs routine radiological monitoring and maintains an ALARA program for the Trojan ISFSI, NRC approval of the proposed license renewal is not anticipated to significantly contribute to cumulative impacts at the Trojan site.

4.14 Continued Storage of Spent Nuclear Fuel

The NRC's licensing proceedings for nuclear reactors and ISFSIs have historically relied upon a generic determination codified in the NRC's regulations at 10 CFR 51.23 to satisfy the agency's obligations under NEPA, with respect to the narrow area of the environmental impacts of storage of spent nuclear fuel (spent fuel) beyond a reactor's licensed life for operation and prior to ultimate disposal (continued storage). The Court of Appeals for the District of Columbia Circuit, in *New York v. NRC*, 681 F. 3d 471 (D.C. Cir. 2012), vacated the NRC's 2010 update to that rule and remanded it to the NRC. Thereafter, the Commission determined that NRC would not issue licenses dependent upon the formerly known Waste Confidence Decision and Temporary Storage Rule until the deficiencies identified by the Courts of Appeals were appropriately addressed (NRC Commission Order CLI–12–16 2012).

On September 19, 2014, the NRC published a final rule at 10 CFR 51.23, "Environmental Impacts of Continued Storage of Spent Nuclear Fuel Beyond the Licensed Life for Operations of a Reactor" (79 FR 56238). That rule, effective October 20, 2014, codifies the NRC's generic determinations in NUREG–2157 regarding the environmental impacts of the continued storage of spent fuel. In CLI–14–08, the Commission held that the revised 10 CFR 51.23 and associated NUREG–2157 cured the deficiencies identified by the court in *New York v. NRC*,

681 F.3d 471 and stated that the rule satisfies the NRC's NEPA obligations with respect to continued storage. The rule, however, does not authorize the storage of spent fuel. As discussed in the statements of consideration for the final rule (79 FR 56238; September 19, 2014), the rule does not address the safety of continued storage of spent fuel. Appendix B of NUREG–2157, however, discusses the feasibility of safe storage of spent fuel.

In EAs prepared for future reactor and spent fuel storage facility licensing actions, 10 CFR 51.23(b) now requires the NRC to consider the environmental impacts of continued storage, if the impacts of continued storage of spent fuel are relevant to the proposed action. The analysis below documents the required consideration of the environmental impacts of continued storage, as determined in NUREG–2157, for the proposed renewal of the Trojan ISFSI license.

4.14.1 Overview of 10 CFR 51.23 and NUREG-2157

NUREG–2157 supports the revised rule at 10 CFR 51.23 and includes, among other things, the NRC staff's analyses related to the particular deficiencies identified by the D.C. Circuit in the vacated Waste Confidence decision and rule. The information in NUREG–2157 was developed using an open and public process.

The NRC staff's evaluation of the potential environmental impacts of continued storage of spent fuel presented in NUREG–2157 identifies an impact level, or a range of impacts, for each resource area for a range of site conditions and timeframes. The timeframes analyzed in NUREG–2157 include the short-term timeframe (60 years beyond the licensed life of a reactor), the long-term timeframe (an additional 100 years after the short-term timeframe), and an indefinite timeframe (see NUREG–2157, Section 1.8.2).

The NRC concluded in NUREG–2157 that the potential impacts of spent fuel storage at the reactor site in both a spent fuel pool and in an at-reactor ISFSI would be SMALL during the short-term timeframe (see NUREG–2157, Section 4.20). However, for the longer timeframes for at-reactor storage, and for all timeframes for away-from-reactor storage, the analysis in NUREG–2157 has determined a range of potential impacts that are greater than SMALL in some resource areas (see NUREG–2157, Sections 4.20 and 5.20, respectively). The analysis in NUREG–2157 also presents an assessment of cumulative impacts for continued storage with ranges of potential impacts for most resource areas (see NUREG–2157, Section 6.5). These ranges reflect uncertainties that are inherent in analyzing environmental impacts to some resource areas over long timeframes. As explained in NUREG–2157 (Appendix D, page D–96), those uncertainties exist regardless of whether the impacts are analyzed generically or on a site-specific basis.

Appendix B of NUREG–2157 provides an assessment of the technical feasibility of a deep geologic repository and continued safe storage of spent fuel. That assessment concluded that a deep geologic repository is technically feasible and that a reasonable timeframe for its development is approximately 25 to 35 years. The assessment in NUREG–2157 referenced the U.S. Department of Energy's "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste" published in January 2013, which stated that the goal "… is to have a repository by 2026; the site characterized, and the repository designed by 2042; and the repository constructed and its operations started by the year 2048." Based on the evaluation of international experience with geologic repository programs—including the issues some countries have overcome—and the affirmation by the Blue Ribbon Commission of the geologic repository approach, the NRC continues to believe that 25 to 35 years is a reasonable period for repository development (i.e., candidate site selection and characterization, final site selection, licensing review, and initial construction for acceptance of waste).

4.14.2 At-Reactor Storage

The analysis in NUREG–2157 concluded that the potential impacts of at-reactor storage during the short-term timeframe would be SMALL (see NUREG–2157, Section 4.20). Further, the analysis in NUREG–2157 stated that disposal of the spent fuel by the end of the short-term timeframe is the most likely outcome (see NUREG–2157, Section 1.2). In this EA, the NRC staff determined that impacts from the proposed renewal for 40 years would be SMALL and not significant for all environmental resource areas. This is due to the passive nature of the ISFSI in that it emits no gaseous or liquid effluents during operation. Also, the ISFSI is designed to minimize radiological doses to workers and members of the public. PGE did not propose any significant changes in authorized operations for the Trojan ISFSI or request approval of any new construction or expansion of the existing ISFSI footprint. Thus, the potential impacts of at-reactor continued storage during the short-term timeframe are consistent with the evaluation of the environmental impacts for the proposed Trojan ISFSI license renewal as documented in this EA.

The analysis in NUREG–2157, however, evaluated the potential impacts of continued storage if the fuel is not disposed of by the end of the short-term timeframe. During the long-term and indefinite timeframes, the analysis in NUREG–2157 determined that impacts to all resource areas would be SMALL, except for historic and cultural resources and nonradioactive waste management. NUREG–2157 determined that the potential impacts to historic and cultural resources from at-reactor storage during the long-term timeframe and the indefinite timeframe are dependent on factors that are unpredictable this far in advance and therefore concluded those impacts would be SMALL to LARGE (see NUREG–2157, Section 4.12). Among other things, as discussed in NUREG–2157, the NRC cannot determine at this time what resources may be present or discovered at a continued storage site a century or more in the future and whether those resources will be historically or culturally significant to future generations.

Additionally, potential impacts greater than SMALL could occur if the activities to replace the ISFSI and construct and replace a dry transfer system (DTS) adversely affect cultural or historic resources and the effects cannot be mitigated. The analysis in NUREG–2157 recognized that ground-disturbing activities occurred during initial construction of the nuclear power plant and, thus, the land within and immediately surrounding the power block has been extensively disturbed. The analysis in NUREG–2157 also explained that if replacement of the ISFSI and construction and replacement DTS occur within the previously disturbed areas or there are no historic or cultural resources present, then impacts would likely be SMALL. If these facilities, however, are located in less-developed or less-disturbed portions of a power plant site outside of the power block with historic and cultural resources present, then impacts to historic and cultural resources could be greater than SMALL (see NUREG–2157, Sections 4.12.2 and 4.12.3). In Section 4.8 of this EA, the NRC staff concluded that potential impacts to historic and cultural resources as a result of the proposed action would be SMALL and not significant.

As discussed in NUREG–2157, given the minimal size of an ISFSI and DTS, and the large land areas at nuclear power plant sites (e.g., the former TNP site occupies approximately 12 ha (30 ac) of the 257 ha (634 ac) Trojan site and the land area developed for the ISFSI is approximately 0.4 ha (1 ac)), licensees should be able to locate these facilities away from historic and cultural resources. Potential adverse effects on historic properties or impacts on historic and cultural resources could also be minimized through development of agreements and implementation of the licensee's historic and cultural resource management plans and procedures to protect known historic and cultural resources and address inadvertent discoveries during construction and replacement of these facilities. However, the analysis in NUREG–2157

recognized that it may not be possible to avoid adverse effects on historic properties under NHPA or impacts on historic and cultural resources under NEPA and, therefore, concluded that impacts would be SMALL to LARGE (see NUREG–2157, Section 4.12.2).

NRC also concluded in NUREG–2157 that the impacts of nonradioactive waste management in the indefinite timeframe would be SMALL to MODERATE, with the higher impacts potentially occurring if the waste from repeated replacement of the ISFSI and DTS exceeds local landfill capacity (see NUREG–2157, Section 4.15). Although the NRC concluded that nonradioactive waste disposal would not be destabilizing (or LARGE), the range reflects uncertainty regarding whether the volume of nonradioactive waste from continued storage would contribute to noticeable waste management impacts over the indefinite timeframe when considered in context of the overall local volume of nonradioactive waste.

As previously discussed, the NRC found in NUREG–2157 that disposal of the spent fuel is most likely to occur by the end of the short-term timeframe. Therefore, disposal during the long-term timeframe is less likely, and the scenario depicted in the indefinite timeframe—continuing to store spent nuclear fuel indefinitely—is highly unlikely. As a result, the most likely impacts of the continued storage of spent fuel are those considered in the short-term timeframe. In the unlikely event that fuel remains onsite into the long-term and indefinite timeframes, the associated impact ranges in NUREG–2157 reflect the accordingly greater uncertainties regarding the potential impacts over these very long periods of time. Taking into account the impacts that the NRC considers most likely, which are SMALL and consistent with the environmental impacts discussed in this EA; the greater uncertainty reflected in the ranges in the long-term and indefinite timeframes compared to the greater certainty in the SMALL findings; and the relative likelihood of the timeframes, the NRC staff finds that the impact determinations for at-reactor storage from NUREG–2157 do not change the staff's evaluation of the potential environmental impacts from the proposed 40-year renewal of the Trojan ISFSI license.

4.14.3 Away-From-Reactor Storage

In NUREG–2157, the NRC concluded that a range of potential impacts could occur for some resource areas if the spent fuel from multiple reactors is shipped to a large (roughly 40,000 MTU away-from-reactor ISFSI (see NUREG–2157, Section 5.20). The ranges for resources such as air quality, terrestrial resources, and aesthetics are driven by the uncertainty regarding the location of such a facility and the local resources that would be affected. For example, regarding terrestrial resource impacts, the analysis in NUREG–2157 explained that the impacts would likely be SMALL. However, it also stated that "… it is possible that the construction of the project could have some noticeable, but not destabilizing, impacts on terrestrial resources, depending on what resources are affected." Therefore, in NUREG–2157, for away-from reactor storage, the NRC concluded that the impacts to terrestrial resources would be SMALL to MODERATE (see Section 5.9.1) for the short-term timeframe, based primarily on the potential impacts of construction activities. In addition, there are uncertainties associated with the longer timeframes that contribute to the ranges for historic and cultural resources and for nonradioactive waste management, for the same reasons discussed above for at-reactor storage.

As discussed in Chapter 2 of this EA, the NRC staff considered the storage of the spent fuel at an away-from-reactor storage facility as an alternative. The NRC determined, however, that it was not a reasonable alternative, because no such facility exists in the United States. However, the NRC has received license applications for consolidated interim storage facilities. A facility

could become available during the continued storage period. If so, an ISFSI of the size considered in NUREG–2157 could store the fuel from up to 25 reactors, which means that only a small portion of the overall impacts of the ISFSI would be attributable to the fuel from any individual reactor.

Based on the factors discussed above, there is uncertainty whether away-from-reactor storage facility would be constructed, uncertainty where it might be located, and uncertainty regarding the impacts in the short-term and the longer timeframes, leading to ranges of impacts. As a result, consideration of the generic impacts from continued storage at an away-from-reactor storage facility provides limited insights to the decision-maker in the overall picture of the environmental impacts from the proposed renewal of the Trojan ISFSI license.

4.14.4 Cumulative Impacts

In NUREG–2157, the NRC examined the incremental impact of continued storage on each resource area analyzed in NUREG–2157 in combination with other past, present, and reasonably foreseeable future actions. The analysis in Section 6.5 of NUREG–2157 presented ranges of potential cumulative impacts for multiple resource areas. These ranges, however, are primarily driven by impacts from activities other than the continued storage of spent fuel at the reactor site; the impacts from these other activities would occur regardless of whether spent fuel is stored during the continued storage period.

Similarly, the NRC evaluated the incremental impact of the proposed renewal of the Trojan ISFSI license on each resource area in combination with other past, present, and reasonably foreseeable future actions. The NRC staff concluded that the potential impacts of the proposed Trojan ISFSI license renewal are not a significant contributor to cumulative impacts. The analysis in NUREG–2157 concluded that in the short-term timeframe, which is the most likely timeframe for the disposal of the fuel in a deep geologic repository, the potential impacts of continued storage for at-reactor storage are SMALL and would, therefore, not be a significant contributor to the cumulative impacts. Therefore, the NRC staff has determined that there would be no significant change to the cumulative impacts analysis in this EA.

5 AGENCIES AND PERSONS CONSULTED

The NRC staff consulted with other agencies regarding the proposed action in accordance with NUREG–1748 (NRC 2003), and contacted the Oregon Health Authority via letter dated August 17, 2017 (NRC 2017g). The Oregon Health Authority responded by email dated May 3, 2017, with a few questions about the cask design life and stating that it was prudent to go with the new 40-year licensing period given past experience with the high-level waste repository and a few minor editorial comments (Oregon Health Authority 2018). Staff revised the EA to address the editorial comments and provided publicly available information in response to the Oregon Health Authority's questions. These consultations were intended to (1) ensure that the requirements of Section 7 of the ESA[2] and Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA)[3] were met and (2) provide the designated state liaison agencies the opportunity to comment on the proposed action.

5.1 National Historic Preservation Act

The NHPA was enacted to create a national historic preservation program, including the National Register of Historic Places and the Advisory Council on Historic Preservation. Section 106 of the NHPA requires Federal agencies to consider the effects of their undertakings on historic properties. NHPA implementing regulations at 36 CFR Part 800, "Protection of Historic Properties," define an undertaking as "… a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval."[4] Therefore, the NRC's approval of this license renewal request constitutes a Federal undertaking. The NRC, however, has determined that the scope of activities described in this license renewal request do not have the potential to cause effects on historic properties, assuming those were present, as the NRC's approval of this license renewal request will not result in construction or land disturbance activities (PGE 2017a). Therefore, in accordance with 36 CFR 800.3(a)(1), no consultation is required under Section 106 of the NHPA.

The NRC staff, however, consulted with the Oregon SHPO by letter dated August 17, 2017 (NRC 2017c). The Oregon SHPO responded by letter dated October 5, 2017. They concurred, based on the fact that this is an ongoing activity and that there are no properties within the project area that are 50 years of age or older and that the proposed license renewal does not have the potential to cause effects to historic properties (Oregon SHPO 2017). The NRC staff also consulted with the Chehalis Tribe by letter on August 29, 2017 (NRC 2017d), the Yakama Tribe by letter on August 29, 2017 (NRC 2017f), and the Grand Ronde tribe by letter on August 29, 2017 (NRC 2017e). The CTGR responded via letter dated October 4, 2017, stating, "… there are numerous ethnographically and archaeologically recorded cultural resources in the immediate vicinity of the Trojan ISFSI that are of significance to the CTGR" (CTGR 2017). As there are no ground-disturbing activities proposed in this license renewal and only continuation of current activity levels with no increase, the NRC staff concludes that no properties will be impacted.

[2] 16 U.S.C. 1536.
[3] 54 U.S.C. Sections 300101-307108.
[4] See 36 CFR 800.16(y).

5.2 Endangered Species Act

Under Section 7 of the ESA and through its implementing regulations (50 CFR Part 402, Subpart B), prior to taking a proposed action, a Federal agency must determine (1) whether endangered and threatened species or their critical habitats are known to be in the vicinity of the proposed action and, if so, whether (2) the proposed Federal action may affect listed species or critical habitats. If the proposed action may affect listed species or critical habitats, the Federal agency is required to consult with the FWS and/or the U.S. National Marine Fisheries Service (NMFS). The Federal agency can either initiate the process to prepare a biological assessment5 or alternatively, engage in informal consultation. Under informal consultation, if the agency determines that the proposed action is not likely to adversely affect endangered or threatened species or their critical habitats, and the FWS or the NMFS, as appropriate, concurs, then the consultation process is terminated and no further action is required on the part of the agency. If the agency cannot make the required informal consultation findings, or if the FWS or the NMFS do not concur with the agency's findings, then the agency must prepare a biological assessment and proceed to formal consultation with either the FWS or the NMFS, as appropriate (50 CFR 402.14). Formal consultation may result in further obligations upon the agency and/or the applicant or licensee.

Approval of the proposed action is not expected to result in any new construction activities or land disturbance and therefore will not affect listed endangered or threatened species or their critical habitats in the vicinity of the Trojan site. The NRC staff consulted with the Portland Field Office within the Oregon Fish and Wildlife Office by letter dated August 15, 2017 (NRC 2017b). The Portland Field Office responded via letter dated October 5, 2017, that based on information provided they concurred that the undertaking will not impact endangered or threatened species or critical habitat (Oregon Department Fish and Wildlife 2017). Therefore, the NRC concludes that the proposed action would not adversely affect federally-listed threatened and endangered species.

6 CONCLUSION AND FINDING OF NO SIGNIFICANT IMPACT

Based on its review of the proposed action, in accordance with the requirements of 10 CFR Part 51, the NRC staff has determined that renewal of NRC SNM License 2509, authorizing continued operation of the Trojan ISFSI for an additional 40 years, will not significantly affect the quality of the environment. In its license renewal request, PGE is proposing no changes in how it handles or stores spent fuel at the Trojan ISFSI. No significant changes in PGE's authorized operations for the Trojan ISFSI were requested as part of the license renewal application. Approval of the proposed action would not result in any new construction or expansion of the existing ISFSI footprint beyond that previously approved. The ISFSI is a passive facility that produces no liquid or gaseous effluents.

No significant radiological or nonradiological impacts are expected from continued normal operations. Occupational dose estimates associated with the proposed action and continued normal operation and maintenance of the ISFSI are expected to be at ALARA levels and within the limits provided in 10 CFR 20.1201. The estimated annual dose to the nearest potential member of the public from ISFSI activities is 0.023 mSv/yr (2.3 mrem/yr) (PGE 2017a), which is below the 0.25 mSv/yr (25 mrem/yr) limit specified in 10 CFR 72.104(a) and the 1 mSv/yr (100 mrem/yr) limit in 10 CFR 20.1301(a)(1). Therefore, the NRC staff has determined that pursuant to 10 CFR 51.31, preparation of an EIS is not required for the proposed action, and pursuant to 10 CFR 51.32, a FONSI is appropriate.

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