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Environmental Assessment and Finding of No Significant Impact for the Construction Permit and Environmental Review Exemptions for the Long Mott Generating Station

Docket Number: NRC-2025-0079

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Cooperating Agency:

U.S. Department of Energy

Environmental Center of Expertise
Division of Rulemaking, Environmental, and Financial Support
Office of Nuclear Material Safety and Safeguards

ABSTRACT

This environmental assessment (EA) describes the environmental review conducted by U.S. Nuclear Regulatory Commission (NRC, the Commission) staff for an application submitted by Long Mott Energy, LLC for a construction permit (CP) under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 (TN249) allowing construction of a nuclear power plant designated as Long Mott Generating Station, in Seadrift, Texas. This EA also addresses exemptions proposed by the NRC staff from the agency's environmental review regulations specified in 10 CFR 51.20(b)(1), 51.25, and 51.75(a), which require preparation of an environmental impact statement (EIS) when issuing a construction permit (TN10253). The exemptions would allow the NRC staff to issue a final EA and Finding of No Significant Impact instead of an EIS to meet the staff's obligations under the National Environmental Policy Act of 1969 (NEPA) (TN661) and the NRC's regulations for the environmental review of the Long Mott Energy, LLC CP application. This EA follows procedures in 10 CFR 51.30, "Environmental assessment," and 10 CFR 51.31, "Determinations Based on Environmental Assessment," which are NRC's regulations for preparing EAs to implement NEPA. The NRC staff concludes that the potential environmental impacts from the construction at Long Mott Generating Station, and from the exemptions to NRC's environmental review regulations, would not be significant. Accordingly, the NRC staff has determined that a Finding of No Significant Impact is warranted, and pursuant to 10 CFR 51.31, the preparation of an EIS is not required.

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EXECUTIVE SUMMARY

By letter dated March 31, 2025 (LME 2025-TN12671), Long Mott Energy, LLC (LME) submitted an application to the U.S. Nuclear Regulatory Commission (NRC, the Commission) for a construction permit (CP) pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 (TN249), that would allow construction of a nuclear power station designated as the Long Mott Generating Station (LMGS) on an approximately 1,537 acre (ac) (622 hectare [ha]) site located in Calhoun County, Texas.

Proposed Action

The proposed action is to decide whether to issue a construction permit (CP) to LME under 10 CFR Part 50 (TN249) that would allow the construction of a nuclear power station designated as the LMGS. The proposed LMGS site is located in Calhoun County, Texas, adjacent to the existing Seadrift Operations facility (SDO), located in Seadrift, Texas.

Purpose and Need

The purpose of and need for the proposed action is to construct and demonstrate an Xe-100 advanced reactor in support of the U.S. Department of Energy's (DOE) Advanced Reactor Demonstration Program, and to replace the existing natural gas-fired co-generation plant at the SDO site with a non-carbon emitting generating plant (consistent with Dow Chemical Company Inc.'s [Dow's] corporate decarbonization goals) that meets Texas regulatory requirements and is capable of producing approximately 320 megawatt electric (MWe) of power or 800 megawatt thermal (MWt) of steam with high reliability and a high-capacity factor with intra-hour flexibility.

Environmental Impacts of Construction

Table ES-1 summarizes the potential environmental effects of the proposed agency action and provides the conclusion for each resource area considered.

Table ES-1 Summary of Environmental Impacts from the Proposed Action

Resource Area	EA Section	Summary of Impact
Land Use and Visual Resources	3.1	LMGS would convert approximately 320 ac of cropland to industrial use and temporarily convert an additional 400 ac of cropland, for a total of approximately 720 ac of cropland affected. LMGS would be compatible with adjacent industrial land use, consistent with the enforceable policies of the Texas CMP, and would not alter the area's visual character. LMGS would convert up to 1 mi^2 of prime farmland.
Air Quality	3.2	Potential impacts to air quality in the vicinity of the LMGS associated with construction activities are expected to be typical of construction projects. Heavy equipment will generate diesel exhaust and fugitive dust emissions. The emissions are projected to comply with TCEQ and EPA guidelines.

Resource Area	EA Section	Summary of Impact
		The proposed LMGS is intended to replace an existing natural-gas fired co-generation plant to provide power and steam to an adjacent industrial facility. This will result in a decrease in atmospheric emissions of criteria pollutants and GHGs once LMGS is online and the current plant is taken off-line.
Geology	3.3	N/A
Surface Water	3.4	Development of the LMGS site and water supply to Basin #5 will result in localized changes to site drainage patterns on the LMGS site, runoff to West Coloma Creek, and the channel of the Calhoun Canal near the new intake. LMGS water use is a small fraction of monthly mean Guadalupe River flows, and any required increase of water diverted to the GBRA canal to support LMGS is well below the existing pumping capacity of the GBRA diversion. LMGS water use would not be expected to reduce water availability for the single downstream water right on the Guadalupe River or those associated with the GBRA Calhoun Canal. Additionally, the magnitude of LMGS water use compared to diversion rights in the Guadalupe—San Antonio Basin is a fraction of a percent and therefore would not substantially affect basin-wide water availability (Wurbs 2005-TN12535). Wastewater from LMGS will be processed by the SDO's wastewater treatment facilities and will be discharged at the existing TPDES outfall. The effect of the development of the LMGS site on stormwater runoff water quality will be managed by BMPs and the site will be designed, permitted, and operated in accordance with all applicable laws and regulations. LMGS water use is small compared to Guadalupe River flows and would not sizably impact freshwater inflows to the estuary system.
Groundwater	3.5	Site hydrogeologic characteristics, including the presence of the confining clay unit in the upper Beaumont Formation, prevents significant downward migration of contaminants into the underlying aquifer units. Excavations during construction will be limited to shallow depths (approximately 2 ft) within the impermeable clay Beaumont Formation, which is not regarded as water-bearing. Minor dewatering that may be required during construction would be temporary and localized, with negligible impacts to groundwater flow paths or elevations. The temporary sediment basin and permanent stormwater basin may have a local impact on groundwater flow paths and elevations, but these changes are unlikely to extend beyond the site boundary due to the discontinuous nature of the more permeable sand layers of the Chicot aquifer and the relatively small footprint (less than 1 percent of the overall site area) of the ponds. No dewatering will occur during plant operation, and groundwater will not be used for any purpose. Furthermore,

Resource Area	EA Section	Summary of Impact
		the LMGS will utilize an air-cooled system, meaning no water is consumed or discharged during the cooling process, further minimizing the potential for contaminants to interact with groundwater. Plant operation does not involve liquid discharges to groundwater, and robust preconstruction and construction-phase monitoring programs will enable the identification of potential inadvertent releases to the environment. These combined measures ensure that potential impacts to groundwater resources during construction, operation, and decommissioning remain minimal.
Aquatic Ecological Resources	3.6	Construction that could affect aquatic resources includes building structures associated with the intake on the GBRA Calhoun Canal, the water intake pipeline stream crossings, two bridges that would be built across West Coloma Creek for vehicle traffic, stormwater outfalls into West Coloma Creek, utility crossings over West Coloma Creek, and clearing and grading that could introduce runoff and sediment to streams on the LMGS site. All TCEQ and USACE guidelines and mitigative requirements would be followed (LME 2025-TN12163). In addition to the required mitigation work, TPWD has provided recommendations to LME to protect aquatic species and species of concern during construction work, including BMPs. These can be found in the first letter in Section 1A, Agency Correspondence, of the Long Mott ER and are incorporated by reference (LME 2025-TN12163). Additional BMPs and conservation measures provided by FWS to protect ESA-listed mussels would also provide protection to other aquatic species and are incorporated by reference (FWS 2025-TN12668; LME 2026-TN12669). Combined, these BMPs should minimize impacts to West Coloma Creek's aquatic communities.
Terrestrial Ecological Resources	3.7	The project would be situated in an existing industrial site and land disturbance would be limited to previously developed lands and croplands. The applicant plans to adhere to required site permits and BMPs for the construction of LMGS, which would reduce impacts.
Historic and Cultural Resources	3.8	The project area has been previously impacted by various construction activities, including the construction of the existing Seadrift plant, other surrounding facilities, and ongoing farming/cultivation in the area. WSP conducted archaeological surveys for the APE and did not identify any cultural resources. The proposed action would result in No Historic Properties Affected, as defined in 36 CFR 800.4(d)(1) (TN513). There would be no impact to historic and cultural resources.
Socioeconomics	3.9	Construction would last over 44 months, requiring up to 1,473 workers during peak construction. Contractors would be responsible for assuring workers are available, by skill, craft, and trade, when needed, including temporary

Resource Area	EA Section	Summary of Impact
		housing, if necessary. Some workers would reside and commute from within the ROI. This would result in little if any increased demand for temporary housing. As discussed in LME's ER Section 2.5, rental housing is available in the socioeconomic ROI (see also ER Table 2.5-16) (LME 2025-TN12163).
Radiological Health	3.10	At certain times during construction, devices containing byproduct material may be used in support of construction, such as for soil compaction testing or radiography, by licensed individuals. Devices utilizing byproduct material are required to be controlled by the devices' licensee(s) for very specific uses under controlled conditions. The dose to construction workers from byproduct material is expected to have negligible contribution to their annual dose.
Nonradiological Human Health	3.11	The applicant plans to reduce the potential for nonradiological occupational and public health hazards through implementation of safety practices, training, and physical control measures (LME 2025-TN12163) for the construction of the LMGS.
Nonradiological Waste	3.12	Construction debris created by excavation and land clearing would be either recycled or disposed of offsite to a licensed facility. Liquid waste produced during construction would be stored and disposed according to regulations. During construction, the applicant would follow all applicable BMPs and Federal, State, and local requirements and standard for handling, transporting, and disposing of nonradiological wastes.
Transportation of Radioactive Material	3.13	No radioactive material would be transported during construction, and no radiological impacts are anticipated.
Uranium Fuel Cycle and Radiological Waste Management	3.14	No nuclear fuel would be present and no radiological waste would be generated during construction.
Postulated Accidents	3.15	No nuclear fuel would be present during construction, and no radiological impacts are anticipated.
Climate Change	3.16	The NRC staff determined that the expected impacts of the construction, operation, and decommissioning of the LMGS would not be materially altered by the projected effects of climate change. LMGS is located on developed industrial property adjacent to existing SDO facilities in Calhoun County, Texas, and does not require large-scale new greenfield development. This siting minimizes potential climate-change effects on land use, terrestrial and aquatic ecology, historic and cultural resources, and nonradiological waste management (LME 2025-TN12163).

APE = area of potential effect; BMP = best management practice; CMP = Coastal Management Program; Dow = Dow Chemical Company; EPA = U.S. Environmental Protection Agency; ER = environmental report; ESA = Endangered Species Act of 1973, as amended; FWS = U.S. Fish and Wildlife Service; GBRA = Guadalupe-Blanco River Authority; GHG = greenhouse gas; LME = Long Mott Energy, LLC; LMGS = Long Mott Generating Station; NRC = U.S. Nuclear Regulatory Commission; ROI = region of influence; SDO = Seadrift Operations facility; TCEQ = Texas Commission on Environmental Quality; TPDES = Texas Pollutant Discharge Elimination System; TPWD = Texas Parks and Wildlife Department; USACE = U.S. Army Corps of Engineers; WSP = WSP USA Environment & Infrastructure, Inc.

Level of NEPA Determination

The NRC staff considered the environmental impacts of granting an exemption from regulatory requirements to prepare an environmental impact statement (EIS) for this CP under 10 CFR 51.20(b)(1), 51.25, and 51.75(a) (TN10253). The NRC staff finds that there would be no environmental impacts resulting from the issuance of the exemptions because the exemptions simply allow the NRC to issue an EA and Finding of No Significant Impact instead of an EIS to meet the staff's obligations under NEPA and the NRC's regulations for the environmental review of the LME CP application.

Because the impacts of the proposed action have been determined to be not significant (see Table ES-1), the NRC staff has determined that granting the proposed exemptions would not result in significant impacts to the human environment. Therefore, preparation of an EA has been determined to be appropriate.

Alternatives

Section 102(2)(C)(iii) of NEPA states that an EA shall include a detailed statement on alternatives to the proposed action, including the no-action alternative, that are technically and economically feasible, and meet the purpose and need of the proposal.

Under the no-action alternative, the NRC would not issue a CP to LME. Therefore, the applicant would not be able to build the LMGS to demonstrate the Xe-100 reactor and to replace the existing natural gas-fired co-generation plant at the SDO. As such, the purpose and need for the proposed action would not be met. In the short term, at the LMGS site, none of the environmental effects associated with the DOE's authorization of preconstruction and the NRC's authorization of construction would occur under the no-action alternative. Additionally, in the short term under the no-action alternative, the adjacent Dow Chemical plant would continue to be served by the existing natural gas-fired plant (with environmental impacts similar to the existing impacts), and the proposed site would remain available for other government or private industrial development projects. Many of the environmental impacts resulting from land disturbance and building new industrial facilities on the site might still occur at some time in the future. However, possible environmental benefits of developing the Xe-100 reactor technology as a safe power generation source with reduced carbon emissions would be negated or delayed.

Because part of the purpose and need for the proposed Federal action is to demonstrate the Xe-100 reactor, the applicant did not consider energy alternatives to the proposed action. The applicant did evaluate potential siting alternatives for the proposed facilities that met the purpose and need requirement to provide electricity and steam to the SDO. As such, all reasonable alternative sites must be within 1.5 miles of the SDO in order to provide process steam at the required temperature and pressure. In general, based on the close proximity of each of the alternative sites, the environmental impacts associated with the alternative site locations would be similar in nature and magnitude to those of the proposed site. Construction of the LMGS at the Proposed Site or any of the alternative sites would either utilize land that has already been disturbed for industrial use or would result in a loss of prime farmland. Each of the sites contains streams, ponds, or wetlands that would be impacted, although the majority of these features are intermittent and seasonal and do not support aquatic or terrestrial species. Otherwise, impacts associated with groundwater hydrology, surface water use, socioeconomics, air quality, traffic, recreation, and public services are expected to be substantially similar to those of the proposed site. Based on the NRC staff's review (see Sections 4.2.2.2 and 4.8) and considering the substantially disturbed nature of the existing proposed site for the LMGS, none of the alternative sites are environmentally preferable to those of the proposed site.

Recommendation

As discussed further in this EA, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, the NRC staff recommends, unless safety issues mandate otherwise, that the NRC issue the requested CP to LME. This recommendation is based on:

- The NRC staff's review of LME's environmental report, information gathered during the environmental site audit, and responses to requests for additional and clarifying information;
- the NRC staff's consultation with Federal, State, Tribal, and local agencies; and
- the NRC staff's independent environmental review and assessment summarized in this EA.

ABBREVIATIONS AND ACRONYMS

°C	degree(s) Celsius
°F	degree(s) Fahrenheit
ac	acre(s)
ACC	air-cooled condenser
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as reasonably achievable
APE	area of potential effect
APWR	United States Advanced Pressurized-Water Reactor
ARDP	Advanced Reactor Demonstration Program
BA	biological assessment
BMP	best management practice
CCGCD	Calhoun Country Groundwater Conservation District
CFR	*Code of Federal Regulation*
cfs	cubic feet per second
CI	conventional island
cm	centimeter(s)
CMP	Coastal Management Program
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
COL	combined license
CP	construction permit
CWA	Clean Water Act
dBA	a-weighted decibel
DBA	Design Basis Accidents
DO	dissolved oxygen
DOE	U.S. Department of Energy
DPS	distinct population segment
EA	environmental assessment
EFH	Essential Fish Habitat
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
EPR	U.S. Evolutionary Power Reactor
ER	environmental report

ESA	Endangered Species Act of 1973, as amended
ESBWR	Economic Simplified Boiling Water Reactor
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
Fort St. Vrain	Fort St. Vrain Nuclear Generating Station
FPPA	Farmland Protection Policy Act
ft	feet/foot
FWS	U.S. Fish and Wildlife Service
GB	Galveston Bay
GBRA	Guadalupe-Blanco River Authority
GHG	greenhouse gas
gpm	gallons per minute
Gy/day	grays per day
ha	hectare(s)
HALEU	High-Assay Low-Enriched Uranium
HAPC	Habitat Areas of Particular Concern
hr	hour(s)
HVAC	Heating, Ventilation, and Air Conditioning
in.	inch(es)
IPaC	Information for Planning and Consultation
km	kilometer(s)
kV	kilovolt(s)
LLRW	low-level radioactive waste
LME	Long Mott Energy, LLC
LMGS	Long Mott Generating Station
LRWH	liquid radioactive waste handling
m	meter(s)
Ma	million years
MACCS	MELCOR Accident Consequence Code System
MCL	maximum concentration level
MCM	million cubic meter(s)
mg/L	milligrams per liter(s)
MGD	million gallons per day
MHz	megahertz

mi	mile(s)
ML/d	megaliters per day
MLLW	mixed low-level waste
MMT	million metric ton(s)
mph	miles per hour
mrem	millirem(s)
MT	metric ton(s)
MTU	metric tons of uranium
MWe	megawatt electric
MWt	megawatt thermal
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act of 1969, as amended
NHPA	National Historic Preservation Act of 1966, as amended
NRC or Commission	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Place
NSR	New Source Review
OL	operating license
OSHA	Occupational Safety and Health Administration
Peach Bottom	Peach Bottom Atomic Power Station
PM	particulate matter
PSAR	preliminary safety analysis report
PSD	Prevention of Significant Deterioration
RAI	Request for Additional Information
rad/day	radiation-absorbed dose per day
RCI	Request for Confirmation of Information
rem	roentgen equivalent man
REMP	radiological environmental monitoring program
ROI	region of influence
Ryr	Roentgen-year
SAMA	severe accident mitigation alternative
SAMDA	severe accident mitigation design alternative
SAV	submerged aquatic vegetation
SDO	Seadrift Operations facility
SE	State Endangered
SGCN	Species of Greatest Conservation Need
SPCC	Spill Prevention, Control and Countermeasure

ST	State Threatened
STP	South Texas Project Electric Generating Station
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TRISO	TRi-structural ISOtropic
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USGCRP	United States Global Change Research Program
WCS	Waste Control Specialists
WMA	Wildlife Management Area
WSP	WSP USA Environment & Infrastructure, Inc.
wt%	weight percent

1 INTRODUCTION

By letter dated March 31, 2025 (LME 2025-TN12671), Long Mott Energy, LLC (LME) submitted an application to the U.S. Nuclear Regulatory Commission (NRC, the Commission) for a construction permit (CP) pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 (TN249), that would allow construction of a nuclear power station designated as the Long Mott Generating Station (LMGS) in Calhoun County, Texas.

1.1 Proposed Action

The proposed action is to decide whether to issue a CP to LME under 10 CFR Part 50 (TN249) that would allow the construction of a nuclear power station designated as the LMGS. If a CP is issued, LME would be required to apply for an operating license (OL) under 10 CFR Part 50 for authorization to operate the proposed LMGS. If the OL application is accepted for review by the NRC, the NRC would then perform an additional environmental review.

The proposed LMGS site is approximately 1,537 acres (ac) (622 hectares [ha]) in Calhoun County, Texas, adjacent to the existing Seadrift Operations facility (SDO), located in Seadrift, Texas. The SDO is owned and operated by the Union Carbide Corporation, a subsidiary of the Dow Chemical Company. The SDO began operations in 1954, and covers approximately 4,700 ac (1,900 ha), employing more than 1,200 people. The SDO manufactures more than 4 billion pounds (1.8 billion kilograms) of consumer products annually, including plastic packaging, footwear, wire and cable insulation, and solar cell membranes (X-Energy 2024-TN12508).

1.2 Purpose and Need

The purpose of and need for the proposed action is to construct and demonstrate the Xe-100 advanced reactor in support of the U.S. Department of Energy's (DOE) Advanced Reactor Demonstration Program (ARDP) and to replace the existing natural gas-fired co-generation plant at the SDO site with a non-carbon emitting generating plant (consistent with Dow Chemical Company's [Dow's] corporate decarbonization goals) that meets regulatory requirements of the State of Texas and is capable of producing approximately 320 megawatt electric (MWe) of power or 800 megawatt thermal (MWt) of steam with high reliability and a high-capacity factor with intra-hour flexibility. The electricity and steam generated from the project is intended to support the entirety of the energy needs for the SDO.

LME is receiving funding as part of the DOE ARDP, the goal of which is to speed the demonstration of advanced nuclear reactors through cost-shared partnerships with U.S. industry. LME proposes to demonstrate the Xe-100 advanced reactor in support of the DOE ARDP and to replace the existing natural gas-fired co-generation plant at the SDO site with approximately 800 MWt (320 MWe) of reliable and flexible power with a high-capacity factor.

The determination of need and the decision to build a reactor are within the authority of the applicant. This definition of purpose and need reflects the NRC's recognition that unless there are findings in the NRC's safety review required by the Atomic Energy Act of 1954 (TN663), as amended, or findings in the environmental review under National Environmental Policy Act of 1969 (NEPA) that would lead the NRC to reject a CP application, the agency does not have a role in the planning decisions as to whether a particular reactor should be constructed and operated.

The purpose for the DOE action is to comply with DOE's statutory mandates to select and fund the demonstration of advanced reactors through cost-shared partnerships with U.S. industry. The LMGS project, demonstrating X-energy's Xe-100 advanced reactor, was selected by DOE under the ARDP. The need for the DOE action is to respond to LME's request for financial assistance through the cost-shared partnership to complete construction activities for the LMGS, as described in this environmental assessment (EA).

1.3 Cooperating Agency

DOE and LME have entered into a cooperative agreement to provide financial assistance to support the construction of the LMGS. As a result, DOE's action of providing financial assistance is considered a Federal action subject to DOE's NEPA procedures. Because of these NEPA responsibilities, DOE is participating as a cooperating agency in the preparation of this EA.

1.4 Preconstruction Activities

In a final rule dated October 9, 2007 (72 FR 57416-TN260), the Commission established the definition of "construction" in 10 CFR 51.4 (TN10253) as those activities that fall within its regulatory authority. Many of the activities required to build a reactor are not part of the NRC action to issue a CP, because they do not have a reasonable nexus to radiological health and safety and/or common defense and security; therefore, they are not within the NRC's authority to regulate. Activities associated with building the proposed facility that are not within the purview of the NRC action and that may be undertaken without prior NRC authorization are grouped under the term "preconstruction." Under 10 CFR 51.45 (TN10253), applicants are required to include in an environmental report (ER) a description of the impacts of the applicant's preconstruction activities.

Preconstruction activities include clearing and grading, excavating, building service facilities (e.g., paved roads, parking lots, etc.), erecting support buildings, and other associated activities. These preconstruction activities may take place before the application for a CP is submitted, during the NRC staff's review of a CP application, or after a CP is granted.

Although preconstruction activities are outside the NRC's regulatory authority, many preconstruction activities are within the regulatory authority of DOE. Because preconstruction is a precursor to construction of the proposed LMGS, which is subject to NRC authorization, and because discussion of preconstruction and construction impacts together enhances the readability of the document and provides a more complete analysis of the environmental impacts of the proposed action, Chapter 3 presents a single combined discussion of preconstruction and construction impacts for each resource.

1.5 Exemptions

In accordance with 10 CFR 51.6 (TN10253), the NRC may grant exemptions from the requirements of 10 CFR Part 51 if it determines that the exemptions are authorized by law and are otherwise in the public interest. The NRC staff is proposing to grant exemptions to 10 CFR 51.20(b)(1), 51.25, and 51.75(a), which require preparation of an environmental impact statement (EIS) when issuing construction permits for nuclear power plants. Because the impacts of the proposed action have been determined to be not significant (see Section 5.1), the NRC staff has determined that granting the proposed exemptions would not result in significant impacts to the human environment. Therefore, the NRC staff has determined that an EIS need not be prepared and that preparation of an EA is appropriate.

The NRC staff considered the environmental impacts of granting an exemption from NRC regulatory requirements for preparing an EIS for this CP under 10 CFR 51.20(b)(1), 51.25, and 51.75(a) (TN10253). The NRC staff finds that there would be no environmental impacts resulting from the issuance of the exemptions because the exemptions simply allow the NRC to issue a final EA and Finding of No Significant Impact (FONSI) instead of an EIS to meet the staff's obligations under NEPA and the NRC's regulations.

1.6 Significance Determination

Preparation of an EA is appropriate for an action that either is not likely to have a significant effect or for which the significance of the effects is unknown. The EA would be used to support the NRC's determination of whether to issue a FONSI or to prepare an EIS. In considering whether an adverse effect of the proposed Federal action is significant, the NRC staff examined both the context (local versus global) of the action and the intensity (magnitude) of the effect.

Context refers to the characteristics of the geographic area or setting where the potential impact would occur. For example, the effects of a given water withdrawal from a lake or ocean may be different from that of the same quantity of water withdrawal from a smaller body of water. Depending on the scope of the action, the potential global, national, regional, and local contexts are also considered as well as the duration, including short-and long-term effects.

Intensity refers to the impact severity. The analysis of the intensity of effects considers many factors which are outlined in NRC guidance documents (NRC 2003-TN1983: Section 3.4.6.3).

Each impacted resource area is therefore evaluated with a rationale provided to explain the determination whether the impact(s) would be "significant" or would be "not significant." If impacts from the proposed Federal actions are determined to be not significant, a FONSI is prepared, whereas, if the impacts are determined to be significant, an EIS would be prepared.

In addition to these impact thresholds under NEPA, there are effects determination definitions that are applicable specifically for the Endangered Species Act of 1973, as amended (ESA) (TN1010) and the National Historic Preservation Act of 1966, as amended (NHPA) (TN4157). The ESA effects determination for federally listed species are as follows:

- No effect: Federally listed species or critical habitat will not be affected, directly or indirectly.
- May affect but is not likely to adversely affect: All effects on federally listed species or critical habitat are beneficial, insignificant, or discountable.
- May affect and is likely to adversely affect: An adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action and the effect is not: discountable, insignificant, or beneficial.

The implementing regulations for NHPA Section 106 define specific criteria for identifying an adverse effect (36 CFR 800.5 and 36 CFR 800.6) (TN513) on a historic property:

- No historic properties affected: No historic properties in the project area because they are less than 50 years old or were determined to be not eligible for listing in the National Registry of Historic Places.

- No adverse effect: Historic properties were identified within the project area of potential (APE) effects, but the criteria of adverse effects in 36 CFR 800.5(a)(1) are not met.

- Adverse effect: Historic properties were identified within the project APE, and the criteria of adverse effects in 36 CFR 800.5(a)(1) are met.

As shown in Section 5.1, there are no resource areas that have been determined to have significant environmental impacts. Therefore, the NRC staff finds that there are no significant environmental impacts on the human environment that would result from the granting of these exemptions from NRC regulations requiring the preparation of an EIS.

2 PROPOSED PROJECT

The information presented below summarizes key characteristics of the LMGS project that the NRC staff considered when assessing the environmental impacts of the proposed action. The summaries focus on the preconstruction and construction of the proposed facilities. Any information about the operation and decommissioning of the proposed facilities is provided to aid in the analysis of the entire life-cycle phases of the LMGS project (e.g., anticipated water discharges to existing surface waters during operation). New and significant information regarding operation and decommissioning may become available after any issuance of the CP and would be described and assessed in the subsequent environmental review related to issuance of an OL for LMGS.

2.1 Project Overview

LME proposes to build the LMGS on an approximately 1,537 ac (622 ha) in Calhoun County, Texas, adjacent to the SDO facility, as seen in Figure 2-1, Figure 2-2, and Figure 4-1. The LMGS would consist of four Xe-100 reactor modules, two turbine-generator sets, air-cooled condensers (ACCs), and auxiliary facilities. The Xe-100 reactor module is a high-temperature gas-cooled reactor that uses TRi-structural ISOtropic (TRISO) fuel. Each of the four Xe-100 reactor modules is capable of generating 80 MWe of electrical power or approximately 200 MWt of steam, resulting in a total of 320 MWe/800 MWt for the project.

Figure 2-1 Long Mott Generating Station Site Location and Vicinity. Source: LME 2025-TN12163: Figure 3.1-2.

2.2 Site Location and Layout

The applicant describes the site location and layout in Chapter 3 of the ER, as depicted in Figure 2-2. Structures associated with the LMGS include the Reactor Building, the Fuel Handling Annex Building, the Helium Service Facility, the ACC Utility Building, and a meteorological tower. When complete, the nuclear island (NI) will be approximately 34.4 ac (13.9 ha). Additional structures include a permanent stormwater and temporary sediment basin, new raw and makeup water intake structures and supply pipelines, and a new switchyard and associated transmission lines connecting to the existing SDO substation.

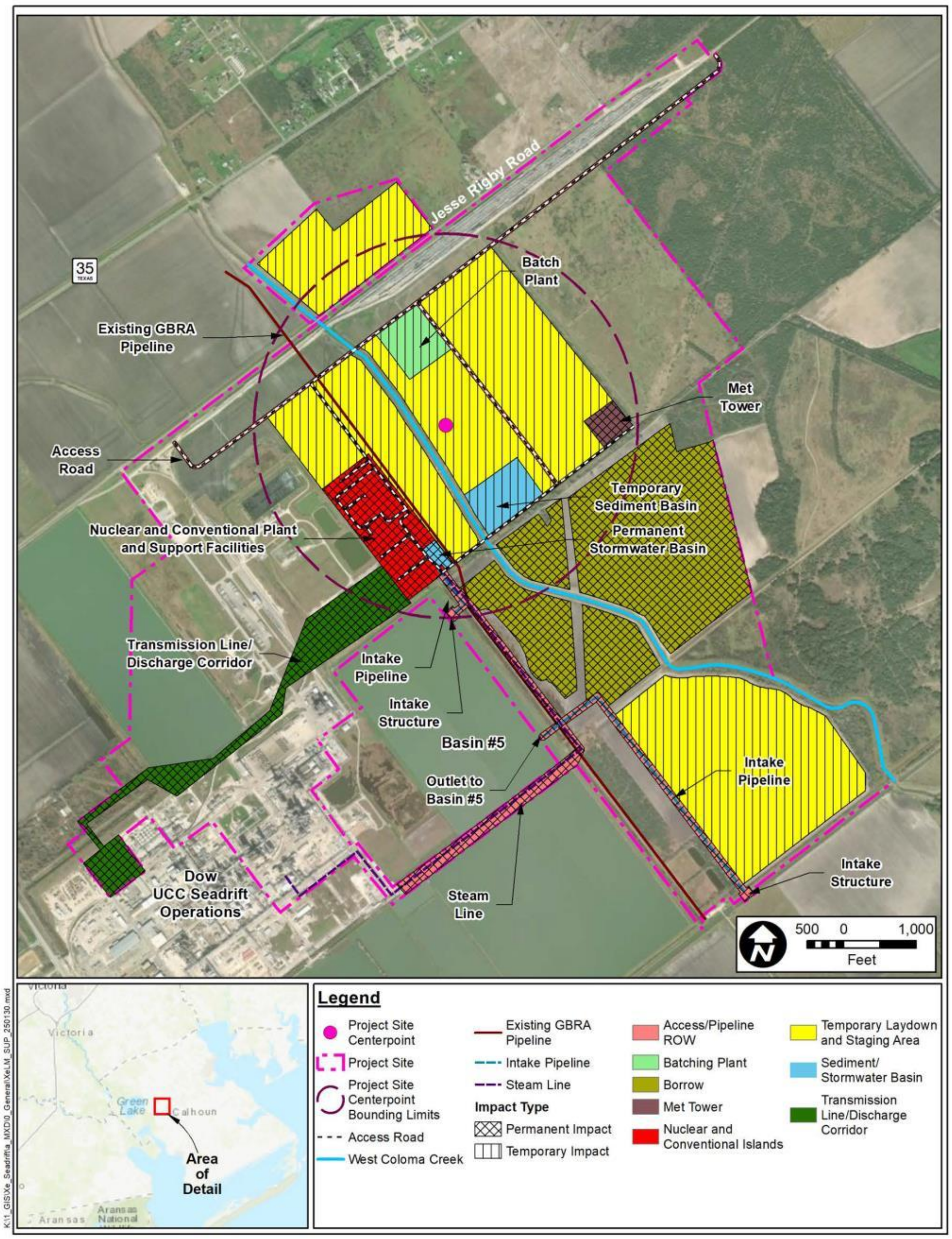

Figure 2-2 Long Mott Generating Station Site Plan. Source: LME 2025-TN12163: Figure 3.1-3.

2.3 Site Workers and Vehicular Deliveries

The applicant estimates the numbers of site workers in Section 4.4.2.1 of the ER, estimating a peak of 1,473 construction workers in month 21 of the anticipated 44-month building period. Once constructed and operational, the ER estimates a peak of 1,653 operational workers. Section 4.4.2.3.1 of the ER conservatively estimates 100 construction truck deliveries per day, as well as one vehicle per each worker on site (LME 2025-TN12163).

2.4 Preconstruction Activities

Preconstruction activities at the LMGS would include clearing, grubbing, and grading of the site. These activities would involve the removal of vegetation and the establishment and removal of spoils and topsoil in preparation for excavation. Erosion and sediment control best management practices (BMPs), such as silt fences, drainage channels, drainage blocks, tire cleanout at site exit, and erosion and sediment control structures, would be implemented to control erosion and stormwater runoff and direct it to the stormwater and/or sediment control basins (LME 2025-TN12163). Any onsite wetlands would be delineated.

Temporary facilities would be built during preconstruction, including offices, warehouses, equipment laydown and storage, concrete batch plants, personnel areas, and access facilities. Temporary utilities include aboveground and underground power, potable water, wastewater, fire protection, and gas and air systems.

2.5 Construction Activities

Construction activities considered in this EA include the structural construction and completion of structures, systems, and components as described in Section 3.9.2 of the ER for the NI and conventional island (CI) (LME 2025-TN12163). Construction of the proposed LMGS would last approximately 44 months, and would include shallow excavations using backhoes and dump trucks, with cranes used to place equipment into their intended locations. Structures, systems, and components that are relevant to this review include, but are not limited to, facility construction, landscaping and stormwater drainage, systems for water intakes and discharges, sanitary waste systems, dewatering systems, and power transmission systems.

2.6 Waste Systems

Nonradioactive wastes generated during construction and operation include construction debris, water pumped from excavations during construction, spoils, CI process water that may contain water treatment chemicals or biocides, waste from floor and equipment drains, municipal and sanitary waste, stormwater runoff, gaseous effluents, used oils, universal waste, and hazardous waste. All waste would be segregated at the point of generation and would be labeled appropriately to facilitate disposal.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

This section presents the affected environment and the potential environmental impacts of the proposed action of issuing a CP for the LMGS. This section is organized into separate subsections addressing specific environmental resource areas identified by the NRC staff's scoping process as being relevant to the proposed action. Each subsection presents the affected environment, environmental impacts, and the NRC staff's conclusions regarding the significance of the environmental impacts. The range of possible conclusions considered by the NRC staff in assessing the significance of impacts on environmental resource areas is presented in Chapter 1.

To present a complete environmental review, this EA covers the potential impacts of construction and also describes what information is known to aid in the analysis of the subsequent life-cycle phases of the LMGS project (i.e., operation and decommissioning). The NRC staff recognizes that new and significant information regarding operation and decommissioning may become available subsequent to any issuance of a CP. The NRC staff would therefore review any application for an OL for the LMGS for new and significant information that might alter the staff's conclusions presented here regarding the CP application.

The continued operation of the SDO is the major ongoing action that has the potential to impact resources impacted by the LMGS, both in terms of its proximity to the LMGS and the relationship of the LMGS to the SDO (see Section 1.2). Because the LMGS is intended to replace the existing natural-gas co-generation plant currently powering the SDO, analysis of the impacts of the construction and operation of the LMGS account for the reasonably foreseeable action of shutting down this natural-gas co-generation plant within the description of the affected environment for individual resource areas as appropriate.

Additionally, the South Texas Project Electric Generating Station is located 47 miles (mi) (76 kilometers [km]) to the northeast of the proposed LMGS. The analysis of the impacts described in this chapter consider the South Texas plant and its location relative to the proposed LMGS as appropriate.

3.1 Land Use and Visual Resources

3.1.1 Affected Environment

The LMGS site comprises approximately 1,537 ac (622 ha) in Calhoun County, Texas, owned and managed by Dow that includes the existing SDO facility and undeveloped land consisting mostly of cultivated cropland with small amounts open water, wetlands, scrub/shrub lands, and forest (LME 2025-TN12163: Sections 2.1 and 2.2.1). Table 2.2-1 of the ER provides estimates of each land cover type on the site as of 2021, according to the Multi-Resolution Land Characteristics Consortium National Land Cover Database (NLCD). Figure 2.1-2 of the ER is a map depicting land uses surrounding the site, including the SDO facility, cultivated cropland, and open waters and wetlands associated with the Guadlupe River to the east, including the Guadalupe Delta Wildlife Management Area (WMA). Figure 2.1-3 of the ER is an oblique aerial photograph depicting the same area. Other pertinent land use information for the site and vicinity, including coordinates for the site, and special land uses, highways, and other transportation facilities in the vicinity are provided in Section 2.2.1 of the ER (LME 2025-TN12163).

Most undeveloped soils on and surrounding the LMGS site have been designated by the U.S. Department of Agriculture as prime farmland, defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. More information on agricultural activity on the site and in the surrounding vicinity is provided in Section 2.2.1 of the ER (LME 2025-TN12163).

Calhoun County, Texas has not established any zoning regulations (LME 2025-TN12163: Section 4.1.1.1). The site and vicinity are situated in the designated Coastal Zone for Texas (LME 2025-TN12163: Section 2.2.1). As noted therein, the National Coastal Zone Management Program was created as a voluntary partnership between the Federal government and the U.S. coastal and Great Lakes states and territories to address national coastal issues. Actions at the site are therefore subject to compliance requirements under the Federal Coastal Zone Management Act (TN1243).

Section 2.2.2 of the ER characterizes the electric transmission line facilities servicing the LMGS site and associated rights-of-way and indicates that transmission infrastructure improvements necessary for the LMGS would be conducted on the LMGS site and would not involve offsite work. Section 2.2.3 of the ER characterizes land uses within a 50 mi (80 km) region surrounding the LMGS site.

3.1.2 Environmental Impacts of Construction

Building the LMGS would permanently convert approximately 320 ac (129 ha), consisting mostly of cropland, to industrial use and would temporarily convert an additional area of approximately 401 ac (162 ha), also consisting mostly of cropland, to temporary features including a concrete batch plant, temporary construction laydown and staging areas, and a temporary sediment basin (LME 2025-TN12163: Section 4.1.1.1). The permanent and temporary land use changes on the 1,537 ac (622 ha) LMGS site are quantified in Table 4.1-1 of the ER. The approximately 721 ac (292 ha) of affected land includes approximately 642 ac (260 ha) of cultivated cropland, 42 ac (17 ha) of naturally vegetated uplands, 23 ac (9 ha) of previously developed land associated with the SDO, 10 ac (4 ha) of open water, and 3.7 ac (1.5 ha) of wetlands would be affected. Wetland impacts are characterized further in Section 3.7.2. Excluding the approximately 23 ac (9 ha) of previously developed land, approximately 698 ac (282 ha) of previously non-urbanized land would be temporarily or permanently converted to industrial use. The entire LMGS site is located within Zone X (Area of Minimal Flood Hazard) of the Flood Insurance Rate Map for Calhoun County, Texas (LME 2025-TN12163: Section 2.3.1.1.1.2), and hence none of the affected land lies within a Flood Insurance Rate Map or FIRM-designated floodplain.

Most of the approximately 642 ac (260 ha) of cultivated cropland affected by the LMGS project is comprised of prime farmland (LME 2025-TN12163: Section 4.1.1.1). The applicant has minimized the loss of prime farmland by minimizing the project’s footprint, reducing the need for borrow material, and reclaiming some of the temporarily disturbed cropland for future agricultural use (LME 2025-TN12163: Section 4.1.1.1). Even with these mitigation measures, the NRC staff recognizes that the disturbance of nearly 1 mi^2 (1.6 square kilometers [km^2]) of prime farmland actively used for crop production is capable of reducing agricultural production. The NRC staff recognizes that while temporarily disturbed farmland might be reclaimed for subsequent agricultural use, the reclamation process might not be capable of fully restoring the soil properties that formerly made the land valuable for crop production. Additionally, the development activity would take place adjacent to the SDO, an existing industrial facility, and would not intrude into unfragmented agricultural landscapes or interfere with surrounding large blocks of agricultural land.

Even though the actions of private entities that affect prime farmland do not require consultation with the United States Department of Agriculture Natural Resources Conservation Service or other regulatory compliance measures under the Farmland Protection Policy Act (FPPA) (TN708), and actions by Federal regulatory agencies such as NRC to license or permit actions affecting prime farmland likewise do not require FPPA compliance, the applicant still performed analyses specified under the FPPA and consulted with the Natural Resources Conservation Service (NRCS) regarding the anticipated prime farmland impacts from building the LMGS (LME 2025-TN12163: Section 4.1.1.1). The applicant completed a Farmland Conversion Impact Rating (NRCS Form AD-1006), presented in the ER as Appendix 1A, which indicated a prime farmland impact score of 190, exceeding the threshold score of 160 above which the NRCS requires evaluation of alternative sites or a demonstration that there are overriding reasons for use of the proposed site (USDA 2024-TN12610). The applicant demonstrated an overriding reason for using the proposed site because of the need for the LMGS to provide steam to the SDO and the fact that all of the available land for development adjoining the SDO comprises prime farmland (LME 2025-TN12163: Section 4.1.1.1; USDA 2024-TN12610).

Because Calhoun County, Texas lacks zoning regulations, there are no potential zoning conflicts resulting from the LMGS project. The NRC staff notes that because the LMGS site already contains an existing major industrial facility, the SDO, additional industrial development on the site would not noticeably conflict with other non-agricultural land uses in the area. LMGS is located within the official boundary of the Texas Coastal Management Program (CMP) (LME 2025-TN12163: Coastal Zone, Figure 2.2-5). In March 2025, SDO submitted a Texas Coastal Management Program Consistency Certification package to the Texas General Land Office (LME 2025-TN12163: Appendix 1A). The consistency certification package submitted by SDO states that building the LMGS is consistent with the goals and policies of the Texas CMP due to the project dependence upon proximity to the SDO, the established adjacent industrial use of the SDO, and the distance from the coast (LME 2025-TN12163: Section 4.1.1.1). No response was received from the Texas General Land Office. As a result, consistent with 31 Tex. Admin. Code § 30.30(l) (TN12967), the LMGS has been conclusively presumed to be consistent with the Texas CMP.

Building the LMGS would not involve any offsite land use changes. The applicant expects that the in-migrating workforce could use nearly half of the available housing units in a three-county area surrounding the LMGS site but that the effects would only be temporary, distributed over a large area, and not disruptive of the patterns of surrounding land use (LME 2025-TN12163: Section 4.1.1.2). More information on housing-related impacts is presented in Section 3.9. As noted in more detail in Section 3.7, building the LMGS station would not noticeably affect the Guadalupe WMA. Debris generated by building the LMGS would be disposed of in existing licensed disposal facilities such as the City of Victoria Landfill, which has approximately 22 years of remaining capacity (LME 2025-TN12163: Section 4.1.1.2).

Because of the size and height of the LMGS, it would be visible from most of the sensitive visual receptors noted above in the description of the affected environment. The tallest feature of the LMGS would be the Reactor Building Cooling Water expansion tank, approximately 129 feet (ft) (39 meters [m]) above grade (LME 2025-TN12163: Section 3.1.2), which would be visible a substantial distance from the site, considering the flat terrain and sparseness of trees. Building another industrial facility on the LMGS site would not change the general visual character of the site and adjoining lands, which are characterized by industrial facilities surrounded by agricultural land. Additional information on visual impacts from building the LMGS is presented in Section 4.4.1.3 of the ER (LME 2025-TN12163).

Past development activity, including the SDO, has produced a landscape comprising widely scattered industrial and energy production facilities separated by broad swaths of agricultural land. The presence of the LMGS is not likely to alter the patterns of land use in the area, including agricultural land use, or the visual characteristics of the landscape.

3.1.3 Environmental Impacts of Operation

The approximately 320 ac (129 ha) of land permanently disturbed to build the LMGS would remain dedicated to the LMGS throughout the period of operations (LME 2025-TN12163: Section 5.1.1.1). The NRC staff notes that after construction is completed, the approximately 401 ac (162 ha) of land temporarily disturbed to build the LMGS would be freed up for other land uses. Operations would not result in any additional land use changes, and no additional prime farmland would be disturbed (LME 2025-TN12163: Section 5.1.1.1). Operation of the ACCs to cool the LMGS would not generate any drift affecting adjacent lands (LME 2025-TN12163: Section 5.1.1.1). The applicant expects that the in-migrating workforce to operate the LMGS would reside across a surrounding three-county area (LME 2025-TN12163: Section 5.1.1.1). More information on housing-related impacts is presented in Section 3.9. As noted in more detail in Section 3.7, operating the LMGS station would not noticeably affect the Guadalupe WMA. Low-level radioactive waste generated by LMGS operations would require disposal in permitted radioactive waste disposal facilities (LME 2025-TN12163: Section 5.1.2.2), as discussed further in Section 3.14. Other waste generated by operating the LMGS would be disposed of in existing licensed disposal facilities such as the City of Victoria Landfill, which has approximately 22 years of remaining capacity (LME 2025-TN12163: Section 5.1.2.2). The applicant anticipates that no new landfills would have to be developed specifically to handle waste generated by LMGS operations. The NRC staff expects that the overall visual character of the LMGS site as visible to the public from surrounding lands would not change over the operational period.

3.1.4 Environmental Impacts of Decommissioning

Decommissioning could require new temporary use of additional land on the LMGS site outside of the approximately 320 ac (129 ha) occupied by the LMGS during operations, but the additional land needed would be no greater than the land that is temporarily needed for building the facility (LME 2025-TN12163: Section 5.11.1). The NRC staff additionally notes that if any of the approximately 401 ac (162 ha) of land temporarily disturbed by building the LMGS is subsequently used for other development activities, those uses might have to be moved or terminated to accommodate decommissioning. However, the LMGS site would likely still include abundant areas of other undeveloped land, that could be used instead to accommodate decommissioning. Table 2.2-1 of the ER indicates that the site contains approximately 1,341 ac [543 ha] of undeveloped land (excluding the 196 ac [79 ha] presently occupied by the SDO), of which the applicant has designated only about 701 ac (284 ha) for permanent or temporary use by the LMGS. That leaves over 600 ac (243 ha) of other land on the site that might be usable for decommissioning if land temporarily used to build the LMGS were no longer available (as long as the other land remains undeveloped). Use of land not formerly subject to development-related disturbance could result in additional losses of prime farmland. If decommissioning involves use of reclaimed agricultural land, the soils on that land would experience the same physical disturbances caused by any former temporary use.

Decommissioning could result in the beneficial impact of freeing up the 320 ac (129 ha) of land permanently occupied by the LMGS during operations for other future land uses. The timing and amount of land freed up and the range of possible reuses would depend on the details of a future plan for decommissioning. The visual impacts during decommissioning would be generally as described, and bounded by, the description of impacts for building the LMGS. The NRC staff would assess the land use and visual impacts of decommissioning in more detail as part of the environmental review of an OL.

3.1.5 Conclusions

The NRC staff concludes that the potential land use and visual impacts of the construction, operation, and decommissioning of the LMGS would be not significant. Construction and operation of the LMGS would be compatible with existing and reasonably foreseeable land use in the surrounding area, which would be subject to the enforceable policies of the Texas CMP. Additionally, construction and operation of the LMGS would take place in an existing industrial setting in an area lacking zoning, and would not alter the area's overall visual character. Building the LMGS would require the loss of up to 1 mi^2 of prime farmland, which would reduce regional agricultural activity. However, because the new development would adjoin existing industrial development and would not extend into agricultural areas lacking fragmentation by urban development, and there would still be a very large area of prime farmland remaining in the region, these effects would likely not be noticeable.

3.2 Air Quality

3.2.1 Affected Environment

The LMGS site is located in Calhoun County, Texas. Calhoun County is a coastal county located in the southeastern portion of Texas. The climate is classified as maritime subtropical, which is marked by relatively short, mild winters; long, hot summers; and mild springs and falls. Meteorological information in the vicinity of LMGS was obtained from a variety of sources (LME 2025-TN12163), including from local and regional airports and the South Texas Project Electric Generating Station (STP). Correlation analysis indicated that differences in wind patterns and temperatures between the various monitoring locations were minimal (LME 2025-TN12163).

Wind at the LMGS site is consistent with the dominant influence of the Azores high-pressure system and the coastal location of the site. Seasonal variation of the prevailing directions shows a predominance of southeasterly winds except in January, July, and August, when south winds prevail, and November and December, when northerly winds prevail. Annual average wind speeds are on the order of 4.5 meters per second (m/s) (10 miles per hour [mph]), with some variability between locations (LME 2025-TN12163). The Pasquill stability class can be calculated using a variety of methods, including from the temperature difference between two elevations (as done for LMGS). Using data from the STP tower, stability class was determined for the time period from 2017 through 2021. Stability classes D and E were the most common stability classes observed, occurring a combined 56 percent of the time, while stability classes B and C were only observed a combined 11 percent of the time (LME 2025-TN12163).

The Clean Air Act (TN1141), last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (40 CFR Part 50-TN1089) for six principal pollutants. These pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide. The Clean Air Act includes both primary and secondary standards, protecting public health (primary) as well as public welfare (secondary). Calhoun County, where the proposed LMGS would be located, is in the category of attainment for all National Ambient Air Quality Standards (NAAQS) pollutants, which means that the County meets the standards. The attainment status describes the ambient air quality resulting from the past and present actions. For reasonably foreseeable planned actions, the proposed LMGS is intended to replace an existing natural-gas fired co-generation plant currently providing power and steam to SDO. This will result in a decrease in atmospheric emissions of criteria pollutants and greenhouse gases (GHGs) once LMGS is online and the current plant is taken off-line.

The EPA's Regional Haze Rule is intended to improve and protect visibility in national parks and wilderness areas (40 CFR 51.308-51.309) (TN1090). The Regional Haze Rule requires States to develop regional haze State implementation plans to reduce visibility impairment at Class I Federal Areas. There are no federally designated Class I areas within 100 kilometers (km) (62 mi) (LME 2025-TN12163: Section 2.7). The nearest Class I area to the LMGS site is Big Bend National Park, located approximately 370 mi (595 km) to the west of the site. Because the LMGS is more than 31 mi (50 km) from the nearest Class I area, a Class I visibility impact analysis is not needed.

GHGs are gases with the potential to absorb reflected energy from the surface of the Earth, producing an insulating effect within the atmosphere. These gases include carbon dioxide (CO_2), methane, nitrous oxide, and fluorinated compounds. In May 2010, the EPA issued the GHG Tailoring Rule. This rule set the thresholds for a phase-in approach to regulating GHG emissions under the Prevention of Significant Deterioration and Title V permitting programs. According to the rule, operating permits issued to major sources of GHGs under the Prevention of Significant Deterioration or Title V permitting programs must contain provisions requiring the use of best available control technology to limit the emissions of GHGs, if the sources have potential of non-GHG pollutant emissions and if their estimated GHG emissions are at least 75,000 tons per year of CO_2 equivalent. GHGs can be emitted from a variety of sources, and are comprised of multiple compounds, with CO_2 being the primary GHG. At the State level, GHG emissions have fluctuated over the last 25 years. Since 2000 in Texas, the lowest CO_2 emissions occurred in 2009 with 589.5 million metric tons (MMT) and the greatest emissions occurred in 2018 with 681.0 MMT (LME 2025-TN12163).

3.2.2 Environmental Impacts of Construction

Potential impacts to air quality in the vicinity of the LMGS associated with construction activities are expected to be typical of construction projects. Heavy equipment will generate diesel exhaust and fugitive dust emissions. The emissions are projected to comply with Texas Commission on Environmental Quality (TCEQ) and EPA guidelines (LME 2025-TN12163: Section 4.6). Predicted emissions, as shown in Table 3-1 of the ER (LME 2025-TN12653) and Appendix G, indicate that CO and CO_2 will be the primary atmospheric emissions during construction, consistent with diesel equipment necessary for construction activities.

3.2.3 Environmental Impacts of Operation

Potential impacts to air quality in the vicinity of the LMGS associated with operations stem from plant emissions. Atmospheric emissions during operations are discussed in Section 5.9 of the ER (LME 2025-TN12163). Potential emission sources include vehicle traffic, operation of emergency generators, a diesel-powered fire pump, reactor operations and transmission lines. These are all small sources and do not exceed TCEQ thresholds and would not result in a

National Ambient Air Quality Standards exceedance. As such, the expected air quality impacts associated with the operation of the LMGS are expected to be not significant (Table 3-1).

Table 3-1 Summary of Air Emissions from Construction and Operation Activities at Long Mott Generating Station. Source: LME 2025-TN12653.

Constituent	Total Construction Emission Estimates (Tons/Year)[(a)]	Construction Emission Estimates subject to NSR/Title V/PSD consideration (Tons/Year)	Operation Emission Estimates (Tons/Year)[(b)]
PM_{10}	161	4.52	0.064[(c)]
$PM_{2.5}$	18.8	0.74	-
SO_2	0.851	0.734	0.0634
NO_x	49.8	9.52	13.7
CO	196	8.39	1.07
VOC	17.6	0.946	0.64

NSR = New Source Review; PSD = Prevention of Significant Deterioration.
"-" denotes not data in the table cell.
(a) Includes emissions from on-road commuting.
(b) Emissions are estimated for 100 hours of equipment operation per year based on 40 CFR 60.4211 (TN1020).
(c) Total PM emissions reported.

3.2.4 Environmental Impacts of Decommissioning

NUREG-0586, *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities* (NRC 2002-TN7254) (Decommissioning GEIS), outlines the anticipated environmental impacts for decommissioning of reactors and nuclear facilities. Key activities evaluated in the Decommissioning GEIS include fuel removal, decontamination, dismantlement of radioactive and nonradioactive structures, and management of spent fuel. The NRC concludes in NUREG-0586 that impacts of the decommissioning activities of facilities similar to LMGS are either not detectable or are very minor (LME 2025-TN12163: Section 10.1). The expected air quality impacts associated with decommissioning the LMGS are therefore expected to be not significant.

3.2.5 Environmental Impacts of Greenhouse Gases

The Commission Order in CLI-09-21 (NRC 2009-TN6406) provides direction to the NRC staff to consider the impacts of emissions of CO_2 and other GHGs in its environmental reviews. In support of a molten salt reactor project for Abilene Christian University (NRC 2024-TN10337), an estimate of GHG emissions based on a reference 1000 megawatt electric (MWe) advanced reactor was developed. The life-cycle GHG emissions for the LMGS were calculated in a similar manner by scaling the reference reactor emission estimates (Appendix G). Based on these calculations, the estimated GHG emissions over the course of the LMGS project are 327,000 metric tons (MT) CO_2(e) which includes construction, operation, the uranium fuel cycle, transportation of fuel and waste, and decommissioning, including extended SAFSTOR.

3.2.6 Conclusions

The NRC staff concludes that the potential air quality impacts of the construction, operation, and decommissioning of the LMGS would be not significant. The proposed LMGS is intended to replace an existing natural-gas fired co-generation plant to provide power and steam to an adjacent industrial facility. This will result in a decrease in atmospheric emissions of criteria pollutants and GHGs once LMGS is online and the current gas-fired plant is taken off-line.

3.3 Geology

This section generally describes the geology of the LMGS site and site vicinity that informs the groundwater analyses discussed in Section 3.5. A more detailed description of regional and site-specific geology of the LMGS site is presented in Section 2.5 of the applicant's preliminary safety analysis report (PSAR) (LME 2025-TN12162). The description of the geologic features of the site and site vicinity and the detailed analyses and evaluations of geologic, seismic, and geotechnical data required for assessment of site safety issues related to the proposed plant are addressed in the NRC staff's safety evaluation.

As described in Section 2.5 of the PSAR (LME 2025-TN12162) and Section 2.6 of the ER, the LMGS site lies within the Coastal Prairies sub-province of the Gulf Coastal Plains physiographic province (LME 2025-TN12163: Figure 2.6-1). At the site and in the site vicinity, the major Pleistocene (1.8 to 0.012 million years [Ma] in age) sedimentary deposits include the Beaumont and Lissie Formations, both of which consist of alternating sequences of unconsolidated to partially consolidated sand, silt, and clay that dip gently toward the Gulf Coast (LME 2025-TN12163). The alternating sequences are discontinuous lenses that comprise part of the Chicot aquifer, which is a major source of groundwater in the site vicinity. The site is relatively flat with a mean ground elevation of approximately 28 ft (8.5 m) NAVD 88 (LME 2025-TN12163).

Figure 3-1 depicts a general hydrostratigraphic column for the LMGS site vicinity (LME 2025-TN12163: Figure 2.6-6) and indicates that the Beaumont Formation, which outcrops at the site, is composed of clay interbedded with lenses of water-bearing sand. The Beaumont is overlain by Holocene (0.012 Ma [12,000 years] to the present) alluvium and varies in thickness from 0 to 1500 ft (0 to 457.2 m). Previous investigations identified 11 localized stratigraphic units within the upper 70 ft (21.3 m) of the Beaumont Formation underlying the site (LME 2025-TN12163). Hydrostratigraphic cross sections A-A′, B-B′, C-C′, and D-D′ in the PSAR (LME 2025-TN12162: Figures 2.4.12-14, 2.4.12-15, 2.4.12-16, and 2.4.12-17, respectively) show that Sand B does not occur at the LMGS site.

Syndepositional (i.e., associated with loading by deposition of sediments in the Gulf) growth faults are clustered by age in distinct fault systems and generally parallel to the Gulf coastline. The LMGS site lies within the Frio growth fault system that is about 40 mi (60 km) wide and located immediately landward of the current Gulf coastline. The fault system formed contemporaneously with deposition of sediments on the Late Oligocene (28.1—23.03 Ma) shelf margin. No surface expression of growth faults was indicated from LiDAR (Light Detection and Ranging) data collected in the area surrounding the site (LME 2025-TN12162). While reactivation of growth faults could be triggered by hydrocarbon extraction and groundwater pumping and result in local land subsidence (Morton et al. 2006-TN12532; Qiao et al. 2023-TN12533), there is no reported evidence of subsidence in the site area (LME 2025-TN12162). The nearest oil and gas extraction well is approximately 6 mi (10 km) west of the site (TWDB 2025-TN12534).

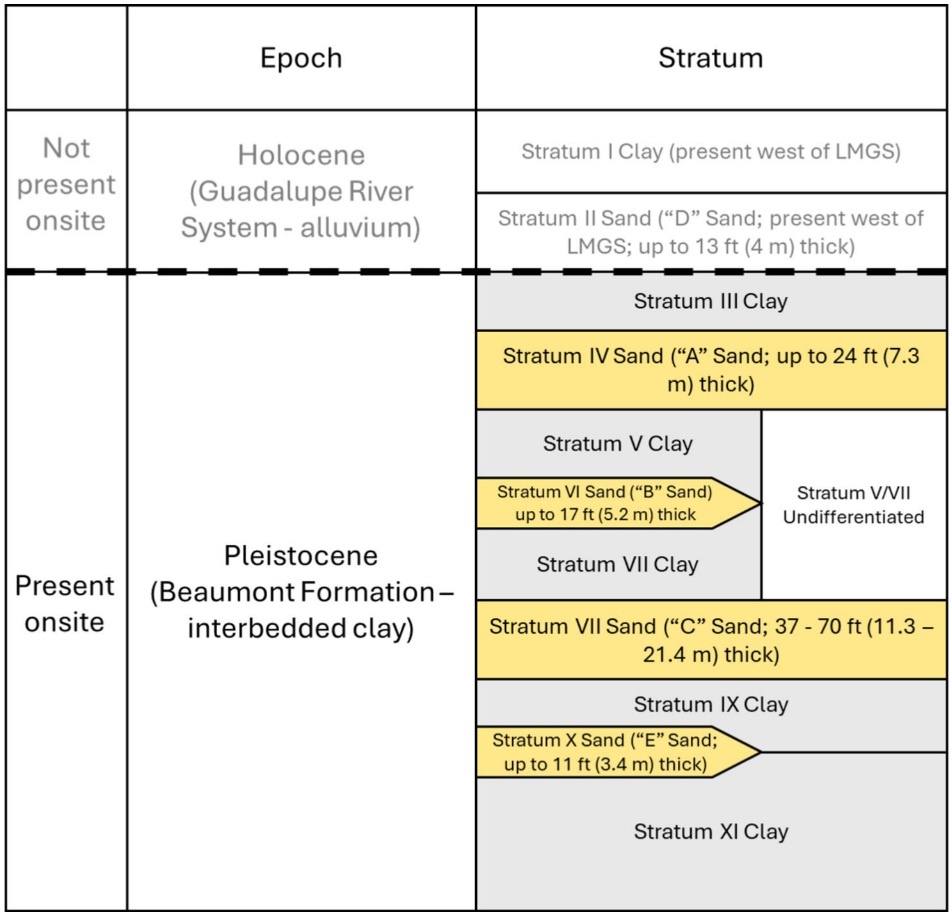

Figure 3-1 General Hydrostratigraphic Column for the Long Mott Generating Station Site and Vicinity. Adapted from LME 2025-TN12163: Figure 2.6-6.

3.4 <u>Surface Water</u>

3.4.1 Affected Environment

The LMGS site is located in a hydrologically diverse local and regional setting with numerous natural and engineered surface water features. A comprehensive description of surrounding surface water features is provided in Section 2.3.1 of the ER and incorporated here by reference. Key surface water features include the Guadalupe River, Guadalupe Estuary System, Green Lake, Guadalupe-Blanco River Authority (GBRA) Diversion Canal, GBRA Calhoun Canal, multiple artificial storage basins near the proposed LMGS site, Victoria Barge Canal, and West Coloma Creek (Figure 3-2).

The Guadalupe River, located several miles west and northwest of the site, is the major river in the vicinity of the LMGS site with an upstream drainage area of 10,128 mi^2 (km^2) and mean flows of 1,582 cubic feet per second (cfs) at USGS gauge no. 08188800 (located near the GBRA division (Figure 3-2a) over the period from 2001 through 2023. The Guadalupe River is the source of water for LMGS operations. A system of pumps, pipelines, and canals operated by the GBRA is used to route water diverted from the Guadalupe River eastward to supply a variety of end uses, including current SDO and future LMGS demands (Figure 3-2a). Water supplied to the GBRA Calhoun Canal travels from the diversion on the Guadalupe River through the GRBA

Diversion Canal, traversing portions of the Hog and Goff Bayous, and is then pumped under the Victoria Barge Canal into the Calhoun Canal (Figure 3-2). Off channel storage basins constructed adjacent to the SDO facility provide water for SDO operations. The basins have a combined surface area of 1,192 ac (482 ha), normal storage capacity of 6,774 ac-ft (8.35 million cubic meters [MCM]), and maximum storage capacity of 10,365 ac-ft (12.78 MCM) (LME 2025-TN12163). The water levels of the SDO basins are typically maintained at near constant levels with water pumped from the Calhoun Canal to offset losses from SDO water demands, evaporation, and seepage. One of these basins, Basin #5, would provide water for LMGS construction and operations.

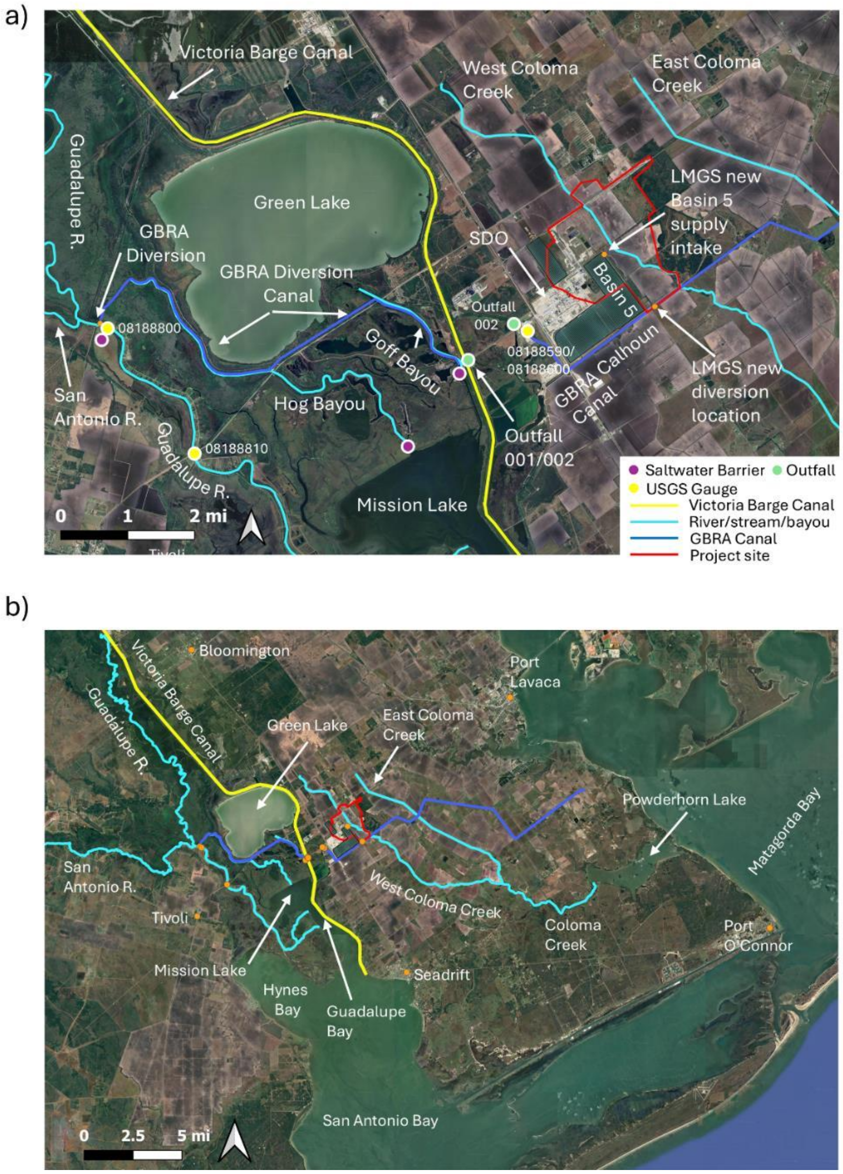

Figure 3-2 Local (a) and Regional (b) Surface Water Features. Figure Created in QGIS Using Information in the Environmental Report and from Publicly Available Sources. Sources: LME 2025-TN12163; Google Maps 2025-TN12502; USGS 2025-TN12503.

West Coloma Creek is a major stream near the LMGS site and crosses the LMGS project site (Figure 3-2). West Coloma Creek receives runoff from the eastern portion of the LMGS site. Discharge from West Coloma Creek combines with the East Coloma Creek before discharging into Powderhorn Lake (Figure 3-2b).Finally, t he Victoria Barge Canal is a 35 mi (56 km) canal operated by the U.S. Army Corps of Engineers (USACE) that provides a navigable waterway from the inland Port of Victora to the Gulf Intracoastal Waterway/San Antonio Bay (LME 2025-TN12163).

Water use and operation of reservoirs in the Guadalupe Basin have reduced surface water discharge throughout the basin, resulting in an approximately 50 percent reduction in freshwater inflows to the coastal estuary (Guadalupe Bay, San Antonio Bay) (LME 2025-TN12163). Reduced flows have increased the frequency and extent of saline encroachment occurrences into coastal streams. To mitigate these effects on freshwater quality, saltwater barrier dams have been installed on the Guadalupe River and also near the mouths of Hog and Goff Bayous (Figure 3-2a). The diversion location for the GBRA canal is located 550 ft (167.6 m) upstream of the Guadalupe River saltwater barrier. Recognition of the importance of freshwater flows for controlling salinity levels of estuaries in Texas has led to the development of minimum freshwater inflow targets to protect estuary health. The TCEQ uses the Guadalupe-San Antonio River Basin Water Availability Model to manage water in the Guadalupe-San Antonio River Systems, including considerations of environmental flows for freshwater streams.

Water Use:

Regional surface water use includes permits for municipal, manufacturing, mining, power, irrigation, and livestock. Surface water use also includes nonconsumptive uses such as navigation and recreation. A summary of water uses within 50 mi (80 km) of the LMGS site is provided in Table 2.3.1-8 of the ER (LME 2025-TN12163). The majority of water use in Calhoun County is for irrigation and manufacturing. Based on 2022 data, annual water use by the SDO facility, including use by the current natural gas co-generation plant that LMGS would replace, was 11,309 ac-ft (13.95 MCM). Plant water use includes steam generation for SDO operations, demineralized water, and water treatment. Using long-term net evaporation estimates provided by the Texas Water Development Board, estimated annual evaporative losses from the SDO basins are 1,019 ac-ft (1.26 MCM) or around 10 percent of 2022 SDO water use (LME 2025-TN12163). Estimated maximum annual net evaporation was 3.6 times higher than the average estimated annual evaporative losses, or approximately 3,700 ac-ft (4.56 MCM). Seepage estimates are not available but the high clay content sediment underlying the SDO basins would suggest low seepage rates.

Texas uses a priority-based water rights system to govern the use of surface water resources. Therefore, water supplied by the GBRA diversion is permitted through State authorized surface water rights. Dow operates SDO, and holds 6 surface water rights that collectively permit annual withdrawals of 175,501 ac-ft (216.48 MCM) (LME 2025-TN12163: Table 2.3.1-10). All but 13,000 ac-ft (16 MCM) of these rights are jointly owned by Dow and the GBRA. Authorized use for industrial activities represents 53,942 ac-ft (66.53 MCM) of these rights, with the remainder authorized for irrigation and municipal uses. The reliable supply provided by these rights is estimated at 159,719 ac-ft (197.01 MCM), with an estimated supply reliability range of 95–100 percent across the 6 rights (LME 2025-TN12163). The Dow water rights are senior to most of the rights in the Guadalupe River Basin (LME 2025-TN12163). In cases of limited surface water availability, senior water rights have priority to withdraw water before more junior rights. Figure 2.3.2-13 of the ER shows all surface water rights in Calhoun and Victoria Counties and Table 2.3.1-9 of the ER lists their associated uses, priority dates, and permitted annual volumes. Due to its proximity to the outlet of the Guadalupe River, there is only one water right on the Guadalupe downstream of the GBRA diversion (No. 4276—industrial, 272 ac-ft [0.33 MCM]). There are also two water rights located downstream of the Dow water rights: one is near Hog Bayou (No. 3864—irrigation, 50 ac-ft [0.062 MCM]), and the other is southwest of the site (No. 5639—irrigation, 40 ac-ft [0.049 MCM]). All three of these rights are junior to the Dow rights.

Records of GBRA Calhoun Canal flows are available from 1971 to 2023 from USGS gauge nos. 08188590 and 08188600. GBRA diversions over the 2014 to 2023 period averaged 41,762 ac-ft (51.51 MCM). Surface water uses supplied by the Calhoun Canal include municipal, industrial, and agricultural uses. Long-term records are also available from the Guadalupe River shortly downstream of the GBRA diversion (USGS gauge no. 08188800). From 2000 to 2023, Guadalupe River flows had the highest mean monthly discharge in May (1,870 cfs) and the lowest mean monthly discharge in August (1,180 cfs). Streamflows in the Guadalupe River are typically lowest in the summer, which coincides with the highest diversion rates for the GBRA canal (LME 2025-TN12163). Historical monthly diversions for the GBRA canal from 2016 to 2023 range from 30.2 to 105.1 cfs, with higher use in the summer and lower use in the winter (LME 2025-TN12163: Table 2.3.1-3). The existing pumping capacity for the GBRA diversion is 160,000 GPM (356.26 cfs) and the permitted capacity is approximately 280,000 GPM (621.93 cfs) (LME 2025-TN12163). Water is pumped from the Guadalupe River on an as needed basis via the GBRA Main Pump Station to maintain water levels in the GBRA Calhoun Canal.

Water Quality:

Wastewater and stormwater discharges from SDO are permitted by Texas Pollutant Discharge Elimination System (TPDES) Permit No. 0000447000. Water quality data from monitoring at permitted outfalls 001 and 002 over the 2020 to 2023 period are presented in ER Table 2.3.1-12 and their locations are shown in Figure 3-2a. The 2024 Integrated Report (TCEQ 2025-TN12271, TCEQ 2025-TN12272) issued by the TCEQ reports on the water quality of Texas' surface waters. The Integrated Report meets the requirements of the Clean Water Act (CWA) Sections 305(b) and 303(d). San Antonio Bay, Hynes Bay, and Mission Lake are combined into a single segment for the 303(d) list and were listed as a Category 5 impaired water body due to fecal coliform. Category 5 waters are waters where available data or information indicate that at least one designated use is not being supported or is threatened, and a total maximum daily load is needed (TCEQ 2025-TN12271). Powderhorn Lake and Matagorda Bay are combined into a single segment for the 303(d) list and were listed as a Category 5 impaired water body due to fecal coliform. Segment 1801 of the Guadalupe River, downstream of the saltwater barrier, was listed as Category 5 for bacteria impairing recreational use. The GBRA Diversion Canal, GBRA Calhoun Canal, Dow Drainage Canal, and West Coloma Creek are not assessed surface water quality segments for the 2024 Integrated Report.

Pre-application monitoring was conducted to characterize baseline hydrologic conditions and water quality. Field surveys related to baseline hydrologic conditions included wetland and stream delineations and also location, size, flow, outfalls, and erosion (LME 2025-TN12163: Section 2.3.1.1). Water-level recorders collected continuous data at two locations on West Coloma Creek in 2023 and 2024—one upstream and one downstream of the LMGS site. Quarterly surface water quality monitoring of source water bodies and receiving streams was performed in 2023 and 2024. Monitoring included parameters outlined in NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (LME 2025-TN12163: Table 6.6-1). Baseline water quality monitoring was conducted at ten locations, with four locations along the Calhoun Canal, four locations along West Coloma Creek, and two locations along the Dow Drainage Canal (LME 2025-TN12163: Figure 2.3.2-14). Exceedances of established TCEQ water quality values and/or EPA maximum concentration levels (MCLs) were identified in each of the three monitored water bodies, specifically:

- West Coloma Creek: total aluminum, dissolved oxygen, manganese, lead, chlorophyll-a. *Escherichia coli*, selenium, total chromium, total thallium, nitrogen (nitrate), nitrogen (nitrite), total phosphorus, and total arsenic.
- GRBA Calhoun Canal: total aluminum, dissolved oxygen, manganese, lead, chlorophyll-a nitrogen (nitrate), mercury, and phosphorus.
- Dow Drainage Canal: total aluminum, dissolved oxygen, manganese, lead, chlorophyll-a mercury.

The above identified exceedances provide information on baseline water quality for source and receiving water bodies near LMGS but do not imply any regulatory violations. Baseline water quality monitoring also measured temperature, salinity, and turbidity for the three water bodies, summarized in Section 2.3.1.3.1 of the ER (LME 2025-TN12163). The data showed temperatures of the water bodies reached the mid- to high-90s degree Fahrenheit (°F) or 35 degrees Celsius (°C), salinity ranged from fresh to brackish, and turbidity ranged from low to very high with the highest turbidity in West Coloma Creek.

Flooding:

According to the Federal Emergency Management Agency Flood Insurance Rate Map for Calhoun County the LMGS site is located in Zone X—area of minimal flood hazard (outside the 500-year flood zone); however, a detailed flood hazard study has not been conducted for West Coloma Creek (LME 2025-TN12163). The ER notes that the segment of West Coloma Creek within the project site is channelized with average bank full width of 50 ft (15 m) and height of 20 ft (6 m) and has an observable ordinary high-water mark of 3 ft (1 m). Site-specific flood protection issues are considered as part of the plant's safety review.

3.4.2 Environmental Impacts of Construction

Impacts from construction activities described in Section 2 include both temporary and permanent impacts to local hydrology and water quality and temporary construction-related water use. In total, construction would disturb approximately 720 ac (291 ha) with 320 ac (129 ha) of that disturbance being permanent. As described in Section 3.7, land disturbance would be primarily to croplands and previously developed lands. Water needed for construction activities (e.g., concrete mixing, dust abatement, soil compaction) will be obtained from Basin #5 under existing SDO water rights (LME 2025-TN12163). The anticipated water use throughout the approximate 4-year building phase is approximately 80 ac-ft/year, which is less than 1 percent of annual SDO usage based on 2022 data or 0.06 percent of available Dow water rights based on GBRA diversion over the last 10 years (LME 2025-TN12163).

As shown in ER Figure 3.1-3, a new pumping station intake structure will be constructed along the northern bank of the Calhoun Canal that will route water via a new pipeline to Basin #5 to support water demand for LMGS operations. The new intake structure is the only planned alteration of the Calhoun Canal and will be recessed into the existing channel bank. Calhoun Canal is an artificial water distribution system and not subject to regulation by the USACE or the TCEQ. Section 4.2.1.1.2.2 of the ER describes anticipated localized, temporary disturbances to three intermittent and ephemeral streams associated with the installation of the new pipeline

(LME 2025-TN12163). A new intake structure and supply pipeline dedicated to providing raw water from Basin #5 to LMGS will also be constructed. LME does not plan to conduct dredging within any waterways for the construction or operation of LMGS (LME 2025-TN12596).

Planned construction includes measures to manage stormwater runoff from the LMGS site to mitigate flood hazard to both onsite and offsite properties and to reduce adverse impacts to water quality. The soils at the LMGS site have low permeability and therefore the addition of impervious surfaces from site development will have less of an influence on runoff as compared to sites with more permeable soils. Additionally, stormwater infrastructure will be engineered to manage runoff from the developed site. During construction, a temporary 13.2 ac (5.3 ha) sediment retention basin (LME 2025-TN12163: Figure 3.1-3) will be constructed to reduce sediment loading to West Coloma Creek. Any necessary dewatered groundwater would be routed to the sediment retention basin and eventually discharged to West Coloma Creek. Because excavation depths for LMGS construction are expected to be very shallow (2 ft or 0.6 m), dewatering discharge is anticipated to be small. Permanent stormwater management infrastructure will include the construction of a 1.7 ac (0.7 ha) stormwater basin to manage runoff from the NI/CI area (LME 2025-TN12163: Figure 3.1-3) and addition of stormwater outfall structures on West Coloma Creek. The permanent stormwater basin will discharge accumulated runoff to West Coloma Creek. Additionally, two bridges designed for vehicle traffic are planned to span West Coloma Creek. Depending on the condition of the channel banks near the bridge locations, localized modifications may be needed to bank segments immediately upstream and downstream of the bridges. In summary, construction activities will result in localized modifications of the West Coloma Creek channel near the two planned bridges, the new stormwater outfalls, and where the channel is deemed to be in poor condition, but large-scale alteration of the channel is not planned. West Coloma Creek is subject to USACE authority, and any modifications of the channel would require Section 404 permitting. There are no new transmission line corridors planned for offsite connections to or from the LMGS site.

Section 4.2.1 of the ER describes regulations governing construction activities that involve surface water resources that the construction of LMGS will comply with (LME 2025-TN12163). These include: (1) the development and implementation of a site-specific Stormwater Pollution Prevention Plan (SWPPP) and BMPs (e.g., silt fencing, mulching, geotextiles, buffer strips) to mitigate stormwater pollution associated with construction (e.g., erosion and sedimentation), as required by the TCEQ Construction General Permit No. TXR150000 (TCEQ 2023-TN12624), (2) implementation of a Spill Prevention, Control and Countermeasure (SPCC) plan, (3) adherence to local (Calhoun County) floodplain development and drainage standards that comply with Texas Water Code Chapter 26 and Article 16, and 4) compliance with Federal (USACE) regulations related to modification of West Coloma Creek or any other Section 404 jurisdictional waters. Building phase hydrological monitoring (water level, temperature) will include continuous data collection at the two West Coloma Creek locations and any other locations required by the Construction General Permit (LME 2025-TN12163: Section 6.3.2.1). Water quality monitoring will include quarterly water quality sampling at the baseline monitoring locations for the Calhoun Canal and West Coloma Creek, and any additional monitoring required by the Construction General Permit.

3.4.3 Environmental Impacts of Operation

Water use associated with LMGS includes both water used by LMGS and water sent to SDO for its operations. A complete description of LMGS water use is provided in Section 3.3.1 of the ER. The ER estimates average water withdrawals for LMGS to be 9.92 cfs and a maximum of 12.97 cfs, and average consumptive use of 6.3 cfs and a usage of 6.68 cfs maximum (LME

2025-TN12163: Table 3.3.-1). Steam production from LMGS, which accounts for an estimated 54 percent of anticipated water use, is expected to be similar to the existing co-generation station (LME 2025-TN12596) that the LMGS is replacing. Limited data on historical monthly water withdrawals for SDO are available. Data collected in 2022 on SDO diversions from the Calhoun Canal showed an average withdrawal of 7,011 gallons per minute (gpm) or 15.6 cfs (11,309 ac-ft/year) and monthly minimum and maximum withdrawals, respectively, of 3,870 gpm or 8.62 cfs (Feb), and 13,626 gpm or 30.35 cfs (May).

Water for LMGS operations would be supplied by existing surface water rights held by Dow as described in Section 2.3.1.2.2 of the ER (LME 2025-TN12163). LMGS will be dry cooled using ACCs so there will be no water withdrawals or consumption associated with reactor cooling, and no heated cooling water will be discharged to the environment. Water for LMGS operation will be sourced from Basin #5, one of the existing human-made storage basins at the SDO facility (Figure 2-2). During LMGS operation, withdrawals from the Calhoun Canal will be made to maintain normal water levels in the SDO basins, including Basin #5 (LME 2025-TN12163). The rate of withdrawals for LMGS operation is not expected to have large annual variability (LME 2025-TN12596). Operation of the new diversion intake on the Calhoun Canal could result in localized sedimentation, which will be managed by periodic dredging. Dredged sediment will be disposed of at an approved location (LME 2025-TN12163). The Calhoun Canal is not a CWA jurisdictional water body and Section 404 permitting is not required for dredging activities (LME 2025-TN12163).

Records are not available on the water demand and consumptive use of the current co-generation station, preventing a direct analysis of the anticipated change in water use due to LMGS operation. Instead, the ER takes the approach of adding the anticipated LMGS water use to the 2022 SDO facility withdrawal data, which encompasses water supply for all SDO operations, including the natural gas co-generation plant. This approach yields conservative estimates of water use for LMGS operation in conjunction with SDO operations. Following this approach, the average water withdrawal rate is 25.52 cfs (2022 SDO average + LMGS mean) and the maximum is 43.32 cfs (2022 SDO maximum + LMGS maximum). The average combined water use of SDO and LMGS (including the existing gas-fired plant) is approximately 10.5 percent of the total water rights allowed by Dow. USGS gauge no. 08188800 is located just downstream of the GBRA diversion. Using mean monthly flows from this gauge over the period between 2000 to 2023, the average withdrawal rate ranges from 1.35 to 2.13 percent of the Guadalupe River flows near the GBRA diversion and maximum withdrawals correspond to 2.3 to 3.62 percent of mean monthly flows. When considering estimated withdrawals of LMGS only, average withdrawals correspond to 0.53 to 0.83 percent and maximum withdrawals correspond to 0.69–1.08 percent of mean monthly Guadalupe River flows; because LMGS is replacing the existing co-generation station, the net effect of LMGS operation on surface water use would be less than the ranges presented above. Additionally, condensate from steam used at SDO will be routed back to SDO basins for future reuse (LME 2025-TN12596).

Relevant considerations for LMGS operational impacts to water availability include effects on Guadalupe River flow, on water supply in the GBRA Calhoun Canal, and on upstream and downstream water rights. Based on the analysis in the preceding paragraph, water demand to support LMGS operation represents a small percentage of Guadalupe River flows, and even the maximum LMGS demand of 12.97 cfs would not be expected to affect the single small downstream water right on the Guadalupe River (no. 4276) nor would it result in a substantial reduction in freshwater inflows to Guadalupe Bay and the broader coastal estuary system. Guadalupe River diversions are operated by Dow under the direction of the GBRA to meet water demands of users in the Calhoun Canal system. Therefore, any increase in SDO withdrawals due to LMGS operations would result in compensatory increases in diversions and would not be expected to reduce water availability in the Calhoun Canal for users downstream of SDO on the Calhoun Canal. Because the Dow water rights have high seniority, in the event of drought they would have priority over junior water rights, even those upstream. Assuming that LMGS is adding 9.9 cfs of annual average withdrawals to SDO water right usage (the actual increase in withdrawals would be lower due to the decommissioning of the current co-generation plant), this increase represents a very small amount of total water availability in the Guadalupe-San Antonio River Systems, which are managed as one region by the TCEQ. Using the estimated average natural available flow of 3,062 cfs (Wurbs 2015-TN12504), the 9.9 cfs of LMGS withdrawals are 0.32 percent of average available flow for the Guadalupe-San Antonio River Systems.

LMGS will not release radiological or thermal liquid effluents to the environment, nonradiological wastewater will be routed to the existing liquid waste treatment system for SDO, and after treatment will be discharged through an existing permitted TPDES Outfall into the Victoria Barge Canal (Outfall 001/002, Figure 3-2a). Dewatering discharge is only associated with the construction phase of LMGS and no dewatering discharge will occur during operation. The outfall also discharges a portion of SDOs stormwater runoff. LMGS operation is expected to add up to 2.3 million gallons per day (MGD) of wastewater discharge at the combined outfall (LME 2025-TN12163: Section 5.2.1.1.2). TPDES permitted daily average and daily maximum discharges for the outfall are 12 MGD and 17 MGD, respectively (TCEQ 2021-TN12608). Current wastewater discharge ranges from 1.4 MGD to 5 MGD and effluent concentrations comply with established TPDES permit limits (LME 2025-TN12163: Section 5.2.1.1.2). Using the current maximum discharge rate of 5 MGD, LMGS operation would increase the discharge at the TPDES outfall to 7.3 MGD, well below the permitted daily average and maximum limits. LME is engaged with the TCEQ to obtain a 401 Water Quality Certification for LMGS (LME 2025-TN12596). The issuance of a 401 Certification will be contingent on compliance with applicable water quality standards. The LMGS stormwater management system will be designed to meet the requirements for a TCEQ Multi-Sector General Permit for Industrial Activities. Stormwater discharge will be monitored and controlled as required by TCEQ TPDES Permit No. 0000447000 (TCEQ 2021-TN12608). In accordance with Title 40 of the CFR Part 112 (40 CFR Part 112-TN1041), a SPCC plan will be developed and implemented for the LMGS site to reduce the likelihood of oil or other hazardous material spills and specify response measures if such a spill occurs. Operational monitoring to assess impacts to surface waters resulting from plant operation will follow requirements of the existing TPDES permit. Modifications of the existing monitoring program due to LMGS operation have not been determined yet, but surface water monitoring will be implemented in accordance with applicable regulatory requirements.

3.4.4 Environmental Impacts of Decommissioning

Decommissioning impacts to surface water resources at the LMGS site are expected to be minimal and comparable to those anticipated during construction activities, as described in the NRC’s Decommissioning GEIS (NRC 2002-TN7254). Raw water needs during decommissioning would be significantly decreased from those during operations. Some surface water may be used during decommissioning activities for workforce potable and sanitary use and for dust suppression. LME expects decommissioning water use rates to be less than those expected for construction. The NRC staff expects that stormwater would be managed to prevent erosion under applicable permits and BMPs, and spill prevention and control measures would be implemented to minimize the risk of releases of nonradiological contaminants related to equipment use. Should LME submit an OL application for future operations, a more detailed analysis of decommissioning-related surface water impacts would be provided during the environmental review.

3.4.5 Conclusions

The NRC staff concludes that the potential surface water resource impacts of the construction, operation, and decommissioning of the LMGS would be not significant. Development of the LMGS site and water supply to Basin #5 will result in localized changes to (1) site drainage patterns on the LMGS site and runoff to West Coloma Creek, and (2) localized modifications of the northern bank and channel of the Calhoun Canal near the new intake. Water use for the construction and operation of LMGS is a small fraction of monthly mean Guadalupe River flows, and any required increase of water diverted to the GBRA canal to support LMGS is well below the existing pumping capacity of the GBRA diversion.

LMGS water use would not be expected to reduce water availability for the single downstream water right on the Guadalupe River or those associated with the GBRA Calhoun Canal. Additionally, the magnitude of LMGS water use compared to diversion rights in the Guadalupe—San Antonio Basin is a fraction of a percent and therefore would not substantially affect basin-wide water availability (Wurbs 2005-TN12535). LMGS will not release radiological or thermal liquid effluents to the environment. Nonradiological wastewater from LMGS will be processed by SDOs wastewater treatment facilities and will be discharged at the existing TPDES outfall. The effect of the development of the LMGS site on stormwater runoff water quality will be managed by BMPs and the site will be designed, permitted, and operated in accordance with all applicable laws and regulations. LMGS water use is small compared to Guadalupe River flows and would not significantly impact freshwater inflows to the estuary system. Moreover, as LMGS is replacing the existing co-generation plant which has a primary purpose of providing steam to SDO, surface water use impacts from the operation of LMGS would largely amount to a continuation of what is already being experienced, rather than the creation of new impacts.

3.5 Groundwater

This section summarizes the groundwater resources of the LMGS site and surrounding area, and the potential effects on water use and water quality resulting from the proposed action. To inform the evaluation of groundwater resources, hydrogeology of the LMGS site and vicinity was considered. Geology is summarized above in Section 3.3. A description of groundwater resources in the LMGS site and vicinity is provided in Section 2.3.2 of the ER (LME 2025-TN12163) and Section 2.4.12 of the PSAR (LME 2025-TN12162). The descriptions presented here are based on these and other sources of publicly available hydrologic information, as cited in this section.

3.5.1 Affected Environment

The LMGS site is located within the Gulf Coast Region of Texas. The region is subdivided into three major aquifer systems. Of these, the site lies within the Gulf Coast Aquifer, also known as the Coastal Lowlands aquifer, that is the largest and main source of groundwater in the area (TWDB 2006-TN12559). The Gulf Coast Aquifer is also subdivided into five units, the deepest of which is the Catahoula confining system. The Catahoula is overlain by the Jasper aquifer, consisting of Oakville Sandstone and the Flemming Formation. The Evangeline aquifer is separated from the Jasper by the leaky, confining units of the Burkeville system, which is overlain by the Chicot aquifer. The Chicot aquifer, the shallowest of the aquifer units, is composed of (from deepest to shallowest) the Willis Sand, the Bentley and Montgomery Formations (i.e., the Lissie Formation), the Beaumont Formation, and surficial alluvium (Baker 1979-TN12597). The Chicot aquifer is composed entirely of Pleistocene (1.8 to 0.012 Ma) and Holocene (0.012 Ma to present) sediments (see Section 3.3). Figure 2.3.2-16 of the ER (LME

2025-TN12163) is a cross section of the regional aquifers. Based on State groundwater models, there is a hydraulic connection between the Chicot, Evangeline, and Jasper aquifers, with upward vertical gradients driving flow through the leaky Burkeville confining unit (LME 2025-TN12163: Figure 2.3.2-18).

Site-specific groundwater conditions are controlled by the discontinuous lenses of sand, silt, and clay that make up the Chicot aquifer. Groundwater primarily occurs in the sand lenses embedded in the less-permeable clays of the Beaumont Formation. The shallowest sand units are likely hydraulically connected to Holocene alluvium, which consists of sand deposits that outcrop south of the site along the Guadalupe River. Groundwater dynamics in the alluvium and sand lenses of the Beaumont Formation are strongly influenced by nearby surface water features, including West Coloma Creek, ephemeral precipitation-driven streams present at the site, and tidal fluctuations in surrounding lowland areas (LME 2025-TN12163). Hydrostratigraphy of the site, including 11 distinct stratigraphic units of clay and sand (e.g., A-, B-, C-, and E-sands), are depicted in Figure 3-1 of Section 3.3. Figure 3-3 provides a generalized conceptual site model of the SDO site subsurface. The LMGS site is adjacent to and north-northeast of the SDO site so the subsurface hydrogeologic units are generally comparable. However, the “Stratum I Clay” and “B-sands” are generally not present beneath the LMGS site.

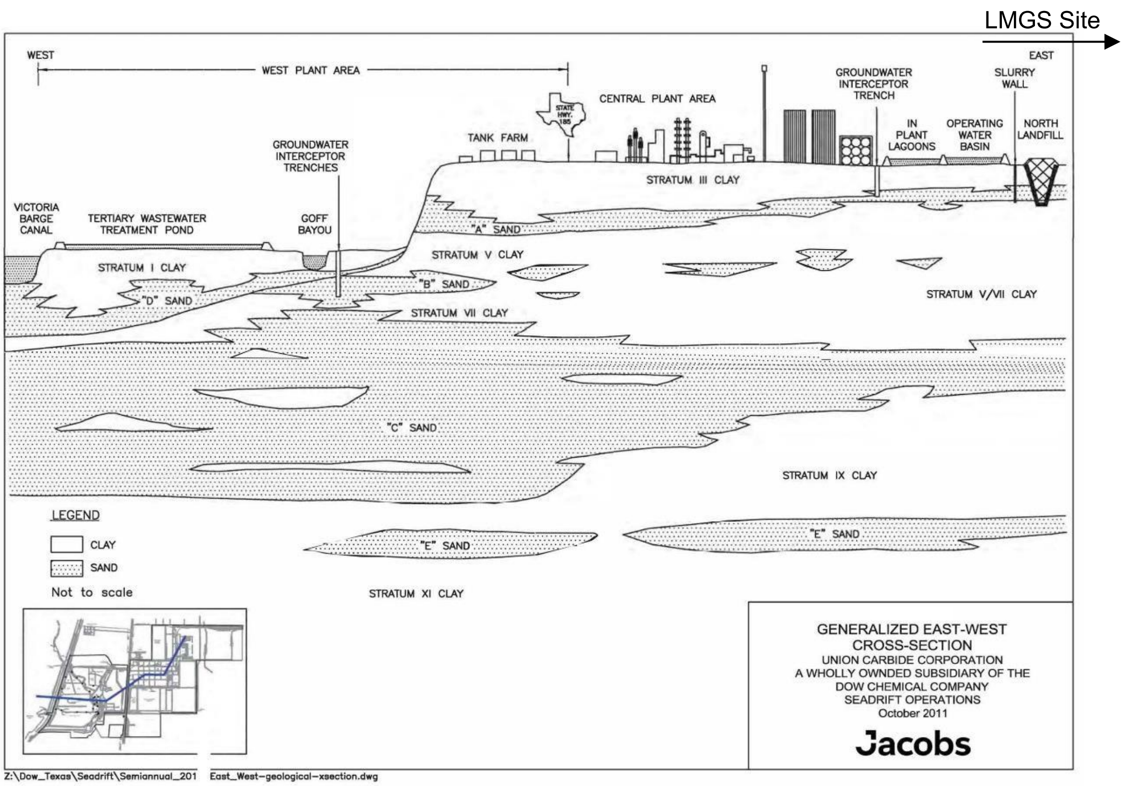

Figure 3-3 Generalized East-West Cross Section of the Seadrift Operations Facility Site Near the Long Mott Generating Station Site, from the Environmental Report (LME 2025-TN12163: Figure 2.3.2-21) and Preliminary Safety Analysis Report (LME 2025-TN12162: Figure 2.4.12-11)

Regionally, recharge to the Gulf Coast Aquifer System occurs in unconfined, outcropping units in the uplands. Water that infiltrates to the shallow saturated zone flows horizontally through continuous sand lenses and generally discharges to hydraulically connected surface water bodies. Water that reaches intermediate to deeper zones of the aquifer system flows toward the southeast, where it discharges via groundwater pumping, upward flow toward topographic lows, or to the Gulf of America (Kasmarek and Robinson 2004-TN12598). Oden and Truini (2013-TN12599) estimated rechange to the Chicot aquifer to range from 0.2 to 7.2 inches (in.) (0.51 to 18.3 centimeters [cm]) per year based on sample data from 14 wells in Montgomery County (northern Houston). However, variations in the hydrogeology and surficial conditions likely affect the recharge rate locally. At the site, the SDO basin may contribute significant recharge to the shallow A-sand, and infiltration recharge is noted to be greater in the northeastern part of the site (LME 2025-TN12163). Little natural groundwater discharge is anticipated within the site boundaries due to the prevalence of clay-rich units underlying West Coloma Creek and other topographically low areas.

Groundwater monitoring at the site extends to a depth of approximately 200 ft (61 m) and encompasses multiple stratigraphic units within the upper Chicot aquifer, including the A-, C-, and E-sand, each overlain by distinct clay units (III clay, V/VII clay, and IX clay, respectively) (LME 2025-TN12163) (see Figure 3-3). The conceptual site model characterizes the groundwater zones as semi-confined to confined within the shallow A-sand, confined at intermediate depths in the C-sand, and deeply confined within the E-sand. At each monitoring location, three separate monitoring wells were installed to measure water quality in the different sand units. Slug tests and pumping tests were conducted during field investigations (LME 2025-TN12162: Section 2.4.12) to determine site-specific hydraulic properties of the water-bearing units (LME 2025-TN12162: Tables 2.4.12-7, 2.4.12-10, and 2.4.12-12).

Groundwater elevations indicate a downward vertical gradient between sand units. Hydraulic conductivity of the sand units is several orders of magnitude larger than the clays, limiting the transport of water between disconnected sand lenses and/or units. The estimated average linear velocity of the shallowest sand unit (A-sand) is relatively low, approximately 10 ft/year (3 m/year) (based on the geometric mean values provided in Table 2.4.12-12 of LME 2025-TN12162 and an estimated effective porosity of 0.25). Flow directions vary between sand units and seasonally due to precipitation, with the general flow for the A-sand east-northeast, for the C-sand west-southwest, and for the E-sand northwest-southwest. Additional semi-annual groundwater monitoring is conducted at two landfill locations adjacent to the western LMGS site boundary. Monitoring of the North Landfill and its Expansion Cell on the SDO site includes 8 wells installed in the A-sand and 13 wells in the C-sand. Due to the significant thickness of the C-sand unit (approximately 30 ft [9.1 m]), 4 of the 13 wells are screened in the lower portion of the C-sand. Subsurface barrier walls extend to the clay beneath the A-sand to reduce the potential for offsite transport of landfill contaminants (LME 2025-TN12162).

Regionally, groundwater serves as the primary source of drinking water for 7 of the 12 counties within a 50 mi (80 km) radius of the LMGS site. In Calhoun County, groundwater consumption totaled approximately 1.15 MGD (4.35 megaliters per day [ML/d]) in 2019 (CCGCD 2023-TN12600). To safeguard regional groundwater resources, the Calhoun County Groundwater Conservation District Groundwater Management Plan includes a resolution to limit average drawdown in the Gulf Coast Aquifer System to no more than 13 ft (4 m) by December 2080. Modeled projections for groundwater availability in Calhoun County estimate that approximately 6.8 MGD (25.7 ML/d) will be accessible between 2020 and 2069 (CCGCD 2023-TN12600). The nearest public water well to the LMGS site, located at a recreational vehicle campground 4 mi (6 km) northeast of the site boundary, supplies approximately 0.05 MGD for residential use.

Additionally, several domestic use wells, owned by individuals, are located approximately 0.4 mi (0.6 km) to the north of the site (TCEQ 2025-TN12601; LME 2025-TN12163).

The Gulf Coast Aquifer is not a designated sole-source aquifer. The nearest sole-source aquifer to the LMGS site is the Edwards Aquifer, approximately 115 mi (188 km) northwest. The Calhoun Country Groundwater Conservation District (CCGCD) promotes conservation and preservation of water resources within its jurisdiction through the Groundwater Conservation Program. The CCGCD supports initiatives including rainwater harvesting, responsible groundwater use, integrated management of groundwater and surface water, measures to prevent subsidence and waste, brush control, and projects that enhance recharge (CCGCD 2025-TN12623).

As part of pre-application monitoring efforts, groundwater monitoring data were collected from 18 observation wells on a quarterly basis over a 9-month period (December 2023 to August 2024). While most analytes were below MCLs, some exceptions were noted in specific groundwater units. In the A-sand zone, calcium and uranium concentrations exceeded MCLs, whereas arsenic and nitrite were elevated in the C-sands. In the E-sands, beryllium, calcium, nitrate, and nitrite were detected above MCL thresholds (LME 2025-TN12163).

Groundwater quality around the North Landfill/Expansion Cell is monitored via a network of 21 wells sampled semiannually for benzene, bis(2-chloroethyl) ether, methyl isobutyl ketone, naphthalene, toluene, chromium, and lead. The ER states the results of sampling between 2019 and 2021 were below the laboratory's reporting limit, which is equal to or less than the associated background threshold value (LME 2025-TN12163).

3.5.2 Environmental Impacts of Construction

Per Section 3.1, the proposed site will comprise 1,537 ac (622 ha), of which the NI/CI footprint will encompass 34.4 ac (13.9 ha). Excavation within the NI/CI building area will comprise the first 2 ft (0.6 m) of topsoil (i.e., clay), which will then be filled to grade with crushed rock. If required, excavation dewatering will be accomplished using pumping from sumps located around the perimeter and at the base of the excavation (LME 2025-TN12163).

Land and surface modifications during preconstruction and construction activities could affect the local distribution of infiltration and recharge on the LMGS site. Changes in local recharge patterns could result from site stormwater management, including the construction of a stormwater basin and sediment basin as part of preconstruction activities (LME 2025-TN12163). Stormwater will be collected and controlled using a temporary 13.2 ac (5.3 ha) sediment basin and a permanent 1.7 ac (0.69 ha) stormwater basin (LME 2025-TN12163: Figure 3.1-3). Discharges from these basins will be routed to West Coloma Creek and regulated under the TCEQ Construction General Permit No. TXR150000 (TCEQ 2023-TN12624) and the site's TPDES permit. While the final design of the basins is unknown, excavation will likely occur predominantly in the less-permeable, clay-rich units of the Beaumont Formation. Collected groundwater may recharge the shallow groundwater of the A-sand where there is hydraulic connection. Groundwater in the A-sand is currently influenced by the SDO basins near the LMGS.

Other than construction dewatering, no groundwater use is anticipated during construction. The building excavations are anticipated to be shallow (2 ft [0.3 m]), and will intersect the upper, confining clay layer at the site. The clay is not a water-bearing unit. Any dewatering needed for excavations will likely be minimal and of short duration so will limit the distance at which effects of dewatering could occur. Because the dewatering would be temporary and unlikely to affect groundwater availability or quality beyond the site boundary, the NRC staff expects the groundwater impacts of dewatering to be minor.

No direct discharges to groundwater are planned during construction. Water pumped from excavations and stormwater will ultimately be discharged to West Coloma Creek, though a portion of the collected water may infiltrate into the ground via the temporary sediment basin or permanent stormwater basin. In addition to the Construction General Permit and the TPDES administered by TCEQ, stormwater and runoff will be managed in accordance with the requirements described in Section 3.4.2. Spill prevention and control BMPs would be followed to minimize potential releases of equipment fuel and other nonradiological contaminants that could affect groundwater quality (LME 2025-TN12163). Transport of contaminants from potential spills at the site will be further mitigated by the low-permeability upper clay layer.

Groundwater monitoring during LMGS construction and preoperational phases will utilize wells established during site characterization, though several of these monitoring wells will be sealed and abandoned as part of construction activities. Groundwater elevation data will continue to be gathered from the remaining wells throughout the construction phase.

3.5.3 Environmental Impacts of Operation

This section describes potential impacts on existing groundwater resources from operation of the LMGS. A more detailed analysis of impacts on existing groundwater resources from operating activities would be conducted during the environmental review for an OL, if LME submits an OL application and NRC accepts it for review.

Land-surface modifications, stormwater management practices, and discharges from the plant could affect local infiltration and groundwater recharge at the LMGS site. However, any changes in recharge are expected to be localized at the site and limited to shallow groundwater within the immediate property boundaries. The applicant stated that plant building foundations are planned to be shallow (2 ft [0.6 m]) and within the upper, non-water bearing confining clay layer. Therefore, any changes to groundwater flow paths and elevations are expected to be negligible beyond the footprint of the buildings (LME 2025-TN12163). No permanent dewatering activities are planned, and groundwater extraction will not be required to support plant operations.

Discharges from the LMGS site will be monitored to ensure compliance with the terms of the site-specific TPDES permit (TCEQ 2021-TN12608). Spill prevention and control BMPs will be followed during plant operation to minimize the risk of releases of equipment fuel and other nonradiological contaminants that could affect groundwater quality. LMGS will be cooled using ACCs so there will be no water withdrawals or consumption associated with reactor cooling and no heated cooling water will be discharged to the environment.

The applicant stated that groundwater quality monitoring would be conducted quarterly during the first year of operations, after which monitoring parameters would be reviewed and revised, as appropriate for the long-term program (LME 2025-TN12163). Groundwater monitoring conducted as part of a groundwater protection program would provide ongoing monitoring to detect inadvertent releases and protect groundwater quality onsite. If LME submits an OL application, a more detailed analysis of operations-related groundwater impacts would be provided during the OL environmental review.

3.5.4 Environmental Impacts of Decommissioning

Decommissioning impacts to groundwater resources at the LMGS site are expected to be minimal and comparable to those anticipated during construction activities. The NRC's Decommissioning GEIS (NRC 2002-TN7254) found impacts to groundwater resources to be SMALL for the existing fleet of LWRs. This finding was based on the large reduction in water use during decommissioning compared to operations, the limited duration of decommissioning activities, the removal (rather than the creation) of contamination sources, and the implementation of spill prevention and liquid waste management controls. The NRC staff considers it likely that the Xe-100 design features will further reduce the potential for groundwater impacts below the levels evaluated in the GEIS. Specifically, the use of helium as a primary coolant eliminates the liquid-coolant leak pathway for subsurface contamination, and the absence of large-volume contaminated water systems, such as cooling ponds or spent fuel pools, eliminates those potential sources of contamination.

No groundwater withdrawal is planned during the decommissioning of shallow building foundations, which are not deep enough to require significant dewatering upon removal. Stormwater would be managed to prevent erosion using BMPs, and spill prevention and control measures would be implemented to minimize the risk of releases of nonradiological contaminants related to equipment use. Should LME submit an OL application for future operations, a more detailed analysis of decommissioning-related groundwater impacts would be provided during the environmental review.

3.5.5 Conclusions

The NRC staff concludes that the potential groundwater impacts of the construction, operation, and decommissioning of the LMGS would be not significant. This determination is supported by site hydrogeologic characteristics, including presence of the confining clay unit in the upper Beaumont Formation. This confining layer prevents significant downward migration of contaminants into the underlying aquifer units (e.g., A-, C-, and E-sands). Excavations during construction will be limited to shallow depths (approximately 2 ft [0.3 m]) within the impermeable clay Beaumont Formation, which is not regarded as water-bearing. Minor dewatering that may be required during construction would be temporary and localized, with negligible impacts to groundwater flow paths or elevations. The temporary sediment basin and permanent stormwater basin may have a local impact on groundwater flow paths and elevations, but these changes are unlikely to extend beyond the site boundary due to the discontinuous nature of the more permeable sand layers of the Chicot aquifer and the relatively small footprint of the ponds (less than 1 percent of the overall site area).

No dewatering will occur during plant operation, and groundwater will not be used for any purpose during operation. Furthermore, the LMGS reactor modules will utilize an air-cooled system, meaning no water would be consumed or discharged during the reactor cooling process, further minimizing the potential for contaminants to interact with groundwater. Plant operation would not involve liquid discharges to groundwater, and robust preconstruction and construction-phase monitoring programs will enable the identification of potential inadvertent releases to the environment. These combined measures ensure that potential impacts to groundwater resources during construction, operation, and decommissioning remain minimal.

3.6 <u>Aquatic Ecological Resources</u>

3.6.1 Affected Environment

The LMGS site is located on the West Coloma Creek, along the GBRA Calhoun Canal System, and the Victoria Barge Canal (LME 2025-TN12163). Nearby connected waterways include East Coloma Creek and Coloma Creek, which flow east into Powderhorn Lake, and Mission Lake, Green Lake, and the Guadalupe River which all empty into Guadalupe Bay then San Antonio Bay and ultimately the Gulf (see Figure 3-2). Additionally, there are several manmade water basins onsite used for operational water supply, including Basin #5 which will supply water for LMGS, and a manmade discharge canal that drains into the Victoria Barge Canal (see Section 3.4.1 and Figure 3-2 for additional details).

3.6.1.1 Biological Communities

<u>Benthic Invertebrates</u>: The macroinvertebrate community in the Guadalupe River, which feeds the GBRA canal, was previously sampled in 2008 (Exelon 2012-TN12213; LME 2025-TN12163: Table 2.4-9). The majority of the aquatic benthic invertebrates collected were mud snails (Hydrobiidae), followed distantly by basket clams (Corbiculidae), pea clams (Sphaeriidae), shrimp (Palaemonidae), and a handful of other aquatic benthic invertebrates.

In 2023, BIO-WEST, Inc. conducted the first mussel surveys of the GBRA Canal system in Calhoun County to inform the Guadalupe River Habitat Conservation Plan that is being developed by GBRA to address complexities of water management and ensure regulatory compliance (BIO-WEST 2023-TN12189). At each of the 16 sites surveyed, a track hoe was used to dredge approximately 20 m^2 of sediment from the canal bottom. Two species, round pearlshell (*Glebula rotundata*) and mapleleaf (*Quadrula quadrula*), which are typically found in sluggish silty habitats in the lower portions of Texas coastal basins, were collected (BIO-WEST 2023-TN12189).

The Project Long Mott Ecological Resource Technical Report, Sections 2.3.2 and 3.2.2, are incorporated by reference (WSP 2024-TN12606). In the fall of 2023 and spring of 2024, researchers conducted sampling at nine locations in West Coloma Creek, the GBRA Calhoun Canal, and the Dow Drainage Canal (WSP 2024-TN12606). Using D nets and petite ponar dredges, they collected 68 taxa during fall sampling. The most abundant taxa found were pollution and low-oxygen tolerant midges (*Tanypus* sp.), nearly all of which occurred in West Coloma Creek, while only a few pollution sensitive mayflies were observed.

<u>Fish</u>: The fish communities in the Guadalupe River, Goff Bayou, and the GBRA Main Canal, were previously sampled in 2008 (Exelon 2012-TN12213; LME 2025-TN12163: Table 2.4-13). In the GBRA canal, the most abundant fish collected was longear sunfish (*Lepmis megalotis*, 23.5 percent) followed by western mosquitofish (*Gambusia addinis*) at 14.2 percent and warmouth (*Lepomis gulosus*, 8 percent) (Exelon 2012-TN12213). Smaller minnow and minnow-like species were common in the canal but larger fish like gar and catfish were few.

The Project Long Mott Ecological Resource Technical Report, Sections 2.3.1, 3.2.1, and 3.3 are incorporated by reference (WSP 2024-TN12606). Researchers conducted seasonal fish surveys from 2023 to 2024 to identify fish species at the LMGS site and surrounding areas (WSP 2024-TN12606). They sampled nine locations, including West Coloma Creek, the GBRA Calhoun Canal, and the drainage channel west of the LMGS site using backpack electrofishing, boat electrofishing, and seining. During summer 2023, researchers identified 19 fish species. The tolerant Sailfin molly (*Poecilia latipinna*) dominated West Coloma Creek (out of 15 species total), the tolerant western mosquitofish (*Gambusia affinis*) dominated the GBRA Calhoun Canal (out of 10 species), and the exceptionally tolerant sheepshead minnow (*Cyprinodon variegatus*) was most common in the drainage outfall (out of 6 species). In fall 2023, researchers observed 23 species. Western mosquitofish dominated West Coloma Creek (out of 12 species), while sailfin molly and tolerant gizzard shad (*Dorosoma cepedianum*) were most common in the GBRA Calhoun Canal (out of 15 species). Sheepshead minnow remained the most abundant species in the drainage outfall (out of 8 species). In winter 2024, researchers recorded 18 species. Sailfin molly was most abundant in West Coloma Creek (out of 11 species), and invasive common carp (*Cyprinus carpio*) dominated the GBRA Calhoun Canal (out of 11 species). The drainage outfall had just 3 species, with sailfin molly being most common. In spring 2024, researchers found 17 fish species. Western mosquitofish dominated both West Coloma Creek (out of 10 species) and the GBRA Calhoun Canal (out of 11 species), while sheepshead minnow remained most abundant in the drainage outfall (out of 5 species).

3.6.1.2 Important Species and Habitats

Recreationally Important Fisheries: There are many recreationally important species located in the Guadalupe River Basin and San Antonio Bay. More specifically relevant to the proposed LMGS site are recreationally fished white shrimp (*Litopenaeus setiferus*), red drum (*Sciaenops ocellatus*), and largemouth bass (*Micropterus nigricans*) based on 2023-2024 onsite aquatic surveys (LME 2025-TN12163: Tables 2.4-14 through 2.4-17). White shrimp were collected from West Coloma Creek, GBRA Calhoun Canal, and Dow Drainage Canal; red drum were collected from West Coloma Creek, largemouth bass were collected from West Coloma Creek and GBRA Calhoun Canal, and alligator gar were collected from West Coloma Creek. There are currently no advisories on fish consumption from the Guadalupe River Basin or San Antonio Bay.

Commercially Important Fisheries: In Texas, Texas Parks and Wildlife Department (TPWD)-managed commercial fishing is any activity that involves taking or handling fresh or saltwater aquatic products for pay or for the purpose of barter, sale, or exchange (TPW Undated-TN12188). This includes freshwater and saltwater finfish, shrimp, crabs, and oysters. Commercially important species observed in West Coloma Creek include white shrimp, blue crab, channel catfish, and alligator gar; in GBRA Calhoun Canal white shrimp and channel catfish; and in Dow Drainage Canal white shrimp, blue crab, and alligator gar.

State-Protected and Other Special Status Aquatic Species: In Texas, animal or plant species of conservation concern may be listed as threatened (TAC 31-65.175) or endangered (TAC 31-65.176) under the authority of State law and/or under the U.S. Endangered Species Act (ESA) (TX Admin. Code 31-65-TN12204). Species may be listed as State threatened or endangered even if not federally listed. The State list deals only with the status of the species within Texas and that are managed by TPWD. Table 3-2 shows the State-listed species that may occur near the intake and outfalls for LMGS or in downstream areas. The NRC staff compiled this information from the ER, and the TPWD's Texas Natural Diversity Database and Rare, Threatened, and Endangered Species of Texas (LME 2025-TN12163; TPW 2019-TN12190, TPW 2025-TN12205). None of the species listed in Table 3-2 are endemic (native to and known to occur only in a certain place) to the area.

Texas also protects WMAs which were created to support wildlife research, resource management, education, and public outdoor recreation, which ensure the conservation of natural resources. There are three WMAs in the area around LMGS, the closest, located across the Victoria Barge Canal is the Guadalupe Delta WMA, and out in San Antonio Bay are the Welder Flats WMA and the Matagorda Island WMA (TPW Undated-TN12191).

Table 3-2 State-Listed Aquatic Species that May Occur Near the Long Mott Generating Station Site

Common Name	Species	Status	Collected Location and (Year)	Habitat
alligator gar	*Atractosteus spatula*	SGCN	GR (2008), WCC (2023)	In Texas, alligator gar inhabit large rivers, reservoirs, and coastal bays, spawning in shallow, vegetation-filled waters when water temperatures rise above 68°F (TPW Undated-TN12192).
opossum pipefish	*Microphis brachyurus*	SGCN	None	Adults live and give birth in low-salinity estuarine or freshwater areas within 30 mi of the coast, young move or are carried to offshore waters (TPW 2025-TN12206).
giant manta ray	*Manta birostris*	SGCN	None	Giant manta rays are commonly found offshore and in productive coastal areas including estuarine waters, oceanic inlets, bays, and intercoastal waterways (NOAA 2025-TN12250).
saltmarsh topminnow	*Fundulus jenkinsi*	SGCN	None	Occupies estuaries and saltmarsh edges along the Gulf and uses small interconnected tidal creeks for feeding and reproduction (TPW 2025-TN12206).
shortfin mako shark	*Isurus oxyrinchus*	ST	None	Pelagic species that occupies the upper water column, juveniles are common in coastal waters all the way up to the low-tide line (NOAA 2025-TN12195).
southern flounder	*Paralichthys lethostigma*	SCGN	GR (2008)	Adults and juveniles inhabit riverine, estuarine, and coastal waters and prefer muddy, sandy, or silty substrates, they migrate offshore to spawn (TPW 2025-TN12206).
hawksbill sea turtle	*Eretmochelys imbricata*	SE	None	Live in clear offshore waters of mainland and island shelves commonly where coral reefs are found although occasionally inland near jetties or with sargassum mats. Not known to nest in Texas (TPW Undated-TN12198).

Common Name	Species	Status	Collected Location and (Year)	Habitat
green sea turtle	*Chelonia mydas*	ST	None	Feed in shallow water with abundant seagrass, some nesting does occur in Texas from April to September (TPW 2025-TN12206).
Kemp's ridley sea turtle	*Lepidochelys kempii*	SE	None	Prefer open ocean and juveniles float on large mats of sargassum with the females only coming ashore to lay eggs. Nesting occurs in Texas from April to August (TPW Undated-TN12201).
loggerhead sea turtle	*Caretta caretta*	ST	None	Juveniles and adults spend their lives in open ocean returning to nesting beaches between April and September. Some nesting does occur in Texas primarily on Padre Island but occasionally on Mustang Island (TPW 2025-TN12206).
West Indian Manatee	*Trichechus manatus*	ST	CC (2025), GB (2021)	Very rare in Texas but there have been occasional sitings in Corpus Christi Bay and Galveston Bay (Schmidly and Bradley 2016-TN12275).

DDC = Dow Drainage Canal; GB = Galveston Bay; GBRACC = GBRA Calhoun Canal; GBRAMC = GBRA Main Canal; GR = Guadalupe River; WCC = West Coloma Creek; SGCN = Species of Greatest Conservation Need; SE = State Endangered; ST = State Threatened.

Federally Protected Aquatic Species and Habitats: The NRC staff summarizes its findings with respect to federally protected ecological resources protected under the ESA (TN1010) and the Magnuson-Stevens Act (TN1061), and the outcome of the related consultations in the biological evaluation in Appendix E. In addition, the NRC staff concludes that no marine sanctuaries occur near or within the site region (50 mi radius) of LMGS and that the issuance of a CP would have no effect on sanctuary resources. Thus, the National Marine Sanctuaries Act does not require the NRC to consult with the National Oceanic and Atmospheric Administration for the proposed action and sanctuary resources are not discussed further in this document.

Invasive and Nuisance Species: The Texas Invasive Species Coordinating Committee aims to coordinate governmental efforts to prevent and manage invasive species statewide. TPWD is the primary agency responsible for managing aquatic invasive species which include common carp (*Cyprinus carpio*), Rio Grande cichlid (*Herichthys cyanoguttatusgiant*), Eurasian watermilfoil (*Myriophyllum spicatum*), water hyacinth (*Eichoria crassipes*), zebra mussel (*Dreissena polymorpha*), Asian clam (*Corbicula fluminea*), and apple snail (*Pomacea maculata*) (Texas Administrative Code, Title 31, Part 2, Chapter 57, Subchapter A (TN12276); LME 2025-TN12163). These species may occur in the project area; for example, while zebra mussels have not been detected locally, they are found upstream in the Guadalupe River Basin, and GBRA monitors for their presence or absence (GBRA 2024-TN12203).

3.6.2 Environmental Impacts of Construction

Impacts on the aquatic ecosystem from building the LMGS would mainly be associated with impacts to GBRA Calhoun Canal and West Coloma Creek. Also, onsite streams, ponds, ditches, etc. could be impacted by soil-disturbing activities that lead to soil erosion during site preparation and the building of LMGS.

3.6.2.1 Site and Vicinity

Construction that could affect aquatic resources include building structures associated with the intake on the GBRA Calhoun Canal, the water intake pipeline stream crossings, two bridges that would be built across West Coloma Creek for vehicle traffic, stormwater outfalls into West Coloma Creek, utility crossings over West Coloma Creek, and clearing and grading that could introduce runoff and sediment to streams on the LMGS site (LME 2025-TN12163). As part of the TCEQ Construction General Permit No. TXR150000 compliance, LME would develop and implement a site-specific SWPPP to manage stormwater and reduce pollutant loading into onsite waterbodies (TCEQ 2025-TN12614). LME would also have to comply with applicable Section 404 permit requirements and coordinate with USACE. TPWD has recommended several general practices for the building phase to avoid impacts to aquatic resources and BMPs for use in riparian areas (LME 2025-TN12163). Additional BMPs and conservation measures provided by U.S. Fish and Wildlife Service (FWS) to protect ESA-listed mussels would also provide protection to other aquatic species and are discussed in more detail in Appendix E.

The GBRA Calhoun Canal runs south along HWY 185 and then turns north toward Port Lavaca and runs along the south side of the SDO facility where water is pulled from the canal into the operating basins, currently via the GBRA Relift 1 Pump Station (LME 2025-TN12596). A new pumping station would be constructed to pump water needed for LMGS from the GBRA Calhoun Canal to Basin #5, and these would be connected via pipeline (LME 2025-TN12163). Although the intake design is not yet completed, LME plans to build one the similar to the existing onsite pump stations and the structure would be recessed into the northern bank of the canal to prevent flow obstruction (LME 2025-TN12163). During construction a temporary sheet pile wall or similar structure would be used to limit impacts to the aquatic environment, erosion control measures such as rip rap and silt fencing would also be used to minimize erosion and subsequent sedimentation. Temporarily disturbed banks would be restored and replanted to prevent any additional erosion.

The West Coloma Creek channel passes through the area that would be disturbed to build the LMGS, and the banks and adjoining lands would be disturbed on both sides of the channel. Plans include building two bridges and utility crossings over the channel, as well as installing new stormwater outfall structures that discharge into the creek (LME 2025-TN12163). Approximately 88 linear ft (26.8 m) of stream channel could be impacted. During construction a temporary sheet pile wall or similar structure would be used to limit impacts to the aquatic environment. In addition, LME would avoid building activities during ecologically sensitive times (e.g., spawning) to minimize potential impacts. All TCEQ and USACE guidelines and mitigative requirements will be followed (LME 2025-TN12163).

The GBRA Calhoun Canal which would supply raw water to Basin #5, where the plant water intake would be located, would get its water from the Guadelupe River (GBRA 2025-TN12187). On the other side of the facility, the proposed plant would utilize the existing water discharge into the Dow Discharge Canal, which drains into the Victoria Barge Canal and then into the Guadalupe Bay and San Antonio Bay.

3.6.2.2 Important Species and Habitats

Only one State-listed Species of Greatest Conservation Need has been found in onsite waterways in the vicinity of the LMGS site. The alligator gar was collected in the Guadalupe River during sampling in 2008 and in the West Coloma Creek in 2023. The southern flounder was also collected in 2008 during sampling of the Guadalupe River but has not been collected onsite.

Alligator gar is a freshwater fish found in rivers, reservoirs, and coastal bays that can grow to over 8 ft (3 m) in length. Recent surveys indicate that this species is in decline in many areas in the southeastern United States but Texas has one of the best remaining alligator gar fisheries. The alligator gar is a recreationally managed sportfish in Texas with a 1 fish per day catch limit and mandatory harvest reporting. Certain areas may be temporarily closed during spawning. Spawning usually occurs in shallow, flooded vegetation typically in April and May in Texas. While alligator gar have been seen in West Coloma Creek, downstream of the project area, they generally prefer larger rivers and are more likely to occur further downstream in Coloma Creek and Powderhorn Lake. The analysis presented above in Section 3.6.1.1 suggests that alligator gar would not be noticeably affected by the proposed action.

<u>Federally Protected Aquatic Species and Habitats</u>: All potential effects on the West Indian manatee, Guadalupe orb, false spike, green sea turtle, Kemp's ridley sea turtle, loggerhead sea turtle, and giant manta ray resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* Federally protected aquatic species. Additionally, the project activities are not anticipated to cause more than minimal adverse effects on essential fish habitat (EFH) and EFH managed species. The NRC staff's review and conclusions for impacts to federally protected ecological resources can be found in the biological evaluation presented in Appendix E.

3.6.3 Environmental Impacts of Operation

This section describes potential impacts on the existing aquatic ecosystems from operating activities at the LMGS site. A more detailed analysis of impacts on the existing aquatic ecosystems would be conducted during the environmental review for an OL, if LME submits an OL application. The NRC staff's analysis of the potential impacts on the aquatic ecosystems, biota, and Federal or State-listed species from operation activities at the LMGS site is based on the ER (LME 2025-TN12163), discussions with and information provided by LME and the State of Texas, and peer-reviewed articles or other documents. The NRC staff considered operational activities that could have potential to affect aquatic species and habitats, including the operation of the intake and discharges. Potential effects from intake operation include water withdrawal and consumption, as well as entrainment and impingement of aquatic biota. Potential effects from discharge operations on the aquatic habitats in the Dow Discharge Canal and West Coloma Creek include physical changes resulting from scouring and chemical discharges.

3.6.3.1 Site and Vicinity

During operations, the NRC staff expects that LME would continue to manage impacts to onsite streams in a manner similar to that described in EA Section 3.6.2.1 using BMPs required by the

SWPPP and TPDES under the TCEQ. The primary concerns related to aquatic resources during operations include water withdrawal and consumption, specifically, flow rate and whether there is enough water to operate the facility without a detrimental impact to the aquatic organisms in the GBRA Calhoun Canal and the Guadalupe River Basin. The LMGS would require makeup water to replace water lost to steam operations at the SDO. Smaller amounts of water would also be required for service water, demineralized water, fire protection, potable water, and other domestic uses. Based on an estimated average consumptive use rate of 6.3 cfs and maximum consumptive rate of about 6.7 cfs for LMGS operation (LME 2025-TN12163), average operation withdrawals would remove 9.92 cfs with a maximum withdrawal rate of 12.97 cfs, which is less than 0.8 percent of the average Guadalupe River flow upstream of the GBRA diversion, depending on the time of year. Additional information about water use during operations can be found in Section 3.4.3.

The EPA has developed regulations that address water withdrawals and intake flow restrictions for new facilities that produce electric power (40 CFR Part 125-TN254). These regulations implement Section 316(b) of the CWA and provide limits on the total design intake flow for all cooling-water intake structures. The limits depend on the type of waterbody in which the intake structure is located. For facilities that withdraw from a freshwater river or stream, the regulations limit the total design intake flow to no more than 5 percent of the mean annual flow.

Some treated wastewater and stormwater may also be discharged through the existing discharge on the Dow Discharge Canal, at the TPDES permitted outfall (002) (LME 2025-TN12163). Nonradiological effluent from the LMGS would be third party wastewater to the existing TPDES (TCEQ 2021-TN12608) permit for the SDO combined outfall at the Victoria Barge canal and would be treated to meet the existing acceptance criteria thereby causing no additional impact at the discharge location. Storm water from LMGS would primarily be discharged through a new storm water basin into West Coloma Creek. These discharges and releases from the stormwater basin would be managed in accordance with appropriate design standards and requirements of the TCEQ TPDES permit that minimize erosion and scour from stormwater.

LMGS would get its raw water pulled from the Guadalupe River by the GBRA. The GBRA Calhoun Canal system uses State-issued permits to divert water from the Guadalupe River near Tivoli, Texas into Goff Bayou and delivers it through the GBRA diversion and canal network. It distributes water to industrial, municipal, and agricultural customers in Calhoun County via a series of irrigation canals, checks, pump stations, and pipelines, including the GBRA Calhoun Canal where the LMGS intake would be located (GBRA 2025-TN12187). Water use during operations is discussed in Section 3.4.3. Heat from the LMGS is discharged through air-cooled heat exchangers or exported as steam to the SDO, and no heated water is expected to be discharged to offsite waterbodies.

3.6.3.2 Important Species and Habitats

West Coloma Creek supports a somewhat diverse range of species, especially downstream where it combines with East Coloma Creek to form Coloma Creek. There is one known State-listed species, the alligator gar, found in the creek. As the primary threats to the alligator gar are habitat loss due to river damming and overfishing, it is unlikely that the operation of LMGS and stormwater discharges into West Coloma Creek would affect it. LME is working with TCEQ to obtain a 401 Water Quality Certification for LMGS, which depends on meeting applicable water quality standards (LME 2025-TN12596). The LMGS stormwater management system will be designed to comply with TCEQ’s Multi-Sector General Permit for Industrial

Activities, and stormwater discharges will be monitored and controlled under TPDES permit no. 0000447000 (TCEQ 2021-TN12608). In compliance with 40 CFR Part 112 (TN1041), LME will develop and implement an SPCC plan for the LMGS site to minimize the risk of oil or hazardous material spills and outline response measures if spills occur. Operational monitoring would follow existing TPDES permit requirements to assess potential impacts from plant operations. Although any modifications to the current monitoring program have not yet been determined, regulatory requirements and BMPs should minimize impacts to West Coloma Creek's aquatic communities.

Federally Protected Aquatic Species and Habitats: All potential effects on the West Indian manatee, Guadalupe orb, false spike, green sea turtle, Kemp's ridley sea turtle, loggerhead sea turtle, and giant manta ray resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* Federally protected aquatic species. Additionally, the project activities are not anticipated to cause more than minimal adverse effects on EFH and EFH managed species. The NRC staff's review and conclusions for impacts to federally protected ecological resources can be found in the biological evaluation in Appendix E.

A more detailed analysis of impacts on aquatic resources due to operations would be conducted during the environmental review for an OL, if LME submits an OL application.

3.6.4 Environmental Impacts of Decommissioning

Potential impact depends on the decommissioning activity. The greatest potential decommissioning impact on protected species would be associated with the dismantling of the nuclear plant, including intake and discharge structures. Many activities that could affect ecological resources during decommissioning are the same types of activities that occur during reactor construction (see Section 3.6.2). Impacts resulting from decommissioning a nuclear power plant are analyzed in the Decommissioning GEIS (NRC 2002-TN7254) and would be further assessed as part of the environmental review for an OL, if LME submits an OL application.

3.6.5 Conclusions

The NRC staff concludes that the potential aquatic resources impacts of the construction, operation, and decommissioning of the LMGS would be not significant. This conclusion is based upon the above analysis and is supported by LME's design to minimize the footprint of disturbance and plans to implement appropriate BMPs to minimize sedimentation, erosion, and other disturbances to onsite and connected waterways.

3.7 Terrestrial Ecological Resources

3.7.1 Affected Environment

The LMGS and its vicinity lie within the Western Gulf Plain (EPA Level III Ecoregion 34) and its subdivisions, the Northern Humid Gulf Coastal Prairies and Mid-Coast Barrier Islands and Coastal Marshes (EPA Level IV Ecoregions 34a and 34h; Griffith et al. 2004-TN12207). The Western Gulf Plain ecoregion is characterized by relatively flat topography that is dominated by grasslands and croplands (LME 2025-TN12163: Section 2.4.1.1). The LMGS site is located within the Northern Humid Gulf Coastal Prairies ecoregion which is characterized by coastal plains historically dominated by grasslands and small oak clusters. Currently, most of the ecoregion has been converted to agriculture and urban areas. The 6 mi (10 km) vicinity surrounding the LMGS site extends to the Mid-Coast Barrier Islands and Coastal Marshes ecoregion which is characterized by saline, brackish, and freshwater marshes, barrier islands, and tidal flat sands and clays.

The 1,537 ac (622 ha) site consists of croplands (48 percent), herbaceous cover (29 percent), medium intensity developed land (13 percent), open water (5 percent) and scrub-shrub (<5 percent) (LME 2025-TN12163: Table 2.2-1 and Figure 2.4-2). Other cover types such as wetlands and evergreen forest cover less than 5 percent of the site.

In 2023, a wetlands delineation identified 17 wetlands onsite totaling approximately 26.8 ac (10.9 ha) according to standard protocols (LME 2025-TN12163: Section 2.4.1.2.2 and Figure 2.4-4). The delineation was conducted during the growing season and evaluated the occurrence of hydrophytic vegetation, hydric soils, and wetland hydrology according to USACE delineation protocols and Atlantic and Gulf Coastal Plain Regional Supplement (USACE 1987-TN2066, USACE 2010-TN12208). A majority of the delineated wetlands are classified as palustrine emergent wetlands. The applicant has not yet sought a determination regarding the regulatory status of the delineated wetlands under the CWA. Two of the wetlands, SD-WET-14 and SD-WET-15, are potentially federally jurisdictional (LME 2025-TN12163: Section 2.4.1.2.2 and Figure 2.4-4). They are palustrine emergent wetlands located within drainage ditches that flow into West Coloma Creek.

As described in Section 3.1.1, the entire LMGS site is situated within the area regulated under the Coastal Zone Management Act (NOAA 2025-TN12209). However, based upon the consistency certification package submitted by SDO and the lack of response from the Texas General Land Office, the LMGS is conclusively presumed to be consistent with the Texas CMP (LME 2025-TN12163: Section 4.1.1.1).

Biologists conducted multiple terrestrial surveys to characterize the habitat conditions and species present on the site and in the surrounding areas (LME 2025-TN12163: Section 2.4.1.3). They compiled a list of regionally occurring special status species, evaluated their potential for occurring onsite and offsite, conducted field surveys to evaluate terrestrial habitats, searched for nests, and compiled species lists for observed wildlife and plant species (LME 2025-TN12163: Section 2.4.1.3). For the LMGS site, the terrestrial species list includes 8 mammals, 59 birds, 8 amphibians, and 211 plants.

<u>Important Species and Habitats</u>

Section 2.4.1.3 of the ER (LME 2025-TN12163: Section 2.4.1.3) identifies and characterizes terrestrial species managed under Federal and State regulations. These analyses cover species listed or proposed to be listed as threatened or endangered under the ESA (Table 3-3), species designated with State-protected status, eagles protected under the Bald and Golden Eagle Protection Act (TN1447), and migratory birds protected under the Migratory Bird Treaty Act (TN3331). Terrestrial habitats regarded by the NRC as “important” for purposes of environmental review include any wildlife sanctuaries, refuges, preserves, or habitats identified by Federal or State agencies as unique, rare, or of priority for protection; wetlands and floodplains; and land areas identified as critical habitat for species listed by the FWS as threatened or endangered and other habitats of known or indicated interest (NRC 2024-TN10251).

Federally Listed Species

The action area for purposes of assessing impacts to federally listed resources under the ESA is defined as all areas that could be directly or indirectly affected by a Federal action and may include areas beyond the immediate area of the action (50 CFR Part 402-TN4312). For the present Federal action, the NRC staff defined the action area as the entire LMGS site, including areas not subject to disturbance by the proposed action to reflect possible indirect effects on habitats in the surrounding landscape. The action area also includes lands in the surrounding vicinity up to 1 mi (1.6 km) out from the perimeter of the LMGS site boundary that may experience increased noise and lighting from construction and operation activities.

The NRC staff conducted a desktop review of the LMGS action area, using Section 2.4.1.3 of the ER (LME 2025-TN12163: Section 2.4.1.3), available scientific literature and studies, and other publicly available information. The NRC staff accessed the IPaC database independently on November 25, 2025 (FWS 2025-TN12643), evaluated ESA-listed or proposed-to-be-listed species that could occur within the action area, and determined effects, which are presented in Table 3-3. Complete analyses of these federally protected species are presented in Appendix E.

Table 3-3 Federally Protected Terrestrial Species Evaluated for the Proposed Long Mott Generating Station

Common Name	Species	Potential to Occur within Action Area	Current Federal Status[(a)]	U.S. Nuclear Regulatory Commission Effect Determination[(b)]
Attwater's greater prairie-chicken	*Tympanuchus cupido attwateri*	No	FE	NE
Northern aplomado falcon	*Falco femoralis septentrionalis*	Yes	FE	NLAA
Whooping crane	*Grus americana*	Yes	FE	NLAA
Rufa red knot	*Calidris canutus rufa*	Yes	FT	NLAA
Piping plover	*Charadrius melodus*	Yes	FT	NLAA
Eastern black rail	*Laterallus jamaicensis*	Yes	FT	NLAA
Tricolored bat	*Perimyotis subflavus*	Yes	PFE	NLAA
Monarch butterfly	*Danaus plexippus*	Yes	PFT	NLAA

(a) Indicates protection status under the Endangered Species Act. FE = federally endangered; FT = federally threatened; PFE = proposed for Federal listing as endangered; PFT = proposed for Federal listing as threatened.
(b) The NRC staff makes its effect determinations for Federally listed species in accordance with the language and definitions specified in the FWS and National Marine Fisheries Service Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031). NLAA = may affect, but not likely to adversely affect.

State-Protected Species

The NRC staff independently reviewed the State-protected species list for two counties (Calhoun and Refugio Counties) within the 6 mi (10 km) vicinity of the LMGS (LME 2025-TN12163; TPW 2025-TN12205). Besides the federally listed species, which are discussed in detail in EA Appendix E, there is 1 State-endangered, 12 State-threatened, and 58 State-sensitive species potentially within these counties. Of these species, 26 have potential habitat onsite. In February 2024, TPWD stated its concerns about water consumption and conflicts with species of greater concern, including the whooping crane, which is both federally and State-listed. In addition, TPWD had several recommendations for construction including BMPs, lighting, and review of applicable laws and the list of protected species (LME 2025-TN12163: Agency Correspondence).

Eagles and Migratory Birds

The Bald and Golden Eagle Protection Act (TN1447) extends regulatory protections to the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*). The Act prohibits anyone without a permit from the Secretary of the Interior from “taking” bald eagles or golden eagles, including their parts, nests, or eggs. The Migratory Bird Treaty Act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale any migratory bird or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued under Federal regulations (TN3331). The Bald eagle was observed within the LMGS vicinity, but no raptor nests were observed. No bird species listed under the Endangered Species Act (ESA) were observed during field surveys on the LMGS site or LMGS vicinity. No raptor nests observed on site during field surveys (LME 2025-TN12596).

Of the 29 birds of conservation concern recognized as occurring in the landscape surrounding the site (FWS 2025-TN12643), American golden-plover, Forster’s tern, and lesser yellowlegs have been recorded within the past 10 years at the Dow plant (eBird 2025-TN12210, eBird 2025-TN12211, eBird 2025-TN12212). All other birds of conservation concern besides the prairie loggerhead shrike have been documented in the vicinity (Exelon 2012-TN12213, iNaturalist 2025-TN12214, eBird 2025-TN12215) and are likely to inhabit or use the LMGS site or nearby habitats during migration and the breeding season.

Important Terrestrial Habitats

Important terrestrial habitats include any wildlife sanctuaries, refuges, preserves, or habitats identified by Federal or State agencies as unique, rare, or of priority for protection; wetlands and floodplains; and land areas identified as critical habitat for species listed by the FWS as threatened or endangered and other habitats of known or indicated interest (NRC 2018-TN6006). Important habitats in and around the LMGS site include streams and onsite or offsite wetlands, including a constructed wastewater treatment pond and wetland complex on the west side of TX-185, just outside of the LMGS site. This area is owned by Dow and managed in conjunction with Federal and State agencies for wildlife (LME 2025-TN12163: Section 2.4.1.6).

The Guadalupe Delta WMA is within the vicinity of the LMGS. Within the LMGS region, there is whooping crane critical habitat at the Welder Flats WMA 12 mi (19 km) south of site and piping plover critical habitat 18 mi (29 km) south on Matagorda Island within Aransas National Wildlife Refuge (FWS Undated-TN12216). No designated critical habitat for terrestrial species occurs within the LMGS site (FWS 2025-TN12643).

TPWD Rare Plant Community of Texas (TPW 2011-TN12217) lists nine rare plant communities within Calhoun and Refugio Counties: black mangrove shrubland, southern umbrella-sedge, southern beaksedge herbaceous vegetation, shoregrass herbaceous vegetation, Texas coastal bend live oak-redbay forest, sandhill coastal prairie, Texas coastal bend interdune swale grassland, Colima-panalero-chapote matorral, and sugarberry-cedar elm calcareous floodplain forest. During offsite reconnaissance, a representative example of the Texas Coastal Bend Interdune Swale Grassland was identified approximately 13 mi (21 km) southeast of the LMGS site, just east of the Welder Flats WMA (LME 2025-TN12163: Section 2.4.1.6).

Invasive Species

Invasive species are identified as non-native organisms whose introduction causes or is likely to cause economic or environmental harm or harm to human, animal, or plant health (Executive Order 13751, 81 FR 88609-TN8375). Texas Department of Agriculture Noxious and Invasive Plant contains 6 invasive plant species and 26 noxious weeds (TX Admin. Code 4-19-TN12218). LME identified 17 invasive plants onsite.

3.7.2 Environmental Impacts of Construction

The terrestrial ecological impacts from the totality of building LMGS, including preconstruction and construction, include a combined permanent disturbance of approximately 320.1 ac (130 ha) of terrestrial habitat on the site (LME 2025-TN12163). Most of the permanent impacts (241.6 ac [98 ha]) involve cropland (Figure 3-4). Out of the 23.5 ac (9.5 ha) of palustrine emergent wetlands onsite, approximately 0.9 ac (0.4 ha) would be permanently filled and an additional 1 ac (0.4 ha) would be permanently converted to another vegetation type. Out of the 3.3 ac (1.3 ha) of palustrine scrub-shrub wetlands onsite, 1.8 ac (0.7 ha) would be permanently converted to another vegetation type but none would be permanently filled. Temporary impacts would total approximately 401 ac (162 ha), which would be revegetated or restored after completion of construction. To minimize the spread of invasive species, the applicant plans to restore temporarily affected areas with native species and periodically monitor and implement control measures such as herbicide application, hand pulling, or mechanical removal (LME 2025-TN12163).

Potential effects from building new reactors include permanent and temporary habitat loss; conversion, fragmentation, and degradation of upland and wetland habitats; direct mortality of less mobile species or individuals, construction noise on wildlife, and wildlife collisions with vehicles, plant buildings and structures, and construction equipment.

The applicant provided details about the impacts of proposed preconstruction and construction activities in Sections 1.3, 1.4, 3.9, 4.3.1, 5.6.1, and 6.3.2 of the ER (LME 2025-TN12163: Sections 1.3, 1.4, 3.9, 4.3.1, 6.3.2), including schedules, permits, and BMPs; and clearing, grading, dewatering, herbicide usage, management of excavated soils and construction wastes, placement of foundations, and constructing buildings and infrastructure. Maintenance activities would involve minimal pesticide and herbicide application in the onsite transmission line corridor, but would be prohibited within wetlands and streams (LME 2025-TN12163: Section 5.6.1). The vegetation management for the transmission lines and switchyards includes mechanical (i.e., mowing, pruning, weeding) and chemical (i.e., herbicide) controls (LME 2025-TN12596).

TCEQ requires a Construction General Permit for stormwater discharges from any clearing, grading, or excavation project disturbing at least 5 ac (2 ha) (not necessarily contiguous), when part of a larger common development plan. Construction operators who obtain this permit must prepare a SWPP detailing potential pollution sources and proposed BMPs to be used to prevent stormwater contamination.

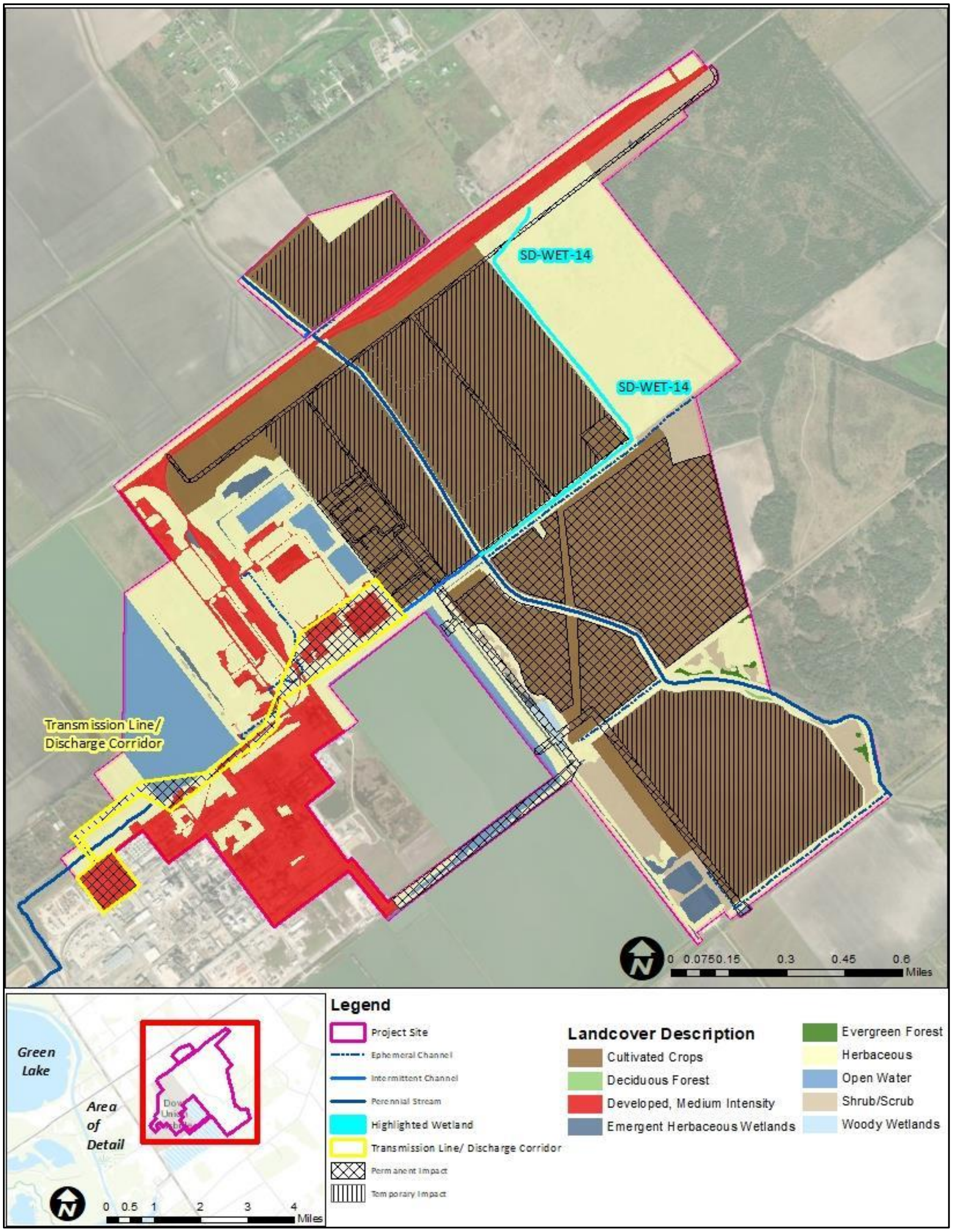

Figure 3-4 Permanent and Temporary Impacts on the Long Mott Generating Station Site. Source: LME 2025-TN12163: Figure 4.3-1.

Active nest surveys and avoidance buffers may be implemented to minimize impacts to migrating birds if vegetation clearing occurs within bird nesting season (March 15 through September 15) (LME 2025-TN12163: Section 4.3.1). If vegetation clearing occurs within nesting season, TPWD recommends conducting nest surveys 5 days or less prior to activities. LME has stated that workers will conduct daily walkdown surveys to avoid nest establishment in or in the immediate vicinity of work areas (LME 2026-TN12669). In addition, TPWD recommends a buffer zone of 328 ft (100 m) for raptor nests during February 1st through July 15th (LME 2025-TN12163: Appendix 1A). LME has committed to limiting equipment speed to 5 mph or less to the extent practicable during vegetation clearing (LME 2026-TN12669). Additional information on the recommendations from other agencies is provided in Appendix E.

Construction noise and vibrations can affect wildlife. Estimated construction equipment sound levels are expected to range up to 80–85 a-weighted decibel (dBA) at 50 ft (15 m) (LME 2025-TN12163: Section 4.3.1). Ambient noise from traffic, trains, and harvesting tractors observed on the site ranges from 64.7 dBA to 77.6 dBA (LME 2025-TN12163: Table 2.9-2). Construction noise may temporarily discourage some terrestrial wildlife from using directly adjacent habitat, but sensitive wildlife likely already avoids the area adjacent to the currently operating SDO industrial facilities and ambient noise. Noise controls may be implemented during constriction in compliance with laws and regulations (LME 2025-TN12163: Section 4.6.2).

Birds and bats can be injured or killed by collision with tall buildings, structures such as meteorological towers, transmission towers and lines, or equipment such as construction cranes. Building activities for LMGS would require a heavy lift crane of unspecified height to be temporarily present onsite (LME 2025-TN12163: Section 4.4.1.3). Proposed building elevations would range from 50–199 ft (15–60 m) above ground level (LME 2025-TN12163: Table 3.1-1, Request for Confirmation of Information TE-3). The applicant proposed building two 138 kilovolts (kV) transmission lines with 15 transmission structures. Birds nesting on power line towers and poles during construction have a greater risk of collisions, because nesting birds have more flights close to power lines (APLIC 2006-TN794). The applicant would follow applicable Federal and State regulatory requirements and Avian Power Line Interaction Committee (2012-TN6779) guidelines to reduce negative impacts to birds when finalizing the design and installing the proposed transmission lines and structures (LME 2025-TN12163: Section 4.3.1, LME 2025-TN12605).

Terrestrial wildlife moving across the site could be killed or injured by collision with machinery and vehicles. However, while collisions could result in loss of individuals, traffic mortality rarely limits population size (Forman and Alexander 1998-TN2250). Because of the abundance of similar terrestrial habitat surrounding the site, most mobile individuals could be expected to avoid areas of heavy vehicular use and instead move through areas of less disturbed habitat.

3.7.3 Environmental Impacts of Operation

This section describes potential impacts on terrestrial ecological resources from operating activities at the LMGS site. A more detailed analysis would be prepared during the environmental review for an OL, if LME submits an OL application. The analysis of the potential impacts on the terrestrial ecosystems, biota, and State-listed species from operations of LMGS is based on the applicant’s ER (LME 2025-TN12163: Section 5.10), along with the NRC staff’s independent analyses of terrestrial habitats and species.

No additional terrestrial or wetland habitat would be physically disturbed by operations beyond what was disturbed for the existing facilities. Other potential impacts on terrestrial ecological resources from operations would be similar to but less than those described for construction. Noise generation would affect wildlife as described above for construction, but noise generation would be from quieter sources than heavy construction equipment. The noise would also take place next to the existing SDO industrial facilities that generate noise typical of operating industrial facilities. Operational impacts on terrestrial ecological resources would result primarily from landscaping and facility maintenance, operations noise, and potential collisions with vehicles, fences, transmission lines, buildings, and other tall structures. Herbicides would be applied for maintenance as needed on transmission and steam lines, parking lots, operating areas, and access roads, as well as any targeted invasive plant management, following the herbicides' labeled uses (LME 2025-TN12596). LME would use BMPs for landscaping, herbicide application, and stormwater management.

Terrestrial biota may be exposed to radionuclides from direct contact, inhalation, or ingestion of food or soil. DOE Standard 1153-2019 (2019-TN6817) provides methods, models, and guidance that can be used to characterize radiation doses to terrestrial and aquatic biota exposed to radioactive material. The following DOE guidance dose rates are the levels below which no adverse effects to resident populations are expected: riparian animal: 0.1 radiation-absorbed dose per day (rad/day) (0.001 grays per day [Gy/day]); terrestrial animal: 0.1 rad/day (0.001 Gy/day); terrestrial plant: 1 rad/day (0.01 Gy/day); aquatic animal: 1 rad/day (0.01 Gy/day). The NRC requires nuclear power plants to maintain a radiological environmental monitoring program (REMP) in accordance with NRC regulations. REMP monitoring would confirm that radiological emissions are below regulatory limits, and any exceedances would be detected and addressed. More information about human and biota responses to radiation can be found in Section 3.10.

LMGS would utilize a dry cooling system that dissipates heat through mechanical fans over a system of heat exchanger tubes and doesn't release water vapor or salts. The ACCs would be approximately 98 ft (30 m) tall (LME 2025-TN12163: Table 3.1-1).

3.7.4 Environmental Impacts of Decommissioning

This section describes the environmental impacts associated with the termination of operations and the decommissioning of LMGS at a future date. All operating nuclear power plants are expected to terminate operations and undergo decommissioning when a decision is made to cease operations. The overall impact depends on the decommissioning activity. Many activities that could affect ecological resources during decommissioning are the same types of activities that occur during reactor construction.

The NRC staff expects that land disturbance during decommissioning would take place mostly within already developed lands within the onsite area occupied by the LMGS facilities but may require storage of debris or equipment in adjoining areas of previously disturbed soils elsewhere on the site. The NRC staff also expects that noise generated during decommissioning may involve intermittent generation of higher noise levels than during operation as buildings and structures are demolished, with effects on wildlife as described above for construction. The NRC staff would assess the impacts of decommissioning in more detail as part of the environmental review of an OL, if LME submits an OL application.

3.7.5 Conclusions

The NRC staff concludes that the potential terrestrial ecological resources impacts of the construction, operation, and decommissioning of the LMGS would be not significant. This conclusion is based upon the above analysis and reflects that the project would be situated in an existing industrial site and land disturbance would be limited to previously developed lands and croplands. The applicant plans to adhere to required site permits and BMPs for the construction of LMGS, which would help reduce impacts.

3.8 <u>Historic and Cultural Resources</u>

This section describes the cultural background and the historic and cultural resources at the LMGS site and its surrounding area. NEPA (42 *United States Code* [U.S.C.] 4321 et seq.) (TN661) requires Federal agencies to consider the potential effects of their actions on the human environment, which includes aesthetic, historic, and cultural resources as these terms are commonly understood, including such resources as sacred sites. Section 106 of the NHPA (54 U.S.C. § 306108-TN4839) requires Federal agencies to consider the effects of their undertakings on historic properties. While the NHPA emphasizes impacts on historic properties, for NEPA compliance, impacts on cultural resources that are not eligible for or listed in the National Register of Historic Places (NRHP) would also need to be considered. In accordance with 36 CFR 800.8(c) (TN513), the NRC complies with the obligations required under NHPA Section 106 through its environmental review process under the NEPA.

Historic and cultural resources describe material culture left behind from past human activity. These resources include sites, objects, landscapes, structures, or other natural features of significance to groups of people who have traditional association with it. Historic properties are defined as resources eligible for listing in the NRHP. The NRHP is the Nation's official list recognizing buildings, structures, objects, sites, and districts of national, State, or local historical significance which merit preservation. The criteria for eligibility are listed in the 36 CFR 60.4 (TN1682) and include (a) association with significant events in history; (b) association with the lives of persons significant in the past; (c) embodiment of distinctive characteristics of type, period, or construction; and (d) sites or places that have yielded, or are likely to yield, important information.

3.8.1 Affected Environment

The proposed action is the issuance of a CP for the construction of the LMGS. The APE consists of approximately 1,537 ac (622 ha) of the LMGS site and represents the location and extent of areas required for all LMGS-related construction and operation activities. A 0.5 mi (0.8 km) buffer has been incorporated to account for potential indirect impacts on architectural resources and historic properties, if present (Figure 3-5). This determination is made irrespective of land ownership or control.

Cultural Background

Documented human occupation in Texas began prior to the Paleoindian Period, roughly 20,000 years ago. Two archaeological sites are known to contain deposits dating to this time. The Gault site in Central Texas has well-dated archaeological deposits dating before the academically accepted earliest known occupation, Clovis, associated with the Paleoindian period. Excavations have yielded lithic artifacts and other cultural material (large bifaces, macro-blades, flaked tools) predating Clovis culture, dating between 22,000 and 16,000 years ago (TSHA 2025-TN12506). The Debra L. Friedkin site in Bell County, Texas is another pre-Paleoindian site, with archaeological evidence of early site use starting approximately 16,000 years ago (Waters et al. 2018-TN12507).

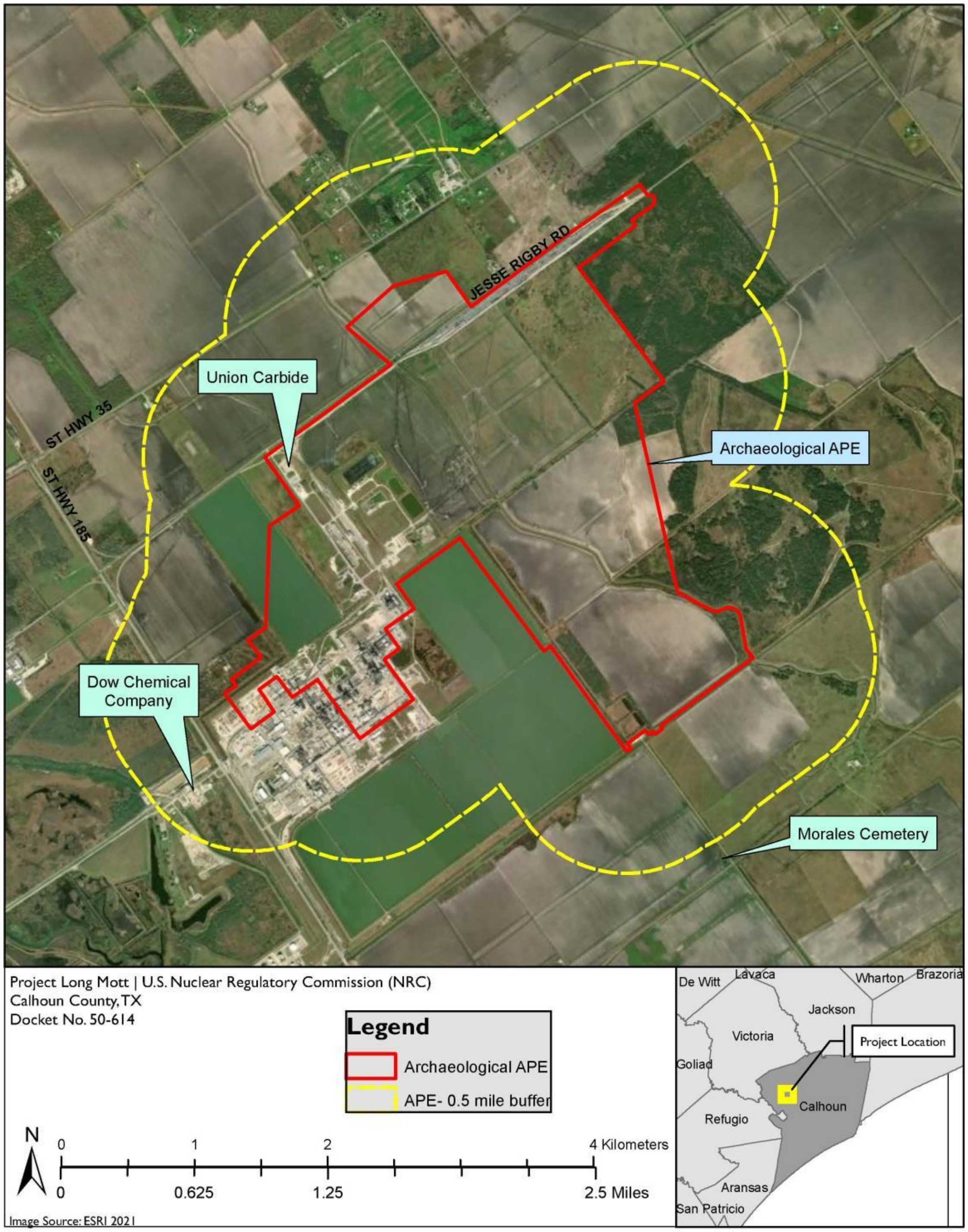

Figure 3-5 Archaeological Area of Potential Effect at the Long Mott Generating Station Site

The Paleoindian Period (13,500–8,000 BC) is typically characterized by small groups of highly mobile nomadic hunters who followed big game such as mammoths, mastodons, and bison across the landscape. The Clovis and Folsom cultures typically represent this period. Locally, the Golondrina Complex (~10,000 years ago) is a hallmark of the South Texas Plains, while the

Angostura and Scottsbluff point types mark the transition into the Early Archaic phase (Hester Undated-TN12509). Clovis points have been found near Port Lavaca, along Oso Creek, and in San Patricio County (TSHA 2025-TN12510).

The Archaic Period (8,000 BC–AD 700) represents a continuation of the hunter/gatherer subsistence economy practiced during the Paleoindian Period. The archaeological record reveals a shift in settlement patterns during this period. People adapted to warmer environments, expanding plant and small-game foraging, and developing specialized tools. Toolkits from this period show the predominance of hand stones and milling slabs for the processing of hard seeds and other plant foods. The Archaic Period is divided into the Early, Middle, and Late eras. The Early Archaic in the Coastal Bend is typified by stemmed points such as Baird and Taylor-style projectiles, documented from the coast into the interior of the State. The Middle Archaic Period is mainly typified by Calf Creek points. Typical Late Archaic projectile varieties across South Texas include Ensor, Frio, Fairland, and Ellis styles (TSHA 2025-TN12510).

The Late Prehistoric Period (AD 700–1500) in south Texas is characterized by the emergence of the bow and arrow and intensified use of coastal and inland resources. Scallorn, Edwards, and Zavala points began to emerge around 1,300 years ago (TSHA 2025-TN12510). Other material culture such as perforators, small and large end scrapers, and flake knives have also been noted in Late Prehistoric sites. The Kirchmeyer site in Calhoun County represents Late Prehistoric activity in the region. Artifacts identified at the site have included Rockport-style ceramics and metal fragments, noting transitions into early colonial settler times. Mesoamerican-influenced artifacts have also been identified in this region. Taylor (2025-TN12513) analyzed 29 human bone artifacts from multiple Late Prehistoric sites in South Texas that have appeared to have been modified into musical instruments, similar to the Aztec's *omichicahuaztli*, musical rasps made out of femurs (Taylor 2025-TN12513).

The Long Mott area of Texas was inhabited by the Karankawa Tribe prior to European exploration (Ricklis 1996-TN12224). The Karankawas nomadic people relied heavily on the coastal estuaries for their diet, which included fish, shellfish, bison, and deer (Lipscomb and Seiter 2020-TN12225). Their subsistence methods involved hunting, fishing, and gathering, adapting to the seasonal availability of food. The Tribe's first recorded interaction with Europeans occurred in 1528, documented by Álvar Núñez Cabeza de Vaca, a survivor of Pánfilo de Narváez's 1527–1528 expedition, who provided crucial ethnological insights into their way of life (Johnson 2020-TN12226). Although these early encounters introduced European diseases, it was not until over a century later that substantial European interactions occurred (Lipscomb and Seiter 2020-TN12225). The Spanish attempted to convert the Karankawa to Christianity by establishing missions like Mission Espíritu Santo in Goliad, about 45 mi (72 km) northwest of the project area (Roell 2017-TN12227). Following Mexican independence from Spain in the 1820s, changes in land distribution began, which were further influenced by Texas's declared independence from Mexico in 1836 and its annexation by the United States in 1845, leading to further shifts in settlement patterns and land use (Davis 2016-TN12237).

Historic and Cultural Resources at LMGS

In Texas, the Texas Historical Commission (THC) is responsible for administering Federal and State-mandated historic preservation programs to identify, evaluate, register, and protect the State's archaeological and historic resources under the direction of the Texas SHPO. The THC maintains the *Texas Archeological Sites Atlas* (Atlas) electronic database, which inventories all the registered cultural resources within the State, including those within the LMGS vicinity. The

NRC staff queried the Atlas database to gain a better understanding of the historic and cultural resources within the region. A 0.5 mi (0.8 km) radius was used to identify all historic properties that could be potentially affected by the undertaking.

The Atlas database search indicated that there are no previously recorded archaeological sites, historic buildings, or historic properties within the archaeological APE or the 0.5 mi (0.8 km) buffer area. The closest historic property to the project area is the Victoria Barge Canal, just over 1.5 mi west of the project area. In 1945, Congress authorized the construction of the 35 mi (56 km) long canal through the Rivers and Harbors Act of 1945. Construction on the Calhoun County portion began in 1954 and extended into Victoria County in 1958 (TSHA 2021-TN12602). Today, the USACE maintains the canal. In addition to the canal being a significant economic resource for the county, it is also a recreational spot for general aquatic activities and fishing. The canal was determined eligible for listing on the NRHP in 2023 under Criterion A for its association with maritime history, industry, and transportation on a local level (Stantec 2023-TN12239).

Although not considered eligible for the NRHP, the Moreman Community Cotton Gin is within the 0.5 mi (0.8 km) buffer area, about 2,526 ft (770 m) north of the APE. The gin is part of a complex that originated in 1934 and is recognized as being one of the earliest cotton gins in the area. In 2016, the State added a historical marker near the property noting its importance as a community center and its contribution to the county’s early economic development in the early 1900s. Over the years, the complex has been heavily modified to its current state but still continues to operate today, providing economic and industrial opportunity to local cotton farmers (LME 2025-TN12251; THC 2020-TN8672).

LME indicated that no Traditional Cultural Properties (TCPs) are recorded within the APE or within a 1 km (0.6 mi) buffer area surrounding the APE. Further, LME confirmed that no potential TCPs were identified during WSP USA Environment & Infrastructure, Inc.’s (WSP’s) survey (LME 2025-TN12596). To date, no TCPs have been identified by NHPA Section 106 consulting parties.

Previous Surveys

Two previously conducted archaeological surveys are recorded in the Atlas database (#8400009819 and #8400009824). However, the Atlas search provided no details regarding the purpose of the surveys, the investigating firm, the sponsoring agency(ies), or the results of the field investigation. The only information provided is that both surveys occurred sometime in May 2001. Both surveys are over 1,312 ft (400 m) northeast of the APE (THC 2020-TN8672).

One built environment survey has been conducted in the project area. Between October 2021 and October 2022, Johnson, Mirmiran & Thompson, Inc. (now Stantec), conducted a countywide built environment survey across four counties (Aransas, Calhoun, Jefferson, and Refugio) to document and assess impacts to historic resources that resulted from Hurricane Harvey. In Calhoun County specifically, 2,973 historic-age resources were documented and evaluated for potential listing on the NRHP. This consisted of 2,917 historic age buildings, 27 sites, objects, and structures, 20 neighborhoods/communities constructed after World War II, six mobile home communities, and three industrial complexes. Of the 2,973 documented resources, 2,896 resources were recommended not eligible for the NRHP, 43 properties were recommended eligible, two resources were already listed on the National Register (the La Salle monument and the Matagorda lighthouse) and three historic districts were recommended eligible for listing on the NRHP: Port Lavaca, Lynnhaven, and Point Comfort. The Port Lavaca historic district was inventoried individually and collectively as a historic district due to the number of resources within the district that were constructed prior to World War II. Stantec recommended 29 properties as contributing to the district and 6 properties as non-contributing to the district. The Point Comfort district had been previously determined eligible, therefore Stantec reassessed the district and maintained its eligibility determination. Due to all the buildings being constructed after 1949, Lynnhaven was recorded as one resource, consistent with the survey methodology approved by the THC (Stantec 2023-TN12239).

New Surveys

LME contracted the environmental firm WSP in 2023 to complete archaeological and architectural surveys of the proposed action area to support its submittal of the CP application.

For the archaeological survey, WSP surveyed a total of 1,548 ac (626 ha) but documented the results in two separate reports. The first report covered 617 ac (250 ha) surveyed for DOE's funding action pertaining to siting activities at LMGS (Hunter and Cantrell 2023-TN12277). The remaining 930 ac (376 ha) were documented in the supplemental report included in the ER (LME 2025-TN12251). Prior to the field investigation, WSP provided its planned methodology to THC for their concurrence, which occurred June 7, 2023 (LME 2025-TN12596). A total of 382 shovel tests were excavated across the APE in 75–100 m (246–328 ft) intervals. Although 75 m (246 ft) exceeds the suggested 30 m (100 ft) interval recommended by the Council of Texas Archaeologists, the intervals were deemed appropriate by THC for the project area due to the disturbed nature of the APE resulting from prior industrial development in the area. No cultural resources were identified in the survey. THC concurred with WSP's determination of No Historic Properties Affected February 16, 2024 (LME 2025-TN12163).

An architectural survey was conducted the same week as the archaeological survey. A total of 10 historic-age properties were identified within 0.5 mi (0.8 km) of WSP's architectural APE. Seven of the resources were previously documented by Stantec in their 2021–2022 county-wide historic resources survey. In addition to re-visiting the properties Stantec recorded, WSP identified and recorded three additional new resources in their survey (AR 2, AR 3, and AR 7). AR 2 consists of the remnant structural foundations and one extant structure of the former GAF Chemicals Corporation (now ISP Technologies, LLC) industrial facility, located northeast of State highway 185. AR 3 is about 850 m (0.5 mi) northwest of AR 2 and consists of 2 utility structures associated with the former GAF Chemicals Corporation. AR 7 is a residential building constructed in 1965. None of the resources inventoried during WSP's survey were recommended eligible for the NRHP. THC concurred with the recommendation February 16, 2024 (LME 2025-TN12163).

Consultation

The NRC staff initiated NHPA Section 106 consultation with the Advisory Council on Historic Preservation (NRC 2025-TN12515), the THC (NRC 2025-TN12536), and 21 federally recognized Tribes (NRC 2025-TN12537). In the letters, the NRC staff provided information about the proposed action, defined the APE, and indicated that the NHPA review would be integrated with the NEPA process in accordance with 36 CFR 800.8(c). Responses were received from the THC (THC 2025-TN12538), the Advisory Council on Historic Preservation (ACHP 2025-TN12539), Kickapoo Tribe of Texas (NRC 2025-TN12568), the Comanche Nation (Comanche Nation 2025-TN12612), and the Cherokee Nation (Cherokee Nation 2025-TN12540).

On March 5, 2026, the NRC staff provided the historic and cultural resources section of the EA, including the NRC staff's preliminary determination of No Historic Properties Affected, to the consulting parties for review and comment. The Delaware Nation responded on March 5, 2026, confirming that no historic properties are within the APE (Delaware Nation 2026-TN12914). The THC concurred with the NRC staff's findings and determination on March 18, 2026 (TSHA 2026-TN12913). On April 16, 2026, the Alabama-Quassarte Tribal Town declined to participate as a consulting party stating that they identified no concerns about potential impacts to properties of religious or cultural significance to their Tribe (Alabama-Quassarte 2026-TN13189). The Tonkawa Tribe of Oklahoma submitted comments May 5, 2026, requesting notification in the event that any human remains, funerary objects, or other evidence of historical or cultural significance are inadvertently discovered (Tonkawa Tribe 2026-TN13226).

3.8.2 Environmental Impacts of Construction

Construction can be the most impactful activity to cultural resources due to ground-disturbing activities associated with excavation, vegetation clearing, utility installation, and facility construction. In this case, the project area has been impacted by previous construction activities, including the construction of the existing Seadrift plant and surrounding facilities. The area has also been impacted by ongoing farming and cultivation. In September 2025, DOE analyzed and approved ground-disturbing activities as part of site characterization and environmental monitoring activities within the project footprint of the current proposed action (DOE 2023-TN12667). The installation and sampling activities reviewed in September 2025 by DOE for its proposed action are considered preconstruction activities under NRC's regulatory purview; therefore, they are mentioned as known impacts from construction but are not analyzed in this EA as part of the NRC's proposed action. The scope reviewed by DOE included sampling and characterization of water, soil, rock, or contaminants, installation and operation of field instruments, well drilling for sampling and monitoring of groundwater, installation and operation of air monitoring equipment, and the installation, operation, and monitoring of a 200 ft (60 m) meteorological tower (LME 2025-TN12596). Based on the negative findings of cultural resources from WSP's archaeological surveys (Hunter and Cantrell 2023-TN12277; LME 2025-TN12251), DOE determined that the activities would not impact historic and cultural resources within the project area.

For the NRC's proposed action, it is expected that little to no impacts to historic and cultural resources or historic properties are to occur within the APE. However, construction activities typically excavate at deeper depths than archaeological surveys do. If cultural resources were to be inadvertently discovered, they would most likely be in disturbed contexts. Based on confirmatory information provided by the applicant, the NRC staff understands that LME intends to have an Inadvertent Discovery Plan in place prior to the beginning of construction to cover the inadvertent discovery of cultural resources, if applicable (LME 2025-TN12596). Indirect impacts from construction (visual or auditory) to historic properties such as the NRHP-eligible Victoria Barge Canal would be temporary. Any impacts would most likely be limited by the existing SDO facility, existing structures, vegetation, and local terrain.

3.8.3 Environmental Impacts of Operation

As previously stated, the majority of impacts to historic and cultural resources and/or historic properties mostly result from physical ground-disturbing activities. Once the plant is operational, it is expected that there would be little to no impacts to potential unknown cultural resources in the area. If additional ground-disturbing operational or maintenance activities were to occur, it would most likely occur in previously disturbed contexts impacted by the construction described in Section 3.8.2. Similar to construction impacts, indirect impacts from plant operation to historic and cultural resources and historic properties within the region would most likely be limited due to the existing SDO facility, structures, vegetation, and local terrain.

3.8.4 Environmental Impacts of Decommissioning

Impacts to historic and cultural resources and historic properties from decommissioning are expected to be similar to those described in Sections 3.8.2 and 3.8.3. Further analysis of potential impacts would be assessed when the applicant submits a license amendment request for decommissioning activities. For the proposed action, because there are no known historic and cultural resources or historic properties within the APE or within 0.5 mi (0.8 km) of the APE, impacts to historic and cultural resources and historic properties would not be expected.

3.8.5 Conclusions

For the purposes of NHPA, the proposed action would result in No Historic Properties Affected, as defined in 36 CFR 800.4(d)(1) (TN513). There would be no impact to historic and cultural resources. The NRC staff determined that impacts to historic and cultural resources and historic properties related to construction, operations, and decommissioning of the LMGS would be not significant.

3.9 Socioeconomics

This section describes the socioeconomic impacts of the proposed agency action including regional and local economic and tax impacts. Socioeconomic impacts are determined by the amount of change in social and economic conditions during construction, operation, and decommissioning. For example, job creation and the buying of goods and services during construction and operation could affect regional employment, income, and tax revenue. In addition, the proposed action would generate two types of jobs: (1) construction and decommissioning jobs, which are transient, short-term, and not likely to have a long-term socioeconomic impact, and (2) operations jobs, which are generally long term and have a greater potential for permanent socioeconomic impact.

Transportation impacts are defined in terms of changes in level of service conditions on local roads. Additional vehicles during construction, operations, and decommissioning could lead to traffic congestion and level of service impacts on local roadways and delays at intersections.

3.9.1 Affected Environment

This section briefly describes certain socioeconomic conditions that could be affected by the construction, operation, and eventual decommissioning of LMGS. Section 2.5 of the ER (LME 2025-TN12163), provides more detailed information on regional and local socioeconomic conditions that could be affected by the construction and operation of the LMGS. This information is incorporated here by reference.

The residential distribution of the LMGS operation workforce would likely be the same as the residential distribution of the current SDO workforce. The largest percentage of SDO workers reside in Victoria County, Texas (64.3 percent). The neighboring counties of Calhoun (where the LMGS site is located) and Jackson provide 16.5 percent and 3.2 percent of SDO workers, respectively. Workers from these counties, together with Victoria County, account for approximately 84 percent of total SDO employment (753). The remaining 16 percent of the workforce commute from counties outside the three-county region. Because most of the SDO operational workforce resides in Victoria, Calhoun, and Jackson Counties, these three counties represent the socioeconomic region of influence (ROI) and the basis for evaluating impacts.

The State of Texas does not tax personal income. However, Texas does impose a franchise tax on taxable entities formed or organized in Texas or doing business in Texas. These include corporations, limited liability companies, banks, State-limited banking associations, savings and loan associations, corporations, professional corporations, partnerships, trusts, professional associations, business associations, joint ventures, and other legal entities. Texas also imposes a miscellaneous gross receipts tax on utility companies servicing cities and towns with a population of 1000 or more. The tax is based on the population of the incorporated area where the service is provided.

Property taxes in Texas are levied by local governments, school districts, and special purpose districts. Districts are responsible for appraising property at market value each year. The Texas Comptroller of Public Accounts conducts School District Property Value Studies to determine the taxable value of property in each school district—affecting a school district's State funding.

The LMGS site is located on 13 tax parcels in Calhoun County, with a combined assessed property value of $406,620. This results in an annual property tax payment of $5,728 to the county and other tax jurisdictions. In addition to Calhoun County, these tax authorities include CCGCD, Calhoun Independent School District, Water Control and Improvement District 1, and Drainage District 10.

In preparation for the development of LMGS, Dow entered into a property Tax Abatement Agreement with Calhoun County. The agreement exempts Dow from paying annual property taxes for 10 years—comprising the LMGS construction period and the first few years of operation. Dow will not be making property tax payments for LMGS during this time. However, in accordance with the Property tax abatement agreement, Dow agreed to pay $4 million to Calhoun County in lieu of the property tax payments.

Dow will resume paying property taxes after 10 years, in accordance with State and local tax law. In addition, improvements at the LMGS site could increase its property value and the annual amount of property taxes paid.

ER Table 2.5-16 (LME 2025-TN12163) provides information on housing units in the socioeconomic ROI, most of which are located in Victoria County. Approximately 70 percent of the units in 2021 were owner-occupied with approximately 30 percent available for rent or sale. In addition, the Gulf Coast region around LMGS is a major recreational area with many hotels, motels, recreational vehicle parks, campgrounds, and vacation rentals.

3.9.2 Environmental Impacts of Construction

The socioeconomic impact of LMGS construction on the local and regional economy and tax base would vary, with the greatest impact occurring in communities where the majority of construction workers reside and spend their income. As a result, some communities could experience an economic boom from increased income and tax revenue generated by the purchase of goods and services during construction and an increased demand for temporary (rental) housing.

Construction of the proposed LMGS would last over 44 months and could require up to 1,473 workers during peak construction. At peak, this number of workers represents about 2.4 percent of the total civilian labor force in the socioeconomic ROI in 2023. The contractor(s) hired to construct LMGS would be responsible for assuring workers, by skill, craft, and trade, are available when needed—including arranging for temporary housing, if necessary. Some construction workers would also reside and commute from within the ROI. This would result in little if any increased demand for temporary housing. As discussed in LME's ER Section 2.5, there is plenty of available rental housing in the socioeconomic ROI (LME 2025-TN12163: Table 2.5-16). Given the number of construction workers, housing impacts during construction would be not significant.

Dow would pay no property taxes during LMGS construction due to the 10-year Tax Abatement Agreement with Calhoun County. In addition to the $4 million payment to Calhoun County, other sources of revenue would come from sales taxes and fees paid during construction for purchases of materials and sales or leases of equipment and other items in the socioeconomic ROI. Tax and fee revenue would mostly benefit the Calhoun County. Local communities would likely experience some of the economic benefits from sales tax revenue and income expenditures during construction. Given the duration of construction (less than 4-years), tax revenue impacts in the socioeconomic ROI would not be long term or significant.

3.9.3 Environmental Impacts of Operation

Prior to LMGS startup and the commencement of operations, local communities would see an influx of up to 96 operations workers with their families and an increased demand for permanent housing and public services (LME 2025-TN12163). These communities would also experience the economic benefits from increased income and tax revenue generated by the purchase of goods and services needed to operate and maintain the LMGS. Consequently, LMGS operations has a greater potential for causing more permanent, long-term socioeconomic impacts within the region.

Local communities would benefit from increased employment, tax revenue, and income generated during LMGS facility operations. However, given the small number of operations workers and housing availability, LMGS operations would generate little, if any, noticeable changes in socioeconomic conditions. In addition, the 10-year tax abatement agreement exempts Dow from having to pay property taxes during the first years of operation. Therefore, the overall socioeconomic impact during LMGS operation would be not significant.

3.9.4 Environmental Impacts of Decommissioning

Given housing availability and the short duration of decommissioning activities, those activities would generate little, if any, socioeconomic impact. The need for workers would help maintain employment levels and Dow Union Carbide Corporation would continue to pay property taxes during decommissioning. Therefore, the overall socioeconomic impact during decommissioning would be not significant.

3.9.5 Conclusions

The NRC staff concludes that the potential socioeconomic impacts of the construction, operation, and decommissioning the LMGS would be not significant.

3.10 Radiological Health

The following section addresses the potential public and occupational health effects from radiological sources and releases from the LMGS site. This section refers to tables in the ER (LME 2025-TN12163) and these are incorporated by reference.

3.10.1 Affected Environment

The radiological affected environment from the LMGS is described in Section 2.10 and the REMP is described in Section 6.2 of the LMGS ER (LME 2025-TN12163). These are described and incorporated by reference.

The site will start environmental monitoring 2 years before operation of the LMGS to determine background baseline levels. Current sources of radiation are stated in the ER as cosmic, internal, terrestrial, and human-made sources (medical, consumer products, and nuclear facilities).

The REMP includes the number and location of sample collection points and measuring devices, the pathway sampled or measured, sample collection frequency, type and frequency of analysis, and the general types of sample collection and measuring equipment.

The South Texas Plant is currently operating 47 mi from the proposed construction location. As described in Section 2.10 of the ER (LME 2025-TN12163), the annual dose from gaseous emissions at STP are expected to be very low to individuals near STP and the larger distance to LMGS, causing any potential dose to individuals at the LMGS to be lowered to zero.

3.10.2 Environmental Impacts of Construction

Radiological impacts from construction of the LMGS are described in Section 4.5 of the ER (LME 2025-TN12163). At certain times during construction, byproduct material may used in support of construction, such as soil compaction testing or radiography, by licensed individuals. Devices utilizing byproduct material are required to be controlled by the device’s licensee for very specific uses under controlled conditions. The dose to construction workers from byproduct material used during construction is expected to have negligible contribution to their annual dose.

3.10.3 Environmental Impacts of Operation

The annual dose limits for members of the public are provided in 10 CFR 20.1301 (TN283), and specifically in 10 CFR 20.1301(a), which limits dose to 100 millirem(s) (mrem)/yr total effective dose equivalent. This dose limit is inclusive of limits stated in 40 CFR Part 190 (TN739), required under 10 CFR 20.1301(e), with Subpart B limiting annual dose to 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ of any member of the public. The 40 CFR Part 190 annual doses would be as the result of exposures to planned discharges of radioactive materials, except radon and its daughters, to the general environment from uranium fuel cycle operations and to radiation from these operations. While 40 CFR Part 190 does not directly apply to non-LWRs (ASLB 2007-TN6826), LME provided a comparison to the dose values under this regulation in Table 5.4-24 of the ER (LME 2025-TN12163) that are shown in Table 3-5.

Radiological environmental impacts during operation of the LMGS are discussed in Section 5.4 of the ER (LME 2025-TN12163). Potential emission sources include release of gaseous and liquid effluents and direct exposure from emitted radiation. For LMGS, no radiological liquid effluents are planned to be released to the surrounding environment from the proposed design (see LME PSAR Section 9.2.2). Section 5.4.1 of the ER describes exposure pathways to the public, workers, and non-human biota near the site. Pathways include direct exposure, inhalation, and consumption of meat, dairy, and vegetables produced near the LMGS site. The ER states in Section 5.4.4.1.1 that the LMGS does not discharge liquid effluents (LME 2025-TN12163).

The operation of additional units at the proposed site could result in observable doses to individual members of the public. However, this dose is expected to remain appreciably low and non-impactful.

3.10.3.1 Occupational Doses

Section 5.4.5 of the ER (LME 2025-TN12163) states that information related to the annual occupation dose to operational workers will be provided in the OL application and that these doses will comply with 10 CFR Part 20 (TN283). The NRC staff will confirm compliance at the OL stage of the licensing process should the applicant submit an OL application.

3.10.3.2 Doses to Members of the Public

Estimates of doses to members of the public from radiological gaseous emissions have been completed. These were calculated for hypothetical maximally exposed individuals at locations stated in Table 5.4-3 of the ER (LME 2025-TN12163). Doses to the whole body and critical organs are found in Tables 5.4-15 to 5.4-21 of the ER (LME 2025-TN12163). This analysis combined atmospheric dispersion and deposition factor values specific to the release point's location relative to receptor locations to estimate annual dose. The estimated doses were compared to limits in 10 CFR 20.1301 (TN283) and 40 CFR Part 190 (TN739) and were presented in ER Tables 5.4-23 and 5.4-24 (LME 2025-TN12163).

As provided in ER Table 5.4-3, the doses were calculated for an individual at the site boundary (400 m from the release point), nearest residence (0.87 mi [1.4 km]), nearest vegetable garden (1.59 [2.56 km]), at 4 cattle farms (ranging from 3.30 to 5.19 mi [or 5.31 to 8.53 km]), and for the population in the surrounding 50 mi (80 km) radius of the proposed site. The distances are measured from the estimated radiological gaseous release point. Receptor locations are listed in PSAR Table 2.3.5-1 (LME 2025-TN12162) and the 50 mile population distribution for the population dose are provided in PSAR Table 2.1.3-4 (LME 2025-TN12162) and ER Table 2.5-1 (LME 2025-TN12163), all tables are incorporated by reference. The doses provided in Table 3-4 represent the highest potential value for a member of the public (i.e., the maximally exposed individual) at the site boundary. The annual 50-mile total population dose from the operation of LMGS would be a very small fraction of the natural background dose that the surrounding population receives every year. Specifically, LMGS would contribute less than 0.1 percent of natural background doses as shown by comparing values from ER Tables 5.4-22 and 5.4-25 (LME 2025-TN12163). While 10 CFR Part 50, Appendix I (TN249) and 40 CFR Part 190 are not applicable to a non-light-water-reactor (LWR) design, they do allow for a comparison of LMGS doses to the requirements for the current LWR reactor fleet.

Table 3-4 Long Mott Generating Station Dose to Maximally Exposed Individual Compared to Limits Specified in 10 CFR Part 50 Appendix I

Type of Dose	Annual Site Dose	Limit Specified in 10 CFR Part 50, Appendix I
Gamma Air (mrad)	2.03×10^{-1}	10
Beta Air (mrad)	1.11×10^{-1}	20
Total Body (mrem)	2.61×10^{-1}	5
Skin (mrem)	1.46×10^{-1}	15
Maximum Organ from Iodine and Particulates (mrem)	5.50×10^{-1}	15

CFR = *Code of Federal Regulations*.
Source: 10 CFR Part 50-TN249.

Table 3-5 Long Mott Generating Station Estimated Annual Dose Compared to Limits Specified in 40 CFR Part 190

Exposure Type	Exposure	Limit Specified in 40 CFR Part 190
Whole Body Dose (mrem/yr)	1.63×10^{-1}	25
Thyroid Dose (mrem/yr)	5.50×10^{-1}	75
Dose to Any Organ Other than Thyroid (mrem/yr)	2.48×10^{-1}	25

CFR = *Code of Federal Regulations*.
Sources: LME 2025-TN12163 (Table 5.4-24); 40 CFR Part 190-TN739.

The analysis provided in the CP application indicates that the LMGS would meet the applicable and comparable dose criteria, however, the calculations would be updated and refined at the OL state should an application be submitted.

3.10.3.3 Doses to Non-Human Biota

Section 5.4.4.1 of the ER (LME 2025-TN12163) addresses doses to non-human biota. The analysis only considers gaseous emissions because there are no plans for radiological liquid effluents to be released to the surrounding environment from the proposed design (see LME PSAR Section 9.2.2). Doses are considered at the site boundary for representative biota including muskrat, raccoon, heron, and duck. The dose to non-human biota is size dependent, due to being primarily from immersion and deposition of material. Therefore, of the animals considered, all are bounded by the dose to a maximally exposed individual. The ER relies on this concept, as stated in ICRP 26 that "…if man is adequately protected then other living things are also likely to be sufficiently protected" (ICRP 1977-TN713). This concept, in conjunction with research on the biological effects of radiation summarized in NUREG-1555, Section 5.4.4 (NRC 2007-TN614), indicates that there are no non-human biota that are more radiosensitive than humans. The dose to the surrogate species is summarized in Table 3-6.

Table 3-6 Long Mott Generating Station Annual Maximum Biota Dose

Exposure Type	Annual Dose
External Dose (mrem)	1.54×10^{-1}
Internal Dose (mrem)	5.49×10^{-3}
Total Dose (mrem)	1.60×10^{-1}
Source: LME 2025-TN12163 (Table 5.4-26).	

The annual doses are low when compared to limits for humans, but also when considered with regards to International Atomic Energy Agency and NCRP dose guidelines for absorption by nonhuman biota.

3.10.3.4 Radiological Environmental Monitoring

The radiological affected environment from LMGS is described in Section 2.10 of the ER. The ER describes the REMP designed for the LMGS site in Section 6.2. The REMP is designed to adequately characterize the radiological environment in the vicinity of LMGS by sampling air, water, soil, and food products, as well as measuring radiation directly. The LMGS REMP program would be implemented using guidance from Regulatory Guide (RG) 4.1, Revision 2 (NRC 2009-TN3802); RG 4.13, Revision 2 (NRC 2019-TN12240); RG 4.15, Revision 2 (NRC 2007-TN3804); and the Radiological Assessment Branch Technical Position, Revision 1 (NRC 1979-TN12242). The REMP will include (LME 2025-TN12163) (1) the number and location of sample collection points and measuring devices, and the pathway sampled or measured, (2) sample size, sample collection frequency, and sampling duration, (3) the type and frequency of analysis, and (4) general types of sample collection and measuring equipment.

Establishment of the REMP will begin 2 years prior to operation of LMGS, though will be implemented in a phased approach as described in Table 6.2-1 of the ER (LME 2025-TN12163). The REMP monitoring sites are arranged at representative locations surrounding the project site. These locations are shown on Figure 6.2-1 of the ER (LME 2025-TN12163). The locations are positioned radially sounding the construction site and at points along the site boundary.

3.10.4 Environmental Impacts of Decommissioning

The ER Section 5.11 describes the estimated impacts of decommissioning as stated in the Decommissioning GEIS, Supplement 1 (NRC 2002-TN7254). The Decommissioning GEIS included the impacts from the decommissioning of two high temperature gas reactors (HTGRs), Peach Bottom Atomic Power Station (Peach Bottom) Unit 1 and Fort St. Vrain Nuclear Generating Station (Fort St. Vrain). The decommissioning activities of these two reactors were not expected to result in environmental impacts different from those of an LWR.

A key concept to consider is that one Xe-100 reactor module (200 MWt) is equivalent to Peach Bottom Unit 1 (200 MWt), but that a complete site of 4 Xe-100 reactor modules (800 MWt) is roughly equivalent to Fort St. Vrain (842 MWt). In addition, the Decommissioning GEIS states that “Previous or anticipated decommissioning activities at the [fast breeder reactor] or [high-temperature gas-cooled reactor] have not and are not expected to result in occupational or public doses that are different from those found at other nuclear facilities” (NRC 2002-TN7254). Because of this, is it reasonable to expect that radiological environmental impacts of decommissioning the LMGS site would have impacts similar to those described in the Decommissioning GEIS.

Upon permanent cessation of LMGS operation, all radioactive material would be transferred to various types of storage containers based on the type of material and then shipped to licensed disposal sites or appropriately stored onsite (e.g., Spent Fuel Intermediate Storage Facility). Radiation area monitoring would continue to ensure safe storage of the radioactive material until it is removed from the site or for spent TRISO fuel, placed in a specifically designed and certified dry cask storage system, if necessary. The Decommissioning GEIS discusses the expected radiological impacts that would occur during the decommissioning of a large LWR (i.e., a 1,130 MWe pressurized-water reactor or 1,100 MWe boiling water reactor), including the appropriate practices to minimize radiological exposure to workers, and finds that impacts would be small and that no additional mitigation measures are likely to be sufficiently beneficial to be warranted (NRC 2002-TN7254). The Xe-100 reactor module, individually, is smaller than a LWR but considering that the LMGS would include four such modules with a total capacity of 320 MWe, namely less than the reactors addressed in the Decommissioning GEIS. Additionally, the Decommissioning GEIS analysis is based on a per reactor basis rather than for a site since the number of reactors at a current site can vary. Therefore, the NRC staff expects that the impacts of decommissioning an Xe-100 reactor module would be less than the radiological health impacts stated in the Decommissioning GEIS, Supplement 1, Table 6-1 (NRC 2002-TN7254).

3.10.5 Conclusions

The NRC staff concludes, based upon the above analysis, that impact from the use of byproduct materials during construction activities is negligible and the regulatory requirements for radiation protection would be met during construction, operation and decommissioning. The NRC staff concludes that the potential radiological health impacts of the construction, operation, and decommissioning of the LMGS would be not significant.

3.11 Nonradiological Human Health

3.11.1 Affected Environment

This section describes the affected environment at the LMGS site and vicinity. It describes additional baseline public and occupational health conditions that could be affected by the construction, operations, and decommissioning of the proposed facility. See Section 3.1 for information on land use and visual resources, Section 3.2 for information on air quality resources, Sections 3.4 and 3.5 for information on water resources, Section 3.9 for information on socioeconomic resources, and Section 3.12 for information on nonradiological waste impacts. Each of these sections provide information in the affected environment subsection that would be pertinent to nonradiological human health.

The nearest residence is approximately 0.20 mi (0.32 km) north of the LMGS, as measured from the tentative site boundary. As of 2020, approximately 5,159 people lived within 10 mi (16 km) of the LMGS site (LME 2025-TN12163: Section 2.9.1). The applicant conducted a review of preexisting environmental issues involving hazardous chemicals on or near the LMGS site and one release point was identified at the existing SDO facility (LME 2025-TN12163: Section 2.9.1.2).

3.11.2 Environmental Impacts of Construction

This section describes the potential nonradiological public and occupational health effects of construction activities. Construction activities can cause physical impacts including noise, vibration, shock from blasting, odors, vehicle exhaust, and dust that could affect public and worker health (LME 2025-TN12163: Section 4.1.1).

Construction workers are at risk from accidents and occupational hazards typical of any construction site when building and installing new facilities. Construction accidents (e.g., falls, electric shock, asphyxiation, and burns), trenching hazards, and exposure to noise generated by heavy earth-moving equipment are also possible. In 2023, the U.S. Bureau of Labor Statistics reported that the national incidence rate for nonfatal occupational injuries and illnesses for the heavy and civil engineering construction industry was 1.9 per 100 full-time workers and that the rate for the nuclear electric power generation industry was 0.2 per 100 full-time workers (BLS 2024-TN11032). The incidence rate for nonfatal occupational injuries and illness for the construction industry in 2023 for the State of Texas was 1.2 per 100 full-time workers (BLS 2024-TN12245).

Noise is anticipated to increase during construction-related activities, from sources such as operation of heavy equipment, machinery, and an increase in traffic of such vehicles. There are no municipal, county, or State-level regulations that establish quantitative noise level limits applicable to the LMGS site (LME 2025-TN12163: Section 2.9.2.2). As reported in the ER, the nearest offsite noise-sensitive receptors in proximity to the LMGS site are residences located north adjacent to State Highway 35, the closest of which is approximately 0.2 mi (0.3 km) north of the site. The closest residence could receive a maximum noise level of 58.6 dBA from operation of construction equipment, assuming straight line noise attenuation (LME 2025-TN12163: Section 4.4.1.1). As discussed in the ER, this attenuation exceeds the EPA's conservative recommendation of 55 dBA for outdoor noise levels. However, the project noise level remains below the baseline noise level for the area as measured by the applicant at noise measurement location 8 (NM-8), which is a calculated day-night average community noise level of 77.6 dBA (LME 2025-TN12163: Section 4.4.1.1, Table 2.9-2, Noise Monitoring Location NM-8). NM-8 is the closest noise monitoring location to the nearest sensitive receptor. There are no blasting activities planned during construction of the LMGS (LME 2025-TN12596).

Construction activities will also result in a temporary and infrequent increase in air emissions from sources such as fugitive dust, fine particulate matter, and vehicular/engine-driven equipment emissions. Air emissions are discussed further in Section 3.2.

Water is used to support construction activities such as concrete testing, hydrostatic pipe testing, dust control, and compaction (LME 2025-TN12163: Section 3.9.3). Water resources are discussed further in Sections 3.4 and 3.5.

The applicant acknowledges that there is potential for chemical, biological, and physical occupational hazards throughout construction of LMGS, but such hazards are reduced through adherence to Occupational Safety and Health Administration (OSHA) and State safety standards, practices, and procedures, including those set forth in 29 CFR Part 1910 and the Texas State Health and Safety Code (LME 2025-TN12163: Section 4.4.4.1). The NRC staff assumes that during construction activities hazardous chemicals will be used and stored according to threshold limits established by OSHA in Appendix A to 29 CFR 1910.119 (TN654).

3.11.3 Environmental Impacts of Operation

A detailed analysis of the impacts of LMGS operations would be prepared during the environmental review of the application for an OL should LME submit one to the NRC. The analysis below provides a summary of possible operational impacts from physical hazards, chemical hazards, biological hazards, and electromagnetic fields.

Physical Hazards

Construction activities involve health risks to workers, including accidents related to slips, trips, and falls, heat or cold stress, burns, frostbite, electric shock, and repetitive motion injuries (LME 2025-TN12163: Section 4.4.4.1). Occupational hazards (i.e., physical hazards, noise) are managed through compliance with OSHA regulations. According to the Memorandum of Understanding between the NRC and OSHA (NRC 2013-TN10165), plant conditions that result in an occupational risk, but do not affect the safety of licensed radioactive materials, are under the statutory authority of OSHA rather than the NRC. Federal regulations governing occupational noise are found in 29 CFR Part 1910 (TN654) and 40 CFR Part 204 (TN653). The regulations in 29 CFR Part 1910 deal with noise exposure in the construction environment, and the regulations in 40 CFR Part 204 generally govern the noise levels of construction equipment.

Chemical Hazards

The applicant acknowledges that there are chemical hazards surrounding both LMGS and SDO and these are minimized and managed by complying with OSHA regulations (LME 2025-TN12163: Section 2.9.1). As a toxic and explosive chemicals manufacturer, there is potential for chemical release and exposure at the nearby SDO facility; however, SDO minimizes the potential for this by complying with all applicable regulations (LME 2025-TN12162: Section 2.2.2.2.1). The PSAR includes a list of toxic and explosive chemicals near LMGS (LME 2025-TN12162: Table 2.2-2).

Biological Hazards

Nuclear power plant workers can also be exposed to disease-causing microorganisms (also referred to as etiological agents) from enteric pathogens (such as *Salmonella* spp. and *Pseudomonas aeruginosa*) through cleaning or performing maintenance activities or any water system in general. Additional exposures to bacteria (including *Legionella* spp.), thermophilic fungi, and free-living amoeba (such as *Naegleria fowleri* and *Acanthamoeba* spp.) are also possible (LME 2025-TN12163: Section 2.9.1.3).

Electromagnetic Fields

Operation of power transmission systems generate both electric and magnetic fields, referred to collectively as electromagnetic fields. Occupational workers and the public can be exposed to electromagnetic fields through exposure to electrical sources associated with power transmission systems, including switching stations (or substations) on the site and transmission lines connecting the plant to the regional electrical distribution grid. Transmission lines operate at a frequency of 60 hertz (Hz) (60 cycles per second), which is considered to be an extremely low frequency. In comparison, television transmitters have frequencies of 55 to 890 megahertz (MHz), and microwaves have frequencies of 1,000 MHz and greater (NRC 1996-TN288).

At the LMGS site, two new 138 kV transmission lines are planned for installation (LME 2025-TN12163: Section 2.9.4). As reported in the ER, the LMGS transmission route was selected based on land availability. The applicant states that standards and procedures for interconnection and maintenance meet applicable requirements/local codes, including those of the Federal Energy Regulatory Commission, the North American Electric Reliability Corporation, and the National Electrical Safety Code (LME 2025-TN12163: Sections 3.7.2, 3.7.2.2).

3.11.4 Environmental Impacts of Decommissioning

The NRC staff expects that nonradiological occupational and public safety and health impacts from decommissioning the LMGS would be bounded by the analyses reported for physical, chemical, ergonomic, and biological hazards in Section 4.3.10 of the Decommissioning GEIS (NRC 2002-TN7254), which concluded that these impacts would not be detectable.

3.11.5 Conclusions

The NRC staff concludes that the potential nonradiological human health impacts of the construction, operation, and decommissioning of the LMGS would be not significant. This conclusion is based upon the above analysis and is supported by the applicant's plans to reduce the potential for nonradiological occupational and public health hazards through implementation of safety practices, training, and physical control measures (LME 2025-TN12163) for the construction, operation, and decommissioning of the LMGS.

3.12 Nonradiological Waste

3.12.1 Affected Environment

Chapter 2 describes facility utilities and waste systems, including a description of the LMGS site and its surrounding vicinity. Potential types of nonradioactive wastes expected to be generated, handled, and disposed of include construction debris, spoils, stormwater runoff, municipal and sanitary waste, dust and air emissions, used oils and lubricants from vehicle maintenance, and other hazardous chemicals (LME 2025-TN12163: Section 4.4.5).

The applicant states that nonradioactive wastes would be managed in accordance with Federal, State, and local regulations, such as the Resource Conservation and Recovery Act (TN1281), NPDES permit, or Texas Commission on Environmental Quality via the Texas Administrative Code (LME 2025-TN12163: Section 3.6.3.1). A list of permitted treatment and disposal facilities that provide incineration and disposal of hazardous and non-hazardous waste is documented in Section 3.6.3.1 of the ER (LME 2025-TN12163). LMGS has an established waste management program that is further described in the following subsections.

3.12.2 Environmental Impacts of Construction

As described in Section 4.4.5.1 of the ER (LME 2025-TN12163), construction-related solid nonradiological wastes include construction-related debris (e.g., lumber, stone, and brick), and packaging materials (primarily wood and paper). Typical construction-related liquid nonradiological wastes include various fluids from the onsite maintenance of construction vehicles and equipment (e.g., used lubricating oils, hydraulic fluids, glycol-based coolants, and spent lead-acid storage batteries), incidental chemical wastes from the maintenance of equipment, and the application of corrosion-control protective coatings (e.g., solvents, paints, coatings) (LME 2025-TN12163: Section 4.4.5.1). During the construction phase, the applicant estimates generating an average of 16 roll off containers (40 cubic yard [yd^3] capacity) of construction debris (e.g., concrete, brick/block, mortar, wood, etc.) and 49 roll off containers (40 yd^3 capacity) of general office waste, annually. This averages to approximately two roll off containers of solid waste per week, which will be shipped to an approved landfill for disposal (LME 2025-TN12654).

Nonradioactive waste mitigation efforts include the life-cycle management of chemicals and wastes generated during construction and pollution prevention initiatives. The ER states all materials and wastes are accumulated onsite and disposed of or recycled through licensed offsite disposal and treatment facilities. A list of permitted treatment and disposal facilities that could be used is provided in Section 3.6.3.1 of the ER. Stormwater pollution is minimized by identifying potential sources of pollution and establishing BMPs in a Stormwater Pollution Prevention Plan (LME 2025-TN12163), which will be developed prior to an OL application.

Temporary air emissions of gaseous pollutants and particulate matter will occur from construction-related activities such as soil excavation, grading, erection of structures, workforce commute, concrete batch plants, and machinery operation and maintenance. The ER further states that building-related emissions are typically fugitive dust and equipment engine exhaust, and are localized, intermittent, and temporary (LME 2025-TN12163: Section 4.4.5.3).

3.12.3 Environmental Impacts of Operation

A summary of potential nonradiological waste impacts from operation is provided to ensure that a complete environmental review of the LMGS life cycle is performed. A detailed analysis of the impacts of operation of LMGS would be provided during the environmental review of the application for an OL should LME submit one to the NRC.

Routine LMGS operations will generate solid waste such as paper, plastic, glass, vegetative debris, food waste, and industrial wastes such as hazardous waste, used oils, and universal wastes. The applicant states that LMGS will identify, segregate, and when feasible, recycle solid waste in accordance with Texas Administrative Code Title 30 Chapter 335.1 (TN12249). Operational liquid waste includes nonradioactive facility discharges, which are limited to sanitary sewer and normal plant discharge. The applicant defines normal plant discharge as process waste streams from the CI that may contain water treatment chemicals or biocides, waste from floor and equipment drains, and stormwater runoff (LME 2025-TN12163: Sections 5.5.1.2 and 3.6). There will be a dedicated nonradioactive liquid drainage collection system, which conveys liquids to existing Dow process sewers. A separate dedicated piping system and storage tank will be in place for sanitary wastes, which will ultimately be transferred to the existing Dow wastewater facility (LME 2025-TN12163: Section 4.4.5.2). Wastes will be treated and discharged using existing permitted infrastructure according to SDO’s TPDES permit no. WQ0000447000 (LME 2025-TN12163: Section 3.6.2).

LMGS qualifies as a Small Quantity Generator and therefore manages hazardous waste in accordance with RCRA Subtitle C (LME 2025-TN12163: Section 3.6.3.2). As a small quantity generator, the applicant will minimize waste in accordance with established engineering controls and a pollution prevention plan (LME 2025-TN12163: Section 3.6.3.3). The applicant has administrative procedures that establish responsibilities and controls for waste management handling, storage, pollution prevention, and disposal.

The applicant anticipates nonradioactive gaseous effluents primarily from the intermittent testing and operation of the standby power and fire protection diesel systems as well as diesel generators. In Section 3.6.3.4 of the ER (LME 2025-TN12163), the applicant identifies typical effluents from these operations, including particulates, carbon monoxide, hydrocarbons, and nitrogen oxides. Any gaseous effluent from the site during operation would pass through appropriate filtration prior to release to the atmosphere through a vent stack and is monitored according to the requirements addressed in Section 3.2.

3.12.4 Environmental Impacts of Decommissioning

The NRC staff expects decommissioning to generate nonradiological solid waste materials such as building rubble and debris, concrete and structural materials, wood, glass, metals, finished materials, and office equipment, materials, and supplies. The NRC staff expects that the applicant would use BMPs to limit the amount of dust and other airborne particles. Liquid wastes from chemicals, solvents, and cleaning solutions would produce small amounts of volatilized chemicals, but BMPs would minimize their contribution to degradation of local air quality.

3.12.5 Conclusions

The NRC staff concludes that the potential nonradiological waste impacts of the construction, operation, and decommissioning of the LMGS would be not significant. This conclusion is based upon the above analysis and is supported by site permits and the applicant's planned adoption of BMPs for the construction of the LMGS.

3.13 Transportation of Radioactive Material

3.13.1 Affected Environment

This section addresses the radiological and nonradiological environmental impacts from normal operating (radiological) and accident conditions (radiological and nonradiological) resulting from the shipment of unirradiated fuel to the LMGS, shipment of low-level radioactive waste (LLRW) and mixed waste to offsite disposal facilities during operations, and shipment of spent nuclear fuel to a Federal interim storage facility or, if available, a permanent geologic repository during decommissioning. For the purposes of these analyses, the NRC staff considered the proposed Yucca Mountain, Nevada, repository site as a surrogate destination for a monitored retrievable Federal consolidated storage facility or permanent geologic repository.

3.13.2 Environmental Impacts of Construction

There are no environmental impacts related to the transportation of fuel and waste during construction because the fuel would not have yet been brought onsite and no radioactive waste would have been generated.

3.13.3 Environmental Impacts of Operation

The NRC performed a generic analysis of the environmental effects of the transportation of fuel and waste to and from LWRs in WASH-1238, "Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants" (NRC 1975-TN216; AEC 1972-TN22) and in a supplement to WASH-1238 (NRC 1975-TN216) and found the impacts to be small. The results of WASH-1238 were codified into 10 CFR 51.52 (TN10253), Table S-4. These documents summarize the environmental impacts of transportation of fuel and waste to and from one LWR of 3000 to 5,000 MWt (1,000 to 1,500 MWe). Impacts are provided for normal conditions of transport and accidents in transport for a reference 1,100 MWe LWR. Dose to transportation workers during transportation operations was estimated to result in a collective dose of four person-rem per reference reactor-year.

In NUREG-0170, *Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes* (NRC 1977-TN417, NRC 1977-TN6497), the NRC evaluated the shipment of radioactive material, including shipments of unirradiated fuel, spent nuclear fuel, and radioactive waste to and from nuclear power plants. The NRC concluded in NUREG-0170 that the average radiation dose to the population at risk from normal transportation is a small fraction of the limits recommended for members of the general public from all sources of radiation other than natural and medical sources and is a small fraction of the natural background dose. In addition, the NRC determined that the radiological risk from accidents in transportation is small, amounting to about 0.5 percent of the normal transportation risk on an annual basis. The NRC also determined in NUREG-0170 that the environmental impacts of normal transportation of radioactive materials and the risks attendant to accidents involving radioactive material shipments are sufficiently small to allow continued shipments by all modes. The doses from radioactive waste accidents were negligible when compared to the doses from accidents involving spent nuclear fuel shipments. WASH-1238, NUREG-0170, and other LLRW transportation assessments by the NRC underlie the NRC staff's assessment of the environmental impacts from the transportation of radioactive material to and from LMGS and are incorporated by reference.

Section 5.13.4.1 of the ER (LME 2025-TN12163) indicates that the type of fuel used in LMGS will not meet the conditions of 10 CFR 51.52(a) to directly apply Table S-4 (TN10253). The ER provided a description and analysis of the environmental effects of transportation in accordance with 10 CFR 51.52(b) (LME 2025-TN12163: Section 5.7.2). The information provided in the ER was considered in the NRC staff's review and was compared to Table S-4 as part of the description provided under the requirements of 10 CFR 51.52(b).

3.13.3.1 Fresh High-Assay Low-Enriched Uranium Fuel Shipments

The LMGS will use a High-Assay Low-Enriched Uranium (HALEU) fuel type that is typically enriched up to 20 weight percent uranium-235, although fuel used at LMGS will likely be enriched at 15.5 percent as stated in Section 3.2.1 of the ER. Section 5.7.2 discusses the transportation of nuclear fuel to and from LMGS (LME 2025-TN12163). Section 3.2.1 provides details about the uranium content of fresh HALEU fuel, and Section 5.7.1 provides details on the annual fuel requirements of the Xe-100 reactor module. It is estimated that the Xe-100 design uses 1.785 metric tons of uranium (MTU) of fuel per year. The ER states that a 4 reactor module plant would require 20 shipments of fresh fuel per year, which would equate to 5 shipments of fuel per year for a single Xe-100 reactor module.

The source of fresh fuel was not stated in the ER; however, the fuel production process and discussion of TRISO-X facility was described in Section 5.7.1. The NRC staff has performed a number of environmental evaluations of the shipment of fresh uranium fuel for LWRs operating at higher power levels for lower enrichment levels than LMGS. The transportation impact analysis assumed the transportation package meets the regulatory requirements of 10 CFR 71.47 (TN301), "External Radiation Standards for All Packages." The accident analyses involving unirradiated fuel shipments accounted for radiological doses, along with nonradiological fatalities and injuries due to the physical impacts of an accident.

The analysis of normal operation shipping, frequently called an "incident-free shipping" analysis, is the analysis of material shipments that reach their destination without releasing any radioactive material to the environment. Impacts from these shipments would be from low levels of radiation that penetrate the shielding provided by unirradiated fuel shipping containers. Very low radiation exposures at some level would occur to individuals residing along the route of fuel transportation between the fuel fabrication facility in Oak Ridge, Tennessee and the LMGS site, persons in vehicles traveling along the route of unirradiated fuel shipments, persons present at vehicular stops for refueling, rest, and vehicle inspections, and transportation crew workers.

NUREG-2266, *Environmental Evaluation of Accident Tolerant Fuels with Increased Enrichment and Higher Burnup Levels* (NRC 2024-TN10333) completed an analysis of shipping unirradiated fuel from Richland, Washington to Turkey Point Nuclear Plant (Turkey Point), Florida. This is the longest distance for the transportation of fresh fuel within the United States. That distance of approximately 3,187 mi (5,129 km) bounds the distance from the TRISO-X Fuel Fabrication Facility in Oak Ridge, Tennessee to Seadrift Texas, a distance of approximately 1,072 mi (1,725 km). The number of shipments varies based on reactor design, with boiling water reactors requiring enough fuel to reload half a core and PWRs requiring enough fuel to reload a third of a core. Additionally, the unirradiated HALEU transport packages (e.g., Orano's DN30-X package [NRC 2021-TN12994]), while containing uranium enriched up to 20 weight percent U-235, have external dose rates that are significantly below any package dose rate limits in 10 CFR Part 71. NUREG-2266 applies an external dose rate with respect to the limits in 10 CFR 71.47 for a bounding analysis for unirradiated nuclear fuel shipments. Therefore, these three factors, an increased distance, greater number of shipments and very low external dose rate, bound impacts for the shipment of unirradiated fuel for LMGS. The radiological impacts for LMGS of transportation of fresh fuel should remain bounded by NUREG-2266 (NRC 2024-TN10333) determined impacts.

3.13.3.2 LLRW Shipments

Currently, four operating LLRW disposal facilities in the United States are licensed to accept LLRW from commercial facilities (NRC 2017-TN6518). They are located at Clive, Utah; Andrews County, Texas; near Barnwell, South Carolina; and near Richland, Washington. The Energy*Solutions* disposal facility at Clive, Utah, is licensed by the State of Utah to accept Class A LLRW from all regions of the United States. The Waste Control Specialists site in Andrews County, Texas, is licensed to accept Class A, B, and C LLRW from the Texas Compact generators (Texas and Vermont) and from outside generators with permission from the Texas Compact. Energy*Solutions* Barnwell Operations located near Barnwell, South Carolina, accepts waste from the Atlantic Compact States (Connecticut, New Jersey, and South Carolina) and is licensed by the State of South Carolina to dispose of Class A, B, and C LLRW. U.S. Ecology, located near Richland, Washington, accepts LLRW from the Northwest and Rocky Mountain Compact States (Washington, Alaska, Hawaii, Idaho, Montana, Oregon, Utah, Wyoming, Colorado, Nevada, and New Mexico) and is licensed by the State of Washington to dispose of Class A, B, and C waste. The LLRW disposal sites that could accept LLRW shipments from LMGS are the Energy*Solutions* disposal facility at Clive, Utah, accepting Class A LLRW; U.S. Ecology, near Richland, Washington, accepting Class A, B, and C LLRW; and the Waste Control Specialists site in Andrews County, Texas for Class A, B, and C LLRW. In 2023, a total of approximately 3,290,069 ft^3 (93,164 m^3) of Class A LLRW, 6,292 ft^3 (178 m^3) of Class B LLRW, and 2,505 ft^3 (71 m^3) of Class C LLRW was shipped to the disposal sites (DOE 2024-TN10120). Table 3.5-3 of the ER states that the average expected annual volume of packaged LLRW is 3768 ft^3 (106.7 m^3). The ER stated that the Waste Control Specialists site in Andrews, Texas is the expected disposal location for LLRW from LMGS. The annual amount produced would be a small fraction of the annual amount accepted from other shippers every year.

The NRC has determined that the environmental impacts—radiological and nonradiological—of normal (i.e., incident free) transportation of radioactive materials and the risks and consequences of accidents involving radioactive material shipments in packages for which the NRC has issued design approvals meeting the performance standards of 10 CFR Part 71 were small (49 FR 9375-TN7951). Regulations, shipping practices, and package designs for transporting radioactive material have remained essentially unchanged since 1977. LLRW transported in conjunction with the operation of the LMGS would be a small fraction of the annual volume of LLRW shipped to licensed disposal facilities and would be transported in compliance with U.S. Department of Transportation and NRC regulations.

3.13.3.3 Spent Nuclear Fuel Shipments

The NRC has extensively analyzed shipments of spent LWR fuel to a proposed geologic repository in a number of new reactor licensing reviews and as part of three away-from-reactor interim storage facility licensing reviews (i.e., the Private Fuel Storage Facility, the Holtec International Consolidated Interim Storage Facility, and the Interim Storage Partners Consolidated Interim Storage Facility). Prior NRC transportation analyses of large light water reactor spent fuel environmental impacts in support of license renewal, for burnup levels up to 62 GWd/ MTU, were found to be bounded by Table S-4 of 10 CFR 51.52 (TN10253), as documented in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, Revision 1 (NRC 2013-TN2654) and Revision 2NRC 2024-TN10161). The NRC also assessed large light water reactor spent nuclear fuel shipments in NUREG-2125, *Spent Fuel Transportation Risk Assessment, Final Report*, which demonstrates that NRC regulations continue to provide adequate protection of public health and safety during transportation of spent nuclear fuel (NRC 2014-TN3231).

Table 5.7.2-8 of the ER indicates there would be 11 shipments of irradiated fuel per year, from a 4 reactor module facility. This scales down to 3 shipments, or less, of spent fuel per year for each reactor module. As stated in Sections 5.7.2 and 5.13.4.2 of the ER, LMGS will store spent fuel until future disposition to an authorized location (LME 2025-TN12163).

The analysis of normal transport is summarized in Tables 5.7.2-5 through 5.7.2-9 of the ER (LME 2025-TN12163). The values were compared to dose requirements stated in Table S-4 of 10 CFR 51.52 (TN10253). This comparison is shown in Table 3-7. The collective dose to populations potentially affected by transportation related exposure from radiological materials is low when compared to TRISO-X fuel.

Table 3-7 Long Mott Generating Station Incident-Free Transportation Dose Summary

Exposed Population	Fresh Fuel (person-rem)[(a),(b)]	Radwaste shipped to Andrews, Texas (person-rem)[(a,b)]	Radwaste shipped to Clive, Utah (person-rem)[(a,b)]	Irradiated Fuel shipped to Nye County, Nevada (person-rem)[(a,b)]	Table S-4 Value (person-rem)[(a,b)]
Total Worker	0.11	0.57	0.85	1.02	4.0
General Public	0.15	0.50	1.27	1.82	3.0

(a) Values are normalized to a single reactor module for comparison to Table S-4 and WASH-1238 reference reactor.
(b) Source: LME 2025-TN12163 (Tables 5.7.2-5 to 5.7.2-9).

LME has committed to providing an updated transportation assessment that includes an accident analysis as part of the OL application (LME 2025-TN12596). LME stated that no transportation of spent fuel would occur until a spent fuel repository is operational. A discussion of the transportation doses when compared to Table S-4 in 10 CFR 51.52 (TN10253) was provided at the end of ER Section 5.7.2.

In addition, the NRC staff evaluated the radiological impacts from potential transportation accidents, The structure of TRISO is such that multiple barriers associated with the TRISO kernels and pebbles must be broken before a release of radioactive material from a shipping package would be possible. As discussed in LME ER Sections 3.2.1 and 3.8.2, after reaching a burnup level of approximately 163 GWd/MTU, LME would place the spent TRISO pebbles into sealed canisters for storage during operation. Additionally, the structure of the sealed canister into which spent TRISO pebbles would be placed would provide added levels of robustness, or an additional layer of defense-in-depth beyond that provided by the coated TRISO particles and pebbles, for withstanding physical impacts. Based on structural and thermal analyses, NUREG-2125, *Spent Fuel Transportation Risk Assessment – Final Report* (Jan. 2014), showed that spent fuel within an inner welded canister in the shipping (referred to in NUREG-2125 as canistered fuel) does not rupture even under the most severe accidents analyzed, so no radioactive material would exit the cask (NRC 2014-TN3231: Section E.4.3). The NRC staff expects that the type of storage packaging proposed by LME would perform similarly to the canistered fuel analyzed in NUREG-2125.

3.13.4 Environmental Impacts of Decommissioning

The proposed Xe-100 reactor module is an HTGR, like Fort St. Vrain and Peach Bottom Unit 1, and is within the scope of effects determined in the Decommissioning GEIS (NRC 2002-TN7254), Supplement 1. Peach Bottom Unit 1 was a 200 MWt reactor which is equivalent to one Xe-100 reactor module. Therefore, the impacts related to transportation in the Decommissioning GEIS, Supplement 1 are incorporated by reference.

3.13.5 Conclusions

The NRC staff concludes that there would be no transportation impacts during construction due to the lack of radioactive material present onsite. Further, the potential impacts from the transportation of fuel and waste associated with the operation and decommissioning of the LMGS would be not significant. This conclusion is based upon the above analysis and is supported by analyses discussed in NUREG-0170 (NRC 1977-TN417, NRC 1977-TN6497), NUREG-2266 (NRC 2024-TN10333), and NUREG-0586, Supplement 1 (NRC 2002-TN665).

3.14 Uranium Fuel Cycle and Radiological Waste Management

This section refers to Table 5.7.1-1 in the ER which in turn cites 10 CFR 51.51 Table S-3 (LME 2025-TN12163). ER Table 5.7.1-1 is here incorporated by reference.

3.14.1 Uranium Fuel Cycle

As presented in 10 CFR 51.51(a) (TN10253), a light-water-cooled nuclear power reactor can use Table S-3 as the basis for uranium fuel cycle (UFC) environmental effects. While the Xe-100 reactor is not a light-water-cooled nuclear power reactor, the same uranium fuel cycle that is addressed by Table S-3 would apply to the LMGS.

ER Section 5.7.1 indicates that Table S-3 can be applied to evaluate the impacts of alternative fuel types. Table S-3 would bound the impacts of the Xe-100 reactor fuel because of uranium fuel cycle changes since publication of WASH-1248 (AEC 1974-TN23), the basis of Table S-3. These changes are due to:

- Uranium Recovery—In situ leach recovery (ISR) has become the preferred method of recovering uranium from underground. The ISR method does not produce mine tailings, reduces the releases of radon gas, and eliminates a separate milling facility.

- Enrichment—U.S. uranium enrichment technology is transitioning from gaseous diffusion to gas centrifugation, which only uses a fraction of the electrical energy per separation unit used by its predecessor.
- Current reactor technology more efficiently burns fuel allowing for longer fuel cycles, thereby leading to a reduction in overall UFC impacts (i.e., uranium recovery/conversion, fuel fabrication, and storage/disposal of irradiated fuel).
- Reduction in reliance on coal plants for electrical generation contributions of UFCs results in reduced environmental impacts from nonradiological gaseous effluents.

Additionally, any fuel production facility must satisfy the regulatory requirements of 10 CFR Part 40 (TN4882), "Domestic Licensing of Source Material," 10 CFR Part 70 (TN4883), "Domestic Licensing of Special Nuclear Material," 10 CFR Part 71 (TN301), "Packaging and Transportation of Radioactive Material," and 10 CFR Part 73, "Physical Protection of Plants and Materials" (TN423).

Two aspects of the front end of the fuel cycle are different for LMGS. First, the Xe-100 is designed to use a HALEU enrichment level fuel with up to 20 weight percent (wt%) uranium-235. The annual expected fuel requirement is 1.785 MTU of fresh TRISO-X per year, as compared to 20 to 33 MTU/yr for current LWRs. LMGS is estimated to receive 5 annual shipments of fresh fuel per operating plant (ER Section 5.7.2). Thus, due to the lower quantity of uranium needed, the impacts from uranium recovery and uranium conversion would be less than the impacts presented in WASH-1248 and, therefore, Table S-3 would be bounding.

The source of uranium for HALEU is not specified. One potential source of HALEU is DOE. DOE is supporting efforts regarding availability of HALEU for civilian domestic research, development, demonstration, and commercial use in the United States to prevent reliance on Russia or other foreign suppliers to fuel the next generation of nuclear power (86 FR 71055-TN7945). DOE has ongoing programs related to the HALEU supply chain with necessary investments being announced by DOE for HALEU supply chain development (DOE 2026-TN12703). This includes the DOE HALEU Consortium, which was established by DOE to help secure a domestic supply of HALEU for commercial use. Members of the Consortium can request HALEU through the HALEU allocation process (DOE 2025-TN11671). DOE and its national laboratories are also in the process of recycling used nuclear fuel from government-owned research reactors to recover highly enriched uranium that can then be used to develop HALEU fuel (DOE 2024-TN11670).

The second aspect of the front end of the fuel cycle that is different for LMGS concerns the fuel type: LMGS will use TRISO fuel, a fuel type that is not used in current LWRs. The source of fresh TRISO fuel for the LMGS is expected to be the TRISO-X Fuel Fabrication Facility in Oak Ridge, Tennessee, operated by TRISO-X, LLC, which has the special nuclear material license SNM-7007 issued on February 12, 2026 (91 FR 12627-TN12993). The environmental impacts of TRISO fuel fabrication and shipment were reviewed during NRC's review of this TRISO-X license application (NRC 2026-TN13000). The conclusions of the TRISO-X fuel fabrication FEIS are incorporated by reference here.

3.14.2 Radiological Waste Management

Liquid and solid radioactive waste-management systems would be used for the collection, processing, packaging, and storage of the radioactive materials produced as byproducts during operation and decommissioning of LMGS. Waste processing systems would be designed to meet the design objectives of 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” (TN249) and 10 CFR Part 20 (TN283), “Standards for Protection Against Radiation.” The waste systems are described in ER Section 3.5. The human health impacts from potential emissions are described in ER Section 4.5.1 for construction and Section 5.4 for operations.

3.14.2.1 Liquid Radiological Waste Management

The liquid radioactive waste handling (LRWH) system is described in ER Section 3.5.1 (LME 2025-TN12163). The LRWH system will collect liquid wastes from floor or equipment drains. This system is described schematically in Figure 9.2-1 of the PSAR (LME 2025-TN12162).

As presented in ER Section 5.4.1.1 (LME 2025-TN12163), no liquid radioactive waste is expected to be released from the LRWH. All liquid radioactive waste (other than spent resins) will be transferred to a low activity radioactive waste treatment storage tank. This waste will be stored and processed by filtration and ion exchange to remove radioactive materials to the extent practical, prior to transport for offsite disposal. Spent resins and planned higher activity generated wastes will be stored in the LRWH Spent Resin Tank, prior to dewatering and packaging for transport offsite to be disposed of by a 3rd party as shown in Figure 9.2-1 of the PSAR (LME 2025-TN12162). The estimated activity of liquid radioactive waste produced annually is provided in ER Table 3.5-1 (LME 2025-TN12163).

3.14.2.2 Solid Waste Management and Onsite Fuel Storage

As described in ER Section 3.5.2, the solid radioactive waste handling system would manage typical nuclear facility operations wastes, originating as dry or wet wastes. The system is not intended to manage large waste materials such as core assemblies, spent nuclear fuel, and contaminated equipment. The dry waste stream would contain items like ventilation filters, contaminated tools, plastics, and miscellaneous dry materials. The estimated volume of solid radioactive waste produced annually is provided in ER Table 3.5-2 for a total annual volume of 106.7 m^3 (LME 2025-TN12163).

The Spent Fuel Intermediate Storage Facility (SFISF) is described in ER Section 3.5.4. A single SFISF unit is required to support the full life cycle of an Xe-100 reactor module. Each SFISF unit will contain multiple rows of containers for spent fuel storage and are cooled through natural circulation. Descriptions of impacts from the SFISF support buildings are found in Chapters 4 and 5 of the LME ER (LME 2025-TN12163). The Xe-100 reactor module is expected to use fuel kernels comparable to those used by the HTGR at Fort St. Vrain (LME 2025-TN12596). Both fuel kernels utilize the same three layers of material to encase the fissile material (ORNL 2003-TN7950, LME 2025-TN12162). The first layer applies pyrolytic carbon. The second layer is of silicon carbide and, as described in PSAR Section 6.4.2.1, is the most effective layer in the TRISO coating system in terms of radionuclide retention because it serves as the primary structural barrier to the release of fission products from the coated particle (LME 2025-TN12162). The third layer is a high density isotropic pyrocarbon. While the fuel element that contains fuel kernels may be of different shapes, in both cases the fuel kernels are mixed with graphite and compressed into the final fuel form, i.e., cylindrical rods called “compacts” for Ft. St. Vrain (see Figure 2 of NWTRB 2020-TN7966) and fuel pebbles for the Xe-100 reactor module (see Figure 6.4-3 of the PSAR [LME 2025-TN12162]).

The Fort St. Vrain spent fuel continues to be stored at an NRC-licensed Independent Spent Fuel Storage Installation in Platteville, Colorado, (NWTRB 2020-TN7966; ORNL 2003-TN7950) and is within the scope of the Continued Storage GEIS (NRC 2014-TN4117). The Continued Storage

GEIS references the original NRC license EA published in 1991 (NRC 1991-TN12875) and includes a footnote on page 2-10 citing the Ft. St. Vrain renewal EA, which examines any new and significant information affecting the continued storage of Fort St. Vrain spent fuel.

The Xe-100 reactor module spent TRISO fuel would be stored in the same manner as the Fort St. Vrain spent fuel (e.g., in sealed storage containers cooled through natural circulation via the Spent Fuel Storage System described in the PSAR, Section 1.1.4.3.2 [LME 2025-TN12162]). Germany has safely stored spent TRISO fuel with no environmental releases in a similar storage configuration (dry casks with natural circulation cooling) after two pebble bed HTGRs were operated in Germany, from 1967–1988 (Verfondern 2025-TN12706). As discussed by LME in Section 5.7.1.1 of the ER, the amount of HALEU spent nuclear fuel that LMGS would generate is a small fraction of the nation’s overall inventory of spent nuclear fuel. Thus, the environmental impacts discussed in the Continued Storage GEIS would have similar impacts for LMGS’s HALEU spent nuclear fuel. Therefore, the impacts described in the NUREG-2157, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (NRC 2014-TN4117), are applicable and small for the continued storage of spent nuclear fuel from LMGS. In sum, the impacts from continued storage of spent fuel at LMGS are considered to be not significant for foreseeable time periods, and the impacts stated in NUREG-2157 are expected to bound those at LMGS.

3.14.2.3 Gaseous Waste Management

The gaseous radioactive waste-management system uses the heating, ventilation, and air conditioning (HVAC) system and helium purification system to filter the helium coolant. Figure 9.1-1 of the PSAR is a schematic of these systems. The radioactivity in the HVAC system is monitored continuously to ensure compliance with regulatory limits. Under normal operating conditions, exhaust air is released to the atmosphere through an exhaust stack. For any abnormal event that results in a radiological release, a secured secondary system is used to filter coolant gas.

The helium service system supplies and stores clean helium and purifies helium diverted from the primary coolant loop. The helium service system limits moisture and the presence of oxidizing agents and carbonization within the reactor, steam generator, and primary coolant loops using catalytic converters, absorbent systems, and cryogenic systems to remove different impurities. Some impurities may be released to the atmosphere through the HVAC effluent system

3.14.3 Conclusions

No radioactive material would be present during construction of the LMGS. Further, based upon the preceding discussion, the NRC staff concludes that the potential uranium fuel cycle and radiological wastes impacts of the construction, operation, and decommissioning of the LMGS would be not significant.

3.15 <u>Postulated Accidents</u>

3.15.1 Environmental Impacts of Operation

As described in Section 2.1, this project includes four Xe-100 reactor modules contained within one facility. For consistency with NRC regulations, guidance, and previous discussions of postulated accidents (e.g., to the discussion of LWR risks in NUREG-1437, Revision 2 [NRC

2024-TN10161]), in this section the NRC staff evaluates design basis accidents and severe accidents consistent with the Applicant's PSAR Chapter 3 evaluation of licensing basis events.

3.15.1.1 Design Basis Accidents and Severe Accidents

This section discusses the potential offsite radiological consequences of the design basis accidents (DBA) that could only occur during operations. The results of the analysis are compared to the referenced values for stationary power reactor siting in 10 CFR Part 100 Subpart B, "Evaluation Factors for Stationary Power Reactor Site Applications on or After January 10, 1997" (TN282). The DBA analysis is a conservative evaluation and represents the bounding impacts from the operation and decommissioning of LMGS.

A DBA is an event that could result in radiological consequences exceeding those of any credible accident. It is a bounding calculation of the radiological consequences of postulated DBAs at the proposed site. For LMGS, a set of DBAs were analyzed based on events unique to the design of the Xe-100 reactor module that could hypothetically result in a release of radioactive materials into the environment. DBAs are defined and analyzed in Chapter 3 of the PSAR (LME 2025-TN12162). The seismic B DBA event, described in PSAR Section 3.6.12, was identified as having the largest dose result.

The DBAs for environmental evaluations apply site-specific data and realistic meteorology (i.e., 50th percentile atmospheric dispersion) along with characteristics unique to the design of the Xe-100 reactor module that could hypothetically release radioactive materials to the environment, to estimate doses at offsite locations. The LMGS DBA's offsite radiological consequences were provided by LME in a response to a request for additional information (RAI) on November 6, 2025 (LME 2025-TN12652). Values reported in the RAI response were obtained by scaling values created using 95th percentile dispersion values to the 50th percentile using methodologies stated in RG 1.145 (NRC 1983-TN279). The values used to generate this ratio are stated in the PSAR Section 2.3.4.3 (LME 2025-TN12162). The highest estimated environmental DBA radiological consequences calculated at the EAB and LPZ (LME 2025-TN12652) were well within the applicable dose criteria stated in 10 CFR 50.34 (TN249), which specifies the following:

1. An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 25 rem total effective dose equivalent.

2. An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem total effective dose equivalent.

A further analysis of severe accidents was performed by LME using probabilistic risk assessment techniques and is described in Section 3 of the PSAR (LME 2025-TN12162). LME identified no source terms that could exceed either of the two criteria listed above. The probabilistic risk assessment process uses representative meteorological, demographic, land use, and exposure pathway information to estimate a dose risk using the MELCOR Accident Consequence Code System (MACCS). These impacts are assessed from identified release categories and are summarized in Table 5.13.2-1 of the ER, Supplement 4 (LME 2026-TN12877) and are reproduced in Table 3-8.

Table 3-8 Summary of Severe Accident Impacts for an Xe-100 reactor module at Long Mott Generating Station

Risk Factor	Total
Prompt Fatalities (per reactor-year)	0.00
Latent Cancer Fatality Risk (per reactor-year)	6.04×10^{-5}
Water—Population Dose Risk (person-rem/reactor-yr)	1.28×10^{-3}
Total—Population Dose Risk (person-rem/reactor-yr)	1.12×10^{-1}
Economic Cost Risk ($/reactor-yr)	$6.81 \times 10^{+2}$
Land Area Decontamination Risk (hectares/reactor-yr)	4.45×10^{-4}
Source: LME 2026-TN12877 (LMGS ER, Supplement 4, Table 5.13.2-1).	

A summary of the postulated events and consequences is provided in ER Section 5.13, Supplement 4 (LME 2026-TN12877). The values provided in Table 5.13.2-2 quantify the risk from the severe accidents chosen to represent a bounding estimate of impacts. These values have been compared to the values provided in Appendix E of Generic Environmental Impact Statement for License Renewal of Nuclear Plants,NUREG-1437, Revision 2 (NRC 2024-TN10161) and other recently reviewed reactors and are shown in Table 3-9.

Table 3-9 Severe Accident Frequency and Dose Risk for an Xe-100 reactor module at Long Mott Generating Station

Reactor	Severe Accident Frequency (per Ryr)[(a)]	50 mi Population Dose Risk (person-rem per Ryr)[(a)]
Current Reactor Maximum[(b)]	2.4×10^{-4}	6.9×10
Current Reactor Mean[(b)]	3.1×10^{-5}	1.5×10
Current Reactor Median[(b)]	2.5×10^{-5}	1.3×10
Current Reactor Minimum[(b)]	1.9×10^{-5}	5.5×10^{-1}
AP1000[(c)] Reactor at the Turkey Point Site	2.4×10^{-7}	2.7×10^{-1}
ESBWR at the Fermi 3 Site[(d)]	1.7×10^{-8}	3.2×10^{-2}
US-APWR at the Comanche Peak Site[(d)]	1.2×10^{-6}	3.0×10^{-1}
EPR at the Calvert Cliffs 3 Site[(d)]	5.3×10^{-7}	3.5×10^{-1}
LMGS[(e)]	1.0×10^{-5}[(f)]	1.0×10^{-1}[(f)]

Calvert Cliffs = Calvert Cliffs Nuclear Power Plant; COL = combined license; Comanche Peak Site = Comanche Peak Nuclear Power Plant; EPR = U.S. Evolutionary Power Reactor; ER = environmental report; ESBWR = Economic Simplified Boiling Water Reactor; Fermi = Enrico Fermi Nuclear Generating Station; LMGS = Long Mott Generating Station; MACCS = MELCOR Accident Consequence Code System; Ryr = Roentgen-year; Turkey Point Site = Turkey Point Nuclear Generating Station US-APWR = United States Advanced Pressurized-Water Reactor.
(a) To convert to person-Sv, divide by 100.
(b) Based on MACCS calculations for over 70 current plants at over 40 sites.
(c) The AP1000 is a pressurized-water reactor proposed for use at the Turkey Point site. Accident frequency and dose risk are calculated with MACCS code using Turkey Point site-specific input, Turkey Point Units 6 and 7 COL Application, Part 3—Environmental Report (FPL 2014-TN4058).
(d) NUREG-2268, Table 3-28 (NRC 2025-TN12279).
(e) LMGS ER, Supplement 4 (LME 2026-TN12877).
(f) These values were rounded to align significant digits for comparison against source material.

Table 3-10 shows that the probability-weighted consequences of severe accidents for an Xe-100 reactor module at LMGS are small, even when compared to various other advanced reactors. For perspective, Table 3-10 compares the health risks from severe accidents at larger reactors. The dose risks per reactor-year can be quantified to understand potential human health impacts, or latent cancer fatalities (LCF). The total severe accident risk of an Xe-100 reactor module at LMGS is equivalent to 2 × 10^{-9} LCF per reactor-year.

Table 3-10 Comparison of Average Latent Cancer Fatalities Risk Per Reactor-Year for an Xe-100 reactor module at Long Mott Generating Station

Reactor Site	Average LCF Risk Per Reactor-Year[(a)]
Grand Gulf[(b)]	3 × 10^{-10}
Peach Bottom[(b)]	4 × 10^{-10}
Sequoyah[(b)]	1 × 10^{-8}
Surry[(b)]	2 × 10^{-9}
Zion[(b)]	1 × 10^{-8}
ESBWR at the Fermi 3 Site[(c)]	4 × 10^{-11}
US-APWR at the Comanche Peak Site[(d)]	3 × 10^{-10}
EPR at the Calvert Cliffs 3 Site[(e)]	2 × 10^{-10}
LMGS[(f)]	2 × 10^{-9}

Calvert Cliffs = Calvert Cliffs Nuclear Power Plant; Comanche Peak Site = Comanche Peak Nuclear Power Plant; EPR = U.S. Evolutionary Power Reactor; ESBWR = Economic Simplified Boiling Water Reactor; Fermi = Enrico Fermi Nuclear Generating Station; Grand Gulf = Grand Gulf Nuclear Station; LCF = latent cancer fatalities; LMGS = Long Mott Generating Station; Peach Bottom = Peach Bottom Atomic Power Station; Sequoyah = Sequoyah Nuclear Plant; Surry = Surry Nuclear Power Plant; US-APWR = U.S. Advanced Pressurized-Water Reactor; Zion = Zion Nuclear Power Plant.
(a) To convert person-rem to person-Sv, divide by 100.
(b) NUREG-1150 (NRC 1990-TN525).
(c) NUREG-2105, Volume 1 (NRC 2013-TN6436).
(d) NUREG-1943, Volume 1 (NRC 2011-TN6437).
(e) NUREG-1936, Volume 1 (NRC 2011-TN1980).
(f) LMGS ER, Supplement 4 (LME 2026-TN12877).

At the OL stage of licensing, the NRC staff would perform a review of new and significant information if an OL application is received and accepted for review. This would include any updated information related to DBAs and severe accidents.

3.15.1.2 Severe Accident Mitigation Analysis

At the time of submission of the LMGS CP application, LME had performed an initial severe accident mitigation alternative (SAMA) and severe accident mitigation design alternative (SAMDA) analysis. The SAMA/SAMDA cost-benefit analysis is a seven-step process based on the guidance in NUREG/BR-0184 (NRC 1997-TN676) and is outlined in the SAMA license renewal guidance of NEI 05-01 (NEI 2005-TN1978). This process is usually intended for a 20-year license renewal period, but LME has applied the methodology to a 60-year (i.e., 40-year initial and 20-year renewal) reactor lifetime. LME completed the initial step of identification of severe accident risk and has indicated it will implement the remaining steps at the OL application stage.

The NRC staff is conducting a thorough independent review of the LMGS safety-related structures, systems, and components, which it will document in its safety evaluation. In that review, the NRC staff will determine whether the structures, systems and components that are important to safety are designed, implemented, and maintained to ensure that they are available and reliable to perform their preventative or mitigative functions when needed so that the likelihood of serious consequences is small. If the NRC staff determines, as documented in its safety evaluation, that LME has met all of the relevant NRC regulatory requirements and, has demonstrated that LMGS would meet the regulatory standards of adequate protection of public health and safety as set forth in 10 CFR 50.35, issuance of a CP may be appropriate. The NRC staff notes, however, that consistent with 10 CFR 50.35, not all design details need be complete at the time of CP issuance, and that because the LME Xe-100 reactor module is a first-of-a-kind reactor, the complete design will likely not be finalized until construction is nearly complete.

LME has stated that a full SAMA analysis would be performed at the OL stage of the licensing process. At that time, the NRC staff would perform a review of any new and significant information, if an OL application is received and accepted for review. This would include a review of the complete SAMA/SAMDA analysis.

3.15.2 Environmental Impacts of Decommissioning

The NRC staff assessed the impact of postulated accidents during operations in Section 3.15.1 above. During decommissioning, spent nuclear fuel and LLRW may be present onsite; however, the impacts of the maximum credible accident during operations should bound the impacts of accidents that remain applicable during decommissioning. With respect to radiological impacts other than those resulting from accidents, the NRC staff concludes that the potential radiological human health impacts of the proposed action during the period of operation and during decommissioning, would be not significant (see Section 3.10.5). This conclusion is based primarily on the facts that (a) the LMGS Xe-100 reactor module is estimated to have radiological effluent releases well below the NRC requirements for potential doses to members of the public (e.g., the nearest resident) with appropriate radiological environmental monitoring, (b) occupational doses would be less than the annual dose limits under 10 CFR Part 20 (TN283), and (c) the conclusions in the Decommissioning GEIS have been determined to bound the impacts for LMGS.

3.15.3 Conclusions

No radioactive material would be present during construction of the LMGS. Further, based upon the above analysis, the NRC staff concludes that the potential postulated accident impacts of the construction, operation, and decommissioning of the LMGS would be not significant.

3.16 <u>Climate Change</u>

3.16.1 Affected Environment

Climate change may alter the affected environment described in Section 3 during the period of the construction, operation, and decommissioning of the LMGS. Climate change is a global phenomenon that the construction, operation, and decommissioning of LMGS would not appreciably alter. However, climate change could provide an environment that may result in changed impacts from the proposed action. This section documents the NRC staff's assessment of the potential changes to the environment resulting from climate change that could affect the environmental impacts of the proposed action.

The interagency U.S. Global Change Research Program (USGCRP) was established under the Global Change Research Act of 1990 (P.L. 101-606) (15 U.S.C. § 2921 et seq. [Global Change Research Act of 1990-TN3330]) to "understand, assess, predict, and respond to human-induced and natural processes of global change" and is the authoritative U.S. government source on likely climate-change impacts in the United States. The NRC staff references the most recent National Climate Assessment (USGCRP 2023-TN9762) and other supporting documents (e.g., Runkle et al. 2022-TN8674) to identify likely environmental trends from climate change in the United States and in the region of the LMGS site. LMGS is located on the Texas Gulf Coast within the Southern Great Plains region as defined by the USGCRP.

Climate-change projections in the latest USGCRP reports cover the period through 2100 and are generally expressed as a change expected for the mid-21st century (e.g., 2036–2065) or late-21st century (e.g., 2071−2099) relative to average conditions existing in the near-present period prior to issuance of the reports (e.g., 1975−2005). Projected changes in the USGCRP reports are dependent on future emissions of heat-trapping gases. The USGCRP's climate-change reports include projections for scenarios in which such emissions continue increasing throughout the 21st century (higher scenario), increase somewhat before decreasing mid-century (lower scenario), and rapidly decrease to a negative value before the end of the century (even lower scenario). Unless otherwise indicated, climate-change projections described below are for the higher scenario of continued increasing emissions.

Under NRC regulations, an OL may be issued for up to 40 years and renewed for additional 20 year periods (10 CFR Part 50-TN249; 10 CFR Part 54-TN4878). LME has stated in the LMGS ER (LME 2025-TN12163) that construction is expected to be completed within 44 months of permit issuance, after which an OL application would be submitted. Based on this anticipated schedule, mid-century climate projections (2036–2065) are representative of the period of construction and initial operations, and late-century projections (2071–2099) are bounding for assessing the effects of climate change on the resource-area impacts presented in this EA.

For the Southern Great Plains region that includes the LMGS site, the following projections are reported in the ER (LME 2025-TN12163) and USGCRP reports:

- Temperature: Texas has warmed by about 1.5°F (0.8 degrees Celsius [°C]) since the early 20th century. Average annual temperatures across the Southern Great Plains are projected to increase by roughly 3.6–5.1°F (2–2.8°C) by mid-century and 4.4–8.4°F (2.4–4.7°C) by the late-21st century relative to 1976–2005. By the late-21st century, central Texas could experience 60 or more additional days per year with maximum temperatures above 100°F (38°C) compared to the historical average (USGCRP 2018-TN5847, USGCRP 2023-TN9762; LME 2025-TN12163).
- Precipitation: Annual average precipitation is projected to change by 0 to −5 percent by mid-century, with the largest decreases in winter (Runkle et al. 2022-TN8674; USGCRP 2023-TN9762). At the same time, the intensity of extreme precipitation events is likely to increase. Extreme 1 day rainfall across much of Texas has already increased by about 5–15 percent since the late 20th century, and the odds of intense precipitation events are projected to rise further by mid-century (USGCRP 2023-TN9762; LME 2025-TN12163).
- Drought and water demand: More intense heat events are likely to exacerbate naturally occurring droughts. Over the next 50 years in Texas, a 17 percent increase in water demand is expected from municipal use, manufacturing, and power generation, and by mid-century municipal water use is projected to rise to about 41 percent of available supply, increasing the risk of shortages during severe drought conditions (LME 2025-TN12163; USGCRP 2018-TN5847).
- Sea level and coastal hazards: The combination of coastal subsidence and sea-level rise is driving retreat of the Texas coastline, including barrier islands and coastal wetlands. Storm surges from hurricanes will tend to be more severe because of higher relative sea levels and a possible increase in extreme hurricane intensity (USGCRP 2023-TN9762; LME 2025-TN12163).

These observed and projected climate changes form the baseline for the NRC's evaluation of how climate change may affect the environmental impacts of LMGS during construction, operation, and decommissioning.

3.16.2 Environmental Impacts of Construction, Operation, and Decommissioning

The NRC staff considered the potential effects of projected climate change on each resource area evaluated in Section 3. Using the projections for the Texas Gulf Coast region cited in Section 3.16.1—such as higher average temperatures, more frequent and intense extreme heat events, more intense precipitation and flooding, drought-related water-supply stress, and gradual relative sea-level rise—the NRC staff compared these conditions to the impact determinations already documented for LMGS.

The NRC staff determined that the expected impacts of the construction, operation, and decommissioning of the LMGS described in Section 3 would not be materially altered by the projected effects of climate change. LMGS is located on developed industrial property adjacent to existing SDO facilities in Calhoun County, Texas, and does not require large-scale new greenfield development. This siting minimizes potential climate-change effects on land use, terrestrial and aquatic ecology, historic and cultural resources, and nonradiological waste management (LME 2025-TN12163).

Water supply and discharge infrastructure for LMGS will be provided through existing Dow/SDO systems permitted under Texas and Federal regulations (LME 2025-TN12163). While climate projections indicate hotter and drier summers and increased municipal/industrial water demand by mid-century (USGCRP 2018-TN5847, USGCRP 2023-TN9762), these changes are not expected to compromise the availability of water or the performance of permitted discharge systems during the anticipated construction, operating, and decommissioning periods analyzed in this EA. The LMGS site is not within a designated floodplain, and no substantive changes to the facility footprint are anticipated during its life; as such, no persistent impacts from building activities are expected (LME 2025-TN12163). NRC regulations require that plant structures, systems, and components important to safety be designed to withstand the effects of natural phenomena, such as flooding or sea level rise, without loss of capability to perform safety functions. Further, nuclear power plants are required to operate within technical safety specifications in accordance with the plants' NRC operating licenses, including coping with natural phenomena hazards. The NRC staff conducts safety reviews before allowing licensees to make operational changes due to changing environmental conditions. Additionally, the NRC staff evaluates nuclear power plant operating conditions and physical infrastructure to ensure safe operation under the plant's operating licenses through the NRC's Reactor Oversight Program. If new information becomes available about changing environmental conditions that threaten safe operating conditions or challenge compliance with a plant's technical specifications, the NRC staff will evaluate that information to determine if any safety-related changes are needed at the plant.

Projected increases in temperature and ozone formation are not expected to change the small, localized, and intermittent construction emissions or the limited operational emissions described in Section 3.2. These emissions are regulated under TCEQ and EPA requirements (LME 2025-TN12163).

Impacts to the transportation of radioactive materials and to nonradiological health hazards would continue to be mitigated through compliance with U.S. Department of Transportation and OSHA regulations (LME 2025-TN12163). Shipments of radioactive waste from the LMGS are expected to be infrequent and of small volume relative to licensed disposal capacity; therefore, climate change is not expected to alter the impact determinations for these activities (LME 2025-TN12163).

Radiological health impacts and socioeconomic impacts determined in Section 3 are not significant due to the very low radiological effluent releases expected from the LMGS and the small number of personnel needed to maintain and operate the facility (LME 2025-TN12163). Projected climatological changes are not likely to change these releases or significantly affect the small size of the required workforce.

3.16.3 Conclusions

Based on the above, the NRC staff concludes that the potential climate change impacts associated with the construction, operation, and decommissioning of the LMGS would be not significant.

4 ALTERNATIVES

This section describes alternatives to granting a CP for the LMGS and the environmental impacts of those alternatives. The need to compare the proposed action with alternatives arises from the requirement in Section 102(2)(C)(iii) of NEPA (TN661), which states that an EA shall include a reasonable range of alternatives to the proposed action, including the no-action alternative, that are technically and economically feasible, and meet the purpose and need of the proposal. The NRC implements this requirement through regulations in 10 CFR Part 51 (TN10253) and in in accordance with NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan" (ESRP) (NRC 2007-TN614), which state that the EA will include an analysis that considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and alternatives available for reducing or avoiding adverse environmental effects.

For the licensing of nuclear power reactors, the NRC staff considers a no-action alternative and a range of reasonable alternatives that may include alternative sites, alternative layouts of proposed facilities within a site, modification of existing facilities instead of building new facilities, alternative technologies, and alternative transportation methods in accordance with NUREG-1555 (NRC 2007-TN614). The applicant followed a systematic process for identifying a range of reasonable alternative sites for the proposed LMGS project, as outlined in Section 9.3 of the ER (LME 2025-TN12163). The process involved systematic consideration of possible sites, leading to the identification of three sites adjacent to or near the SDO. The applicant did not consider alternative layouts of the proposed facilities on these sites. There are many possible layouts for the proposed facilities within the sites, but none would substantially differ with respect to environmental impacts. Because none of the three sites presently contain existing facilities, the applicant did not consider opportunities to repurpose existing facilities in lieu of building new facilities.

Because part of the purpose and need for the proposed Federal action is to demonstrate the Xe-100 reactor, the applicant did not consider energy alternatives to the proposed action.

The NRC staff evaluated the applicant's process for identifying reasonable alternatives to the proposed action and finds, as described below, the applicant's process to be reasonable. Specifically, the NRC staff finds that the applicant's process is analytical, logical, appropriate to the purpose and need identified in Chapter 1, and in keeping with the spirit and intent for identifying a range of reasonable alternatives for analysis in an EA. Below, Section 4.1 addresses the environmental impacts from the no-action alternative and Section 4.2 addresses the potential alternative sites for the project, including potential environmental impacts from the alternative sites.

4.1 <u>No-Action Alternative</u>

Under the no-action alternative, the NRC would not issue a CP to LME. Therefore, the applicant would not be able to build the LMGS to demonstrate the Xe-100 reactor and replace the existing natural gas-fired co-generation plant at the SDO. As such, the purpose and need for the proposed action would not be met. While not building the LMGS might not necessarily preclude the future development of reactors using the Xe-100 technology, it could slow or impede the safe and efficient development of the technology and possible environmental benefits from replacement of older, more polluting energy generation technologies. It could require SDO to rebuild or replace the existing onsite natural gas co-generation plant preventing the achievement of decarbonization goals at the site (LME 2025-TN12163: Section 9.1). In the short term, at the LMGS site, none of the environmental effects associated with the DOE's authorization of preconstruction and the NRC's authorization of construction as described in Chapter 3 would occur under the no-action alternative. Additionally, under the no-action alternative, the adjacent Dow Chemical plant would continue to be served by the existing natural gas-fired plant (with environmental impacts similar to the existing impacts), or the proposed site would remain available for other government or private industrial development projects, and many of the environmental impacts resulting from land disturbance and building new industrial facilities on the site might still occur at some time in the future.

4.2 Site Alternatives

The applicant followed the process described in Section 9.3 of the ER (LME 2025-TN12163) to evaluate potential sites for the proposed facilities. The process was informed by NRC guidance including RG 4.2, Revision 3, "Preparation of Environmental Reports for Nuclear Power Stations" (NRC 2018-TN6006) and NUREG-1555 (NRC 2007-TN614).

4.2.1 Process for Identifying Reasonable Alternative Sites

In addition to demonstrating the Xe-100 technology, part of the project's purpose and need is to provide electricity and steam to the SDO, replacing the existing co-generation natural gas-fired power plant. As such, all reasonable alternative sites must be within 1.5 mi (km) of the SDO in order to provide process steam at the required temperature and pressure. After applying this criterion, four potential plant sites located on or adjacent to existing Dow property were identified. A subsequent resource availability and suitability evaluation of these potential sites did not eliminate any of the four sites, described as Site A, Site B, Site C, and Site D. Site A was identified as the proposed site analyzed in Chapters 2 and 3. Sites B, C, and D were carried forward for consideration as alternative sites and are discussed in detail below. Figure 4-1 shows the relative locations and potential boundaries of each of these sites, in relation to the existing SDO.

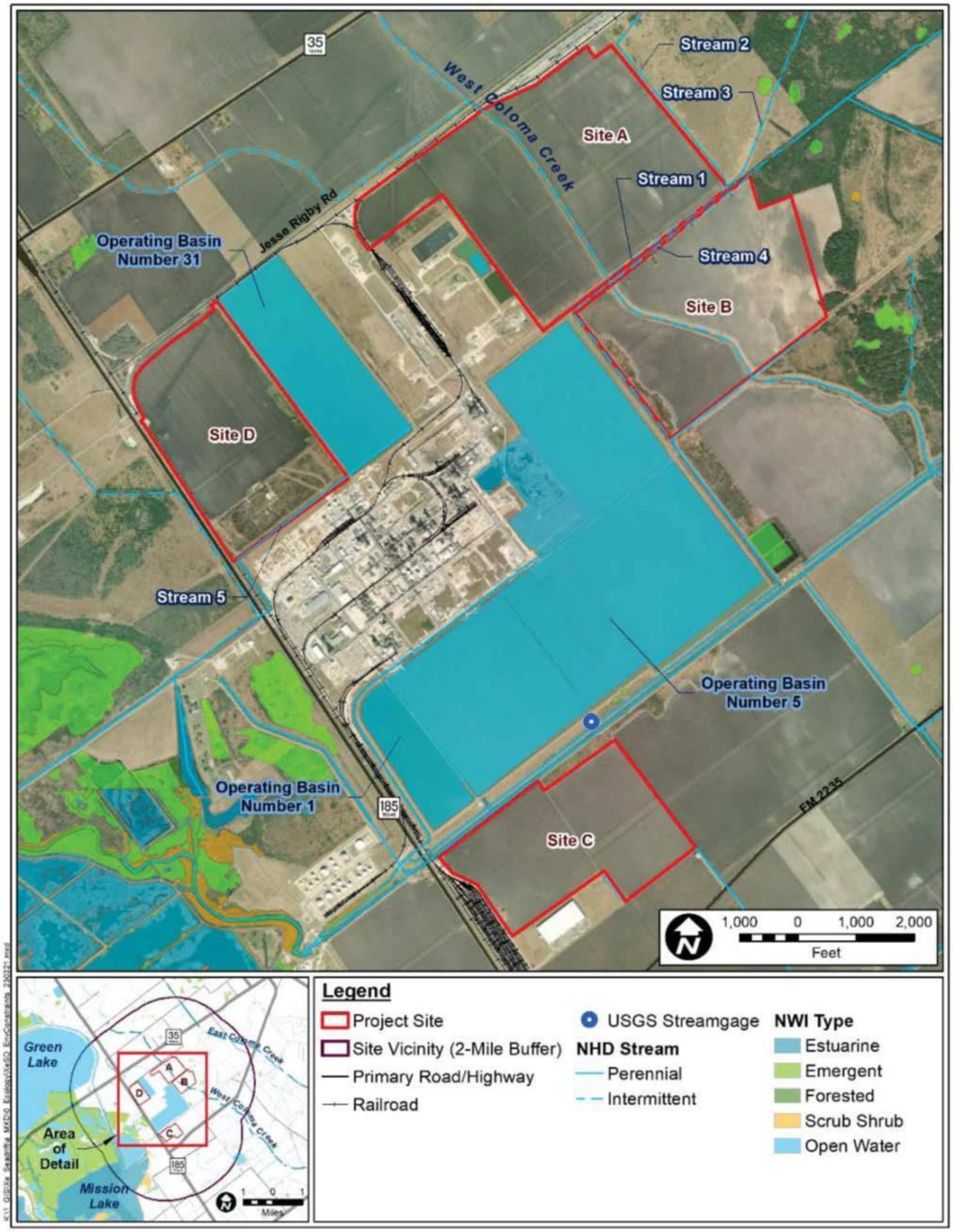

Figure 4-1 Long Mott Generating Station Alternative Project Site Locations. Source: LME 2025-TN12163.

4.2.2 Affected Environment and Environmental Consequences for the Alternative Sites

4.2.2.1 Affected Environment

Alternative Site B comprises approximately 235 ac (95 ha), consists almost entirely of agricultural lands used for cultivation, and is considered prime farmland. One stream and a drainage ditch with associated wetlands are located on Site B. Alternative Site C comprises approximately 166 ac (67 ha), consists almost entirely of agricultural lands used for cultivation, and is considered prime farmland. One pond and an associated wetland are located on Site C. Alternative Site D comprises approximately 193 ac (78 ha), the majority of the site is currently agricultural lands used for cultivation and is considered prime farmland. One stream and emergent wetlands are located on Site D.

4.2.2.2 Environmental Consequences

In general, based on the close proximity of each of the alternative sites, the environmental impacts associated with the alternative site locations would be similar in nature and magnitude to those of the Site A (the proposed site). Construction of the LMGS at the Proposed Site or any of the alternative sites would result in a loss of prime farmland. Each of the sites contains streams, ponds, or wetlands that would be impacted, although the majority of these features are intermittent and seasonal and do not support aquatic species. Otherwise, impacts associated with groundwater hydrology, surface water use, socioeconomics, air quality, traffic, recreation, and public services are expected to be substantially similar to those of the proposed site. Based on the NRC staff's independent assessment, the staff concludes that none of the alternative sites are environmentally preferable to the proposed site.

4.3 <u>System Design Alternatives</u>

The applicant presents alternative heat dissipation systems in Section 9.4 of the ER (LME 2025-TN12163). Since, as discussed in Section 2.1, the proposed heat dissipation system is an air-cooled condenser (ACC), there would be no circulating water system, and therefore no circulating water system alternatives are applicable.

Alternative heat dissipation systems include once-through cooling systems and various closed-cycle cooling systems. A once-through cooling system is not suitable for the LMGS because of the lack of proximity to a surface water body suitable to supply the required water volume as well as the environmental impacts associated with such a system. Similarly, regarding closed-cycle cooling systems, mechanical draft wet cooling towers are not environmentally preferable due to the lack of required water volume. Natural draft cooling towers are not environmentally preferable because of the large footprint of such structures, the visual impacts associated with these towers and associated plumes, as well as the amount of water required. Wet/dry hybrid cooling towers are not environmentally preferable because of the reduced electrical output and additional maintenance associated with the dry portion and the water needs associated with the wet portion. Cooling ponds and spray ponds are not environmentally preferable due to the lack of suitable surface water near the LMGS as well as the large footprints associated with such designs.

4.4 Benefit–Cost Analysis of the Alternatives

A principal objective of NEPA is for each Federal agency to consider in its decision-making process the environmental effects of the proposed agency action and a reasonable range of alternatives. Specifically, Section 102(B) of NEPA (TN661) requires all Federal agencies, to the fullest extent possible, to:

> …identify and develop methods and procedures…, which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations (TN661).

The purpose of this section is to identify potential societal benefits and costs of the proposed agency action and a reasonable range of alternatives. This section focuses on benefits and costs of importance to inform the decision-making process. This section compares the environmental impact conclusions in this EA. Section 10.6 of the ER (LME 2025-TN12163), provides a description of the anticipated benefits of LMGS against costs, including environmental effects. This information is incorporated here by reference.

4.5 Benefits

Benefits of the project include the following:

- addressing need for power of the SDO
- reducing emissions compared to the existing natural gas-fired power plant at the SDO
- demonstrating the Xe-100 reactor
- providing steam and power generation to support the SDO
- increasing tax payments and revenue to the local economy

4.6 Costs

Costs of the project include the following:

- economic costs (capital costs for engineering, construction, material, annual operating expenses and decommissioning)
- land use impacts, water resources, ecological resources, socioeconomic effects (increased demand for housing and public services), historic property and cultural resources, air quality, and nonradiological and radiological health and waste management, as discussed in Chapter 3
- displacement of prime farmland

4.7 Summary of Benefits and Costs

On the basis of the environmental effects evaluated in this EA, the NRC staff concludes that the benefits of constructing, operating, and decommissioning the LMGS outweigh the proposal's economic, environmental, and social costs. This conclusion applies regardless of whether the LMGS is sited adjacent to the existing SDO facility or at any of the three alternative sites.

4.8 Comparison of the Potential Environmental Impacts

The NRC staff compared the effects of the proposed agency action and alternative sites in this EA and concluded that the potential environmental effects would be not significant. The potential impacts from the no-action alternative to each potentially affected environmental resource would also be not significant in the short term but could potentially be significant in the long term because of the delay in possible environmental benefits from developing the Xe-100 technology.

5 CONCLUSIONS AND RECOMMENDATIONS

This chapter presents conclusions and recommendations based on the environmental review of the LMGS CP application. Section 5.15.1 summarizes the environmental impacts of the proposed action. Section 5.2 discusses the unavoidable impacts of the proposed action and identifies resource commitments.

5.1 Environmental Impacts of the Proposed Action

Chapter 3 summarizes the potential environmental effects of the proposed agency action. These conclusions are based on the NRC staff's environmental review, the ER (LME 2025-TN12163), and consultation with Federal, State, local agencies, and Indian Tribes. Table 5-1 summarizes the environmental effects and provides the conclusion for each resource area considered.

Table 5-1 Summary of Environmental Impacts from the Proposed Project

Resource Area	EA Section	Summary of Impact
Land Use and Visual Resources	3.1	LMGS would convert approximately 320 ac of cropland to industrial use and temporarily convert an additional 400 ac of cropland, for a total of approximately 720 ac of cropland affected. LMGS would be compatible with adjacent industrial land use, consistent with the enforceable policies of the Texas CMP, and would not alter the area's visual character. LMGS would convert up to 1 mi^2 of prime farmland.
Air Quality	3.2	Potential impacts to air quality in the vicinity of the LMGS associated with construction activities are expected to be typical of construction projects. Heavy equipment will generate diesel exhaust and fugitive dust emissions. The emissions are projected to comply with TCEQ and EPA guidelines. The proposed LMGS is intended to replace an existing natural-gas fired co-generation plant to provide power and steam to an adjacent industrial facility. This will result in a decrease in atmospheric emissions of criteria pollutants and GHGs once LMGS is online and the current plant is taken off-line.
Geology	3.3	N/A
Surface Water	3.4	Development of the LMGS site and water supply to Basin #5 will result in localized changes to site drainage patterns on the LMGS site, runoff to West Coloma Creek, and the channel of the Calhoun Canal near the new intake. LMGS water use is a small fraction of monthly mean Guadalupe River flows, and any required increase of water diverted to the GBRA canal to support LMGS is well below the existing pumping capacity of the GBRA diversion. LMGS water use would not be expected to reduce water availability for the single downstream water right on the Guadalupe River or those associated with the GBRA Calhoun Canal. Additionally, the magnitude of LMGS water use compared to diversion rights in the Guadalupe—San Antonio Basin is a

Resource Area	EA Section	Summary of Impact
		fraction of a percent and therefore would not substantially affect basin-wide water availability (Wurbs 2005-TN12535). Wastewater from LMGS will be processed by the SDO’s wastewater treatment facilities and will be discharged at the existing TPDES outfall. The effect of the development of the LMGS site on stormwater runoff water quality will be managed by BMPs and the site will be designed, permitted, and operated in accordance with all applicable laws and regulations. LMGS water use is small compared to Guadalupe River flows and would not sizably impact freshwater inflows to the estuary system.
Groundwater	3.5	Site hydrogeologic characteristics, including the presence of the confining clay unit in the upper Beaumont Formation prevents significant downward migration of contaminants into the underlying aquifer units. Excavations during construction will be limited to shallow depths (approximately 2 ft) within the impermeable clay Beaumont Formation, which is not regarded as water-bearing. Minor dewatering that may be required during construction would be temporary and localized, with negligible impacts to groundwater flow paths or elevations. The temporary sediment basin and permanent stormwater basin may have a local impact on groundwater flow paths and elevations, but these changes are unlikely to extend beyond the site boundary due to the discontinuous nature of the more permeable sand layers of the Chicot aquifer and the relatively small footprint (less than 1 percent of the overall site area) of the ponds. No dewatering will occur during plant operation, and groundwater will not be used for any purpose. Furthermore, the LMGS will utilize an air-cooled system, meaning no water is consumed or discharged during the cooling process, further minimizing the potential for contaminants to interact with groundwater. Plant operation does not involve liquid discharges to groundwater, and robust preconstruction and construction-phase monitoring programs will enable the identification of potential inadvertent releases to the environment. These combined measures ensure that potential impacts to groundwater resources during construction, operation, and decommissioning remain minimal.
Aquatic Ecological Resources	3.6	Construction that could affect aquatic resources includes building structures associated with the intake on the GBRA Calhoun Canal, the water intake pipeline stream crossings, two bridges that would be built across West Coloma Creek for vehicle traffic, stormwater outfalls into West Coloma Creek, utility crossings over West Coloma Creek, and clearing and grading that could introduce runoff and sediment to streams on the LMGS site. All TCEQ and USACE guidelines and mitigative requirements would be followed (LME 2025-TN12163). In addition to the required mitigation work, TPWD has provided recommendations to LME to protect aquatic species and species of concern during construction work, including BMPs. These can be found in the first letter in Section 1A, Agency Correspondence, of the Long Mott ER and are incorporated by reference (LME 2025-TN12163). Additional BMPs and conservation measures provided by FWS to

Resource Area	EA Section	Summary of Impact
		protect ESA-listed mussels would also provide protection to other aquatic species and are incorporated by reference (FWS 2025-TN12668; LME 2026-TN12669). Combined, these BMPs should minimize impacts to West Coloma Creek's aquatic communities.
Terrestrial Ecological Resources	3.7	The project would be situated in an existing industrial site and land disturbance would be limited to previously developed lands and croplands. The applicant plans to adhere to required site permits and BMPs for the construction of LMGS, which would reduce impacts.
Historic and Cultural Resources	3.8	The project area has been previously impacted by various construction activities, including the construction of the existing Seadrift plant, other surrounding facilities, and ongoing farming/cultivation in the area. WSP conducted archaeological surveys for the APE and did not identify any cultural resources. The proposed action would result in No Historic Properties Affected, as defined in 36 CFR 800.4(d)(1) (TN513). There would be no impact to historic and cultural resources.
Socioeconomics	3.9	Construction would last over 44 months, requiring up to 1,473 workers during peak construction. Contractors would be responsible for assuring workers are available, by skill, craft, and trade, when needed, including temporary housing, if necessary. Some workers would reside and commute from within the ROI. This would result in little if any increased demand for temporary housing. As discussed in LME's ER Section 2.5, rental housing is available in the socioeconomic ROI (see also ER Table 2.5-16) (LME 2025-TN12163).
Radiological Health	3.10	At certain times during construction, devices containing byproduct material may be used in support of construction, such as for soil compaction testing or radiography, by licensed individuals. Devices utilizing byproduct material are required to be controlled by the devices' licensee(s) for very specific uses under controlled conditions. The dose to construction workers from byproduct material is expected to have negligible contribution to their annual dose.
Nonradiological Human Health	3.11	The applicant plans to reduce the potential for nonradiological occupational and public health hazards through implementation of safety practices, training, and physical control measures (LME 2025-TN12163) for the construction of the LMGS.
Nonradiological Waste	3.12	Construction debris created by excavation and land clearing would be either recycled or disposed of offsite to a licensed facility. Liquid waste produced during construction would be stored and disposed according to regulations. During construction, the applicant would follow all applicable BMPs and Federal, State, and local requirements and standard for handling, transporting, and disposing of nonradiological wastes.
Transportation of Radioactive Material	3.13	No radioactive material would be transported during construction, and no radiological impacts are anticipated.
Uranium Fuel Cycle and Radiological Waste Management	3.14	No nuclear fuel would be present, and no radiological waste would be generated during construction.

Resource Area	EA Section	Summary of Impact
Postulated Accidents	3.15	No nuclear fuel would be present during construction, and no radiological impacts are anticipated.
Climate Change	3.16	The NRC staff determined that the expected impacts of the construction, operation, and decommissioning of the LMGS would not be materially altered by the projected effects of climate change. LMGS is located on developed industrial property adjacent to existing SDO facilities in Calhoun County, Texas, and does not require large-scale new greenfield development. This siting minimizes potential climate-change effects on land use, terrestrial and aquatic ecology, historic and cultural resources, and nonradiological waste management (LME 2025-TN12163).

BMP = best management practice; CFR = *Code of Federal Regulations*; Dow = Dow Chemical Company Inc.; CMP = Coastal Management Program; EA = environmental assessment; EPA = U.S. Environmental Protection Agency; ER = environmental report; FWS = U.S. Fish and Wildlife Service; GBRA = Guadalupe-Blanco River Authority; GHG = greenhouse gas; LME = Long Mott Energy, LLC; LMGS = Long Mott Generating Station; ROI = region of influence; SDO = Seadrift Operations (facility); TCEQ = Texas Commission on Environmental Quality; TPDES = Texas Pollutant Discharge Elimination System; TPWD = Texas Parks and Wildlife Department; USACE = U.S. Army Corps of Engineers; WSP USA Environment & Infrastructure, Inc.

5.2 Resource Commitments

The following sections address issues related to resource commitments contributing to the cost-benefit analysis presented in Section 4.4.

5.2.1 Unavoidable Adverse Environmental Impacts

For the purpose of this EA, unavoidable adverse environmental impacts are defined as adverse environmental impacts that cannot be avoided even with the implementation of mitigation measures. The applicant addresses unavoidable adverse environmental impacts in Section 10.2 of the ER (LME 2025-TN12163) and summarizes the unavoidable adverse environmental impacts and proposed mitigations in Table 10.2-1 of the ER (LME 2025-TN12163).

As noted in Chapter 3, the NRC staff concluded that there would be no significant effects for the affected resource areas. However, this conclusion does not necessarily indicate that there would not be any adverse environmental effects that could be offset or minimized through mitigation. For those resource areas determined to have impacts from construction, there are opportunities to minimize and mitigate the adverse environmental effects. Therefore, Table 5-2 presents the unavoidable adverse environmental impacts from the construction of the LMGS, including mitigation and control measures intended to lessen adverse environmental effects. Unless noted otherwise, the mitigation measures presented in Table 5-2 are adapted from Section 10.2 and Tables 10.2-1 and 10.2-2 of the ER (LME 2025-TN12163).

Table 5-2 Unavoidable Adverse Environmental Impacts for Proposed Project

Resource Area	Unavoidable Adverse Impact	Mitigation Measures
Land Use and Visual Resources	Permanent conversion of 320 ac from primarily cropland to industrial use.	Restore temporarily impacted areas after building is complete using native or non-invasive plant species. Restrict soil stockpiling and reuse in designated areas on the LMGS site.

Resource Area	Unavoidable Adverse Impact	Mitigation Measures
		Further consultation with U.S. Department of Agriculture Natural Resources Conservation Service and incorporate any mitigation requirements as needed. Conduct consistency determination and incorporate any mitigation measures as needed. Dispose of construction-related debris generated in an existing licensed facility.
Air Quality	None	None
Water Resources	Minor, localized, short-term impact to West Coloma Creek. Minor, short-term impact related to the use of water during building activities.	Impact to West Coloma Creek overbank flow during high flow conditions is managed through adherence of regulatory requirements for site design and operation. Temporary features uses during construction of two bridges over West Coloma Creek comply with relevant regulations, agency approvals, and typical standards for construction related to overall channel flow capacity. Management of dewatered groundwater in permanent stormwater basin.
Aquatic Ecological Resources	Minor, localized, short-term impacts to aquatic ecosystems during building.	To minimize stream disturbance, personnel and equipment will only enter riparian areas when essential to complete work.
Terrestrial Ecological Resources	Localized establishment of invasive species in disturbed areas. Localized impacts due to lighting. Direct and indirect impacts to potential wetlands are avoided and minimized as much as possible. Mitigation could reduce impacts.	Restore temporarily affected area with native or non-invasive plant species and conduct periodic monitoring and control measures. Minimize the amount of nighttime light, using down-shielding, and full cutoff luminaries. Comply with Texas Commission on Environmental Quality and U.S. Army Corps of Engineers 404 permit guidelines to mitigate destruction of 3.7 ac of wetlands.
Historic and Cultural Resources	None	None

Resource Area	Unavoidable Adverse Impact	Mitigation Measures
Socioeconomics	None	Train and appropriately protect employees and construction workers to reduce the risk of potential exposure to noise, dust, and exhaust emissions. Return public roads, signs, and markings to preexisting conditions or better to address physical deterioration of roadways used to access the LMGS site.
Radiological Health	Exposure of plant personnel to radiation.	Develop administrative programs and procedures governing Radiation Protection and Health Physics in conjunction with the radiation protection design features with the intent to maintain occupational radiation exposures to ALARA levels.
Nonradiological Waste Management	Minor reduction in landfill capacity.	Solid waste is managed in accordance with the applicable Federal, State, and local requirements and standards, and disposed of within landfills having sufficient capacity.
Nonradiological Human Health	None	None
Transportation of Radioactive Material	None	None
Uranium Fuel Cycle	Increase in off-site energy requirements, land use, erosion, emissions and water use, and associated impacts to land use, water use, air and water quality, aquatic and terrestrial ecosystems, the public, construction workforce, and socioeconomic resources due to LMGS fuel consumption. Occupational and public exposures to radioactive materials from incident-free transportation.	None
Postulated Accidents	None	None
Climate Change	None	None

ALARA = as low as reasonably achievable; LMGS = Long Mott Generating Station.

5.2.2 Relationship Between Local Short-Term Uses of the Environment and Maintenance and Enhancement of Long-Term Productivity

The construction of the facilities under the proposed action would result in short-term uses of environmental resources. “Short-term” is the period of time during which construction, operation, and decommissioning activities would take place. While the applicant indicates that decommissioning would commence once the facilities reach the end of their licensed life, the applicant does not indicate how long decommissioning would take. Applicants for the licensing of new reactors typically do not develop a plan for decommissioning when applying for CPs and/or OLs and no such plan is required at this time.

While the uses of, and impacts on, environmental resources would primarily be minimal over the short-term, the long-term benefits from the construction of the LMGS could be substantial. The LMGS could help demonstrate the commercial viability of the Xe-100 technology and provide electricity and process steam to the SDO.

5.2.3 Irreversible and Irretrievable Commitment of Resources

An irreversible commitment of resources occurs when potential impacts have the possibility to limit future options for a resource. An irretrievable commitment of resources is defined as the lost production or use of a resource that would cause the resource to be unavailable for use by future generations. Irreversible and irretrievable commitments of resources for construction of a nuclear power facility such as the LMGS include the commitment of water, energy, raw materials, and other natural and human-made resources. In general, the commitments of capital and labor for a project such as the LMGS are also irreversible.

Building, operating, and decommissioning the LMGS would entail the irreversible and irretrievable commitment of energy, water, chemicals, fossil fuels, and other natural and human-made resources, and would consume concrete, structural steel, steel sheet pilings, precast piles, precast panels, asphalt, stone, roofing/siding, and temporary structures. These materials would be irretrievable unless LME recycles them during decommissioning (e.g., if LME finds another facility to use such materials).

5.2.4 Unresolved Conflicts

NEPA requires the NRC to study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. In reviewing the potential impacts associated with the proposed action, the NRC staff did not identify any unresolved conflicts concerning alternative uses of available resources.

5.3 Recommendation

After weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, the NRC staff recommends, unless safety issues mandate otherwise, that the NRC issue the requested CP to LME. This recommendation is based on:

- The NRC staff's review of LME's ER, information gathered during the environmental audit, and responses to requests for clarifying information
- the NRC staff's consultation with Federal, State, local agencies, and Indian Tribes
- the NRC staff's independent environmental review and assessment summarized in this EA

6 FINDING OF NO SIGNIFICANT IMPACT

The proposed action before the NRC is to determine whether to issue a CP to LME to authorize construction of the LMGS. The proposed action also includes a determination whether to grant exemptions from the requirements in 10 CFR 51.20(b)(1), 10 CFR 51.25, and 10 CFR 51.75(a) (TN10253). The NRC has conducted an environmental review of the LME CP application as well as the proposed exemptions, and prepared an EA. Based on its determinations in the EA that there would be no significant environmental impacts for each potentially affected resource area, and there would be no environmental impacts resulting from granting the exemptions, the NRC staff has determined that the proposed action would not have a significant effect on the quality of the human environment. Accordingly, the NRC staff has made a determination that preparation of an EIS is not required for the proposed action, that a FONSI is warranted, and that exemptions from the cited regulations in 10 CFR Part 51 should be issued. This finding and the related environmental documents referenced throughout the EA are available for public inspection as discussed in the EA.

7 REFERENCES[1]

10 CFR Part 20. *Code of Federal Regulations*, Title 10, *Energy*, Part 20, “Standards for Protection Against Radiation.” TN283.

10 CFR Part 40. *Code of Federal Regulations*, Title 10, *Energy*, Part 40, “Domestic Licensing of Source Material.” TN4882.

10 CFR Part 50. *Code of Federal Regulations*, Title 10, *Energy*, Part 50, “Domestic Licensing of Production and Utilization Facilities.” TN249.

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” TN10253.

10 CFR Part 54. *Code of Federal Regulations*, Title 10, *Energy*, Part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants.” TN4878.

10 CFR Part 70. *Code of Federal Regulations*, Title 10, *Energy*, Part 70, “Domestic Licensing of Special Nuclear Material.” TN4883.

10 CFR Part 71. *Code of Federal Regulations*, Title 10, *Energy*, Part 71, “Packaging and Transportation of Radioactive Material.” TN301.

10 CFR Part 73. *Code of Federal Regulations*, Title 10, *Energy*, Part 73, “Physical Protection of Plants and Materials.” TN423.

10 CFR Part 100. *Code of Federal Regulations*, Title 10, *Energy*, Part 100, “Reactor Site Criteria.” TN282.

10 CFR Part 1021. *Code of Federal Regulations*, Title 10, *Energy*, Part 1021, “National Environmental Policy Act Implementing Procedures.” TN11138.

29 CFR Part 1910. *Code of Federal Regulations*, Title 29, *Labor*, Part 1910, “Occupational Safety and Health Standards.” TN654.

36 CFR Part 60. *Code of Federal Regulations*, Title 36, *Parks, Forests, and Public Property*, Part 60, “National Register of Historic Places.” TN1682.

36 CFR Part 800. *Code of Federal Regulations*, Title 36, *Parks, Forests, and Public Property*, Part 800, “Protection of Historic Properties.” TN513.

40 CFR Part 50. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 50, “National Primary and Secondary Ambient Air Quality Standards.” TN1089.

[1] Many references cited in this document and listed in this chapter are available through the NRC Library on the NRC’s public web site at http://www.nrc.gov/reading-rm/doc-collections/ and through the NRC’s Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html. Other references include open literature items, such as books, journal articles, transactions, *Federal Register* notices, Federal and State legislation, and congressional reports. Such documents may be accessed at the website listed in the reference or may be purchased from the sponsoring organization, as appropriate.

40 CFR Part 51. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 51, “Requirements for Preparation, Adoption, and Submittal of Implementation Plans.” TN1090.

40 CFR Part 60. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 60, “Standards of Performance for New Stationary Sources.” TN1020.

40 CFR Part 112. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 112, “Oil Pollution Prevention.” TN1041.

40 CFR Part 125. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 125, “Criteria and Standards for the National Pollutant Discharge Elimination System.” TN254.

40 CFR Part 190. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 190, “Environmental Radiation Protection Standards for Nuclear Power Operations.” TN739.

40 CFR Part 204. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 204, “Noise Emission Standards for Construction Equipment.” TN653.

50 CFR Part 402. *Code of Federal Regulations,* Title 50, *Wildlife and Fisheries*, Part 402, “Interagency Cooperation—Endangered Species Act of 1973, as amended.” TN4312.

49 FR 9375. March 12, 1984. “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions and Related Conforming Amendments.” *Federal Register*, Nuclear Regulatory Commission. TN7951.

72 FR 57416. October 9, 2007. “Limited Work Authorizations for Nuclear Power Plants.” *Federal Register,* Nuclear Regulatory Commission. TN260.

81 FR 88609. December 8, 2016. “Safeguarding the Nation from the Impacts of Invasive Species.” Executive Order 13751. *Federal Register*, Office of the President. TN8375.

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APPENDIX A

CONTRIBUTORS TO THE ENVIRONMENTAL ASSESSMENT

Members of the U.S. Nuclear Regulatory Commission (NRC, the Commission) Office of Nuclear Material Safety and Safeguards; Division of Rulemaking, Environmental, and Financial Support (REFS); and Environmental New Reactor Branch prepared this environmental assessment along with staff from Pacific Northwest National Laboratory (PNNL). Staff from other NRC branches and from PNNL provided supplemental technical support and technical editing. Table A-1 identifies each contributor's name and affiliation, summary of education and experience, and indication of function or expertise contributed to the document.

Table A-1 List of Preparers

Name & Affiliation	Education/Experience	Function or Expertise
Becka Iveson, PNNL	MS Hydrogeology and Water Resource Management; BS Earth and Environmental Science; Over 5 years in groundwater resource assessment and environmental impact evaluation, contaminated land risk assessment and remediation, and natural resource management and monitoring	Groundwater Hydrology
Bradley Fritz, PNNL	MS Environmental Engineering BS Physics Over 15 years of relevant experience in atmospheric measurements and regulatory compliance	Air Quality and Meteorology
Bradley Werling, NRC	BA Engineering Physics BS Chemistry MS Environmental Science Duke NEPA Certificate 25+ years of experience as an analytical chemist including air monitoring analyses and radionuclide transport studies with 20 years of experience preparing and reviewing NEPA documents.	Air Quality and Meteorology
Caitlin Wessel, PNNL	PhD Marine Science MS Coastal, Marine, and Wetland Science BS Biology BS Math 11 years of relevant experience in environmental impact assessment and aquatic ecology	Aquatic Ecology, Endangered Species Act Compliance
Cleve Davis, PNNL	PhD Environmental Science MS Anthropology BS Botany 25 years of relevant experience in NEPA	Historic and Cultural Resources, National Historic Preservation Act Compliance

Name & Affiliation	Education/Experience	Function or Expertise
Colby Mangini, PNNL	PhD Radiation Health Physics MHP Radiation Health Physics BS Physics CHP 20 combined years of relevant experience in radiological health physics, environmental dose assessment, and nuclear materials risk assessment	Accidents, Decommissioning, Fuel Cycle, Health Physics, Radiological Health, Transportation
Dana Vesty, PNNL	BS Environmental Science PWS 8 years of experience in environmental assessments, permitting, environmental resource monitoring, and data analysis	Terrestrial Ecology, Endangered Species Act Compliance
Dave Goodman, PNNL	JD Law BS Economics Over 15 years of experience including NEPA environmental impact assessments, ecological restoration, Endangered Species Act, land use and visual resources, and environmental law and policy	Project Management, Project Description, Purpose and Need, Alternatives, Conclusions and Recommendations
Donald Palmrose, NRC	PhD Nuclear Engineering MS Nuclear Engineering BS Nuclear Engineering 39 years of experience including operations on U.S. Navy nuclear powered surface ships, technical and NEPA analyses, nuclear authorization basis support for DOE, and NRC project management	Accidents, Decommissioning, Health Physics, Radiological Health, Transportation, Waste Management
Gerry Stirewalt, NRC	PhD Structural Geology with two postdoctoral appointments BA Geology/Mathematics Registered PG and CEG Over 50 years of relevant experience in environmental and engineering geology, including 3-D geospatial modeling of subsurface stratigraphy, tectonic faults, and groundwater contaminant plumes	Groundwater Hydrology, Geology
Gretchen Applegate, DOE	BS Environmental Science Over 15 years of experience in NEPA	Project Management, Purpose and Need
Hayley McClendon, PNNL	BS Environmental Science 9 years of relevant experience in environmental compliance, including waste management and permitting	Project Management, Project Description, Purpose and Need, Alternatives, Nonradiological Human Health, Noise, Nonradiological Waste Management

Name & Affiliation	Education/Experience	Function or Expertise
Jeffrey Rikhoff, NRC	MRP Regional Environmental Planning MS Development Economics BA English 44 years of combined industry and government expertise in NEPA compliance for DOE Defense Programs/NNSA and Nuclear Energy, DoD, and DOI; project management; socioeconomic impact analysis, historic and cultural resource impact assessments, consultation with American Indian Tribes, and comprehensive land use and development planning studies	Benefit-Cost, Need for Power, Socioeconomics
Joe O'Hara, NRC	MS Engineering Management BS Marine Engineering Qualified NRC Resident Inspector Project management experience in light water commercial, micro and advanced reactors	Project Management
Jonathan Napier, PNNL	PhD Radiation Health Physics MS Health Physics BS Environmental Science Certified health physicist with 9 years of experience in health physics, nuclear materials inspections and licensing, and radiation safety	Accidents, Decommissioning, Fuel Cycle, Health Physics, Radiological Health, Transportation, Waste Management
Kazi Tamaddun, PNNL	PhD Civil and Environmental Engineering MS Civil Engineering 8 years of experience in hydrologic, hydraulic, ecosystem, and water systems modeling; hydro-climatology; and climate-change modeling and analysis	Climate Change
Kimberly Leigh, PNNL	BS Environmental Science 25 years of experience in NEPA compliance and project management	Nonradiological Human Health, Noise
Lindsey Renaud, PNNL	MA Anthropology BA Anthropology 15 years in cultural resource management, Section 106 and 110 compliance, and NEPA environmental impact assessments; Secretary of the Interior-qualified Registered Professional Archaeologist; Experience in Tribal engagement and Native American Graves Protection and Repatriation Act compliance	Historic and Cultural Resources, National Historic Preservation Act Compliance
Lloyd Desotell, NRC	MS Civil Engineering MS Water Resources Management BA Environmental Studies 20+ years of experience conducting surface and subsurface hydrologic analyses	Surface Water Hydrology
Peyton Doub, NRC	MS Plant Physiology (Botany) BS Plant Sciences (Botany) Duke NEPA Certificate; Professional Wetland Scientist; Certified Environmental Professional; 38 years of experience in terrestrial and wetland ecology and NEPA	Alternatives, Aquatic Ecology, Land Use, Terrestrial Ecology

Name & Affiliation	Education/Experience	Function or Expertise
Philip Meyer, PNNL	PhD Civil Engineering MS Civil Engineering BA Physics 30 years of relevant experience in subsurface hydrology and contaminant transport, including 15 years of experience in groundwater resource assessment and environmental impacts analysis	Climate Change, Groundwater Hydrology
Rajiv Prasad, PNNL	PhD Civil and Environmental Engineering MTech Civil Engineering BE Civil Engineering 25 years of experience in applying hydrologic principles to water resources engineering, hydrologic design, flooding assessments, environmental engineering, and impact assessment, including 15 years of experience in NEPA environmental assessments of surface water resources	Surface Water Hydrology
Rao Tammara, NRC	MS Environmental/Nuclear Engineering MS Chemical Engineering BS Chemical Engineering 50 years of engineering/consulting experience	Accidents, Decommissioning, Fuel Cycle, Health Physics, Radiological Health, Nonradiological Human Health, Noise, Transportation, Waste Management
Robert Hoffman, NRC	BS Environmental Resource Management 35 years of experience in NEPA compliance, environmental impact assessment, alternatives identification and development, and energy facility siting	Project Management
Sarah Lopas, NRC	MPA Environmental Policy BA Molecular Biology and Environmental Science 23 years of combined industry and government experience in environmental reviews, and NRC project management for licensing and rulemaking	Historic and Cultural Resources, National Historic Preservation Act Compliance
Shannon Healy, NRC	MS Environmental Science BS Biology 10 years combined academic and professional experience	Aquatic Ecology, Terrestrial Ecology, Endangered Species Act Compliance
Stephen Ferencz, PNNL	PhD Geosciences (Hydrogeology/Hydrology) MA Earth Sciences BA Geology 7 years of experience in hydrologic, groundwater, and water systems modeling; 3 years of experience in environmental remediation and site characterization	Surface Water Hydrology
Teresa Carlon, PNNL	BS Information Technology 30 years of experience as SharePoint administrator, project coordinator, reference management, and databases	References

Name & Affiliation	Education/Experience	Function or Expertise
Tracy Fuentes, PNNL	PhD Urban Design and Planning MS Plant Biology BS Botany Over 15 years of experience, including NEPA planning; environmental impact analysis, environmental resource monitoring, data analysis, and research	Terrestrial Ecology, Endangered Species Act Compliance

AM or MA = Master of Arts; BA = Bachelor of Arts; BS = Bachelor of Science; DoD = U.S. Department of Defense; DOE = U.S. Department of Energy; DOI = U.S. Department of Interior; CEG = Certified Engineering Geologist; CHP = Certified Health Physicist; ESA = Endangered Species Act; GIS = Geographic Information System; GradCert = Graduate Certificate; MBA = Master of Business Administration; MRP = Master of Regional Planning; MS = Master of Science; MSA = Magnuson–-Stevens Fishery Conservation and Management Act; NEPA = National Environmental Policy Act of 1969; NMSA = National Marine Sanctuary Act; NNSA = National Nuclear Security Administration; NRC = U.S. Nuclear Regulatory Commission; PG = Professional Geologist; PhD = Doctor of Philosophy; PNNL = Pacific Northwest National Laboratory; PSM = Professional Science Masters; PWS = Professional Wetland Scientist; USACE = U.S. Army Corps of Engineers.

APPENDIX B

AGENCIES, ORGANIZATIONS, TRIBES, AND INDIVIDUALS CONTACTED

The U.S. Nuclear Regulatory Commission (NRC, the Commission) is providing electronic copies of the Long Mott Generating Station Construction Permit Environmental Assessment to the agencies, organizations, Tribes, and individuals listed in Table B-1. The NRC will provide copies to other interested organizations and individuals upon request.

Table B-1 List of Agencies, Organizations, Tribes, and Persons to Whom Copies of this Environmental Assessment Are Sent

Name	Affiliation	Contact Information
-	U.S. Environmental Protection Agency, Region 6	NEPA Program U.S. EPA Region 6 1201 Elm St Dallas, TX 75270
-	U.S. Geological Survey	-
-	Texas Parks & Wildlife	-
Joseph Bell, State Historic Preservation Officer	Texas Historical Commission	311 E Austin St Austin, TX 78701
Jaime Loichinger, Executive Director	Advisory Council on Historic Preservation	401 F Street NW, Suite 308 Washington, DC 20001-2637
Gretchen Applegate, Compliance Specialist	U.S. Department of Energy	gretchen.applegate@hq.doe.gov
Theodore E. Villicana	Comanche Nation	#6 SW “D” Avenue, Suite C Lawton, OK. 73502
Thora Padilla	Mescalero Apache Tribe	P.O. Box 227 Mescalero, NM 88340
Brad Kills Crow, Chief	Delaware Tribe of Indians	5100 Tuxedo Blvd. Bartlesville, OK 64006
Cecilia Flores, Tribal Council Chairwoman	Alabama-Coushatta Tribe of Texas	571 State Park Road 56 Livingston, TX 77351
Deborah Dotson, President	Delaware Nation, Oklahoma	P.O. Box 825 Anadarko, OK 73005
Durrell Cooper, Chairman	Apache Tribe of Oklahoma	511 E. Colorado St. Anadarko, OK 73005
E. Michael Silvas, Governor	Ysleta del Sur Pueblo	P.O. Box 17579 Ysleta Station El Paso, TX 79917
Forrest Tahdooahnippah, Chairman	Comanche Nation	P.O. Box 908 Lawton, Oklahoma 73507
Joe Wacoche, Chief	United Keetowah Band of Cherokee Indians	P.O. Box 746 Tahlequah, OK 74464

Name	Affiliation	Contact Information
Jonathan Cernek, Chairperson	Coushatta Tribe of Louisiana	P.O. Box 10 Elton, LA 70532
Jonathan Rohrer, Tribal Historic Preservation Officer	Caddo Nation	P.O. Box 487 Binger, OK 73009
Juan Garza, Jr., Chairman	Kickapoo Traditional Tribe of Texas	2212 Rosita Valley Road Eagle Pass, TX 78852
Lawrence SpottedBird, Chairman	Kiowa Tribe of Oklahoma	P.O. Box 369 Carnegie, OK 73015
Lewis J. Johnson, Chief	Seminole Nation of Oklahoma	P.O. Box 1498 Wewoka, OK 74884
Marshall Pierite, Chairman	Tunica Biloxi Tribe	150 Melacon Drive Marksville, LA 71351
Reggie Wassana, Governor	Cheyenne and Arapaho Tribes of Oklahoma	P.O. Box 38 Concho, OK 73022
Russell Martin, President	Tonkawa Tribe of Indians of Oklahoma	1 Rush Buffalo Road Tonkawa, OK 74653
Ryan K. Morrow, Town King	Thlopthlocco Tribal Town	P.O. Box 188 Okemah, OK 74859
Stephanie Yahola, Town King	Kialegee Tribal Town	100 Kialegee Drive Wetumka, OK 74883
Thora Padilla, President	Mescalero Apache Tribe	P.O. Box 227 Mescalero, NM 88340
Wilson Yargee, Chief	Alabama-Quassarte Tribal Town	2122 Highway 27 Wetumka, OK 74883
Darwin Kaskaska, Chairman	Kickapoo Tribe of Oklahoma	P.O. Box 70 McCloud, OK 74581

"-" denotes no data in table cell.

APPENDIX C

CHRONOLOGY OF ENVIRONMENTAL REVIEW CORRESPONDENCE

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC or Commission), Long Mott Energy, LLC, and external parties as part of its environmental review for the Long Mott Generating Station construction permit. All documents, with the exception of those containing proprietary information, have been placed in the NRC's Public Document Reading Room at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland, and are available electronically from the NRC's Agencywide Document Access and Management Systems (ADAMS). ADAMS accession numbers for each document are included below. Some of the ADAMS accession numbers below lead to a folder containing several documents. If you need assistance in accessing or searching in ADAMS, contact the Public Document Room staff at 1-(800)-397-4209. Table C-1 lists the environmental review correspondence by date.

Table C-1 List of Correspondence Between the U.S. Nuclear Regulatory Commission and External Parties Concerning Long Mott Generating Station

Date	Correspondence Description	ADAMS Accession No. or *Federal Register* Citation
11/09/2023	Letter to NRC from Travis A. Chapman, X-Energy, LLC, submitting Project Long Mott Presentation Materials - Xe-100 Approach to Severe Accident Mitigation Design Alternatives (SAMDAs) for Environmental Reports	ML23317A098
11/09/2023	X-Energy, LLC presentation, Severe Accident Mitigation Design Alternatives (SAMDAs)	ML23317A099
01/17/2024	Letter to NRC from Stephen Vaughn, X-Energy, LLC, submitting Project Long Mott Presentation Materials—Use of Meteorological Data for Project Long Mott	ML24017A254
02/23/2024	Letter to NRC from Stephen Vaughn, X-Energy, LLC, submitting the 2024 Project Long Mott Regulatory Engagement Plan (REP)	ML24054A835
02/23/2024	X-Energy, LLC, Enclosure 2, Project Long Mott Regulatory Engagements Non-Proprietary (Public)	ML24054A836
03/31/2025	Long Mott Energy, LLC, Submittal of Construction Permit Application for Long Mott Generating Station	ML25090A057
03/31/2025	Long Mott Energy, LLC, Construction Permit Application, Part III Environmental Report	ML25090A063
05/07/2025	Emails between Joe O'Hara, NRC and Milton Gorden, LME, regarding process questions after acceptance of the CP application	ML25127A442
05/12/2025	Emails between Joe O'Hara, NRC and Milton Gorden, LME, regarding ESA Section 7 and the use of IPaC	ML25132A212
06/06/2025	Letter to NRC from Theodore E. Villicana, Comanche Nation Historic Preservation Office—Regarding Acceptance or Docketing of The LMGS CP Application	ML25160A180
06/23/2025	Email from Joe O'Hara, NRC to Milton Gorden, LME transmitting information needs generated by technical review staff	ML25174A248

Date	Correspondence Description	ADAMS Accession No. or *Federal Register* Citation
06/26/2025	Email from Joe O'Hara, NRC to Milton Gorden, LME transmitting additional information need generated by technical review staff	ML25177A122
08/13/2025	NRC Letter to J. Bell, Executive Director, Texas Historical Commission—Request to Initiate Section 106 Consultation for Project Long Mott CP Review	ML25181A038
08/13/2025	NRC Letter to J. Loichinger, Executive Director, Advisory Council on Historic Preservation—Request to Initiate Section 106 Consultation for Project Long Mott CP Review	ML25178B383
08/14/2025	NRC Letter to Durrell Cooper, Chairman, Apache Tribe of Oklahoma—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A047
08/14/2025	NRC Letter to Deborah Dotson, President, Delaware Nation, Oklahoma—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A046
08/14/2025	NRC Letter to Brad Kills Crow, Chief, Delaware Tribe of Indians—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A044
08/14/2025	NRC Letter to Chuck Hoskin, Jr., Principal Chief, Cherokee Nation of Oklahoma—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25181A114
08/14/2025	NRC Letter to Darwin Kaskaske, Chairman, Kickapoo Tribe of Oklahoma—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A070
08/14/2025	NRC Letter to Cecilia Flores, Tribal Council Chairwoman, Alabama-Coushatta Tribe of Texas—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A045
08/14/2025	NRC Letter to E. Michael Silvas, Governor, Ysleta del Sur Pueblo—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A048
08/14/2025	NRC Letter to Forrest Tahdooahnippah, Chairman, Comanche Nation—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A049
08/14/2025	NRC Letter to Joe Wacoche, Chief, United Keetoowah Band of Cherokee Indians—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A050
08/14/2025	NRC Letter to Jonathan Rohrer, Tribal Historic Preservation Officer, Caddo Nation—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A059
08/14/2025	NRC Letter to Juan Garza, Jr., Chairman, Kickapoo Traditional Tribe of Texas—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A060
08/14/2025	NRC Letter to Lawrence SpottedBird, Chairman, Kiowa Tribe of Oklahoma—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A061

Date	Correspondence Description	ADAMS Accession No. or *Federal Register* Citation
08/14/2025	NRC Letter to Jonathan Cernek, Chairperson, Coushatta Tribe of Louisiana—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A058
08/14/2025	NRC Letter to Marshall Pierite, Chairman, Tunica Biloxi Tribe—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A063
08/14/2025	NRC Letter to Lewis J. Johnson, Chief, Seminole Nation of Oklahoma—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A062
08/14/2025	NRC Letter to Russell Martin, President, Tonkawa Tribe of Indians of Oklahoma—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A065
08/14/2025	NRC Letter to Reggie Wassana, Governor, Cheyenne and Arapaho Tribes of Oklahoma—Request to Initiate Section 106 Consultation for Project Long Mott CP Review	ML25226A064
08/14/2025	NRC Letter to Ryan K. Morrow, Town King, Thlopthlocco Tribal Town—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A066
8/14/2025	NRC Letter to Stephanie Yahola, Town King, Kialegee Tribal Town—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A067
08/14/2025	NRC Letter to Wilson Yargee, Chief, Alabama-Quassarte Tribal Town—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A069
08/14/2025	NRC Letter to Thora Padilla, President, Mescalero Apache Tribe—Request to Initiate of Section 106 Consultation for Project Long Mott CP Review	ML25226A068
08/19/2025	Letter to NRC from Hector H. Gonzalez, Foreign Legal Consultant, Kickapoo Traditional Tribe of Texas—Regarding Project Long Mott CP Review	ML25238A198
08/19/2025	Email to NRC form Elizabeth Toombs, Tribal Historic Preservation Officer, Cherokee Nation—Regarding Project Long Mott CP Review	ML25248A032
08/29/2025	Project Long Mott Docs - Long Mott Station Site Audit Plan (ML25240B607) for September 8 - 10, 2025	ML25240B607
09/03/2025	Letter to NRC from Jaime Loichinger, Director, Office of Federal Agency Programs, Advisory Council on Historic Preservation—Regarding Project Long Mott CP Review	ML25252A185
09/09/2025	Letter to NRC from Joseph Bell, State Historic Preservation Officer, Executive Director, Texas Historical Commission—Regarding Project Long Mott CP Review	ML25252A185
09/25/2025	Long Mott Generating Station Environmental Review Information Needs Revision 5 and a 9/18 email titled: Potential typographical errors/incorrect units in the Environmental Report for your consideration	ML25260A594
09/26/2025	Project Long Mott Docs - Long Mott Generating Station - Request for Confirmatory Information (RCI)	ML25269A047

Date	Correspondence Description	ADAMS Accession No. or *Federal Register* Citation
10/08/2025	Project Long Mott Docs - DRAFT Request for Confirmatory Information (RCI) Revision 1	ML25281A305
10/08/2025	Project Long Mott Docs - Long Mott Generating Station Environmental Review - DRAFT Request for Additional Information	ML25281A311
10/17/2025	Letter from Long Mott Energy, Confirmatory Information regarding the Environmental Report for the Long Mott Generating Station Construction Permit Environmental Review	ML25290A123
10/21/2025	Project Long Mott Docs - LMGS Draft RAIs - Revision 1	ML25294A145
11/03/2025	Supplement 3 Regarding the Environmental Report for the Long Mott Generating Station Construction Permit Application	ML25297A164
11/06/2025	NRC Request for Additional Information for Long Mott Generating Station CP Application	ML25307A005
12/05/2025	Long Mott Energy, LLC, Response to Request for Additional Information for the Long Mott Generating Station Construction Permit Application Environmental Report	ML25339A123
01/29/2026	Letter to S. Lee – FWS – Request for Concurrence with Endangered Species Act Determinations for Long Mott CP	ML26005A228
01/29/2026	Letter to A. Brame – NMFS – Request for Concurrence with Endangered Species Act Determinations for Long Mott CP	ML26005A230
01/30/2026	Letter to C. Stevens – NMFS – Request to Initiate Abbreviated Essential Fish Habitat Consultation for Long Mott CP	ML26005A231
02/04/2026	Email to NRC from C. Stevens, Fishery Biologist, NOAA National Marine Fisheries Service regarding request to initiate abbreviated consultation for the proposed Long Mott construction permit	ML26035A118
03/04/2026	Letter to B. Barcena – Lipan Apache Tribe of Texas-State Recognized Tribe – Long Mott Draft EA Section	ML26050A473
03/04/2026	Letter to J. Bell – TX Historical Commission – Long Mott Draft EA Section	ML26056A080
03/04/2026	Letter to J. Loichinger – Advisory Council on Historic Preservation – Long Mott Draft EA Section	ML26050A113
03/04/2026	NRC Letters Notifying NHPA Section 106 Consulting Parties – Availability of Draft Historic and Cultural Resources Section – Long Mott CP	ML26050A079
03/05/2026	Email to NRC from C. Reynolds, Delaware Nation, regarding NHPA Section 106 Consultation	ML26065A070
03/11/2026	Letter to NRC from C. Martin, Assistant Field Supervisor, U.S. Fish and Wildlife Service, regarding concurrence with Endangered Species Act Consultation	ML26071A148
03/18/2026	Email to NRC from Joseph Bell, State Historic Preservation Officer, Executive Director, Texas Historical	ML26082A042

Date	Correspondence Description	ADAMS Accession No. or *Federal Register* Citation
	Commission—Providing Comments on Draft Historic and Cultural Resources Section of the Project Long Mott CP EA	
04/06/2026	Letter to D. Bernhart – NMFS – Request to initiate expedited Endangered Species Act consultation	ML26096A035
04/16/2026	Letter to NRC from S. Rogers, Alabama-Quassarte Tribal Town, Tribal Historic Preservation, Providing Comments on Draft Historic and Cultural Resources Section of the Project Long Mott CP EA	ML26111A088
05/05/2026	Letter to NRC from D. Klemm – NMFS – Concurrence with the NRC's Endangered Species Act determinations	ML26125A259
05/05/2026	Letter to NRC from M. Myer, Tonkawa Tribe of Oklahoma – Long Mott generating station construction Calhoun County, TX	ML26126A021

ADAMS = Agencywide Documents Access and Management System; CP = construction permit; ESA = Endangered Species Act; LME = Long Mott Energy, LLC; LMGS = Long Mott Generating Station; NHPA = National Historic Preservation Act; NMFS = U.S. National Marine Fisheries Services; NPS = Green Lake Master Plan; NRC = U.S. Nuclear Regulatory Commission; RAI = Request for Additional Information; RCI = Request for Confirmation of Information; REP = Regulatory Engagement Plan; SAMDA = Severe Accident Mitigation Design Alternative; SHPO = State Historic Preservation Officer; SLR = subsequent license renewal.

APPENDIX D

REGULATORY COMPLIANCE AND LIST OF FEDERAL, STATE, AND LOCAL PERMITS AND APPROVALS

Table D-1 contains a list of the environmental-related authorizations, permits, and certifications potentially required by Federal, State, regional, and local agencies, and affected Indian Tribes related to site preparation, construction, and operation of the Long Mott Generating Station project.

Table D-1 Authorizations Required for Preconstruction, Construction, and Operation Activities at the Long Mott Generating Station Site

Agency	Authority	Requirement	Activity Covered
FEDERAL	-	-	-
NRC	Atomic Energy Act 10 CFR 50.35 10 CFR 50.50	Construction Permit	Construction of the facilities
NRC	10 CFR 50.57	Operating License	Operation of the facilities
NRC	10 CFR Part 40	Source Material License	Possession, use, and transfer of special nuclear material
NRC	10 CFR Part 30	Byproduct Material License	Production, possession, and transfer of radioactive byproduct material
NRC	NEPA, 10 CFR Part 51	NRC Issuance of Environmental Impact Statement(s)	Evaluation of environmental impacts from construction and operation
NRC	10 CFR Part 70	Domestic Licensing of Special Nuclear Material	Issuance of licenses to receive title to, own, acquire, deliver, receive, possess, use, and transfer special nuclear material
NRC	10 CFR Part 71	Packaging and Transportation of Radioactive Material	Requirements for packaging, preparation for shipment, and transportation of licensed material
U.S. Department of Agriculture	Farmland Protection Policy Act, 7 U.S.C. Section 4201, 7 CFR Part 658	Prime Farmland Impact determination	NRCS farmland conversion impact rating
U.S. Department of Energy	NEPA, 10 CFR Part 1021	Site characterization and environmental monitoring activities	Environmental effects of preconstruction
U.S. Department of Energy	Nuclear Waste Policy Act (42 U.S.C. 10101 et seq.), 10 CFR Part 961	Spent Fuel	Contract for disposal of spent nuclear fuel entered or under negotiation in accordance with 42 U.S.C. 10222(b)(1)
U.S. Army Corps of Engineers	Rivers and Harbors Act, 33 U.S.C.	Section 10 Permit	Any required maintenance dredging

Agency	Authority	Requirement	Activity Covered
	Section 401, 33 CFR Part 322		
U.S. Army Corps of Engineers	Clean Water Act Section 404, 33 CFR Part 323, Coastal Zone Management Act	Section 404 Permit	Disturbance or crossing wetland areas or navigable waters
U.S. Fish and Wildlife Service	Endangered Species Act	Section 7 Consultation	Protection of endangered and threatened species and critical habitats designated under the Federal Endangered Species Act
U.S. Fish and Wildlife Service	Migratory Bird Treaty Act	Migratory Bird effects	Agency consultation is needed for concurrence with no adverse impact or proposed mitigation measures on protected species and/or their nests
Federal Aviation Administration	Federal Aviation Act, 14 CFR 77	Notification of Proposed Construction or Alteration	Clearance for structures at or greater than 200 ft in height
National Oceanic and Atmospheric Administration Fisheries	Endangered Species Act of 1973, 50 CFR Part 18, Magnuson–Stevens Fishery Conservation and Management Act	Consultation regarding potential to adversely impact protected marine and anadromous species	Concurrence with no adverse impact or consultation on appropriate mitigation measures
STATE AND LOCAL	-	-	-
Calhoun County Floodplain Administration	Flood Plain Management Plan C Zone Requirements	Land Disturbing Activity and Construction Permit	Land disturbing activities within the boundaries of Calhoun County including new construction and renovation of buildings
Calhoun County Groundwater Conservation District	Rules of the Calhoun County Groundwater Conservation District	Capping and Plugging of Groundwater Wells	Groundwater well installation and operation
Coastal Coordination Advisory Committee of the Texas General Land Office	Coastal Zone Management Act, Texas Coastal Management Plan	Consistency Determination	Certification of consistency with the Texas Coastal Management Plan
Texas Commission on Environmental Quality	Clean Air Act, General Air Quality Rules, 30 TAC Part 1, Chapters 101, 111, and 116	Air Quality Construction Permit	Construction of air emission sources

Agency	Authority	Requirement	Activity Covered
Texas Commission on Environmental Quality	30 TAC Part 1, Chapter 335	Notification of Registration for Onsite or Offsite Disposal of Industrial Solid Wastes	Onsite and/or offsite disposal of Class III industrial solid waste
Texas Commission on Environmental Quality	30 TAC Part 1, Chapter 350	Texas Risk Reduction Program	Relocation of hazardous waste accumulation area and closure of Class III onsite landfill if necessary
Texas Commission on Environmental Quality	30 TAC Part 1, Chapter 290	Approval of Modification of Public Water System	New or expanded components of water systems, including water wells, storage, treatment, and distribution lines
Texas Commission on Environmental Quality	30 TAC Part 1, Chapter 299	Dam Safety Program	Reconstruction, modification, enlargement, rehabilitation, alteration, or repair of an existing dam
Texas Commission on Environmental Quality	30 TAC Part 1, Chapters 295, 297	Water Rights	Access and use of surface waters
Texas Commission on Environmental Quality	30 TAC Part 1, Chapter 290	Revision or New Permit to Operate a Public Water System	Operation of a public noncommunity water system
Texas Commission on Environmental Quality	Clean Water Act, 30 TAC Part 1, Chapter 321, Texas Water Code Chapter 26	Notice of Registration	Relocation or alteration of existing cooling ponds
Texas Commission on Environmental Quality	Clean Water Act Section 401, 30 TAC Part 1 Chapters 307 and 309	Section 401 Certification	Consistency with water quality standards
Texas Commission on Environmental Quality	Clean Water Act Section 402, Texas Water Code Chapter 26	Texas Pollutant Discharge Elimination System General Permit	Discharge of groundwater
Texas Commission on Environmental Quality	Clean Water Act, Texas Water Code Chapter 26	Stormwater Discharge General Permit	Stormwater discharge during construction
Texas Commission on Environmental Quality	Clean Water Act, Texas Water Code Chapter 26	Establishment/Renewal/ Amendment of Existing TPDES Permit	Liquid discharge to surface water
Texas Commission on Environmental Quality	Oil Pollution Act	Spill Prevention, Control, and Countermeasure Plan Approval	Operation of facility with aboveground and underground storage tanks of oil fuel

Agency	Authority	Requirement	Activity Covered
Texas Department of Licensing and Regulations	16 TAC Part 4 Chapter 76	Groundwater Well Capping and Plugging Permit	Capping and plugging of monitoring wells at completion of subsurface investigation
Texas Department of Transportation	43 TAC Part 10, Chapter 218	Common Carrier Permit, Oversize/Overweight Permit	Transportation of materials within Texas overweight limits
Texas Historical Commission	National Historic Preservation Act, 13 TAC 2	Historic Resources Consultation	Analysis of effects of construction and operations on protected historic resources
Texas Department of State Health Services Radiation Safety Licensing Branch	Texas Health and Safety Code 401.052, 25 TAC Part 289 Chapter 257	Approved emergency plan, quality assurance program for packaging, and business information form	Transportation of radioactive materials
Texas Low-Level Radioactive Waste Disposal Compact Commission	31 TAC Part 21 Chapter 675 Subchapter B	Export Permit	Shipment of LLRW or MLLW
	31 TAC Part 22	Export and Return of LLW Report	Transport of LLRW or MLLW outside of Texas, then returned for disposal within Texas
State of Tennessee Department of Environment and Conservation Division of Radiological Health	Tennessee Department of Environment and Conservation Rule 1200-2-10.32	Revision of Existing Tennessee Radioactive Waste License-for-Delivery	Transportation of radioactive waste into the state of Tennessee (if required)
State of Utah Department of Environmental Quality Division of Radiation Control	R313-26 of the Utah Radiation Control Rules	Revision of Existing General Site Access Permit	Transportation of radioactive materials into the State of Utah (if required)
Private	-	-	-
Waste Control Specialists	Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste, Appendix 5.2-1, Waste Acceptance Plan	Guarantor Certification	Submit a generator certification packet as described in WCS Waste Acceptance Plan, including waste profiles

CFR = *Code of Federal Regulations*; LLRW = low-level radioactive waste; MLLW = mixed low-level waste; NEPA = National Environmental Policy Act; NOAA = National Oceanic and Atmospheric Administration; NRC = U.S. Nuclear Regulatory Commission; TAC = Texas Administrative Code; TPDES = Texas Pollutant Discharge Elimination System; U.S.C. = *United States Code*; WCS = Waste Control Specialists.
"-" denotes not data in the table cell.

APPENDIX E

FEDERALLY PROTECTED ECOLOGICAL RESOURCE CONSULTATIONS

E.1 Endangered Species Act Biological Assessment

The U.S. Nuclear Regulatory Commission's (NRC's, the Commission's) proposed agency action is whether to issue a construction permit for the construction of a nuclear generating station at the Long Mott Generating Station (LMGS) in Calhoun County, Texas. The proposed action would authorize Long Mott Energy, LLC (LME) to construct LMGS, as described in Section 2 of this environmental assessment (EA). LME will have to apply for an operating license prior to initiating operation; however, to the extent practicable, operating impacts were included in the applicant's environmental report (ER) and were assessed, and any new or modified operating impacts will be evaluated during the operating license application review. The NRC staff will consult with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) ("the Services" [collectively] or "Service" [individually]), as appropriate, to ensure that the proposed action is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. The NRC staff structured its biological assessment (BA) in accordance with the Services' suggested BA contents as described at Title 50 of the Code of Federal Regulations (50 CFR) 402.12(f) (TN4312).

E.1.1 Action Area

To assess the potential impact on federally listed species, the NRC staff defines the action areas as the following:

- Terrestrial Region: All terrestrial areas within the LMGS site boundary, including all wetlands on the site, and surrounding vicinity up to 1 mi (1.6 km) out from the perimeter of the LMGS site boundary that may experience increased noise and lighting from construction and operation activities. The terrestrial environment is described in Section 3.7.1 of the EA and in Section 2.4.1 of the ER (LME 2025-TN12163).
- Aquatic Region: All surface water features within the LMGS site boundary (West Coloma Creek, unnamed streams, and open waters), the waterbodies that connect the LMGS site to the Guadalupe River (Guadalupe-Blanco River Authority [GBRA] Diversion Canal, Goff Bayou, and GBRA Calhoun Canal), the waterbodies that may be impacted by consumptive water use (Guadalupe River from the GBRA diversion to where it discharges into Mission Lake and Guadalupe Bay, the entirety of Mission Lake and Guadalupe Bay, and the GBRA Calhoun Canal from proposed intake structure to approximately 1 mi [1.6 km] downstream), and the portion of the Dow Discharge Canal and Victoria Barge Canal that may be impacted by discharges (see). These aquatic resources are described in Section 3.6.1 of the EA and in Section 2.4.2 of the ER (LME 2025-TN12163).

The estimated downstream extent of effects from consumptive water use is likely an overestimation, however, freshwater inflows play a crucial role in maintaining coastal estuarine habitat. Sufficient freshwater inflows are necessary to sustain proper salinity gradients, nutrient loadings, and sediment inputs, which are required to produce an ecologically sound and healthy estuary (TPW 1998-TN12541). The Guadalupe River system is of high ecological value, supporting numerous federally and State-listed species, and experiences reduced freshwater inflows from upstream water use. Therefore, the NRC staff has taken a conservative approach to defining the extent of the downstream effects. Beyond Guadalupe Bay, the effects of LMGS consumptive use would be too small to be meaningfully measured or detected due to the contribution of other surface water and groundwater inflows.

The NRC staff recognizes that, although the defined action area is stationary, federally listed species can move in and out of the action area. For instance, a migratory bird could occur in the action area seasonally as it forages or breeds within the action area. Thus, in its analysis, the NRC staff considers not only those species known to occur directly within the action area but those species that may passively or actively move into the action area.

E.1.2 Federally Listed Species Considered

The NRC staff identified each federally listed, proposed, and candidate species that has the potential to occur in the action area and one proposed designated critical habitat present within the action area. The NRC staff reviewed the ER (LME 2025-TN12163), the FWS' Information for Planning and Conservation database (FWS Undated-TN12613), NMFS' ESA Section 7 Mapper (NOAA 2025-TN12550), available ecological surveys, and other records to determine whether suitable habitat for each species occurs in the action area and whether the species itself may occur in the action area. Table E-1 lists the relevant species protected under the FWS's jurisdiction and summarizes the results of the NRC staff's evaluation, including the habitat requirements and occurrence within the action area. Table E-2 summarizes the results of the evaluation for federally listed species and critical habitats protected under the NMFS's jurisdiction.

The ER mentions additional listed species including the oceanic whitetip shark, blue whale, finback whale, humpback whale, north Atlantic right whale, Rice's whale, sei whale, sperm whale, hawksbill sea turtle, and leatherback sea turtle; however, the NRC staff has determined that these species would not occur within the action area and did not consider them further here.

The NRC staff identified three species of sea turtles that may occur in the action area. The NMFS and the FWS have shared jurisdiction for recovery and conservation of threatened and endangered sea turtles. The NMFS leads the conservation and recovery of sea turtles in the marine environment and the FWS leads the conservation and recovery of these animals on nesting beaches. As such, potential presence and impacts to sea turtle nesting habitat are analyzed under sections specific to FWS jurisdiction and potential presence and impacts to sea turtle aquatic environment are analyzed under sections specific to NMFS jurisdiction.

Table E-1 Occurrences of Federally Listed, Proposed, and Candidate Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction in the Action Area

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
tricolored bat (*Perimyotis subflavus*)	FPE	In the zone 2 year-round active range, this species is often found roosting in road-associated culverts. Over the	Potentially present. The action area falls within the zone 2 year-round active range of the species. The action area's forested areas

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
		winter, individuals may enter short bouts of torpor and forage during warm nights. During the rest of the year, the species occupy forested habitats roosting in trees among leaves (FWS 2024-TN12645).	contain suitable habitat to support foraging, mating, and sheltering. In addition, there are multiple unscreened culverts onsite greater than 2 × 23 ft that can potentially provide habitat (NRC 2026-TN12670). Because no surveys have been conducted to determine the species' presence, the NRC staff conservatively assumes that the tricolored bat could occur within the action area at any time of year.
west Indian manatee (*Trichechus manatus*)	FT	Manatees inhabit a variety of freshwater, estuarine, and marine habitats. The species predominantly feed on seagrass in nearshore, shallow waters averaging 1 to 3 m in depth (90 FR 3131-TN12220; Smith 1993-TN218).	Rare migrant. Manatees are exceedingly rare in Texas waters. The winter months are too cold for the species to be present year-round; however, rare migrants have been observed along the Texas coast during the summer (Schmidly and Bradley 2016-TN12275). Suitable foraging habitat exists within Guadalupe Bay and Mission Lake; therefore, the NRC staff conservatively assumes the West Indian manatee could infrequently be present within the action area during the summer.
Attwater's greater prairie-chicken *(Tympanuchus cupido attwateri)*	FE	This species occurs in mid to tall-grass coastal prairies that are diverse in grasses and flower plants (FWS 2024-TN12221).	Not present. The species is only found in Colorado and Goliad County, Texas (FWS 2024-TN12221). Ecological surveys of the LMGS site in 2023 did not identify this species nor suitable habitat (WSP 2024-

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
			TN12606). The herbaceous communities present onsite and in the surrounding areas are primarily maintained croplands. Onsite vegetation is dominated by Bermuda grass (*Cynodon dactylon*).
eastern black rail *(Laterallus jamaicensis* ssp. *Jamaicensis)*	FT	Eastern black rails are found in a variety of salt, brackish, and freshwater marsh habitats with dense vegetative cover (FWS 2025-TN12222). This bird requires a thick canopy of grasses, sedges, and rushes and, on the Texas Gulf Coast, are often found in areas dominated by *Spartina* cover consisting of gulf cordgrass (*Spartine spartinae*) and saltmeadow cordgrass (*Spartine patens*) (Butler et al. 2023-TN12625).	Potentially present. The wetlands within the LMGS site boundary are primarily associated with drainage features surrounded by industrial or crop land and are overgrown with invasive species; therefore, these areas do not provide suitable habitat for eastern black rail. While gulf cordgrass is known to occur on site, the plant is considered rare or uncommon and only identified within herbaceous and shrub/scrub upland areas (WSP 2024-TN12606). Additionally, ecological surveys of the LMGS site conducted in each season of 2023 did not identify the species, though the species is considered highly secretive and difficult to detect (Stevens et al. 2022-TN12542). Therefore, the NRC staff conclude that the eastern black rail is unlikely to inhabit wetlands within the LMGS site boundary. This species is known to exist within the Guadalupe Delta Wildlife Management Area to the west of the

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
			LMGS site. This area is within the broader offsite action area that may potentially experience indirect impacts associated with LMGS construction. In addition, there is potential black rail habitat within the wetland located near Outfall 001 within the broader action area, but currently no construction direct or indirect impacts are anticipated to this area.
northern aplomado falcon (*Falco femoralis septentrionalis*)	FE	This species requires open grassland or savannah habitat with scattered trees or shrubs (TPW Undated-TN12223). Breeding habitat includes nearly treeless, yucca-studded, herbaceous-dominated communities.	Potentially present. Marginally suitable habitat for non-breeding individuals of this species is present within the action area. However, ecological surveys of the LMGS site conducted each season of 2023 did not identify this species or suitable nesting habitat (WSP 2024-TN12606). Terrestrial impacts are primarily limited to cropland and industrial land. However, non-breeding individuals may pass through or hunt within the open areas of the action area. Therefore, the NRC staff conservatively assumes that non-breeding individuals of this species may occur transiently in the action area.
piping plover (*Charadrius melodus*) [Atlantic Coast and Northern Great Plains populations]	FT	Piping plovers occupy coastal habitat including sand spits, small islands, tidal flats, shoals, and sandbars with	Unlikely migrant. Ecological surveys of the LMGS site conducted in February, August, and November of 2023 did not identify this species or suitable

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
		inlets. Foraging habitat includes sandy mud flats, ephemeral pools, and seasonally emergent seagrass beds with abundant invertebrates. The Texas coast provides wintering habitat for populations migrating from their breeding locations primarily in the U.S. Northern Great Plains and Prairie Canada (FWS 2015-TN12543).	habitat onsite (WSP 2024-TN12606). Suitable habitat for this species occurs along Matagorda Island, where individuals may be present from July through April. Migrating individuals may pass through the action area while traveling to preferentially suitable habitat. Therefore, the NRC staff conservatively assumes that individuals of this species may occur transiently within the action area during migration. The likelihood of occurrence is low, and individuals would likely only be present temporarily for a short duration.
rufa red knot (*Calidris canutus rufa*)	FT	Rufa red knots in Texas utilize coastal marine and estuarine habitat with large areas of exposed intertidal sediments. Laguna Madre supports populations of the species that winter in Texas and provides important migration stopover habitat for other wintering populations passing through in the spring and fall to rest and feed (FWS 2020-TN8850).	Unlikely migrant due to the same reasons as piping plover discussed above.
whooping crane (*Grus americana*)	FE	Whooping cranes winter in the salt flats and marshes along the Texas coast from November 1 through April 30.	Potentially present. Ecological surveys of the LMGS site conducted in February and November of 2023 did not identify this species or suitable

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
		The migratory species breeds in Canada during the summer within poorly drained wetlands (TPW Undated-TN12544).	wintering habitat (WSP 2024-TN12606). Whooping cranes are known to occur within the marshy shorelines of Guadalupe Bay. While suitable habitat does not occur within the LMGS site boundary, the NRC staff assumes that individuals may pass through the site on their way to and from their wintering habitat.
green sea turtle (*Chelonia mydas*)	FT	Green sea turtles nest along the gulfward coast of Texas on the beaches of Padre Island (Shaver et al. 2020-TN12545).	Not known to nest in action area. Green sea turtle nesting on the Texas coast is rare and all confirmed nests on the Texas coast from 1987 through 2019 occurred on North and South Padre Island (Shaver et al. 2020-TN12545).
Hawksbill sea turtle *Eretmochelys imbricata*)	FE	Hawksbill sea turtles nest on sandy beaches, usually near coral reefs (TPW Undated-TN12198).	Not known to nest in action area. The action area does not contain sandy beaches or other suitable nesting habitat and only one Hawksbill nest has ever been documented in Texas, on Padre Island National Seashore (NPS 2025-TN12646).
Kemp's ridley sea turtle *Lepidochelys kempii*)	FE	Kemp's ridley sea turtles primarily nest in Mexico, but some individuals nest in Texas on the beaches from Bolivar Peninsula south (NPS 2025-TN12647).	Not known to nest in action area. Nesting has been documented along the gulfward coast of Matagorda Island (NOAA 2013-TN12615). However, nesting is not known to occur within the inland shores of Guadalupe Bay. The action area does not extend to the gulfward shores of Matagorda Island. Therefore, the NRC staff assumes

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
			nesting habitat for this species is not present within the action area.
false spike (*Fusconaia mitchelli*)	FE	False spike mussels occur in larger creeks and rivers with sand, gravel, or cobble substrates, and with slow to moderate flows. It is not known to occur in impoundments or deep waters. False spike brood eggs and larvae from early spring to late summer and likely rely on red or blacktail shiner and minnows as glochidia hosts (FWS 2022-TN12546).	Potentially present. Marginally suitable habitat occurs within the Guadalupe River portion of the action area from the GBRA diversion to the saltwater barrier dam. This area experiences occasional inflows of salinity, especially during hurricane season, so it is unlikely that these highly sensitive freshwater mussels would inhabit this portion of the Guadalupe River. While no false spike were found in the GBRA canal system during a 2023 sampling effort (BIO-WEST 2023-TN12189), red shiner, a potential host fish, was collected within the Guadalupe River, the Goff Bayou, and the GBRA canal during 2008 survey efforts (Exelon 2012-TN12213; LME 2025-TN12163: Table 2.4-13). During the more recent December 2023 survey efforts, the red shiner was not collected within West Coloma Creek, GBRA Calhoun Canal, or the drainage canal but several species of minnow were collected (LME 2025-TN12163). Critical habitat for this species is located more than 20 mi upstream within the Guadalupe River, outside of the boundaries of the action

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
			area. The NRC staff conservatively assumes that this species could be present within the Guadalupe River portion of the action area from the GBRA diversion to the saltwater barrier dam.
Guadalupe orb *Cyclonaias necki*)	FE	Guadalupe orb is a rare mussel that is endemic to the Guadalupe River Basin. The species occurs in flowing water with firm and stable substrates. The species likely relies on tadpole madtom, flathead catfish, and channel catfish to provide glochidia hosts. (FWS 2025-TN12616)	Potentially present due to same reasons as false spike, discussed above. While surveys of the GBRA canal in 2023 did not identify any federally protected mussel species (BIO-WEST 2023-TN12189), catfish, a potential host fish, were collected within the GBRA canal and West Coloma Creek during seasonal 2023 surveys efforts (WSP 2024-TN12606) and within the Guadalupe River during 2008 surveys (Exelon 2012-TN12213). The NRC staff conservatively assumed that this species could be present within the Guadalupe River portion of the action area from the GBRA diversion to the saltwater barrier dam.
monarch butterfly (*Danaus plexippus*)	FPT	Monarch butterflies occur in prairies, meadows, and grasslands along roadsides across most of North America, especially in areas containing milkweed (FWS 2024-TN11177). On the Texas coast, monarchs may be present from the	Potentially present. Suitable habitat for this species is present within the terrestrial portion of the action area. While ecological surveys of the LMGS site conducted in early November 2023 did not identify this species, milkweed (*Asclepias* sp.) is known to occur within the herbaceous

Species or Critical Habitat	Federal Status(a)	Habitat	Type and Likelihood of Occurrence in Action Area
		mid-October to mid-November (TPW Undated-TN12547).	northeast portion of the LMGS site (WSP 2024-TN12606). Therefore, the NRC staff assumes that monarch butterflies may be present within the herbaceous portions of the action area during the spring migration from late-March through April and during the fall migration from mid-October through mid-November

BMP = best management practice; EA = environmental assessment; FWS = U.S. Fish and Wildlife Service; IPaC = Information for Planning and Consultation; LAA = likely to adversely affect; N/A = not applicable; NE = no effect; NLEB = northern long-eared bat; NRC = U.S. Nuclear Regulatory Commission.
FE = federally endangered; FPE = proposed for Federal listing as endangered; FPT = proposed for Federal listing as threatened; FT = federally threatened; NRC = U.S. Nuclear Regulatory Commission.
(a) Indicates protection status under the Endangered Species Act.

Table E-2 Federally Listed, Proposed, and Candidate Species and Critical Habitats Under the National Marine Fisheries Service Jurisdiction that May Occur within the Long Mott Generating Station Action Area

Species or Critical Habitat	Federal Status(a)	Species Habitat or Critical Habitat Essential Features	Type and Likelihood of Occurrence in Action Area
Green sea turtle (*Chelonia mydas)* (North Atlantic DPS)	FT	Green sea turtles utilize Texas waters for developmental and foraging habitat (NOAA 2025-TN12657). Juvenile and adult turtles occur within bays, passes, and nearshore waters of Texas from Galveston Bay to the Mexican border. Within these waters, individuals forage on macroalgae, seagrass, and invertebrates in depths up to 20 m.	Likely present. Guadalupe Bay provides suitable habitat for foraging, resting, and migrating neritic juvenile and adult green sea turtles. Submerged aquatic vegetation is known to occur within Mission Lake (La Peyre et al. 2017-TN12648). Therefore, the NRC staff assumes juveniles and adults of this species may be present within the aquatic portion of the action area that intersects with Guadalupe Bay.
Green sea turtle critical habitat (TX01)	FPD	Reproductive essential features: from the mean high water line to 20 m depth in waters adjacent to nesting beaches proposed as critical habitat by FWS (88 FR 46376-TN12361). Migratory essential features: from the mean high water line to 20 m depth in sufficiently unobstructed corridors that allow for unrestricted transit between foraging and nesting areas for reproductive individuals.	Reproductive essential features: not present; no nesting beaches designated or proposed as critical habitat by FWS critical habitat in the inshore vicinity of the action area. Migratory essential features: not present; not identified within Texas waters. Surface-pelagic foraging/resting essential features: not present; action area does not extend into open ocean waters.

Species or Critical Habitat	Federal Status[(a)]	Species Habitat or Critical Habitat Essential Features	Type and Likelihood of Occurrence in Action Area
		Surface-pelagic foraging/resting essential features: Atlantic and Gulf of Mexico *Sargassum* -dominated drift communities in waters greater than 10 m depth to the outer boundary of the U.S. EEZ. Benthic foraging/resting essential features: in Texas, this includes all nearshore waters from the mean high water line to 20 m depth.	Benthic foraging/resting essential features: present within Guadalupe Bay; waters between the Mexican border and Lavaca-Matagorda Bay provide high conservation value as they support high density benthic foraging/resting.
Kemp's ridley sea turtle (*Lepidochelys kempii)*	FE	Juveniles associate with floating Sargassum algae for the first 1–2 years of life. Neritic juveniles and adults inhabit the open ocean and nearshore coastal habitats in the Gulf of Mexico and Atlantic Ocean with muddy or sandy bottoms where their preferred prey of crabs are found (NOAA 2025-TN12658).	Likely present. Neritic juveniles and adults Kemp's ridley sea turtles may utilize Guadalupe Bay for foraging and migrating. Submerged aquatic vegetation is known to occur within Mission Lake (La Peyre et al. 2017-TN12648). Therefore, the NRC staff assumes neritic juveniles and adults of this species may be present within the aquatic portion of the action area that intersects with Guadalupe Bay.
Loggerhead sea turtle (*Caretta caretta*)	FT	Hatchlings and oceanic juveniles inhabit the open ocean for the first 7 to 15 years of their lives. Neritic juveniles and adults occupy nearshore coastal waters where they forage for bottom-dwelling invertebrates such as mollusks, crustaceans, and horseshoe crabs (NOAA 2025-TN12659).	Potentially present. Neritic juveniles and adult loggerheads may utilize Guadalupe Bay for foraging and migrating. Submerged aquatic vegetation is known to occur within Mission Lake (La Peyre et al. 2017-TN12648). Therefore, the NRC staff assumes neritic juveniles and adults of this species may be present within the aquatic portion of the action area that intersects with Guadalupe Bay.
Giant manta ray (*Manta birostris*)	FT	Giant manta rays occupy tropical, subtropical, and temperate waters worldwide and are commonly found offshore, in oceanic waters, and in productive coastal areas (NOAA 2025-TN12250). The species can inhabit estuarine waters, oceanic inlets, bays, and intercoastal waterways.	Potentially present. The estuarine waters of Guadalupe Bay provide foraging, migrating and mating habitat for YOY, juvenile, and adult giant manta rays. Submerged aquatic vegetation is known to occur within Mission Lake (La Peyre et al. 2017-TN12648). The NRC staff assumes this species may be present within the aquatic portion of the action area that intersects with Guadalupe Bay.

DPS = distinct population segment; EEZ = U.S. Exclusive Economic Zone; FE = Federally Endangered; FT = federally threatened; FPD = federally proposed designated (critical habitat); FWS = U.S. Fish and Wildlife Service; YOY = young-of-the-year.

(a) All species in this table were identified as potentially occurring within the action area via NMFS Section 7 Mapper (NOAA 2025-TN12550).

E.1.3 Effect Determinations of Federally Listed Species under U.S. Fish and Wildlife Jurisdiction

In Table E-3, the NRC staff determined that the tricolored bat, West Indian manatee, eastern black rail, northern aplomado falcon, piping plover, rufa red knot, whooping crane, false spike, Guadalupe orb, and monarch butterfly have the potential to occur in the action area, and potential impacts to those species are discussed herein. In addition, in Table E-3 the NRC staff describes several federally listed species that were determined to not occur in the action area; therefore, the NRC staff does not address these species any further because the construction and operation of LMGS would have no effect on them.

Table E-3 Biological Evaluation of Federally Listed Species under the Jurisdiction of the U.S. Fish and Wildlife Service Potentially Occurring within the Action Area of the Long Mott Generating Station

Common Name	NRC Staff Evaluation[(a)]	NRC Staff Conclusions[(b,c)]
tricolored bat	E.1.3.1	NLAA
West Indian manatee	E.1.3.5	NLAA
Attwater's greater prairie-chicken	This species is not found in Calhoun County and the herbaceous habitat within the action area is predominantly composed of cropland. There is no suitable habitat to support this species within the action area.	NE
eastern black rail	E.1.3.4	NLAA
northern aplomado falcon	E.1.3.6	NLAA
piping plover	E.1.3.7	NLAA
rufa red knot	E.1.3.7	NLAA
whooping crane	E.1.3.3	NLAA
green sea turtle	No suitable nesting habitat is present within the action area.	NE
hawksbill sea turtle	No suitable nesting habitat is present within the action area.	NE
Kemp's ridley sea turtle	No suitable nesting habitat is present within the action area.	NE
false spike	E.1.3.2	NLAA
Guadalupe orb	E.1.3.2	NLAA
monarch butterfly	E.1.3.8	NLAA

(a) All species in this table identified as potentially occurring within the action area via U.S. Fish and Wildlife Service (FWS) IPaC reports (FWS 2025-TN12643)
(b) The NRC staff makes its effect determinations for federally listed species in accordance with the language and definitions specified in the FWS and National Marine Fisheries Service (NMFS) Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031). NLAA = may affect, not likely to adversely affect. NE = No effect.
(c) Conclusions address both construction and operation impacts.

In the following sections, the NRC staff analyzes the potential impacts of the proposed action on the species and critical habitat with the potential to occur in the action area. Table E-3 summarizes the NRC staff's ESA effect determinations for all federally listed, proposed, and candidate species.

General impacts associated with the action that could affect terrestrial species include: (1) habitat loss, degradation, and modification; (2) behavioral changes resulting from human disturbance; and (3) collision with construction equipment, building infrastructure, and vehicles. General impacts associated with the action that could affect aquatic species include: (1) physical removal of habitat through freshwater withdrawals; and (2) chemical alteration of habitat through discharges.

Guadalupe River Habitat Conservation Plan

Dow Chemical Company Inc. (Dow), of which LME is a wholly owned subsidiary, has signed a Memorandum of Agreement to participate in a Habitat Conservation Plan (HCP) that is being developed by the Guadalupe-Blanco River Authority (GBRA). This HCP would address water management impacts on all potentially present species within the entire Guadalupe River Basin, including the eastern black rail, whooping crane, Guadalupe darter, false spike, Guadalupe orb, and Guadalupe fatmucket. Note, the HCP covers species that are beyond the scope of the NRC staff's review since the HCP encompasses impacts that occur higher up in the watershed where additional federally protected species may be present, but these species are not expected to be present within the downstream reaches of the action area. The HCP would provide the basis for the issuance of an incidental take authorization from the FWS under Section 10 of the ESA, which allows for non-Federal entities to conduct activities that might result in incidental take as long as they minimize and mitigate the impacts. This process is not anticipated to be completed until 2027.

Covered activities under the HCP include water diversions from the Guadalupe River. The HCP proposes a method to quantify take based on the proportion of water withdrawn by each participant in the HCP. The developed methodology accounts for the volume of water withdrawn per entity as well as the seniority of the entity's water right and the location of the withdrawal on the river system. Since more senior water rights have greater impacts on river systems during drought conditions and more downstream withdrawals have a higher impact as they cannot be supplemented by other inputs, the impacts of these users are proportionally addressed in the take calculations. Additional information on the HCP, the covered species, and the technical methods can be found on the HCP webpage (GBRA 2025-TN12626).

E.1.3.1 Tricolored Bat

In Table E-1, the NRC staff concludes that tricolored bats may occur in the wooded portions of the action area or within onsite culverts year-round. If present, bats would occur rarely and in low abundance due to the low quality of suitable habitat within the action area. Bats within the action area may experience the general stressors of terrestrial species associated with the construction and operation of LMGS, as described in Section E.1.3.

<u>Behavioral Changes Resulting from Construction and Operation Activities</u>

Construction and operation activities could prompt behavioral changes in bats. The construction phase of the project is expected to occur over approximately 44 months (LME 2025-TN12163: Section 4.3). During this time, building activities such as land clearing, grading, excavation, and filling will result in an increase in noise, vibration, and general human activity onsite which may disrupt normal feeding, sheltering, and breeding activities (FWS 2016-TN7400). Baseline ambient noise data was collected along the southeastern and eastern boundaries of LMGS within the vicinity of forested habitat. Noise monitoring revealed baseline noise levels of 56.6 dBA along the southeastern boundary and 64.7 dBA along the eastern boundary (LME 2025-TN12163: Section 2.9.2.1). During construction, building activities are expected to result in 80–85 dBA at 50 ft (m) from the noise source and less than 80 dBA at 98 ft (m) (LME 2025-TN12163: Section 4.3.1.1.3). At closer range and louder noise levels, particularly if accompanied by physical vibrations from heavy machinery, many bats would likely be startled to the point of fleeing from their daytime roosts. Fleeing individuals could experience increased susceptibility to predation and would expend increased levels of energy, which could result in decreased reproductive fitness (FWS 2016-TN7400: Table 4-1). Increased noise may diminish foraging success, as demonstrated by Schaub et al. (2008-TN8867) for a similar species, the mouse-eared bat (*Myotis myotis*), in a study that mimicked the traffic sounds experienced within 49 ft (15 m) of a highway.

During the operation phase of the LMGS, noise will continue to occur onsite but at a lower and more constant level. At low noise levels or farther distances, bats would likely habituate to low background noise levels. The greatest cause of noise associated with LMGS operations are the air-cooled condensers, which are expected to increase the existing noise levels onsite to approximately 75 dBA at a distance of 328 ft (100 m) (LME 2025-TN12163: Section 5.10.1.2). Within the LMGS action area, noise, vibration, and other human disturbances could dissuade bats from using the forested habitat, potentially reducing the fitness of the bats. However, bats within the action area have likely become habituated to such disturbances because the Dow Seadrift Operations facility (SDO) has been consistently operating for several decades onsite at a similar level of noise, vibration, and general human disturbance. According to the FWS, bats that are repeatedly exposed to predictable, loud noises may habituate to such stimuli over time (FWS 2010-TN8537). For instance, Indiana bats have been documented as roosting within approximately 1,000 ft (300 m) of a busy State route adjacent to Fort Drum Military Installation and immediately adjacent to housing areas and construction activities on the installation (Army 2014-TN8512). Tricolored bats are expected to respond similarly.

Operation of the LMGS would not include major construction and potential land disturbing impacts would primarily consist of general landscape maintenance activities. Levels and intensity of noise, lighting, and human activity associated with continued day-to-day activities and site maintenance during the operating term would be similar to ongoing conditions on the site associated with SDO, and such activity would only occur on the developed, industrial-use portions of the site (LME 2026-TN12669). All permanent lighting will be down-shielded and pointed away from potential habitat to the extent practicable in accordance with facility security lighting standards (LME 2026-TN12669). While operational disturbances could cause behavioral changes in bats onsite, such as the expenditure of additional energy to find alternative suitable roosts, the NRC staff assumes that tricolored bats, if present, would have already acclimated to regular site disturbances associated with existing industrial operations onsite. Thus, continued disturbances during the operation of the LMGS would not cause behavioral changes in bats to a degree that would be able to be meaningfully measured, detected, or evaluated or that would reach the scale where a take might occur.

<u>Mortality or Injury from Collisions with Construction Equipment, Plant Structures, and Vehicles</u>

Listed bats can be vulnerable to mortality or injury from collisions with plant structures and vehicles. The impacts associated with the proposed action would be similar to those described in Section 3.5.2.1.5 (construction impacts) and 3.5.2.2.5 (operation impacts) of the new reactor generic environmental impact statement (NRC 2026-TN12155), which is incorporated by reference.

During construction, heavy machinery would be present onsite to conduct the construction activities as described in ER Section 3.9 (LME 2025-TN12163). This machinery includes tall equipment such as at least one 200 ft (61 m) crane that will be temporarily present onsite and may cause collision risk for bats in the action area (LME 2025-TN12596). During operation, tall buildings onsite may pose a collision risk for bats in the area. Two 138 kV electrical transmission lines with 15 transmission structures would be constructed to connect LMGS to the existing SDO substation. These lines would be approximately 1 mi (1.6 km) in length within a 100 ft (30 m) wide transmission corridor. Proposed building elevations onsite would range from 50 to 199 ft (15 to 60 m) above ground level, including a 199 ft (61 m) meteorological tower (LME 2025-TN12163: Table 3.1-1, LME 2025-TN12596: Request for Confirmation of Information TE-3). Power plants do not tend to experience high rates of wildlife mortality associated with collisions with site buildings or structures. Accordingly, the NRC staff finds the likelihood of tricolored bat collisions with construction equipment, site buildings, or structures to be extremely unlikely and, therefore, is not considered further.

Vehicle traffic will occur onsite during both construction and operation of LMGS. Vehicle collision risk for bats varies depending on factors including time of year, location of roads and travel pathways in relation to roosting and foraging areas, the characteristics of individuals' flight, traffic volume, and whether young bats are dispersing. Although collision has been documented for several species of bats, the Indiana Bat Draft Recovery Plan (FWS 2007-TN934) indicates that bat species do not seem to be particularly susceptible to vehicle collisions. However, the FWS also finds it difficult to determine whether roads pose a greater risk for bats colliding with vehicles or a greater likelihood of decreasing risk of collision by deterring bat activity (FWS 2016-TN7400). In most cases, the FWS expects that roads of increasing size decrease the likelihood of bats crossing the roads and, therefore, reduce collision risk (FWS 2016-TN7400).

During the proposed construction and operation of LMGS, vehicular traffic from construction activities, truck deliveries, site maintenance activities, and personnel commuting to and from the site would occur. Vehicle use would occur primarily in areas that bats would be less likely to frequent, such as along established county and State roads or within industrial-use areas of the LMGS site. Suitable bat habitat is not common onsite and most vehicle activity would occur during daylight hours when bats are less active. Accordingly, the NRC staff finds the likelihood of future bat collisions with vehicles to be extremely unlikely.

Habitat Loss, Degradation, Disturbance, or Fragmentation, and Associated Effects

A small portion of the LMGS action area includes forested habitat that federally protected bats may rarely to occasionally inhabit at any time of year. In its species status assessment for the tricolored bat (FWS 2021-TN8589), the FWS stated that forest removal may result in the following impacts to tricolored bats: loss of suitable roosting or foraging habitat, longer flights between suitable roosting and foraging habitats because of forest habitat fragmentation, fragmentation of maternity colonies due to loss/fragmentation of travel corridors, and direct mortality or injury during tree removal.

Onsite there is 2.2 ac (0.9 ha) of evergreen forest within the southeastern corner of the LMGS site and 0.2 ac (0.1 ha) of deciduous forest along the west levee of West Coloma Creek (LME 2025-TN12163). Neither of these areas will be directly affected by construction activities. Tree clearing associated with LMGS construction activities will occur within scrub/shrub and woody wetland habitat. The access and pipeline rights-of-way construction will result in a total of 5.3 ac (2.2 ha) of potential tree clearing, of which 3.5 ac (1.4 ha) would be from scrub/shrub habitat located west of the West Coloma Creek and east of the operating basins near SD-WET-09 and 1.8 ac (ha) would be from woody wetlands, within SD-WET-08 (LME 2025-TN12163: Figure 2.4-4). The transmission line construction will result in 0.2 ac (0.1 ha) of potential tree clearing, all of which would be from shrub/scrub habitat that is located between existing development near SD-STR-01. These numbers assume all temporary and permanent impacts will result in tree removal (LME 2025-TN12596). There are multiple uncovered culverts approximately 2 ft × 23 ft (0.6 m × 7 m) located within the northern agricultural fields onsite (NRC 2026-TN12670). Temporary drainage ditches will replace stormwater drainage via the existing agricultural drainage ditches (LME 2025-TN12163: Section 4.2.1.1.3). While the hydrology of the site will change, these culverts will not be directly affected by construction activities (FWS 2025-TN12611).

Tricolored bats tend to forage along forested edges of larger forest openings, along edges of riparian areas, and over water (FWS 2021-TN8589). The proposed tree removal onsite is generally located along drainage features that are disconnected from larger forested areas and surrounded by open agricultural fields or industrial land. As such, these areas are not anticipated to provide suitable foraging habitat for bats but may provide potential roosts. Negative impacts (i.e., mortality or injury) on bats could occur if roost trees are removed. Trees within scrub/shrub habitat likely do not provide suitable roosting habitat as these areas are dominated by low-lying woody vegetation with small trees. Tricolored bats often select tall, large diameter trees for roosting, but will roost in smaller diameter (e.g., 4 in. [10 cm]) trees when roost substrate is present (FWS 2024-TN12627). Suitable roost substrate includes live and dead leaf clusters of deciduous trees located within forests, woodlots, or linear features (FWS 2021-TN8589). Therefore, it is unlikely that bats would be present within scrub/shrub habitat, but it is possible that they may roost in trees within the woody wetland habitat. Any required tree clearing required for construction will occur outside of the tricolored bat maternity season (May 1 through July 15) (LME 2026-TN12669).

Vegetation maintenance onsite that may occur during the operation of LMGS would include transmission line and switch yard maintenance. Vegetation in these areas would be managed by means of mechanical (i.e., mowing, pruning, weeding) and chemical (i.e., herbicide) controls. A majority of the proposed transmission corridors are in developed areas where these controls are currently utilized. During operations, herbicides are used for maintenance as needed on transmission and steam lines, parking lots, operating areas, and access roads, as well as any targeted invasive plant management. LME would apply herbicides according to labeled uses (LME 2025-TN12596).

<u>Summary of Effects and Conclusion</u>

As discussed above, the project will result in increased nighttime traffic near areas of forest, drilling and blasting noise, and application of herbicides (FWS 2025-TN12611). All potential effects on the tricolored bat resulting from the proposed action would be insignificant due to mitigation measures and existing conditions onsite. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the tricolored bat. Because the tricolored bat is proposed for Federal listing, the ESA does not require the NRC to consult with or receive concurrence from the FWS regarding this species, as long as the continued existence of the species is not jeopardized.

E.1.3.2 False Spike and Guadalupe Orb

In Table E-1, the NRC staff concludes that the false spike and Guadalupe orb may occur within the portion of the action area that intersects with the Guadalupe River between the GBRA diversion and the saltwater barrier dam. This dam is utilized during low flow conditions to prevent saltwater intrusion upriver. As such, potentially suitable habitat for the freshwater mussels within the action area only exists upstream of the saltwater dam within the 550 ft (168 m) of the Guadalupe River between the GBRA diversion and the saltwater dam (see Figure 3-2a). However, the false spike and Guadalupe orb are heavily associated with riffle habitat and are highly sensitive to water quality. Basic water chemistry needs for the Guadalupe orb and false spike include water temperatures below 84°F (29°C), dissolved oxygen (DO) concentrations greater than 2 milligrams per liter (mg/L), salinity below 2 parts per thousand (ppt), and total ammonia nitrogen below 0.21 mg/L (FWS 2025-TN12616, FWS 2025-TN12617).

Discrete sample data from USGS Gauge No. 08188800, collocated at the saltwater dam, collected between 1968 and 2013 indicate water temperatures ranging from 43.7°F (6.5°C) to 89.6°F (32°C) with an average of 73°F (23°C), DO concentrations ranging from 3.4 to 11.7 mg/L with an average of 7.3 mg/L, and total ammonia nitrogen ranging from 0 to 2.4 mg/L with an average of 0.1 mg/L (USGS 2025-TN12660). Of the 235 discrete temperature samples collected until 2013, 19 percent exceeded the water temperature requirement of 84°F (29°C) and of the 130 discrete total ammonia nitrogen samples collected through 1996, 94 percent exceeded the concentration requirement of 0.21 mg/L (USGS 2025-TN12660). No salinity data was available for this gauge station or the neighboring upstream and downstream gauges. While the DO was consistently above the 2 mg/L needed in all 192 discrete samples collected from 1968 through 2013, the other available water quality parameters from this gauge (temperature and ammonia nitrogen) indicate that this area would not provide suitable water quality to support these sensitive mussel species. Additionally, this portion of the Guadalupe River does not contain riffle habitat, has an average depth of 5 ft (1.5 m) upstream of the saltwater barrier, and is located within 25 mi (40 km) of the coastline (USGS 2025-TN12660). While salinity data is not available for this area, the proximity to the coast and the need for a saltwater barrier strongly indicate that seasonal influxes of salt water occur, which would prevent the establishment of sensitive mussels within this area.

Based on the temperature data, total ammonia nitrogen data available, the proximity to the coastline, and the absence of riffle habitat, the NRC staff concludes that this portion of the Guadalupe River does not provide highly suitable habitat for the false spike or the Guadalupe orb. However, since no surveys for them have been conducted within this stretch of the Guadalupe River, the NRC staff conservatively assumes that the species could be present and therefore assesses impacts to these species. If present, the only impacts that mussels in this area would experience are associated with water withdrawals from the operation of LMGS. No construction impacts are anticipated within this portion of the action area.

The potential stressors that these mussels could experience from the withdrawal of water from the Guadalupe River are as follows: (1) changes in hydrological regime; (2) water quality impacts; and (3) host species vulnerability.

Changes in Hydrological Regime

Appropriate flow and temperature are critical to delivering oxygen and nutrients for respiration and filtration, allowing glochidia to move to their host and encyst for reproduction, and for removing silt and other fine sediments from within rock structures and crevices preventing mussel suffocation and degradation of mussel habitat. Normal fluctuation in velocity is expected, but extreme changes can be detrimental. Extreme high flow, associated with flood conditions, can potentially dislodge mussels and destroy habitat. Extreme low flows, associated with drought or water withdrawal, can impact reproduction, feeding, respiration, and, potentially, dewatering, exposure, and desiccation.

The operation of LMGS has the potential to impact the hydrological regime through the withdrawal of water from the Guadalupe River at the GBRA diversion (see Section 3.6.1). Based on an estimated average consumptive use rate of 6.3 cfs and maximum consumptive rate of 6.7 cfs for LMGS operation (LME 2025-TN12163), average operations would remove 9.9 cfs, which is less than 0.5 to 0.8 percent of the average Guadalupe River flow upstream of the GBRA diversion, depending on the time of year (USGS 2025-TN12629). Additional information about water use during operations can be found in Section 3.4.3.

Freshwater mussels vary in their ability to withstand emersion (exposure to air). Some species have adapted to withstand prolonged periods of emersion, while others are emersion-intolerant. Mussels move over and through the substrate by means of a protrusible muscular foot. Some species are known to move several feet per hour in response to stagnant conditions or falling water levels. Other species respond to falling water levels by burrowing more deeply into the substrate, seeking moisture. However, most riverine species have evolved under seasonally fluctuating water-level conditions and are unaffected by small fluctuations in water level. Under worst-case conditions, withdrawal losses would result in a 0.48 in. (1.2 cm) lowering of water level downstream of the GBRA diversion.

The impact of consumptive water use would be exacerbated in the summer when streamflow in the Guadalupe River is the lowest and diversion rates into the GBRA canal are the highest (LME 2025-TN12163: Table 2.3.1-3). It is not anticipated that the volume of water withdrawn from the Guadalupe River would cause mussel desiccation or exposure. During rare and extreme low flow events, the total volume of water diverted into the GBRA Diversion Canal would be adjusted based on senior water rights (see Section 3.4). Therefore, senior water rights holders, like LME, could have an exacerbated impact on downstream flow. However, because the construction of LMGS is intended to replace the existing co-generation station onsite, these estimates are conservative as the change in total water diverted is expected to be less than the values identified for LMGS operations. Additional information can be found in Section 3.4.3. As such, any impacts to the hydrological regime caused by the withdrawal of water by LMGS are not expected to reach a level where take might occur.

Water Quality

Appropriate water quality is critical to the survival, reproduction, and persistence of all life stages of freshwater mussels. Water quality requirements for the false spike and Guadalupe orb are presented previously in this section. A reduction in freshwater inflows could cause an increase in water temperature, an increase in concentrations of contaminants, and a decrease in oxygen availability. During low flow events, these impacts are expected to be exacerbated. However, for the same reasons as presented above within the Changes in Hydrologic Regime discussion, these impacts are not expected to reach a level where take might occur.

There would be no discharges into suitable mussel habitat. The only discharges associated with LMGS operations would be the discharge of stormwater and treated nonradiological wastewater into the Victoria Barge Canal and of stormwater into West Coloma Creek. These discharges are managed by Texas Commission on Environmental Quality (TCEQ) and are located in areas where Guadalupe orb and false spike are not expected to occur. Therefore, the impacts associated with discharge are not evaluated further here.

Host Species Vulnerability

Like other unionids, false spike and Guadalupe orb have unusual life cycles. After fertilization, the eggs live in special gill chambers of the females and develop into microscopic larvae called glochidia. Females brood the glochidia and expel them to complete development by attaching to the host's gills or fins. They drop off the hosts as newly transformed juveniles. Mussel host species are susceptible to many of the same threats that affect mussels including contaminants, habitat degradation and fragmentation, lack of water quality and quantity, known disease issues or die-offs, and potential overharvest and collection. Impacts to host species have an indirect effect on mussels through the reduction in the abundance and distribution of its host species.

The false spike has two confirmed host fish, the red shiner and the blacktail shiner, though it is expected that the species may utilize other fish species as hosts as well (FWS 2025-TN12617). The Guadalupe orb likely utilizes the tadpole madtom, flathead catfish, and channel catfish as hosts (FWS 2025-TN12616). All of these potential host fishes have been documented to occur within the Guadalupe River, with most hosts having a stable population in the lower Guadalupe River (Bonner and Perkin 2009-TN12630).

Aquatic surveys of the GBRA canal and West Coloma Creek conducted in 2023 identified 8 channel catfish in the GBRA canal and 2 channel catfish in West Coloma Creek (WSP 2024-TN12606). No red or blacktail shiners were collected during these surveys, though the false spike likely utilizes other species as hosts. No surveys of the Guadalupe River were conducted as a part of this survey effort; however surveys of the Guadalupe River were conducted in 2008 by Exelon (Exelon 2012-TN12213). The most abundant species that was collected during these surveys was the red shiner (48.5 percent of the total 10,310 fish collected). Channel catfish were also collected but in fairly low numbers. Additional details regarding the relevant aquatic surveys can be found in Section 3.6.1.

Adult mussels are not directly susceptible to entrainment or impingement by power plants as they live in the river bottom, but larvae are indirectly susceptible if the host fish species is susceptible. However, since the intake associated with the LMGS site is located distant from the Guadalupe River along the GBRA Calhoun Canal separated by the presence of pumps and diversion structures, it is unlikely that the host fishes that support mussel populations within the Guadalupe River would be entrained or impinged by the LMGS intake. Therefore, the proposed action would not impact host species vulnerability through entrainment or impingement for the false spike or the Guadalupe orb.

The withdrawal of freshwater from the Guadalupe River would have similar effects on the host fish species as described in the Changes in Hydrological Regime and Water Quality discussions above and are not evaluated separately here.

Summary of Effects and Conclusions

All potential effects on the false spike and the Guadalupe orb resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the false spike and the Guadalupe orb. The NRC staff requested concurrence with this determination from FWS under Section 7 of the ESA on January 29, 2026 (NRC 2026-TN12777) and received concurrence on March 11, 2026 (FWS 2026-TN12910).

E.1.3.3 Whooping Crane

In Table E-3, the NRC staff concludes that whooping cranes may occur in the action area. If present, whooping cranes would occur occasionally and for short periods of time while passing through to preferentially suitable wintering habitat.

The Aransas National Wildlife Refuge, located approximately 12 mi (19 km) from LMGS, is the wintering home to the only self-sustaining population of whooping cranes (FWS 2007-TN326). The refuge and surrounding coastal marshes are designated critical habitat for the whooping crane (43 FR 20938-TN8873). Due to the close proximity of LMGS to wintering habitat and its location within the migratory pathway, it is possible that whooping cranes may be present or pass through the LMGS site from November 1 through April 30.

The greatest risk to whooping cranes occurs during the spring and fall migrations, when 60 to 80 percent of losses occur, primarily caused by avian tuberculosis, shooting, non-shooting trauma, avian predation, and collision with power lines (FWS 2007-TN326). Whooping cranes within the action area may experience the general stressors of terrestrial species associated with the construction and operation of LMGS, as described in Section E.1.3.

Environmental Impacts of Construction

Whooping crane habitat has been primarily affected by activities that cause a loss or degradation of wetland and riverine habitats (FWS 2023-TN8854). Out of the 23.5 ac (9.5 ha) of palustrine emergent wetlands onsite, approximately 0.9 ac (0.4 ha) would be permanently filled and an additional 1 ac (0.4 ha) would be permanently converted to another vegetation type. Out of the 3.3 ac (1.3 ha) of palustrine scrub-shrub wetlands onsite, 1.8 ac (0.7 ha) would be permanently converted to another vegetation type, but none would be permanently filled (LME 2025-TN12596). The West Coloma Creek channel runs through the LMGS site and construction plans include building two bridges and utility crossings across the channel, as well as installing new stormwater outfall structures that discharge into the creek (LME 2025-TN12163). Approximately 88 linear ft (26.8 m) of stream channel could be impacted. However, neither the wetlands nor streams onsite provide suitable wintering habitat for the whooping crane. Preferentially suitable migratory habitat for whooping cranes includes wetland mosaic complexes and wide river channels isolated from human disturbance (FWS 2007-TN326). Due to the LMGS site's proximity to suitable wintering habitat, it is unlikely that whooping cranes would utilize the LMGS site as a stopover location during migration.

The predominant impact to whooping cranes during construction activities would include risk of collision with tall construction equipment while whooping cranes are flying over the site. Collision risks associated with construction equipment are described in Section 3.7.2. Tall structures including buildings, construction equipment 15 ft (5 m) high or higher, fences, and antennas in the area will be marked/flagged or laid down on the ground at night or when not in use to provide higher visibility and avoid or minimize potential collision hazards (LME 2026-TN12669). Workers will be educated, with approved FWS materials, to recognize whooping cranes, their habitat, and their federally endangered status. A designated observer will have stop-work authority and will stop work if whooping cranes land within 1,000 ft (305 m) of the active construction area until cranes have moved beyond that distance or left the area and work stoppage can occur safely (LME 2026-TN12669). All sightings of whooping cranes will be documented and reported to the Texas Coastal and Central Plains Ecological Services Field Office in Corpus Christi (LME 2026-TN12669). With these measures in place, the NRC staff finds the likelihood of future whooping crane collisions with construction equipment to be low.

There would be increased noise in the action area during the construction period. Noise impacts associated with construction are described within the tricolored bat section. Whooping cranes within the range of construction noise could demonstrate avoidance of the action area or, if located near the occurrence of sudden, louder construction noises, could be startled and flee the area. This could result in the expenditure of additional energy and reduction of foraging activities.

Environmental Impacts of Operation

All plant operations would continue to occur within already developed land at the LMGS site. LME would be expected to comply with its NPDES or TPDES permit, and no activities during the operation term would alter river flow in a manner that could result in the degradation of the riverine habitat for whooping cranes. Impacts associated with water withdrawal are described in the false spike and Guadalupe orb section. Water withdrawals associated with LMGS operation are not anticipated to noticeably affect salinity levels at a level that could be meaningfully measured or detected within suitable whooping crane habitat.

During the operation phase of LMGS, noise will continue to occur onsite but at a lower, and more constant level. Noise impacts associated with operation are described in Section E.1.3.1 and are expected to be similar to the existing onsite noise levels associated with SDO operation. Therefore, the NRC staff concludes that the continued noise during the operation of LMGS would not cause behavioral changes in whooping cranes to a degree that would be able to be meaningfully measured or detected.

During the proposed LMGS operation term, vehicular traffic from truck deliveries, site maintenance activities, and personnel commuting to and from the site would occur. Vehicle use would occur primarily in areas that whooping cranes would be less likely to frequent, such as along established county and State roads or within industrial-use areas of the LMGS site. Accordingly, the NRC staff finds the likelihood of future whooping crane collisions with vehicles to be extremely unlikely and, therefore, is not considered further.

The risk of collisions with tall structures and in-scope transmission lines poses a threat to whooping cranes and other birds. Collision risks with onsite structures and in-scope transmission lines associated with operation are discussed in Section E.1.3.1. To the extent practicable, LME will implement the practices set forth in Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012-TN6779) to shield and mark any required powerlines. Based on this, the NRC staff finds the likelihood of future whooping crane collisions with buildings, infrastructure, or in-scope transmission lines to be extremely unlikely.

Summary of Effects and Conclusion

All potential effects on the whooping crane resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the whooping crane. The NRC staff requested concurrence with this determination from FWS under Section 7 of the ESA on January 29, 2026 (NRC 2026-TN12777) and received concurrence on March 11, 2026 (FWS 2026-TN12910).

E.1.3.4 Eastern Black Rail

In Table E-1, the NRC staff concludes that eastern black rails may occur within offsite wetlands, but the likelihood of presence within the LMGS site boundary is considered low due to the site's wetland characteristics and the proximity to preferentially suitable habitat within the Guadalupe Delta Wildlife Management Area. The NRC staff assumes that eastern black rails within the vicinity of LMGS would preferentially occupy habitat within the management area.

Of the general stressors of terrestrial species associated with the construction and operation of LMGS, as described in Section E.1.3, the eastern black rail may experience impacts associated with habitat loss, degradation, and modification as well as behavioral changes resulting from human disturbance. As this species is predominantly ground dwelling, it is not expected to experience impacts associated with collision. This species may also experience impacts associated with altered hydrology, drainage modifications, and impounded wetland management (FWS 2019-TN12348).

Habitat Loss, Degradation, and Modification

During construction, 3.7 ac (1.5 ha) of wetlands will be permanently impacted. Of this total, 1.8 ac (0.7 ha) are woody wetlands, and 1.9 ac (0.8 ha) are emergent herbaceous wetlands. Indirect impacts to wetlands may also occur through sedimentation and erosion. These impacts are expected to be reduced through the implementation of BMPs, including mulching, geotextiles, sod stabilization, vegetative buffer strips, and silt fencing. (LME 2025-TN12163: Section 4.3.1.1.2)

The wetlands within the LMGS site boundary are primarily associated with excavated drainage features that are not expected to provide high quality habitat for the eastern black rail (LME 2025-TN12163: Section 2.4.1.2.2). Disturbance of this small pocket of suitable eastern black rail habitat located within the project area will be avoided to extent practicable. Any required disturbance of potential eastern black rail habitat will occur outside of the sensitive breeding period (March 1 through September 30) (LME 2026-TN12669).The eastern black rail typically inhabits large, flat wetland complexes with very dense grassy herbaceous vegetation and adjacent upland habitat with dense vegetative cover (FWS 2019-TN12348). While the emergent herbaceous wetlands onsite potentially meet the vegetation requirements for the species, the impacted wetlands are dominated by invasive vegetation and are surrounded by industrial areas, open water, or cultivated crop fields that would not provide suitable adjacent upland habitat. As such, the NRC staff determines that the eastern black rail is unlikely to inhabit wetlands within the LMGS site boundary and, with the timing restrictions in place, any potential impacts are not expected to reach a level where take may occur.

Behavioral Changes Resulting from Human Disturbance

There would be increased noise in the action area during the construction period. Noise impacts associated with construction are described in Section E.1.3.1. Eastern black rails within the range of construction noise could demonstrate avoidance of the action area or, if located near the occurrence of sudden, louder construction noises, could be startled and flee the area. This secretive species rarely flies and instead usually runs when startled. This could result in the expenditure of additional energy and reduction of foraging activities.

Altered Hydrology, Drainage Modifications, and Impounded Wetland Management

During operation, freshwater would be diverted from the Guadalupe River to supply water to the LMGS site. This withdrawal is described in the false spike and Guadalupe orb section (Section E.1.3.2). Due to the increase in diversion, there would be a decrease in freshwater flow within the Guadalupe River and an increase in flow within the canals that intersect the Guadalupe Delta Wildlife Management Area. These canals are human-made and intended to transport water to downstream users. It is not anticipated that these actions would result in a measurable hydrological modification of wetlands within the Guadalupe Delta Wildlife Management Area.

Onsite wetlands that remain after construction may experience altered hydrology from the modification of stormwater patterns. However, these wetlands were not considered suitable habitat for the eastern black rail and hydrological modifications to them are not expected to have a measurable or detectable impact on the species.

Summary of Effects and Conclusion

All potential effects on the eastern black rail resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the eastern black rail. The NRC staff requested concurrence with this determination from FWS under Section 7 of the ESA on January 29, 2026 (NRC 2026-TN12777) and received concurrence on March 11, 2026 (FWS 2026-TN12910).

E.1.3.5 West Indian Manatee

In Table E-3, the NRC staff concludes that the West Indian manatee may occur within the Guadalupe Bay and Mission Lake portion of the action area during the summer months, but the likelihood of presence is considered low due to the rarity of the species within Texas waters.

The West Indian manatee is protected under both the ESA and the Marine Mammal Protection act of 1972. The species faces threats from collision with boats, entrapment in flood control structures, poaching, habitat loss, and pollution (90 FR 3131-TN12220; 32 FR 4001-TN2750).

The proposed operation of LMGS has the potential to impact the West Indian manatee through the reduction of freshwater inflow into Guadalupe Bay and Mission Lake and the increase in contaminants into the Victoria Barge Canal. The action would not involve an increase in boat traffic, as construction materials are not anticipated to be transported by boat to the LMGS site (LME 2025-TN12596), or involve any construction-related impacts that may affect West Indian manatee habitat.

The reduction in freshwater inflows by the Guadalupe River has the potential to modify the salinity gradients of downstream estuaries, which would then impact the growth of vegetation relied on by manatees for foraging. Water withdrawal impacts are described in the Guadalupe orb and false spike section (Section E.1.3.2). The likelihood of the West Indian manatee being present in Guadalupe Bay or Mission Lake is considerably low and the impacts associated with the freshwater withdrawal would never reach a level where take of the West Indian manatee may occur.

LMGS discharges certain nonradiological chemical pollutants through an existing permitted discharge into the Victoria Barge Canal. The TCEQ limits the allowable concentrations of these pollutants through the site's Texas Pollutant Discharge Elimination System (TPDES) permit. The TPDES permit establishes allowable pollutant discharge concentration limits for total residual chlorine, pH, total phosphorus, fecal coliform, total organic carbon, and total petroleum hydrocarbons at levels at or below the U.S. Environmental Protection Agency (EPA) (2024-TN10276) national recommended aquatic life criteria for acute (short-term) and chronic (long-term) exposure. Under these criteria, the EPA considers "unacceptable acute effects" to be those effects that are lethal or immobilize an organism during short-term exposure to a pollutant. "Unacceptable chronic effects" are those effects that will impair growth, survival, and reproduction of an organism following long-term exposure to a pollutant. Thus, the EPA aquatic life criteria are designed to ensure that aquatic species exposed to pollutants in compliance with these levels do not experience any impairment of growth, survival, or reproduction.

Radiological liquid waste from the nuclear island would be shipped offsite for disposal (approximately 93.5 m^3/hr on average and up to 131.4 m^3/hr at the maximum) and nonradiological liquid waste from the conventional island would be combined with SDO liquid effluent waste stream and discharged to the Victoria Barge Canal at an average flow of 368.1 m^3/hr and a maximum flow of 493.6 m^3/hr. This nonradiological wastewater would be treated by the existing SDO liquid waste treatment system prior to being discharged. The proposed operation of LMGS is anticipated to add up to 2.3 MGD of wastewater discharge at this outfall. Current discharge rates from this outfall range from 1.4 MGD to 5 MGD with effluent concentrations within TPDES permit limits (LME 2025-TN12163: Section 5.2.1.1.2). The addition of LMGS discharge to the existing outfall would increase the total discharge rate to 7.3 MGD, which is well below the TPDES permitted limits of 12 MGD daily average and 17 MGD daily maximum (TCEQ 2021-TN12608). Section 3.4.3 provides additional details regarding wastewater discharges.

The NRC staff assumes that because nonradiological pollutants would be discharged in compliance with existing TPDES permit limits, this discharge would not impair the ability of aquatic life to carry out essential life functions or impair the quality or quantity of the habitat itself.

Summary of Effects and Conclusion

All potential effects on the West Indian manatee resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the West Indian manatee. The NRC staff requested concurrence with this determination from FWS under Section 7 of the ESA on January 29, 2026 (NRC 2026-TN12777) and received concurrence on March 11, 2026 (FWS 2026-TN12910).

E.1.3.6 Northern Aplomado Falcon

In Table E-3, the NRC staff concludes that non-breeding individuals of the coastal Texas population of northern aplomado falcons may occur in the action area. As of the 2024 FWS 5-year review, the coastal Texas population consisted of 26 breeding pairs (FWS 2024-TN12631). Individuals of this species are known to be wide ranging, dispersing up to 230 mi (370 km). One of the two major breeding areas for the species is located at Matagorda Island, approximately 18 mi (29 km) from the LMGS site boundary. Mated pairs exhibit strong nesting territory fidelity and typically remain within a 1.3 to 8.3 mi^2 (3.3 to 21.4 km^2) area of their nest. Juvenile northern aplomado falcons generally do not form a pair bond until they are 2 years of age. During this time, they may range over a 14 to 109 mi^2 (36 to 281 km^2) area.

Breeding habitat in coastal Texas includes nearly treeless, yucca-studded, herbaceous-dominated communities. Per the 2024 FWS 5-year review, habitat utilized by non-breeding individuals cannot be described. It is expected that non-breeding individuals would occupy similar habitat to that of breeding pairs unless such habitat is unavailable. Non-breeding individuals have been observed in areas closer in proximity to forests than what would be considered high quality breeding habitat (FWS 2024-TN12631).

While suitable breeding habitat is not present onsite, the proximity to a known major breeding area indicates that non-breeding individuals may transiently pass through the action area. These individuals may experience increased noise exposure and increased risk of collision associated with the construction and operation of LMGS. These impacts would be similar to those described in the section for the tricolored bat. Northern aplomado falcons are highly susceptible to collision with construction equipment, power lines, or other structures on site due to their hunting behavior (LME 2026-TN12669).

Summary of Effects and Conclusion

All potential effects on the northern aplomado falcon resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the northern aplomado falcon. The NRC staff requested concurrence with this determination from FWS under Section 7 of the ESA on January 29, 2026 (NRC 2026-TN12777) and received concurrence on March 11, 2026 (FWS 2026-TN12910).

E.1.3.7 Piping Plover and Rufa Red Knot

In Table E-3, the NRC staff concludes that piping plovers and rufa red knots may occur in the action area. If present, individuals of these species would only occur occasionally and for short periods of time while transiently passing through the area to preferentially suitable habitat along the coast. Piping plover designated critical habitat occurs within 17 mi (27 km) of the LMGS site (74 FR 23476-TN8848) and proposed critical habitat for the rufa red knot occurs within 50 mi

(81 km) of the LMGS site (88 FR 22530-TN10376). These areas of critical habitat are associated with the barrier islands along the Gulf Coast.

Piping plover may use nearby coastal habitats during migration periods to include sand pits, small islands, tidal flats, shoals, and sandbars with inlets (FWS 2025-TN12353). Piping plovers and rufa red knots within the action area may experience the general stressors of terrestrial species associated with the construction and operation of LMGS, as described in Section E.1.3.

Habitat loss, Degradation, and Modification

The construction of LMGS is not anticipated to degrade, modify, or destroy any potentially suitable piping plover or rufa red knot habitat. Construction impacts are limited to the LMGS site boundary and no potentially suitable habitat occurs within the site boundary.

During operation, the withdrawal of freshwater from the Guadalupe River has the potential to impact the salinity gradients and freshwater inflow downstream within suitable piping plover and rufa red knot habitat. These impacts are assessed in the false spike and Guadalupe orb section (Section E.1.3.2) and are not anticipated to reach a level that could be meaningfully measured or detected.

Behavioral Changes Resulting from Human Disturbance

Behavioral changes resulting from human disturbance are described in Section E.1.3.1 and are expected to be similar to those experienced by piping plovers and rufa red knots. Construction noises would be temporary and are located far enough from suitable habitat that the likelihood of individuals being impacted by sudden, loud construction noises is low. Additionally, operational noises are expected to be restricted to the industrial area of the site and a surrounding 328 ft (100 m) radius. Individuals of the species are unlikely to occupy this area and individuals passing through the area are expected to continue on to preferentially suitable habitat along the coast. Therefore, the NRC staff determines that behavioral changes for piping plover and rufa red knot resulting from construction activities are extremely unlikely to occur and that behavioral changes from operation activities will not result in effects to these species that could be meaningfully measured or detected.

Collision with Construction Equipment, Building Infrastructure, and Vehicles

The risk of collisions with tall structures and in-scope transmission lines poses a threat to protected birds. Collision risk of the piping plover and rufa red knot are similar to those addressed in Section E.1.3.1 and are expected to be extremely unlikely.

Summary of Effects and Conclusions

All potential effects on the piping plover and rufa red knot resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the piping plover and rufa red knot. The NRC staff requested concurrence with this determination from FWS under Section 7 of the ESA on January 29, 2026 (NRC 2026-TN12777) and received concurrence on March 11, 2026 (FWS 2026-TN12910).

E.1.3.8 Monarch Butterfly

In Table E-3, the NRC staff concludes that monarch butterflies may occur in the action area. Monarch butterflies may occur during the spring migration from late-March through April and during the fall migration from mid-October through mid-November. If present, monarchs would occur occasionally and for short periods of time. The primary drivers affecting the health of these species are habitat loss and degradation, and insecticide exposure (FWS 2024-TN11177).

The conversion of native grassland to agricultural or developed land use is a primary risk factor affecting the status of the monarch butterfly. Conversion of grasslands reduces the amount, availability, connectedness, size, and quality of habitat. While agriculture is the primary cause of conversion, any development activity, including road construction, housing and commercial development, and energy projects, that reduces or degrades native grasslands may reduce habitat.

The monarch butterfly is dependent on milkweeds (primarily *Asclepias* spp.) for egg-laying and larval food (87 FR 26152-TN8591). Adult monarchs feed on nectar from milkweeds and from a variety of plant species. Construction activities would predominantly impact cropland, where milkweed is not known to occur (LME 2025-TN12163: Table 4.3-1). However, milkweed has been documented within herbaceous and shrub/scrub classified areas of the LMGS site. Green milkweed (*Asclepias viridis*) was classified as "uncommon" within herbaceous communities onsite and only a small portion of this area will be permanently affected by building activities (LME 2025-TN12596). Within the LMGS site, approximately 37.9 ac (15.3 ha) (8.6 percent) of the 442.4 ac (179 ha) of existing herbaceous land and approximately 3.6 ac (6.3 percent) of the 57.4 ac (23.2 ha) of existing shrub/scrub land will be permanently disturbed by construction (LME 2025-TN12163: Table 4.3-1). Only 0.2 ac (0.1 ha) of herbaceous land and no shrub/scrub land will be temporarily disturbed by construction (LME 2025-TN12163: Table 4.3-1). All temporarily disturbed areas will be seeded and replanted with native grasses, milkweeds, and nectar plants (LME 2026-TN12669).

Periodic disturbances, such as fire, haying, and mowing, are necessary for the long-term conservation of these grassland habitats. Without periodic disturbances, grasslands can become overgrown with woody vegetation, reducing suitable habitat for milkweed to establish. However, periodic disturbances have the potential to negatively impact the species if individuals are present during the disturbing activities. LME does not plan to conduct any activities during the proposed operation that could cause disturbance within the natural grassland areas of the site. LME would maintain areas within the developed portion of the site by mowing; however, these areas are unlikely to provide suitable habitat for monarch butterflies.

During construction, LME would utilize herbicides as needed to control plant growth and revegetation in areas that need to be cleared and grubbed. These areas include a total of 28.1 ac (11.4 ha) of herbaceous land and 3.6 ac (1.5 ha) of shrub/scrub land onsite. Impacts associated with herbicide use would be minimized through the implementation of BMPs, including following the label-recommended directions.

During operation, LME would utilize herbicides for maintenance as needed on transmission and steam lines, parking lots, operating areas, and access roads, as well as any targeted invasive plant management (LME 2025-TN12596). The areas where LME plans to utilize herbicides during operation do not include natural areas, unless for targeted invasive plant management.

Herbicide application could directly affect butterflies in the action area by injuring or killing individuals exposed to these chemicals. Certain herbicides such as glyphosate (e.g., Round Up) can kill milkweed, which could affect the ability of the species to lay eggs and the availability of larval food sources. Given the targeted nature of herbicide application and utilization of BMPs within the site as described in Sections 3.7.2 and 3.7.3, milkweed populations are not expected to be impacted significantly during operation. Monarchs are only expected to occur in the action area seasonally from mid-October through mid-November when individuals are moving between areas of more suitable habitat. Herbicide application during construction and operation could affect butterflies in the action area by indirect exposure to these chemicals. Since all herbicide application during operation would be targeted or limited to industrial areas of the site, it is unlikely to result in hazardous levels of contaminant exposure to monarch butterflies.

Summary of Effects and Conclusion

All potential effects on the monarch butterfly resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the monarch butterfly. Because the monarch butterfly is proposed for Federal listing, the ESA does not require the NRC to consult with or receive concurrence from the FWS regarding this species, as long as the continued existence of the species is not jeopardized.

E.1.4 Effect Determinations of Federally Listed Species under National Marine Fisheries Service Jurisdiction

In Section 3.8.1, the NRC staff determined that green sea turtles (North Atlantic distinct population segment [DPS]), Kemp's ridley sea turtles, loggerhead sea turtles, and giant manta ray have the potential to occur in the aquatic portion of the action area. Additionally, the action area intersects with critical habitat that the FWS has proposed for Federal designation for the green sea turtle (TX01).

In the following sections, the NRC staff analyzes the potential impacts of the proposed construction permit (CP) on these species and critical habitat. Table E-4 summarizes the NRC staff's ESA effect determinations for federally listed, proposed, and candidate species that resulted from the NRC staff's analysis.

Table E-4 Biological Evaluation of Federally Listed Species under the Jurisdiction of the National Marine Fisheries Service to Occur within the Action Area of the Long Mott Generating Station

Common Name[(a)]	ESA Listing Status[(b)]	Listing Rule/Date	Most Recent Recovery Plan/Outline Date	NRC Staff Effect Determinations[(c,d)]
Green sea turtle (North Atlantic DPS)	FT	81 FR 20058-TN10270/April 6, 2016	October 1991	NLAA
Green sea turtle critical habitat (TX01)	FPD	88 FR 46572-TN12359/July 19, 2023	N/A	NLAA
Kemp's ridley sea turtle	FE	35 FR 18319-TN2752/ December 2, 1970	September 2011	NLAA

Common Name[(a)]	ESA Listing Status[(b)]	Listing Rule/Date	Most Recent Recovery Plan/Outline Date	NRC Staff Effect Determinations[(c,d)]
Loggerhead sea turtle (Northwest Atlantic DPS)	FT	76 FR 58868-TN10617/ September 22, 2011	December 2008	NLAA
Giant manta ray	FT	83 FR 2916-TN12437/ January 22, 2018	2019	NLAA

DPS = distinct population segment; ESA = Endangered Species Act; FE = federally endangered; FPD = proposed for Federal designation (critical habitat); FT = federally threatened; N/A = not applicable; NE = No effect; NLAA = may affect, not likely to adversely affect; NRC = U.S. Nuclear Regulatory Commission.

(a) All species in this table identified as potentially occurring within the action area via NMFS ESA Section 7 Mapper (NOAA 2025-TN12550).
(b) Indicates protection status under the Endangered Species Act.
(c) The NRC staff makes its effect determinations for federally listed species in accordance with the language and definitions specified in the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031).
(d) Conclusions address both preparations for construction and operation impacts.

E.1.4.1 Green, Kemp's Ridley, and Loggerhead Sea Turtles

In Table E-2, the NRC staff concludes that adult and neritic (typical of shallow marine environment) juvenile green, Kemp's ridley, and loggerhead sea turtles may be present within the Mission Lake and Guadalupe Bay portion of the action area. Sea turtles utilize the estuarine and inland bays for foraging, resting, and migrating and submerged aquatic vegetation is known to occur within Mission Lake (La Peyre et al. 2017-TN12648).

The NMFS and the FWS jointly listed the green sea turtle under the ESA in 1978. In 2016, the NMFS and the FWS revised this species' listing to divide it into 11 DPSs (81 FR 20058-TN10270). Green sea turtles in the action area belong to the North Atlantic DPS, which is listed as threatened. The Kemp's ridley sea turtle was listed as endangered throughout its range in 1970 (35 FR 18319-TN2752). In 2010, the U.S. and Mexico published the bi-national recovery plan for the species (75 FR 12496-TN2762). The NMFS listed the loggerhead sea turtle as threatened in 1976 (41 FR 24378-TN10616). The NMFS revised this listing several times, and in 2011, the NMFS divided the species into 9 DPSs (76 FR 58868-TN10617). Loggerhead sea turtles in the action area belong to the Northwest Atlantic DPS, which is listed as threatened.

The primary threats to sea turtles include entanglement in fishing gear, ingestion of or entanglement in marine debris, environmental contamination, and degradation of nesting habitat.

During the proposed construction LMGS, the majority of impacts would be restricted to the terrestrial environment. Construction may cause an increase in sedimentation and turbidity in aquatic resources in proximity to the LMGS site boundary. However, building activities would comply with Federal, State, and local regulations. Additionally, LME would develop a stormwater pollution prevention plan and employ BMPs to mitigate this impact (LME 2025-TN12163: Section 4.2.1.1.4). As such, these impacts are expected to be localized and temporary. Any associated increase in turbidity or sedimentation is anticipated to be restricted to streams and waterbodies within or directly adjacent to the LMGS construction activities. Potentially suitable sea turtle habitat is not expected to be impacted by turbidity and sedimentation from construction activities.

The proposed operation of LMGS has the potential to impact sea turtles within the action area through the withdrawal of freshwater from the Guadalupe River at the GBRA diversion structure and the discharge of stormwater and wastewater into the Dow Discharge Canal. During operation, water would be withdrawn from the Guadalupe River. The reduction in freshwater inflow is assessed in the whooping crane section and is not expected to impact sea turtles or their habitat in a way that could be meaningfully measured or detected.

Marine debris and pollution present significant threats to sea turtles (NOAA 2025-TN12661). One of the primary concerns is the ingestion of marine debris. Sea turtles often mistake plastic bags, balloons, and other debris for food, such as jellyfish. Ingesting these materials can lead to intestinal blockages, malnutrition, and even death. Additionally, the ingestion of microplastics can introduce toxic substances into their bodies, further compromising their health. Entanglement in marine debris is another critical issue. Fishing nets, lines, and other debris can entangle sea turtles, restricting their movement and ability to surface for air, which can result in drowning (NOAA 2025-TN12661). Entanglement can also cause severe injuries, such as cuts and amputations, leading to infections and long-term disabilities. Pollution, particularly chemical pollutants, poses additional risks. Runoff from agricultural and industrial activities introduces harmful substances into marine environments. These pollutants can accumulate in the tissues of sea turtles, leading to various health issues, including weakened immune systems, reproductive problems, and developmental abnormalities. Furthermore, pollution can degrade the quality of nesting beaches and foraging habitats. Oil spills, for example, can contaminate beaches, making them unsuitable for nesting (NOAA 2025-TN12661). Contaminated foraging areas can reduce the availability of healthy food sources, impacting the overall fitness and survival of sea turtles.

LMGS would discharge stormwater and wastewater that may contain chemical contaminants into the Dow Discharge Canal during operation. The TCEQ regulates the discharge of pollutants in Texas waters and limits the allowable concentrations of pollutants through TPDES permitting. These limits are designed to ensure that aquatic species exposed to pollutants at or below the EPA national recommended aquatic life criteria (EPA 2024-TN10276) would not impair the growth, survival, or reproduction of aquatic life nor aquatic habitat. Additionally, the discharge would occur outside of suitable sea turtle habitat within the Dow Discharge Canal and would be diluted to the point that they would be undetectable by the time they reach suitable foraging/resting habitat. Accordingly, the NRC staff concludes that the discharge of pollutants would not result in impacts that could be meaningfully measured or detected.

<u>Summary of Effects and Conclusions</u>

All potential effects on the green sea turtle, Kemp's ridley sea turtle, and loggerhead sea turtle resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the green sea turtle, Kemp's ridley sea turtle, and loggerhead sea turtle. The NRC staff requested concurrence with this determination from NMFS under Section 7 of the ESA on January 29, 2026 (NRC 2026-TN12783). NMFS provided concurrence with the NRC's findings in a letter dated May 5, 2026 (NMFS 2026-TN13225).

E.1.4.2 Green Sea Turtle Critical Habitat

The NMFS designated critical habitat for the green sea turtle in 1998 (63 FR 46693-TN12551). In 2023, the NMFS issued a proposed rule to designate additional areas of critical habitat and modify existing critical habitats (88 FR 46572-TN12359). The proposed rule includes critical habitat unit TX01 that encompasses Texas waters from Galveston Bay to Mexico, including waters in the action area, from the mean high water line to 20 m (66 ft) depth.

In Table E-2, the NRC staff concludes that the Mission Lake and Guadalupe Bay portion of the action area intersects with proposed critical habitat unit TX01 for the green sea turtle. Mission Lake and Guadalupe Bay provide essential features for benthic foraging/resting for juvenile, subadult, and adult green sea turtles. Waters in this region support high density benthic foraging/resting and therefore are of high conservation value. Food resources for foraging green sea turtles include seagrass, macroalgae, and invertebrates. Resting habitats include underwater areas with reduced disturbance where turtles can rest, digest, thermoregulate, and avoid predation. Activities that may impact benthic foraging habitat or resting refugia include construction, dredging, oil and gas activities, vessel activities, fishing and aquaculture activities, recreational activities, and pollution (88 FR 46572-TN12359).

Impacts to the benthic foraging/resting essential features associated with the proposed CP for LMGS are similar to those addressed in the section above for impacts to green, Kemp’s ridley, and loggerhead sea turtles. These impacts are limited to the reduction in freshwater input into Mission Lake and Guadalupe Bay and the discharge of stormwater and wastewater into the Victoria Barge Canal.

Freshwater inputs into TX01 contribute to maintaining food resources at levels that are sufficient to support survival, development, growth, and reproduction of green sea turtles. Seagrass beds primarily occur in shallow areas fringing the barrier islands along the Texas coast (Hobson and Whisenant 2018-TN12552). While seagrass is known to occur in small patches along the coastline of San Antonio Bay, preferentially suitable foraging habitat consisting of larger expanses of seagrass occurs further toward the coast within Espíritu Santo Bay (TPW 2016-TN12553). It is expected that sea turtles in the area would primarily forage within these areas, but individuals may occasionally use Guadalupe Bay for foraging or resting. The reduction in freshwater input due to the consumptive water use of LMGS is not expected to affect the essential benthic foraging/resting features of TX01 in a way that would be meaningfully measured or detected.

During operation, LMGS will discharge stormwater and wastewater through an existing permitted outfall into the Dow Discharge Canal. This discharge is permitted by the TPDES with contaminant limits and monitoring requirements. The impacts of this discharge are evaluated in the section on green, Kemp’s Ridley, and loggerhead sea turtles and any pollutant discharges would be diluted to the point that they would be undetectable by the time they travel through the Victoria Barge Canal and reach suitable foraging/resting habitat. Accordingly, the NRC staff concludes that the discharge of pollutants would not result in impacts that could be meaningfully measured or detected.

<u>Summary of Effects and Conclusion</u>

The proposed project *may affect but is not likely to adversely affect* the essential features for the benthic foraging/resting of green sea turtles within critical habitat unit TX01 and would have *no effect* on all other essential features as they are not present within the action area.

All potential effects on the green sea turtle proposed critical habitat resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the proposed critical habitat of the green sea turtle. Because the critical habitat is proposed for Federal designation, the ESA does not require the NRC to consult with or receive concurrence from the FWS as long as the action is not likely to adversely modify the proposed critical habitat.

E.1.4.3 Giant Manta Ray

The NMFS listed the giant manta ray as threatened in 2018 (83 FR 2916-TN12437). The NMFS issued a direct final rule in 2023 to revise the scientific name of the species to *Mobula birostris* (88 FR 81351-TN12554). A draft recovery plan for the species was published in 2024 (89 FR 82991-TN12555). Within the draft recovery plan, the NMFS identifies the primary threats to the giant manta rays that occupy the Western North Atlantic region are associated with fisheries related activities.

In Table E-2, the NRC staff concludes that young-of-the-year (YOY), juvenile, and adult giant manta rays may be present within the San Antonio Bay portion of the action area. Impacts to the giant manta ray are similar to those addressed in the section for impacts to green, Kemp's ridley, and loggerhead sea turtles. These impacts are limited to the reduction in freshwater input into Mission Lake and Guadalupe Bay and the discharge of wastewater into the Victoria Barge Canal. The effects of these impacts would be insignificant and the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the giant manta ray. The NRC staff requested concurrence with this determination from NMFS under Section 7 of the ESA on January 29, 2026 (NRC 2026-TN12783). NMFS provided concurrence with the NRC's findings in a letter dated May 5, 2026 (NMFS 2026-TN13225).

E.1.5 Cumulative Effects

In the context of the ESA, cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02) (TN4312). When formulating biological opinions during formal Section 7 consultation, the Services consider cumulative effects when determining the likelihood of jeopardy or adverse modification. During informal consultation, a Federal Agency need only consider cumulative effects under the ESA in the biological assessment if listed species would be adversely affected by the proposed action and formal Section 7 consultation is necessary. Because the NRC staff concluded that the proposed CP is not likely to adversely affect the potentially present species within the action area, consideration of cumulative effects is not required.

E.2 Magnuson-Stevens Act Essential Fish Habitat Assessment

The sections below consist of the NRC staff's essential fish habitat (EFH) assessment and effect determinations relevant to the proposed LMGS construction permit.

E.2.1 Essential Fish Habitat Considered

Under the provisions of the MSA, the Fishery Management Councils and NMFS have designated EFH for certain federally managed species. EFH is defined as the waters and substrate necessary for spawning, breeding, feeding, or growth to maturity (16 *United States Code* [U.S.C.] 1802(10)) (TN12474). For each federally managed species, the Fishery Management Councils and NMFS designate and describe EFH by life stage (i.e., egg, larva, juvenile, and adult). On the Gulf Coast of Texas, the responsible Fishery Management Council is the Gulf Council. The Gulf Council defines Fishery Management Plans (FMPs) for the region, including for shrimp, red drum, reef fish, coastal migratory pelagics, corals, and spiny lobsters.

In addition to the species managed by these FMPs, highly migratory species may be present in the region and are managed by the Highly Migratory Species Management Unit.

The EFH within the proposed project area is located within the estuarine habitat of San Antonio Bay, including the inland estuarine reaches of Guadalupe Bay and Mission Lake, and the Victoria Barge Canal (see Figure 3-2 for a map showing the location of these aquatic features). This area is within the West Texas estuarine boundary of ecoregion 5 that extends from Freeport, Texas to the Mexico border as designated by the Gulf Council. The potential categories of EFH in the project area include unconsolidated shore, open water, estuarine emergent wetland, estuarine aquatic bed, and estuarine scrub/shrub wetland.

The Gulf Council has designated Habitat Areas of Particular Concern (HAPC) for the region in the Generic EFH Amendment (GMFMC 1998-TN12632) and the Final Generic Amendment Number 3 for Addressing HAPC (GMFMC 2005-TN12662). No HAPC are located within or near the LMGS project area.

The majority of seagrass beds (90 percent) are found on the southern Texas coast and only 22,710 ac (9,200 ha) of seagrasses are found in Galveston, Matagorda, San Antonio, and Aransas Bays (GMFMC 2004-TN12672). Oyster reefs of various sizes are present in all Texas estuaries but are best developed between Galveston Bay and Corpus Christi Bay (GMFMC 2004-TN12672). Submerged aquatic vegetation is known to occur within Mission Lake (La Peyre et al. 2017-TN12648).

To determine the relevant EFH species for the NRC staff's LMGS CP application review, the NRC staff queried the NMFS's EFH Mapper, an online mapping application. The EFH Mapper identified 10 species or taxa groups for which EFH may occur near the LMGS site (NMFS 2024-TN10304). No HAPC were identified within the vicinity of the project area. The NRC staff also queried the Inland EFH mapping application to obtain additional spatial data and narrow down the relevant species from the taxa groups identified in the EFH Mapper (NMFS Undated-TN12663). For each of the identified species and their relevant life stages, the NRC staff reviewed habitat characteristics documented in scientific literature, EFH descriptions contained in relevant FMPs and amendments, and LME's EFH analysis contained in the ER.

Based on the NRC staff's assessment, 17 EFH managed species were considered relevant for analysis (Table E-5). Species profiles including distribution and habitat characteristics, descriptions of designated EFH, and diet summaries for each of the relevant EFH species and life stages as described for Gulf Council managed species within the Gulf Council's 2016 5-Year Review of Essential Fish Habitat Requirements and for species managed under the Highly Migratory Pelagics FMP within the 2017 Amendment 10 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan are incorporated here by reference (Gulf Council 2025-TN12665; NOAA 2017-TN12407). A summary of the preferred habitat characteristics for specific life stages of EFH species is provided in Table E-6.

Table E-5 Essential Fish Habitat Under the National Marine Fisheries Service Jurisdiction that May Occur within the Long Mott Generating Station Project Area

Management Plan	Common Name	Adult	Juveniles	Neonate	Post-larval	Larvae	Eggs
Shrimp FMP	brown shrimp (*Farfantepenaeus aztecus*)	X[a]	X	-	X	-	-
Shrimp FMP	pink shrimp (*Farfantepenaeus duorarum*)	X[a]	X	-	-	-	-
Shrimp FMP	white shrimp (*Litopenaeus setiferus*)	X[a,b]	X	-	X	-	-
Red Drum FMP	red drum (*Sciaenops ocellatus*)	X	X (early and late juveniles)	-	X	X	X
Coastal Migratory Pelagics	Spanish mackerel	X	X (early and late juveniles)	-	-	-	-
Coastal Migratory Pelagics	cobia	-	-	-	-	X	X
Reef Fish FMP	red grouper	-	X (early juveniles)	-	-	-	-
Reef Fish FMP	goliath grouper (*Epinephelus itajara*)	-	X	-	-	-	-
Reef Fish FMP	gray snapper (*Lutjanus griseus*)	X	-	-	-	-	-
Reef Fish FMP	lane snapper	-	X	-	X	X	-
Reef Fish FMP	yellowmouth grouper	-	X	-	-	-	-
Highly Migratory Pelagics	blacktip shark (Gulf of Mexico Stock)	-	-	X	-	-	-
Highly Migratory Pelagics	bonnethead shark (Gulf of Mexico Stock)	X	X	X	-	-	-
Highly Migratory Pelagics	bull shark	X	X	-	-	-	-
Highly Migratory Pelagics	lemon shark	-	-	X	-	-	-

Management Plan	Common Name	Adult	Juveniles	Neonate	Post-larval	Larvae	Eggs
Highly Migratory Pelagics	scalloped hammerhead shark	-	-	X	-	-	-
Highly Migratory Pelagics	spinner shark	-	-	X	-	-	-

EFH = essential fish habitat; FMP = Fishery Management Plan.

"X" = Species uses area as EFH during; (a) = subadult; (b) = spawning adult; "-" denotes no data in the table cell.

All species in this table were identified as potentially occurring within the action area via NMFS Inland EFH Mapper (NMFS Undated-TN12663) or the NMFS EFH Mapper (NOAA 2025-TN12550).

Table E-6 Habitat Characteristics for Species with Essential Fish Habitat that May Occur within the Long Mott Generating Station Project Area

Common Name	Life Stage	Water Column	Estuarine	Oceanic	SAV	Emergent Marsh	Oyster Reef	Hard Bottom	Soft Bottom	Sand/ Shell	Mangroves	Reef	Banks/ Shoals
brown shrimp	PL	X	-	-	-	-	-	-	-	-	-	-	-
brown shrimp	J	-	-	-	X	X	X	-	X	X	-	-	-
brown shrimp	SA	-	-	-	-	-	-	-	X	X	-	-	-
pink shrimp	J	-	-	-	X	-	X	-	X	X	X	-	-
pink shrimp	SA	-	-	-	X	-	-	-	X	X	X	-	-
white shrimp	PL	X	-	-	-	-	-	-	-	-	-	-	-
white shrimp	J	-	-	-	X	X	X	-	X	-	X	-	-
white shrimp	SA	-	-	-	-	-	-	-	X	X	-	-	-
white shrimp	A	-	-	-	-	-	-	-	X	-	-	-	-
white shrimp	SPA	-	-	-	-	-	-	-	X	-	-	-	-
red drum	E	X	-	-	-	-	-	-	-	-	-	-	-
red drum	LJ	X	-	-	X	-	-	-	X	-	-	-	-
red drum	PL	-	-	-	X	X	-	-	X	-	-	-	-
red drum	EJ	-	-	-	X	-	-	X	X	X	-	-	-
red drum	LJ	-	-	-	X	X	-	-	X	X	-	-	-
red drum	A	-	-	-	X	X	-	X	X	X	-	-	-
Spanish mackerel	EJ	X	X	-	-	-	-	-	-	-	-	-	-
Spanish mackerel	LJ	X	X	-	-	-	-	-	-	-	-	-	-
Spanish mackerel	A	X	X	X	-	-	-	-	-	-	-	-	-
red grouper	EJ	-	-	-	X	-	-	X	-	-	-	-	-
goliath grouper	J	-	-	-	-	-	X	-	X	-	X	-	-
gray snapper	A	-	-	-	-	X	-	X	X	X	-	X	X

Common Name	Life Stage	Water Column	Estuarine	Oceanic	SAV	Emergent Marsh	Oyster Reef	Hard Bottom	Soft Bottom	Sand/ Shell	Mangroves	Reef	Banks/ Shoals
cobia	E	X	-	-	-	-	-	-	-	-	-	-	-
cobia	L	X	-	-	-	-	-	-	-	-	-	-	-
lane snapper	L	X	-	-	-	-	-	-	-	-	-	-	-
lane snapper	PL	X	-	-	X	-	-	-	-	-	-	-	-
lane snapper	J	-	-	-	X	-	-	-	X	X	X	-	X
yellowmouth grouper	J	-	-	-	-	-	-	-	-	-	X	-	-
blacktip shark	N	-	X	-	-	-	-	-	-	-	X	X	-
bonnethead shark	NJA	-	X	-	X	-	-	-	X	X	-	X	-
bull shark	JA	-	X	-	-	-	-	-	-	-	X	-	-
lemon shark	N	-	X	-	X	-	-	-	-	-	X	-	-
scalloped hammerhead shark	N	-	X	-	-	-	-	-	-	-	X	-	-
spinner shark	N	-	X	-	-	-	-	-	-	X	-	-	-

X = Species uses area as essential fish habitat (EFH) during life stage; A = adult; E = egg; N = neonate; EJ = early juveniles; J = juveniles; LJ = late juveniles; PL = postlarval; SA = subadult; SAV = submerged aquatic vegetation; SPA = spawning adult.
"X" denotes presence; "-" denotes no data in the table cell.
All species in this table were identified as potentially occurring within the action area via NMFS Inland EFH Mapper (NMFS Undated-TN12663) or the NMFS EFH Mapper (NOAA 2025-TN12550).

E.2.2 Potential Impacts to Essential Fish Habitat

In Section E.2.1, the NRC staff noted that the Fishery Management Councils and the NMFS have designated EFH for 17 federally managed species of fish (herein referred to as "EFH species") within the inshore estuarine habitat off the Gulf Coast near the project area. In the sections below, the NRC staff analyzes the potential impacts of the proposed Federal action on the EFH and prey of these species.

The NMFS defines "adverse effect" under the MSA as (50 CFR 600.810) (TN1342):

> any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Further, in 50 CFR 600.815(a)(7) (TN1342), adverse effects to EFH resulting from prey loss is discussed as follows:

> Loss of prey may be an adverse effect on EFH and managed species because the presence of prey makes waters and substrate function as feeding habitat, and the definition of EFH includes waters and substrate necessary to fish for feeding. Therefore, actions that reduce the availability of a major prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat that are known to cause a reduction in the population of the prey species, may be considered adverse effects on EFH if such actions reduce the quality of EFH.

There are no anticipated impacts to EFH species or their associated EFH during the proposed period of LMGS construction. Construction would be limited to upland areas and is not expected to cause increased turbidity or sedimentation within EFH or within the vicinity of EFH to cause impacts to the prey base of managed species. BMPs would be implemented to limit indirect effects caused by erosion to the LMGS site boundary and directly adjacent (LME 2025-TN12163).

Operational impacts associated with the proposed LMGS operation have the potential to cause the following adverse effects on EFH in the area: (1) physical removal of habitat through consumptive water use; (2) chemical alteration of habitat through radionuclides and other contaminants in effluent discharges; and (3) reduction in prey base of the habitat. In the sections below, the NRC staff evaluates each potential adverse effect as it relates to the proposed action.

E.2.2.1 Physical Removal of Habitat Through Consumptive Water Use

LMGS would withdraw water from Basin #5, which is fed by various diversion structures from the Guadalupe River, see Section SW. This water would be used by LMGS primarily to provide makeup water to replace water lost to steam operations at SDO. Smaller amounts of water would also be required for service water, demineralized water, fire protection, potable water, and other domestic uses. All water withdrawals represent a loss of fish habitat because withdrawal physically removes the water (habitat) from the river and, ultimately, the estuary. Based on an estimated average consumptive use rate of 6.3 cfs and maximum consumptive rate of 6.7 cfs for LMGS operation (LME 2025-TN12163), average operations would remove 9.9 cfs, which is less than 0.8 percent of the average Guadalupe River flow upstream of the GBRA diversion, depending on the time of year. Additional information about water use during operations can be found in Section 3.4.3.

The majority of the water withdrawn from Basin #5 would be consumed by the LMGS, however approximately 2.3 MGD of wastewater from LMGS operation would be returned via a point source discharge into the Dow Discharge Canal, which leads to the Victoria Barge Canal, and ultimately Guadalupe Bay. Therefore, approximately 43 percent of the water removed from the Guadalupe River would be returned to the Dow Discharge Canal via wastewater discharge. The reduction in freshwater inflows into Guadalupe Bay has the potential to modify the salinity gradients of estuaries containing EFH. The reduction of freshwater inflow could also negatively impact the growth of vegetation relied on by EFH managed species for foraging and shelter.

Researchers have collected EFH species in LMGS seasonal aquatic studies conducted from 2023 to 2024. EFH species collected include white shrimp from West Coloma Creek (243 individuals), the GBRA canal (149 individuals), and the drainage channel west of the LMGS site (292 individuals); and red drum from West Coloma Creek (12 individuals) (WSP 2024-TN12606). Section 3.6 discusses relevant LMGS aquatic studies in more detail.

During LMGS operation, there is the potential for the withdrawal of water from the GBRA Calhoun Canal to result in the impingement and entrainment of EFH species from the operation of the intake located on the GBRA Calhoun Canal. The EPA has developed regulations that address water withdrawals and intake flow restrictions for new facilities that produce electric power (40 CFR Part 125-TN254). These regulations implement Section 316(b) of the Clean Water Act (CWA) and provide limits on the total design intake flow for all cooling-water intake structures. The limits depend on the type of waterbody in which the intake structure is located. For facilities that withdraw from a freshwater river or stream, the regulations limit the total design intake flow to no more than 5 percent of the mean annual flow. For LME to operate, it will have to meet the requirements of Section 316(b) of the CWA, and, if LME meets these requirements, the NRC staff concludes that the impacts of impingement and entrainment associated with LMGS operation will result in no more than minimal adverse effects. A more detailed analysis of impacts on federally protected resources due to operations would be conducted during the environmental review for an operating license (OL).

The appearance of EFH managed species in aquatic studies indicates that the physical removal of habitat through water withdrawal could affect the habitat of these two species. However, as the average operations of LMGS would remove less than 0.8 percent of the average Guadalupe River flow, of which approximately 43 percent would be returned to the Guadalupe Bay via the Dow Discharge Canal, these habitat losses would have negligible impacts on the quality or quantity of fish habitat. Accordingly, the NRC staff concludes that this potential impact would result in no more than minimal adverse effects on the habitat of any EFH species and life stage in the project area.

E.2.2.2 Chemical Alteration of Habitat Through Radionuclides and Other Contaminants in Discharges

During LMGS operation, stormwater would be discharged into West Coloma Creek and combined wastewater and stormwater would be discharged into the Dow Discharge Canal. There would be no discharge of thermal effluent associated with LMGS operation.

LMGS would discharge certain nonradiological chemical pollutants into the Dow Discharge Canal via an existing permitted outfall currently utilized by SDO. The TCEQ limits the allowable concentrations of these pollutants through the site's TPDES permit. The TPDES permit establishes allowable pollutant discharge concentration limits for total residual chlorine, pH, total phosphorus, fecal coliform, total organic carbon, and total petroleum hydrocarbons at levels at or below the EPA (2024-TN10276) national recommended aquatic life criteria for acute (short-term) and chronic (long-term) exposure. Under these criteria, the EPA considers "unacceptable acute effects" to be those effects that are lethal or immobilize an organism during short-term exposure to a pollutant. "Unacceptable chronic effects" are those effects that impair growth, survival, and reproduction of an organism following long-term exposure to a pollutant. Thus, the EPA aquatic life criteria are designed to ensure that aquatic species exposed to pollutants in compliance with these levels will not experience any impairment of growth, survival, or reproduction.

As discussed above, radiological liquid waste from the nuclear island would be shipped offsite for disposal (approximately 93.5 m^3/hr on average and up to 131.4 m^3/hr at the maximum), and nonradiological liquid waste from the conventional island is combined with SDO liquid effluent waste stream, treated by the existing SDO liquid waste treatment system to meet the existing acceptance criteria and discharged through the existing TPDES outfall to the Victoria Barge Canal at an average flow of 368.1 m^3/hr and a maximum flow of 493.6 m^3/hr. The proposed operation of LMGS is anticipated to add up to 2.3 MGD of wastewater discharge at this outfall. Current discharge rates from this outfall range from 1.4 MGD to 5 MGD with effluent concentrations within TPDES permit limits (LME 2025-TN12163: Section 5.2.1.1.2). The addition of LMGS discharge to the existing outfall would increase the total discharge rate to 7.3 MGD, which is well below the TPDES permitted limits of 12 MGD daily average and 17 MGD daily maximum (TCEQ 2021-TN12608). Section 3.4.3 provides additional details regarding the wastewater discharges.

Storm water from LMGS would primarily be discharged through a new storm water basin into West Coloma Creek. These discharges and releases from the stormwater basin would be managed in accordance with appropriate design standards and requirements of the TCEQ TPDES permit that minimize erosion and scour from stormwater. The nearest downstream area of designated EFH is approximately 10 mi (16 km) away from the LMGS site within Powderhorn Lake. Any contaminants present within the discharged stormwater would be regulated by the TCEQ and would be localized. These discharges are not anticipated to have any impact on designated EFH within Powderhorn Lake and are not evaluated further.

The NRC staff assumes that because nonradiological pollutants that are discharged at levels at or below the EPA aquatic life criteria would not impair the ability of fish to carry out essential life functions, such discharges would also not impair the quality or quantity of the habitat itself. Additionally, pollutant concentration limits are already established for the existing SDO outfall and the addition of LMGS discharges would continue to meet the existing acceptance criteria, thereby causing no additional pollutant impacts at the discharge location. Accordingly, the NRC staff concludes that nonradiological pollutant discharges would result in no more than minimal adverse effects on EFH in the affected area.

With respect to the potential impacts of radiological contaminants on fish habitat, the primary radionuclide of concern is tritium. Radiological waste management is addressed in Section 3.14.2. All radiological waste is anticipated to be disposed of offsite. Per 10 CFR Part 20 (TN283), LME would be required to comply with EPA's environmental radiation standards contained in 40 CFR Part 190 (TN739). As a part of this requirement, LME would monitor and report the presence of radionuclides attributable to LMGS operation within the surrounding environment. Any exceedances would be investigated and reported, and a corrective action program would be initiated as appropriate. Thus, the quality of fish habitat in the area is extremely unlikely to be affected by radiological contamination. Accordingly, the NRC staff concludes that radionuclide discharges would result in no more than minimal adverse effects on EFH in the affected area.

E.2.2.3 Reduction in the Prey Base of the Habitat

Reduction in the prey base, or loss of prey, represents a potential impact to the quality of fish habitat. During LMGS operation, there is the potential for the withdrawal of water from the GBRA Calhoun Canal to result in the impingement and entrainment of the prey base for EFH species from the intake located on the GBRA Calhoun Canal. These impacts are described in Section E.2.2.1 and are not expected to noticeably alter the availability of prey of EFH species assuming Section 316(b) of the CWA is met. A more detailed analysis of impacts on aquatic resources due to operations would be conducted during the environmental review for an OL, if LME submits an OL application.

All other potential impacts to the prey base of EFH species, such as physical and chemical alteration of the aquatic environment from effluent discharges, have already been addressed previously in this section. The NRC staff did not identify any unique impacts of these effects that would affect the prey of EFH species but not the EFH itself.

The NRC staff concludes that the reduction in the prey base of the habitat resulting from the proposed LMGS operation would result in no more than minimal adverse effects on EFH in the affected area.

E.2.2.4 Conclusion for Designated Essential Fish Habitat

Based on the above, the NRC staff concludes that the proposed action would result in *no more than minimal adverse effects* on EFH of the federally managed species and life stages identified in Table E-5 within the project area. Impacts associated with the action would primarily be experienced by species that occupy estuarine areas where individuals could experience the chemical alteration of habitat through exposure radionuclides and other contaminants in LMGS discharge. However, the EPA and the State regulate nonradiological contaminants in effluent discharges through the site’s NPDES permit to ensure protection of the aquatic environment.

The NRC staff requested abbreviated EFH consultation with NMFS under Section 305(b)(2)(4) of the MSA on January 30, 2026 (NRC 2026-TN12778). On February 4, 2026 NMFS concurred that the proposed project would result in no more than minimal adverse effects on the designated EFH of all life stages of federally managed fisheries found to occur within the vicinity of LMGS and not adversely affect EFH under NMFS jurisdiction. NMFS did not provide any EFH conservation recommendations (NOAA 2026-TN12774).

E.3 National Marine Sanctuaries Act Consultation

The National Marine Sanctuaries Act of 1966, as amended (TN7197), authorizes the Secretary of Commerce to designate and protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities as national marine sanctuaries. Under Section 304(d) of the act, Federal agencies must consult with the National Oceanic and Atmospheric

Administration's Office of National Marine Sanctuaries if a Federal action is likely to destroy, cause the loss of, or injure any sanctuary resources.

The NRC staff concludes that the closest marine sanctuary, the Flower Garden Banks National Marine Sanctuary is located ~184 mi (297 km) away therefore, no marine sanctuaries occur near or within the site region (50 mi [80 km] radius) of LMGS and that the issuance of a CP would have no effect on sanctuary resources. Thus, the National Marine Sanctuaries Act does not require the NRC to consult with the National Oceanic and Atmospheric Administration for the proposed action.

E.4 Chronology of Federally Protected Ecological Resources Consultations

Table E-7 lists the correspondence between the NRC and the Services pursuant to ESA Section 7 and the Magnuson-Stevens Act that has transpired to date. As discussed in Section E.3, no marine sanctuaries occur near the LMGS site. Therefore, the NRC staff did not engage with the National Oceanic and Atmospheric Administration's Office of National Marine Sanctuaries pursuant to the National Marine Sanctuaries Act for the proposed LMGS CP.

Table E-7 Endangered Species Act Section 7 Consultation Correspondence with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service for the Construction Permit Issuance of the Long Mott Generating Station

Date	Description	ADAMS Accession No.[(a)]
August 14, 2025	Texas Coastal and Central Plains Ecological Services Field Office (FWS) to S. Healy (NRC), Technical assistance letter	ML25233A138
December 18, 2025	Texas Coastal and Central Plains Ecological Services Field Office (FWS) to S. Healy (NRC), Official species list for the proposed LMGS construction permit	ML25352A125
January 29, 2026	S. Healy (NRC) to S. Lee (FWS), Request for concurrence with Endangered Species Act determinations for the LMGS proposed construction permit in Calhoun County, Texas (IPAC Project Code 2025-0115594)	ML26005A228
January 30, 2026	S. Healy (NRC) to A. Brame (NMFS), Request for concurrence with Endangered Species Act determinations for the LMGS proposed construction permit in Calhoun County, Texas (IPAC Project Code 2025-0115594)	ML26005A230
January 30, 2026	S. Healy (NRC) to C. Stevens (NMFS), Request to initiate abbreviated Essential Fish Habitat consultation for the LMGS proposed construction permit in Calhoun County, Texas	ML26005A231
February 4, 2026	C. Stevens (NMFS) to S. Healy (NRC), Concurrence with the NRC's Essential Fish Habitat determinations	ML26035A118
March 11, 2026	Texas Coastal and Central Plains Ecological Services Field Office (FWS) to S. Healy (NRC), Concurrence with the NRC's Endangered Species Act determinations	ML26071A148
April 6, 2026	S. Healy (NRC) to D. Bernhart (NMFS), Request to initiate expedited consultation	ML26096A035
May 5, 2026	D. Klemm (NMFS) to S. Healy (NRC), Concurrence with the NRC's Endangered Species Act determinations	ML26125A259

ADAMS = Agencywide Documents Access and Management System; FWS = U.S. Fish and Wildlife Service; LMGS = Long Mott Generating Station; NRC = U.S. Nuclear Regulatory Commission, NMFS = National Marine Fisheries Service.
(a) Access these documents through the NRC's ADAMS at http://adams.nrc.gov/wba/.

E.5 References

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40 CFR Part 125. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 125, “Criteria and Standards for the National Pollutant Discharge Elimination System.” TN254.

40 CFR Part 190. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 190, “Environmental Radiation Protection Standards for Nuclear Power Operations.” TN739.

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APPENDIX F

ECOLOGY ANALYSIS AND TABLES

Table F-1 State-Listed and Sensitive Terrestrial Species at the Long Mott Generating Station Site

Group	Common Name	Scientific Name	State Status[a]	Potential Habitat Present Onsite	Habitat Potentially Present within 6 mi Vicinity
Amphibian	black-spotted newt	*Notophthalmus meridionalis*	ST	X	X
Amphibian	sheep frog	*Hypopachus variolosus*	ST	X	X
Amphibian	south Texas siren	*Siren lacertina*	-	-	X
Amphibian	southern crawfish frog	*Lithobates areolatus areolatus*	-	-	X
Amphibian	Strecker's chorus frog	*Pseudacris streckeri*	-	-	X
Amphibian	Woodhouse's toad	*Anaxyrus woodhousii*	-	-	X
Bird	bald eagle	*Haliaeetus leucocephalus*	-	-	X
Bird	bank swallow	*Riparia riparia*	-	-	X
Bird	black skimmer	*Rynchops niger*	-	-	X[b]
Bird	Brewer's blackbird	*Euphagus cyanocephalus*	--	X	X
Bird	brown pelican	*Pelecanus occidentalis*		-	X
Bird	cactus wren	*Campylorhynchus brunneicapillus*	-	-	-
Bird	common nighthawk	*Chordeiles minor*	-	X	X
Bird	Franklin's gull	*Leucophaeus pipixcan*	-	-	X[b]
Bird	Henslow's sparrow	*Centronyx henslowii*	-	X	X[b]
Bird	lark bunting	*Calamospiza melanocorys*	-	X	X
Bird	least tern	*Sternula antillarum*	-	-	X
Bird	loggerhead shrike	*Lanius ludovicianus*	-	X	X
Bird	mottled duck	*Anas fulvigula*	-	X	X
Bird	mountain plover	*Charadrius montanus*	-	-	-
Bird	northern bobwhite	*Colinus virginianus*	-	X	X
Bird	pyrrhuloxia	*Cardinalis sinuatus*	-	-	-
Bird	reddish egret	*Egretta rufescens*	ST	-	X
Bird	sanderling	*Calidris alba*	-	-	X

Group	Common Name	Scientific Name	State Status[(a)]	Potential Habitat Present Onsite	Habitat Potentially Present within 6 mi Vicinity
Bird	snowy plover	*Charadrius nivosus*	-	-	-
Bird	Sprague's pipit	*Anthus spragueii*	-	X	X[(b)]
Bird	swallow-tailed kite	*Elanoides forficatus*	ST	-	X[(c)]
Bird	western burrowing owl	*Athene cunicularia hypugaea*	-	-	X
Bird	white-faced ibis	*Plegadis chihi*	ST	X	X
Bird	white-tailed hawk	*Buteo albicaudatus*	ST	X	X
Bird	willet	*Tringa semipalmata*	-	-	X
Bird	Wilson's warbler	*Cardellina pusilla*	-	X	X
Bird	wood stork	*Mycteria americana*	ST	-	X[(b)]
Bird	yellow rail	*Coturnicops noveboracensis*	-	-	X[(c)]
Bird	yellow-billed cuckoo	*Coccyzus americanus*	-		X
Insect	American bumblebee	*Bombus pensylvanicus*	-	X	X
Insect	Comanche harvester ant	*Pogonomyrmex comanche*	-	-	-
Mammal	Aransas short-tailed shrew	*Blarina hylophaga plumbea*	-	-	-
Mammal	big free-tailed bat	*Nyctinomops macrotis*	-	-	-
Mammal	eastern spotted skunk	*Spilogale putorius*	-	X	X
Mammal	hoary bat	*Lasiurus cinereus*	-	-	X[(b)]
Mammal	mountain lion	*Puma concolor*	-	-	-
Mammal	Padre Island kangaroo rat	*Dipodomys compactus compactus*	-	-	-
Mammal	plains spotted skunk	*Spilogale interrupta*	-	X	X
Mammal	southern yellow bat	*Lasiurus ega*	-	-	-
Mammal	white-nosed coati	*Nasua narica*	ST	-	-
Plant	black lace cactus	*Echinocereus reichenbachii* var. *albertii*	SE	-	-
Plant	coastal gay-feather	*Liatris bracteata*	-	X	X
Plant	crestless onion	*Allium canadense* var. *ecristatum*	-	-	X

Group	Common Name	Scientific Name	State Status[(a)]	Potential Habitat Present Onsite	Habitat Potentially Present within 6 mi Vicinity
Plant	Croft's bluet	*Houstonia croftiae*	-	-	-
Plant	Drummond's rushpea	*Hoffmannseggia drummondii*	-	-	-
Plant	Elmendorf's onion	*Allium elmendorfii*	-	-	-
Plant	Indianola beakrush	*Rhynchospora indianolensis*	-	X	X
Plant	Jones's rainlilly	*Zephyranthes jonesii*	-	-	-
Plant	low spurge	*Euphorbia peplidion*	-	-	X
Plant	marsh-elder dodder	*Cuscuta attenuata*	-	-	X
Plant	plains gumweed	*Grindelia oolepis*	-	X	X
Plant	Refugio rainlily	*Zephyranthes refugiensis*	-	X	X
Plant	sand Brazos mint	*Brazoria arenaria*	-	-	-
Plant	seaside beebalm	*Monarda maritima*	-	-	-
Plant	Texas peachbush	*Prunus texana*	-	-	-
Plant	Texas willkommia	*Willkommia texana* var. *texana*	-	-	-
Plant	Tharp's rhododon	*Rhododon angulatus*	-	-	-
Plant	threeflower broomweed	*Thurovia triflora*	-	X	X
Plant	Traub's rainlily	*Zephyranthes traubii*	-	-	X
Plant	tree dodder	*Cuscuta exaltata*	-	-	-
Plant	velvet spurge	*Euphorbia innocua*	-	-	-
Plant	Welder machaeranth-era	*Psilactis heterocarpa*	-	-	X
Plant	Wright's trichocoronis	*Trichocoronis wrightii* var. *wrightii*	-	-	X
Reptile	American alligator	*Alligator mississippiensis*	-	-	X
Reptile	common garter snake	*Thamnophis sirtalis*	-	X	X
Reptile	eastern box turtle	*Terrapene carolina*	-	X	X
Reptile	keeled earless lizard	*Holbrookia propinqua*	-	-	X

Group	Common Name	Scientific Name	State Status[(a)]	Potential Habitat Present Onsite	Habitat Potentially Present within 6 mi Vicinity
Reptile	prairie skink	*Plestiodon septentrionalis*	-	-	-
Reptile	pygmy rattlesnake	*Sistrurus miliarius*	-	-	-
Reptile	salt marsh snake	*Nerodia clarkii*	-	-	X
Reptile	slender glass lizard	*Ophisaurus attenuatus*	-	-	X
Reptile	Tamaulipan spot-tailed earless lizard	*Holbrookia subcaudalis*	-	X	X
Reptile	Texas diamondback terrapin	*Malaclemys terrapin littoralis*	-	-	X
Reptile	Texas horned lizard	*Phrynosoma cornutum*	ST	-	-
Reptile	Texas scarlet snake	*Cemophora lineri*	-	X	X
Reptile	Texas tortoise	*Gopherus berlandieri*	-	-	-
Reptile	western box turtle	*Terrapene ornata*	-	X	X
Reptile	western massasauga	*Sistrurus tergeminus*	-	-	X

"X" denotes presence, "-" denotes no data in the table cell.
(a) ST = State threatened. SE = State endangered (TPWD 2020-TN12666).
(b) Potential habitat for species while migrating, based on habitat descriptions from the Texas Parks and Wildlife (TPW 2025-TN12205).
(c) Potential foraging habitat for species, based on habitat descriptions from the Texas Parks and Wildlife (TPW 2025-TN12205).

F.1 References

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APPENDIX G

GREENHOUSE GAS EMISSION ESTIMATES

The following paragraphs provide a discussion and quantitative greenhouse gas (GHG) emission estimates for a 1,000 MWe reference reactor and the proposed Long Mott Generating Station (LMGS) reactor.

The U.S. Nuclear Regulatory Commission (NRC) staff estimated the GHG emissions of various activities associated with the building, operating, and decommissioning of nuclear power plants. The GHG emission estimates include direct emissions from the nuclear facility and indirect emissions from workforce and fuel transportation, decommissioning, and the uranium fuel cycle. The estimates are based on a single installation of 1,000 MWe output light water reactor with an 80 percent capacity factor henceforth referred to as the reference 1,000 MWe reactor. Estimates of GHG emissions for other projects, like the proposed LMGS project, can be estimated by scaling the GHG emission estimates for this 1,000 MWe reactor. For example, this approach was used evaluating GHG emissions for a research reactor at Abilene Christian University (NRC 2024-TN10337).

Table G-1 contains the GHG emission estimates for the reference 1,000 MWe reactor. As depicted in Table G-1, the estimates assume 7 years of construction, 40 years of operation and 10 years of active decommissioning. The report titled, "*Greenhouse Gas Emissions Estimates for a Reference 1,000 MWe Reactor and the Abilene Christian University Molten Salt Research Reactor"* (NRC 2023-TN9095) contains a detailed description of the assumptions and calculations the NRC staff used to generate the estimates in Table G-1.

Table G-1 Nuclear Power Plant Greenhouse Gas Footprint for the Reference 1,000 MWe Reactor

Source	Activity Duration (yr)[(a)]	Total Emissions (MT CO_2(e))[(b)]
Construction equipment	7	39,000
Construction workforce	7	43,000
Plant operations	40	181,000
Operations workforce	40	136,000
Uranium fuel cycle	40	540,000
Fuel and Waste transportation	40	14,000
Decommissioning equipment	10	19,000
Decommissioning workforce	10	8,000
SAFe STORage workforce	40	10,000
TOTAL	-	**990,000**

"-" denotes not data in the table cell.
(a) Nuclear power plant life cycle for estimating greenhouse gas emissions is assumed to be 97 years, which includes building, operating and decommissioning
(b) Results are rounded to the nearest 1,000 MT CO_2 equivalent (CO_2(e)).
Source: Information above is reproduced from the environmental assessment for the construction permit application for the Abilene Christian University Molten Salt Research Reactor (NRC 2023-TN9095).

Table G-2 contains the GHG emission estimates for the proposed LMGS. The NRC staff assumes that GHG emission estimates for the LMGS could be generally scaled based on the proposed LMGS output relative to the reference 1,000 MWe (i.e., 3,415 MWt) reactor. The proposed LMGS assumes that four 200MWt reactors would be installed for a total output of 800 MWt. As documented in Table G-2, not all of the various sources (i.e., activities) scale the same. For the construction, decommissioning, and SAFe STORage activities, a scaling factor of 0.5 was assumed relative to the reference 1,000 MWe reactor Table G-2. For the LMGS operations, uranium fuel cycle, and fuel and waste transport activities, a scaling factor of 0.3 was calculated from the ratio of power outputs between the four Long Mott reactors (i.e., 800 MWt total) and the reference 3,415 MWt reactor operating at 80 percent capacity:

$$\text{Scaling Factor} = (800 \text{ MWt}/(3{,}415 \text{ MWt} \times 0.8)) = 0.3$$

As depicted in Table G-2, the estimates for the proposed LMGS project assumes 5 years of construction, 40 years of operation, and 10 years of active decommissioning. GHG emission estimates for the reference 3,415 MWt reactor are scaled down to account for the shorter duration of some of these LMGS activities by multiplying the number of years for the various activities as shown here:

$$\text{LMGS } CO_2(e) = 3{,}415 \text{ MWt Reactor } CO_2(e) \times \text{Scaling Factor} \times (\text{Years of Activity for reference reactor/Years of Activity for LMGS reactors}).$$

The estimated total GHG emissions for the proposed LMGS project are approximately 29,000 MT CO_2(e) for the construction phase, 99,000 MT CO_2(e) for the operations phase, and 309,000 MT CO_2(e) over the life cycle of the project (Table G-2). The construction phase estimates are calculated by combining the values for the following activities: construction equipment and construction workforce. The operation phase emission estimates are calculated by combining the estimates for the following activities: plant operations, operations workforce, and fuel and waste transportation.

Table G-2 Life-Cycle Assumptions and Greenhouse Gas Emission Estimates for the Four 200 MWt Long Mott Generating Station Reactors

Source	Reference 3,415 MWt Reactor—Activity Duration (yr)[(a)]	Reference 3,415 MWt Reactor—Total Emissions (MT CO_2(e))[(b)]	Scaling Factor	Activity Duration (yr)[(c)]	Total Emissions (MT CO_2(e))[(b)]
Construction equipment	7	39,000	0.5	5	14,000
Construction workforce	7	43,000	0.5	5	15,000
Plant operations	40	181,000	0.3	40	54,300
Operations workforce	40	136,000	0.3	40	40,800
Uranium fuel cycle	40	540,000	0.3	40	162,000
Fuel and waste transportation	40	14,000	0.3	40	4,200
Decommissioning equipment	10	19,000	0.5	10	9,500
Decommissioning workforce	10	8,000	0.5	10	4,000

Source	Reference 3,415 MWt Reactor—Activity Duration (yr)[a]	Reference 3,415 MWt Reactor—Total Emissions (MT CO_2(e))[b]	Scaling Factor	Activity Duration (yr)[c]	Total Emissions (MT CO_2(e))[b]
SAFe STORage workforce	40	10,000	0.5	40	5,000
TOTAL	**-**	**990,000**	**-**	**-**	**309,000**

"-" denotes no data in the table cell.
(a) Nuclear power plant life cycle for estimating greenhouse gas (GHG) emissions assumed to be 97 years, which includes building, operating and decommissioning.
(b) Results are rounded to the nearest 1,000 MT CO_2 equivalent (CO_2(e)).
(c) Nuclear power plant life cycle for estimating GHG emissions assumed to be 95 years.

G.1 References

NRC (U.S. Nuclear Regulatory Commission). 2023. *Greenhouse Gas Emissions Estimates for a Reference 1,000 MWe Reactor and the Abilene Christian University Molten Salt Research Reactor*. Washington, D.C. ADAMS Accession No. ML23296A113. TN9095.

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