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1.0 INTRODUCTION

This report provides information to the Nuclear Regulatory Commission (NRC) to facilitate preparation of an environmental impact statement in accordance with the provisions of 10 CFR 51 Subpart A, National Environmental Policy Act (NEPA)– Regulations Implementing Section 102 (2) (CFR, 2007a) for the preferred location for a new nuclear power plant on the {Callaway} site in {Callaway County, Missouri}. This report was prepared in accordance with the guidance provided in NUREG-1555, “Environmental Standard Review Plan” (NRC, 1999) and Regulatory Guide 4.2, Revision 2 (NRC, 1976), “Preparation of Environmental Reports for Nuclear Power Stations.”

{U.S. EPR nuclear power plants that are licensed, constructed, and operated in cooperation with UniStar Nuclear Operating Services LLC (UniStar Nuclear Operating Services) are standardized to the extent practical. This allows for a standardized Combined License Application (COLA). Information that is unique to Callaway Plant Unit 2 is enclosed in braces “{}”. Information not enclosed in braces is generic for all UniStar Nuclear Operating Services facilities. The terms “braces” and “brackets” are used interchangeably in this document. Minor changes are made within the generic text that are not identified as site specific. These include figure and table numbers, which are organized sequentially within sections, and minor grammatical changes necessary to support introduction of site specific text. Tables and figures containing site specific information use the convention of brackets/braces around the table or figure title, not the entire table or figure contents. This convention indicates the entire table or figure is site specific.}

1.1 PROPOSED ACTION

{AmerenUE} proposes to construct and operate a new nuclear power plant to be designated as {Callaway Plant Unit 2} located on the {Callaway} site. Federal action resulting in the issuance of a combined license (COL) by the NRC under 10 CFR 52, Early Site Permits; Standard Design Certification; and Combined Licenses for Nuclear Power Plants (CFR, 2007b) is anticipated. The purpose of the new nuclear power plant is to generate electricity for sale.

1.2 PROJECT DESCRIPTION

1.2.1 OWNERSHIP AND APPLICANT

{{Union Electric Company, doing business as AmerenUE, is applying for a combined license to construct and operate the nuclear power plant to be known as Callaway Plant Unit 2. AmerenUE will be the owner, operator and licensee of Callaway Plant Unit 2. The combined license application for Callaway Plant Unit 2 references AREVA’s U.S. Evolutionary Power Reactor (U.S. EPR), now undergoing design certification before the Nuclear Regulatory Commission.

AmerenUE is the second applicant to reference the U.S. EPR in an application for the combined license. The application to construct and operate Calvert Cliffs Nuclear Power Plant Unit 3 is the first and is the reference plant for the U.S. EPR. AmerenUE’s Callaway Plant Unit 2 will likely be the third U.S. EPR to be built and operated in the United States.

AmerenUE will participate in the process for standardized engineering, procurement and construction for Callaway Plant Unit 2 and will operate Unit 2 in accordance with policies and procedures established and maintained by UniStar Nuclear Operating Services, LLC (UNOS). In association with UNOS, AmerenUE will benefit from being part of the fleet of nuclear plants

which maintain strict standardization with regard to the U.S. EPR design certification, as well as licensing, engineering, construction, operations, maintenance, modification, and procurement for the U.S. EPR. UNOS will provide licensing services to AmerenUE.}

1.2.2 SITE LOCATION

{Callaway Plant Unit 2 is located northwest of Callaway Plant Unit 1 on the Callaway site. The Callaway site consists of approximately 2,800 acres (1,133 hectares) dedicated to power generation, fully contained within the 7,354 acre (2,976 hectare) parcel owned by AmerenUE in Callaway County, Missouri, approximately 5 miles (8 km) north of the Missouri River at its closest point and 10 miles (16 km) southeast of the city of Fulton.} The site is approximately {80 mi (129 km) west of the St. Louis Metropolitan area.} Figure 1.2-1 and Figure 1.2-2 illustrate the location of the {Callaway} site.

1.2.3 REACTOR INFORMATION

{Callaway Plant Unit 2 consists of one} pressurized water reactor steam electric system of the AREVA U.S. EPR design. The rated core thermal power will be 4,590 MWt. {The rated and design net electrical output is approximately 1,600 MWe. The Design Certification Application for the U.S. EPR was made in December 2007.}

1.2.4 COOLING SYSTEM INFORMATION

The two major cooling systems interacting with the environment are the Circulating Water System (CWS) and the Essential Service Water System (ESWS). Figure 1.2-3 provides a simplified diagram of these two systems.

1.2.4.1 Circulating Water System

The U.S. EPR uses a CWS to dissipate waste heat rejected from the main condenser and turbine building closed cooling water heat exchangers (via heat exchange with the auxiliary cooling water system) during normal plant operation at full station load. A closed-cycle, wet cooling system is used for {Callaway Plant Unit 2, similar to Callaway Plant Unit 1. The Callaway Plant Unit 2 system uses two natural draft cooling towers for heat dissipation. The CWS cooling towers will have the same basic structure and profile as the cooling tower at Callaway Plant Unit 1.}

The exhausted steam from the low pressure steam turbine is directed to a surface condenser (i.e., main condenser), where the heat of vaporization is rejected to a closed loop of cooling water. Cooling water from the CWS is also provided to the auxiliary cooling water system. Two 100% capacity auxiliary cooling water system pumps receive cooling water from the CWS and deliver the water to the Closed Cooling Water System (CLCWS) heat exchangers. Heat from the CLCWS System is transferred to the auxiliary cooling water system in the CLCWS System heat exchangers and heated auxiliary cooling water is returned to the CWS. The heated cooling water from the main condenser and auxiliary cooling water system is sent to the spray headers of the cooling tower, where heat content of the cooling water is transferred to the ambient air via evaporative cooling and conduction. After passing through the cooling tower, the cooled water is recirculated back to the main condenser and auxiliary cooling water system to complete the closed cycle cooling water loop.

{Makeup water from the Missouri River Alluvial Aquifer (aquifer) is required to replace evaporative water losses, drift losses, and blowdown discharge.

Makeup water for the CWS is taken from the aquifer by pumps installed in a Collector Well River Intake Structure located near Missouri River mile mark 115. The makeup water is pumped through a common line to the water treatment system where it receives treatment to reduce dissolved iron before being sent to the cooling tower basin. Cooling water is pumped through the main condenser, to and from the auxiliary cooling system (all in parallel), and then returns to the cooling towers to dissipate heat to the atmosphere. Figure 1.2-4 provides a conceptual view of the site, showing the relationship of the Callaway Plant Unit 2 cooling towers to Callaway Plant Unit 1. Blowdown from the cooling towers discharge to a common pipe where it combines with the discharge from Callaway Plant Unit 1 and then to the Missouri River.}

1.2.4.2 Essential Service Water System

{The U.S. EPR design has a safety-related Essential Service Water System (ESWS) to provide cooling water to the Component Cooling Water System (CCWS) heat exchangers located in the Safeguard Buildings as well as the Emergency Diesel Generator Heat Exchangers located in the Emergency Power Generating Buildings. The ESWS is used for normal operations, refueling, shutdown/cooldown, anticipated operational events, design basis accidents and severe accidents. The ESWS is a closed-loop system with four safety-related trains and one non-safety-related dedicated (severe accident) train to dissipate design heat loads. Each safety-related train uses one of the four safety-related two-cell mechanical draft cooling towers to dissipate heat during normal conditions, shutdown/cooldown, or design basis accident conditions. The non-safety-related train uses its associated safety-related train ESWS cooling tower (Ultimate Heat Sink (UHS)) to dissipate heat under severe accident conditions. The ESWS water is pumped to the CCWS heat exchanger and to the EDG heat exchanger for the removal of heat. Each of the four ESWS cooling towers has a dedicated CCWS heat exchanger to maintain separation of the safety-related trains. Heated ESWS water returns through piping to the spray distribution header of the {ESWS} cooling tower. Water exits the spray distribution piping through spray nozzles and falls through the tower fill. Two fans provide upward air flow to remove latent and sensible heat from the water droplets as they fall through the tower fill, rejecting heat from the service water to the atmosphere. The heated air will exit the tower and mix with ambient air, completing the heat rejection process. The cooled water is collected in the tower basin for return to the pump suction for recirculation through the system. Each ESWS cooling tower has a dedicated ESWS pump. An additional pump connected to one ESWS train supplies the severe accident train. {Makeup to the ESWS is normally supplied from the Collector Well River Intake System. Blowdown from the ESWS Cooling Tower discharges to a common discharge pipe to the Missouri River.}

Under post-accident conditions lasting longer than 72 hours, water may be supplied from the safety-related ESW Emergency Makeup System (ESWEMS) that utilizes a dedicated Retention pond. The ESWEMS pumps are housed in a safety-related structure near the ESWEMS Retention pond.}

1.2.5 TRANSMISSION SYSTEM INFORMATION

{The transmission system for Callaway Plant Unit 1 utilized two 345 kV circuits from the Montgomery Substation about 21 miles (33.8 km) to the northeast near New Florence, and a 345 kV circuit from the Bland Substation. The Bland Substation is located on the south side of the 345 kV Labadie-Franks-3 transmission line right-of-way, north of Owensville, Missouri, and west of State Highway 19 and is about 29 airline miles (46.7 km) to the south of the plant. This arrangement provides two physically-separated offsite transmission lines comprised of three 345 kV circuits. The nearest distance between a Bland and a Montgomery line is the point where they attach to the switchyard arbors. The distance between the outside phases of these lines at this point is 406 ft (124 m) and is presented in Figure 1.2-2. The Callaway-Bland line was

broken apart in 2005 to allow routing of power to a new substation called Loose Creek. This change was made to reduce line congestion to the south and to provide additional power to Jefferson City.

- ◆ To accommodate the Callaway Plant Unit 2 transmission system requirements, a 345 kV transmission line is routed from the Loose Creek tie-in point approximately 6.7 miles south of the Callaway site to the Callaway Plant Unit 1 Switchyard and the Callaway-Bland line is restored to the original design. The Callaway-Loose Creek line parallels the Callaway-Bland lines and utilizes an additional 150 ft (46 m) easement where it is routed on non-AmerenUE property.
- ◆ Callaway-Montgomery Line 7 and 8 connections are re-located to Callaway Plant Unit 2 Switchyard from the Unit 1 Switchyard and two independent 345 kV transmission lines are routed from the Callaway Plant Unit 2 Switchyard to the Unit 1 Switchyard, tying them together.

Transmission system expansion planning conforms to the process established by the Midwest Independent System Operator (MISO).}

1.2.6 PROPOSED ACTION AND CONSTRAINTS

The proposed action is to construct and operate a new nuclear power unit on the {Callaway} site. The NRC 10 CFR 52 (CFR, 2007b) licensing process will be followed to obtain a combined license. At the time of application submittal, there are no constraints on the review process. Numerous other permits and approvals are required from various Federal, State and local agencies as discussed in Section 1.3. These actions will require public meetings and hearings to obtain the necessary approvals to proceed with construction and operation of the new unit. Constraints may be placed on the action as the various agency reviews and approvals are processed and issued.

Environmental issues are evaluated using a three-tier standard of significance – SMALL, MODERATE, or LARGE. The definitions of the three significance levels are defined in Footnote 3 of Table B-1 of 10 CFR 51 (CFR, 2007c) as follows:

SMALL: Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

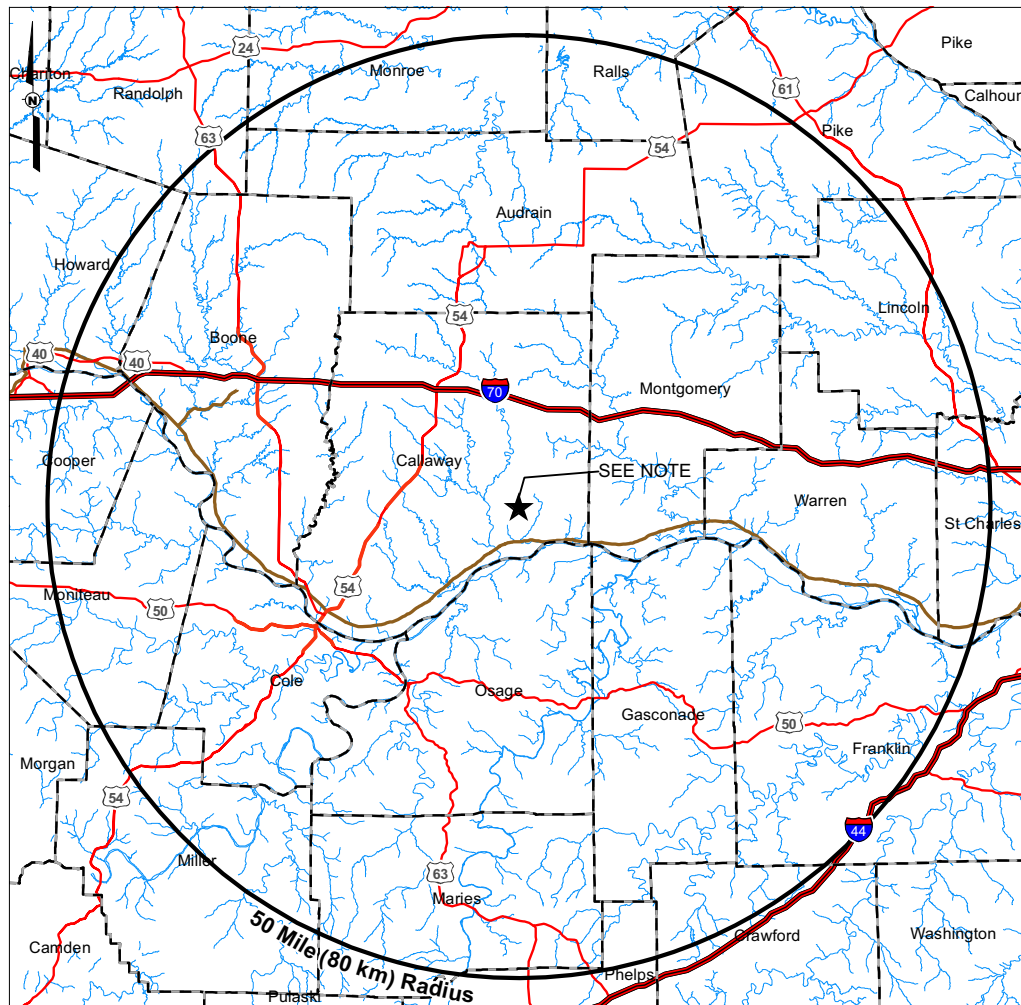
MODERATE: Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE: Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

1.2.7 MAJOR ACTIVITY START AND COMPLETION DATES

The following major activities are scheduled:

{1.	Order Ultra Heavy Forgings for Reactor Vessel and NSSS Components	May 2007
2.	Submit Design Certification Application for the U.S. EPR	December 2007
3.	Submit COL Application for Callaway Plant Unit 2	August 2008
4.	NRC Issues Design Certification for U.S. EPR	October 2010
5.	NRC Issues COL	September 2011
6.	Plant Construction Starts	June 2013
7.	Construction Complete	June 2017
8.	Plant Startup Testing Begins	June 2017
9.	Commercial Operation	December 2017}

Figure 1.2-1—{Callaway Site 50 mi (80 km) Region}**LEGEND:**

- County Boundary
- Interstate Highway
- US Highway
- Katy Trail
- Primary Streams

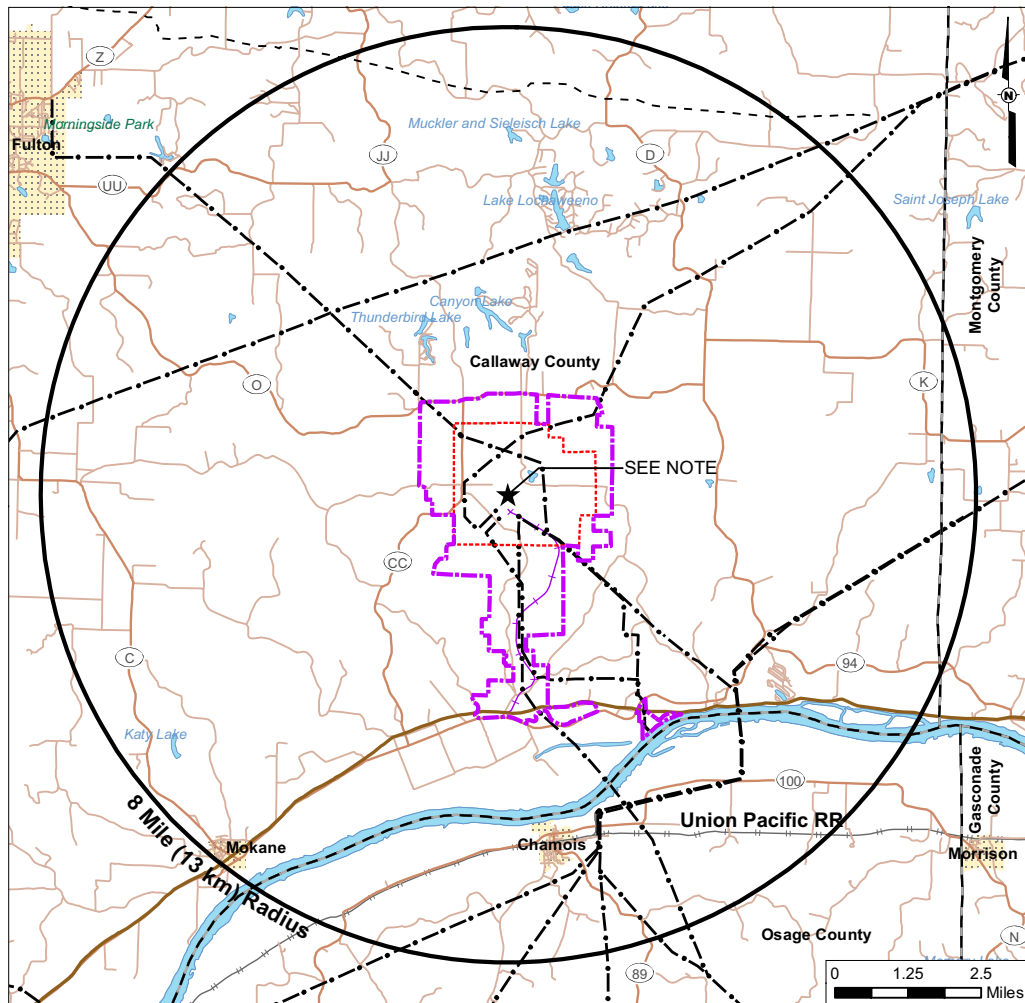
0 5 10 20
Miles

NOTE:

REFERENCE CENTER POINT OF PLANT SITE IS DEFINED AS THE MIDPOINT BETWEEN EXISTING REACTOR FOR CALLAWAY PLANT UNIT 1 AND REACTOR FOR CALLAWAY PLANT UNIT 2.

REFERENCE:

Roads, Katy Trail, and Streams from Missouri Spatial Data Information Service (MSDIS) web site <http://www.msdis.missouri.edu/>. Accessed September 2007.

Figure 1.2-2—{Callaway Site 8 mi (13 km) Region}**LEGEND:**

- County Boundary
- Callaway Plant Site Area
- Ameren Property Boundary
- Pipeline (Natural Gas)
- Power Transmission ROW
- Secondary State and County Highways
- Local, Neighborhood, Rural or City Street
- Railroad
- Railroad - NOT IN USE
- Katy Trail
- Water
- Census Designated Place

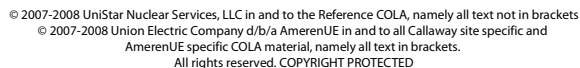
NOTE:

REFERENCE CENTER POINT OF PLANT SITE IS DEFINED AS THE MIDPOINT BETWEEN EXISTING REACTOR FOR CALLAWAY PLANT UNIT 1 AND REACTOR FOR CALLAWAY PLANT UNIT 2.

REFERENCE:

ESRI StreetMap Pro [CD-ROM], 2007, Parks, Streets, Waterbody, and Census Designated Places.
 Katy Trail from Missouri Spatial Data Information Service (MSDIS) web site <http://www.msdis.missouri.edu/>. Accessed September 2007.
 Utility lines and the railroad not in use digitized from USGS 1:24K Topographic Maps. Pipeline digitized from 2006 Missouri USDA NAIP Data and National Pipeline Mapping System.
 Ameren UE Dwg UE 8600-x-89930 (rev 14).
 Ameren UE Dwg UE 8600-x-89931 (rev 12).

Callaway Plant Unit 2



1. FLOWS ARE SHOWN IN GALLONS PER MINUTE ROUNDED TO THE NEAREST GALLON.
2. FLOWS ARE BASED ON AVERAGE DAILY CONDITIONS.
3. FLOWS ARE SHOWN FOR UNIT 2 ONLY.

Legend

----- Startup Flows

———— Normal Flow

Flow Varies with Operating Conditions

Key
 (Average Flows: Gallons Per Minute / Liters Per Minute)
 [Maximum Flows: Gallons Per Minute / Liters Per Minute]

Figure 1.2-4—{Aerial View of Callaway Plant Unit 2 Superimposed}



1.3 STATUS OF REVIEWS, APPROVALS AND CONSULTATIONS

A compilation of environmentally related authorizations required by the project is listed in [Table 1.3-1](#). Also listed in [Table 1.3-1](#) are authorizations that are contingent on project characteristics that have not yet been finalized.

1.3.1 FEDERAL AGENCIES

1.3.1.1 Nuclear Regulatory Commission (NRC)

The Atomic Energy Act of 1954, as amended, gives the NRC regulatory jurisdiction over the design, construction, operation, and decommissioning of {Callaway Plant Unit 2} specifically with regard to assurance of public health and safety in 10 CFR 52 and 40 (CFR, 2007b; CFR, 2007d), which are applicable to nuclear power plants. The NRC performs continuous inspection of construction, operation and maintenance activities of the facility. The NRC, in accordance with 10 CFR 51 (CFR, 2007a), also assesses the potential environmental impacts of the plant.

NRC establishes standards for protection against radiation hazards arising out of licensed activities. The NRC licenses are issued pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Organization Act of 1974. The regulations apply to all persons who receive, possess, use or transfer licensed materials.

Domestic Licensing of Source Material (10 CFR 40) (CFR, 2007d) establishes the procedures and criteria for the issuance of licenses to receive, possess, use, transfer, or deliver source material.

General Applicability to Domestic Licensing of Byproduct Material (10 CFR 30) (CFR, 2007e) establishes the procedure and criteria for the issuance of licenses to receive, possess, use, transfer, or deliver byproduct material.

Domestic Licensing of Special Nuclear Material (10 CFR 70) (CFR, 2007f) establishes procedures and criteria for the issuance of licenses to receive title to, own, acquire, deliver, receive, possess, use and transfer special nuclear material (e.g., fuel) and establishes and provides for the terms and conditions upon which the Commission issues such licenses.

1.3.1.2 U.S. Environmental Protection Agency (EPA)

The EPA has primary authority relating to compliance with the Clean Air Act (CAA), Clean Water Act (CWA), Safe Drinking Water Act (SDWA), and Resource Conservation and Recovery Act (RCRA). {However, EPA Region 7 has authorized Missouri to implement nearly all aspects of permitting, monitoring, and reporting activities relating to these statutes and associated programs.} Applicable state requirements, permits, and approvals are described in Section 1.3.2, State Agencies.

Environmental Standards for the Uranium Fuel Cycle (40 CFR 190 Subpart B) (CFR, 2007g) establishes the maximum doses to the body organs resulting from operational normal releases and received by members of the public.

The SDWA provides for protection of public water supply systems and underground sources of drinking water at 40 CFR 141-143 (CFR, 2007h). 40 CFR 141.2 defines public water supply systems as systems that provide water for human consumption to at least 25 people or at least 15 connections. Underground sources of drinking water are also protected from contaminated releases and spills by this act. {Callaway Plant Unit 2 is using site groundwater for part of its

construction water supply and for its potable water supply during operations; therefore, relevant requirements of the SDWA apply.}

The Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR 350 to 372) (CFR, 2007i) establishes the requirements for Federal, State and local governments, Indian Tribes, and industry regarding emergency planning and “Community Right-to-Know” reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public’s knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment.

The CWA regulates industrial and stormwater point source discharges via the National Pollutant Discharge Elimination System (NPDES) under 40 CFR 122 (CFR, 2007j). The CWA also regulates power plant cooling water intakes and thermal discharges to minimize environmental impacts under Sections 316(b) and (a), respectively. {Permits will be required to support both construction and operation of Callaway Plant Unit 2. These permits will be issued by the Missouri Department of Natural Resources (MDNR).}

Resource Conservation and Recovery Act (RCRA): RCRA regulates all types of solid wastes, including municipal wastes, industrial wastes, and hazardous waste under 49 CFR 107 to 400 (CFR, 2007k). Non-hazardous wastes are regulated under RCRA Subtitle D. Hazardous waste is a waste with properties that make it dangerous or potentially harmful to human health or the environment. The universe of hazardous wastes is large and diverse. Hazardous wastes can be liquids, solids, contained gases, or sludges. They can be the by-products of manufacturing processes or simply discarded commercial products, like cleaning fluids or pesticides. In regulatory terms, a RCRA hazardous waste is a waste that appears on one of the four hazardous wastes lists (F-list, K-list, P-list, or U-list), or exhibits at least one of four characteristics: ignitability, corrosivity, reactivity, or toxicity. Hazardous waste is regulated under the Resource Conservation and Recovery Act (RCRA) Subtitle C.

{Callaway Plant Unit 2} will generate both non-hazardous and hazardous waste. {MDNR regulates waste management in Missouri}.

1.3.1.3 U.S. Department of Transportation (DOT)

DOT regulates transportation of hazardous materials as follows:

- ◆ 49 CFR 107, Hazardous Materials Program Procedures, Subpart G: Registration and Fee to DOT as a Person who Offers or Transports Hazardous Materials (CFR, 2007k).
- ◆ 49 CFR 171, General Information, Regulations and Definitions (CFR, 2007l).
- ◆ 49 CFR 173, Shippers – General Requirements for Shipments and Packages, Subpart I: Radioactive Materials (CFR, 2007m).
- ◆ 49 CFR 178, Specification for Packagings (CFR, 2007n).

{AmerenUE} will arrange for transportation of wastes by licensed and registered transporters.

1.3.1.4 The Noise Control Act of 1972 (42 U.S.C. § 4901 et seq.) (USC, 2007a)

The Noise Control Act transfers the responsibility of noise control to State and local governments. Commercial facilities are required to comply with Federal, State, interstate, and

local requirements regarding noise control. {However, there are no numeric noise control limitations outside of occupational exposures in the Revised Statutes of Missouri (RSMo). Reasonable efforts will be in place to minimize effects and comply with Federal guidelines.}

1.3.1.5 National Historic Preservation Act of 1966 (16 U.S.C. § 470 et seq.) (USC, 2007b)

The National Historic Preservation Act (NHPA) was enacted to protect the nation's cultural resources. The NHPA is supplemented by the Archaeological and Historic Preservation Act. This act directs Federal agencies in recovering and preserving historic and archaeological data that would be lost as the result of construction activities. {In Missouri, the (MDNR) is the agency responsible for carrying out the provisions of the NHPA.}

1.3.1.6 Hazardous Materials Transportation Act (49 U.S.C. § 1801 et seq.) (USC, 2007c)

The Hazardous Materials Transportation Act (HMTA) regulates transportation of hazardous material (including radioactive material) in and between States. According to HMTA, States may regulate the transport of hazardous material as long as they are consistent with HMTA or the Department of Transportation (DOT) regulations that are posed in Title 49 CFR 171-177 (CFR, 2007k). Other regulations regarding packaging for transportation of radionuclides are contained in Title 49 CFR 173 (CFR, 2007m), Subpart I. {AmerenUE} will arrange for transport of hazardous and radioactive materials and wastes from suppliers and to disposal facilities on interstate highways.

1.3.1.7 U.S. Army Corps of Engineers (USACE)

The Clean Water Act established a permit program under Section 404. Regulations are at 33 CFR 322-323. (CFR, 2007o,p) to be administered by the USACE to regulate the discharge of dredged or fill material into "the waters of the U.S." The USACE also evaluates wetlands, floodplains, dam inspection and dredging of waterways. {Callaway Plant Unit 2 will impact non-tidal wetlands and possibly require dredging in navigable waters. Therefore, a Section 404 permit will be required.}

1.3.1.8 Occupational Safety and Health Administration (OSHA)

The Occupational Safety and Health Act of 1970 (OSHA) is designed to increase the safety of workers in the workplace. It provides that the Department of Labor is expected to recognize the dangers that may exist in workplaces and establish employee safety and health standards. The identification, classification, and regulations of potential occupational carcinogens are found at 29 CFR 1990 (CFR, 1980) while the standards pertaining to hazardous materials are listed in 29 CFR 1910 Subpart H (CFR, 2007r). OSHA regulates mitigation requirements and mandates proper training and equipment for workers. {AmerenUE} employees and management are subject to the requirements of 29 CFR 1910.

1.3.1.9 U.S. Department of Interior (DOI)

{The U.S. Fish and Wildlife Services (USFWS) Bureau of DOI is responsible for the protection of threatened and endangered species on land and in fresh waters under the Endangered Species Act (ESA). Consultation is required under Section 7 and regulations are at 50 CFR 402 (CFR, 2007s). {USFWS is also responsible for protecting migratory birds and/or their eggs or nests under the Migratory Bird Treaty Act. Consultation with the USFWS and the Missouri Department of Conservation (MDC) occurred during the development of this Environmental Report. The Northern Harrier (*Circus cyaneus*) is federally protected, and is present in the vicinity of the Callaway Plant site. The Bald Eagle (*Haliaeetus leucocephalus*) was taken off the federal endangered species list, but is still listed as an endangered species in Missouri. On the site,

there are no nesting pairs, however, the site provides good habitat for Bald Eagles to nest. The Indiana Bat (*Myotis sodalist*) may be present in the vicinity of the AmerenUE property and is federally protected.

Four fish and two unionid mussels that are listed as either federally endangered or state endangered may potentially occur near the Callaway plant site and were considered. The fish are: lake sturgeon, Topeka shiner, flathead chub, and pallid sturgeon. The mussels are the pink mucket and the scaleshell. Six additional fish species were also considered that were: (a) listed as vulnerable (S3) in Missouri; (b) listed as critically imperiled (G1), imperiled (G2), or vulnerable (G3) globally and (c) had previously been collected in the study area. These are paddlefish, sturgeon chub, sicklefin chub, blacknose shiner, blue sucker, and plains topminnow.}

1.3.1.10 Federal Aviation Administration (FAA)

The FAA is responsible for safe air navigation and regulates structures greater than 200 ft (60.96 m) high. {Callaway Plant Unit 2} will have structures exceeding this height and notification will be required under 14 CFR 77.13 (CFR, 2007t).

1.3.2 STATE AGENCIES

{The Missouri Department of Natural Resources' (MDNR) responsibility is to protect and restore the quality of Missouri's air, water, and land resources, while fostering smart growth, economic development, healthy and safe communities, and quality environmental education for the benefit of the environment, public health, and future generations. The MDNR consists of several divisions that have responsibility for various permits and environmental programs as described below. The general and specific permits and permit requirements are discussed below by the MDNR program that has responsibility for reviewing and approving the permitting action.

1.3.2.1 Air Pollution Control Program

MDNR, through its Air Pollution Control Program, carries out mandates from the Federal Clean Air Act and administers air pollution monitoring, planning, and control programs to improve and maintain air quality. In this role, MDNR is responsible for processing permit applications for industries that emit pollutants to the air.

Based on EPA data, Callaway County, Missouri is in-attainment for all the National Ambient Air Quality Standards (NAAQS). Attainment means that the air quality is better than the standard. A non-attainment designation requires a state plan to be sent to the EPA describing how the area will implement air quality improvements.

Air Quality Permits to Construct are required to ensure any new, modified, replaced or relocated source of air pollution complies with all air quality requirements CSR 4 Division 240-2.060 (CSR, 2005). Prevention of Significant Deterioration (PSD), if needed, is obtained in conjunction with the Permit to Construct. Air sources with the potential to significantly affect air quality subsequently must obtain an operating permit, which can be a State Permit to Operate (CSR, 2005) or a Clean Air Act Title V Operating Permit (CSR, 2007). Clean Air Act Operating Permits (under Title V) are required for major sources that have a potential to emit more than 100 tons (91 MT) per year for criteria pollutants, 40 tons per year of NO_x or VOCs.

Callaway Plant Unit 2 will have six standby diesel generators (four Emergency Diesel Generators (EDGs), and two Station Blackout (SBO) diesel generators). The auxiliary boilers will use electric heating, and do not contribute directly to air emissions. The CWS cooling towers will emit

particulate matter as PM-10. Permitting for these operational sources will comply with Federal, State, and local emission standards.

Construction phase air emission sources, including the Concrete Batch Plant, will be permitted via the State Permit to Construct and Permit to Operate process and will meet all Federal, State and local emission standards. Measures, such as fugitive dust control, will be employed during construction to minimize emissions.

Mobile sources are not required to obtain an operating permit in Missouri. Vehicles over eight thousand five hundred pounds are exempt (DNR, 2007).

1.3.2.2 Water Management Administration

The Water Pollution Control Program regulates industrial discharges and stormwater via the National Pollutant Discharge Elimination System (NPDES) program, surface and groundwater appropriations, construction of water and sewerage facilities and non-tidal wetland permitting.

NPDES Permits: Construction of Callaway Plant Unit 2 will involve grubbing, clearing, grading or excavation of 1 or more acres (0.4 or more hectares) of land coverage and must receive a NPDES Land Disturbance Construction General Permit (CGP) from MDNR (CSR, 2008). Callaway Plant Unit 2 construction contractors will be clearing up to 700 acres (283 hectares) during the construction phase of the project. A Stormwater Pollution Prevention Plan (SWPPP) will be developed and a Land Disturbance Permit application filed at least 60 days prior to the commencement of construction activities. Process water discharges from the plant to the Missouri River will be regulated under a NPDES discharge permit under 10 CSR 20-6.

Callaway Plant Unit 2 will use Collector Well River Intake System/Alluvial Aquifer water for the cooling tower makeup to meet freshwater needs for the CWS, ESWS, and ESWEMS as shown in [Figure 1.2-3](#).

Callaway Plant Unit 2 will use existing on-site deep wells permitted to supply potable water, fire water and de-mineralized water as shown in [Figure 1.2-3](#).

Section 401 Certification: Callaway Plant Unit 2 will require work in non-tidal wetlands, and therefore will require a Section 404 permit and a Section 401 Water Quality Certification. The Army Corps of Engineers (COE) has jurisdiction over wetland issues and will issue the permits required under section 404. Under Section 401 of the federal Clean Water Act, states can review and approve, condition, or deny all federal permits or licenses that might result in a discharge to State waters, including wetlands (USC, 2007d). A Section 401 Water Quality Certification confirms compliance with the State water quality standards. Activities that require a Section 401 certification include Section 404 permits issued by the USACE (CFR, 2007q). MDNR has a cooperative agreement and joint application process with the USACE relating to Section 404 permits and Section 401 certifications.

1.3.2.3 Waste Management Administration

The MDNR through its Solid Waste Management Program and its Hazardous Waste Program manages the following relevant programs in Missouri: solid waste, hazardous waste management, recycling, and oil control. Callaway Plant Unit 2 will require several permits from the MDNR. A Solid Waste Disposal Facility Permit will be required to handle concrete, steel, wood, and other debris resulting from construction. Municipal solid wastes during operation will be collected by a contractor and disposed of at a permitted municipal landfill. No separate permits are required. An oil operations permit will be required for storage of fuel for the

Emergency Diesel Generators under 10 CSR 20-10.010, 10.074(CSR, 2000). Callaway Plant Unit 2 is registered as a Small Quantity Generator (SQG) and does not have to ship its hazardous waste off-site for 180 days. If the facility ever exceeds 2,200 lbs (0.99 metric tons) of stored hazardous waste at any time, the facility will become a Large Quantity Generator (updated notification to MDNR must occur and quarterly reporting of waste generator will be required) and the facility will have to ship hazardous waste from the site within 90 days. Callaway Plant Unit 1 has a Waste Generator Registration (USEPA Identification Number), and it will apply to Callaway Plant Unit 2. The level of permit and associated monitoring requirements depend on the volume and type of waste generated and whether or not the waste is treated or just stored for off-site disposal. It is anticipated that small to medium volumes of hazardous waste will be stored at the facility for eventual offsite disposal.

AmerenUE is committed to pollution prevention and waste minimization practices and will incorporate RCRA pollution prevention goals, as identified in 40 CFR 261 (CFR, 2007u). A Pollution Prevention Waste Minimization Plan will be developed to meet the waste minimization criteria of NRC, EPA, and state regulations. The Pollution Prevention Waste Minimization Plan will describe how design procedures for operation will minimize (to the extent practicable) the generation of radioactive, mixed, hazardous, and non-hazardous solid waste.

1.3.2.4 Missouri Department of Natural Resources/ State Historic Preservation Office (MDNR/SHPO)

The preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations of Americans (MDNR, 2008).

One of the keys to the program mandated by Congress to achieve this goal was the creation in 1966 of a formal National Register of Historic Places. Another key encouraged the creation of state and tribal historic preservation offices. Missouri's State Historic Preservation Office (SHPO), founded in 1968, was one of the first.

Tax credits are granted to buildings in historical districts. Federal law provides an investment tax credit equal to 20% of approved costs for qualified rehabilitation of certain historic buildings for income-producing use. The federal credits are administered by (SHPO) in the Missouri Department of Natural Resources and the National Park Service.

1.3.2.5 Missouri Department of Transportation (MDOT)

MDOT will review and approve changes to Callaway site access roadways that are within their jurisdiction, including highway access permits as necessary. AmerenUE has consulted with MDOT to discuss traffic impacts and ensure that roadway access plans will meet applicable state requirements.

1.3.2.6 Missouri Department of Health and Senior Services

Missouri Radiation Control Program (MRCP) regulates radiation sources not regulated by the NRC such as x-ray machines typically used to examine welds under Missouri Radiation Protection Law (192.400-192.510, RSMo). Callaway Plant Unit 2 is expected to have such machines on site.

1.3.2.7 Other State Licenses and Registrations

Transport of low level radioactive waste from Callaway Plant Unit 2 to permitted disposal facilities requires licenses and registrations from the receiving states. Currently, AmerenUE anticipates low level radioactive wastes to be shipped to a licensed low level waste facility.}

1.3.3 LOCAL AGENCIES

{Plans for construction and operation of the Callaway Plant Unit 2 are communicated to and coordinated with local organizations, in particular the Callaway County Commissioners.}

Table 1.3-1—{Federal, State and Local Authorizations}

(Page 1 of 4)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Anticipated Application Submittal Date
U.S. Nuclear Regulatory Commission (USNRC)	10 Code of Federal Regulations (CFR) 40; 10 CFR 40, Part 51.52	Source Material License	--(a)	--(a)	Possession, use and transfer of source material	August 2008
USNRC	Atomic Energy Act of 1954 (AEA), 10 CFR 51; 10 CFR 52.89	Environmental Impact Statement (EIS)	--(a)	--(a)	Site approval for construction and operation of a nuclear power station as part of an application for a combined license (COL)	August 2008
USNRC	10 CFR 52, Subpart C	COL	--(a)	--(a)	Combined license for a nuclear power station	August 2008
USNRC	10 CFR 70	Special Nuclear Material License	--(a)	--(a)	Possession, delivery, receipt, use, transfer of fuel	August 2008
USNRC	10 CFR 30	By-Product Material License	--(a)	--(a)	Production, transfer, receipt, acquisition, ownership, possession of nuclear byproduct materials	August 2008
Federal Aviation Administration (FAA)	49 United States Code (USC) 44718, 14 CFR 77.13	Construction Notice	--(a)	--(a)	Construction of structures (>200 feet) affecting air navigation	Ongoing
U.S. Army Corps of Engineers (USACE)	Federal Water Pollution Act, Sec. 404; 33 CFR 322-323; Rivers and Harbors Act, 33 USC 403, Section 10 Wetlands	Individual Permit	--(a)	--(a)	Excavation, dredging, and/or disposal of dredged material in navigable waters; filling of waters of U.S. Needed for construction/modification of the discharge structure, barge slip upgrade, and any filling of waters of U.S.	Ongoing
U.S. Fish and Wildlife Services (USFWS)	Endangered Species Act (ESA), Section 7 (16 USC 35); 50 CFR 402	Consultation regarding potential to adversely impact protected species (non-marine species) and critical habitats	--(a)	--(a)	Identification of protected species and critical habitats onsite and in the vicinity, assessment of project construction and/or operation impacts, and concurrence on appropriate mitigation.	Ongoing

Table 1.3-1 —{Federal, State and Local Authorizations}
(Page 2 of 4)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Anticipated Application Submittal Date
National Marine Fisheries Service (NMFS)	Magnuson-Stevens Fishery Conservation Act, Management Act, Section 305(b) (2)-(4)	Consultation regarding potential impacts to Essential Fish Habitat (EFH)	--(a)	--(a)	Identification of EFH in the site vicinity, assessment of project operations impacts, and concurrence on appropriate mitigation.	Ongoing
USFWS	Migratory Bird Treaty Act, 50 CFR 21	Migratory Bird Permit	--(a)	--(a)	Adverse impacts on protected species and/or their eggs or nests due to site operations	Ongoing
State Historic Preservation Office (SHPO)/	National Historic Preservation Act (NHPA); 36 CFR 800	Cultural Resources Review and Consultation	--(a)	--(a)	Identification, description, and evaluation of cultural resources on and in the site vicinity with the potential to be impacted by plant construction and/or operations. Concurrence on appropriate mitigation.	Ongoing
MDNR	Federal Water Pollution Control Act, 33 USC 1251 et seq., Title 10, Div. 20-7.031	Section 401 Water Quality Certification	--(a)	--(a)	Compliance with state water quality standards	Ongoing
MDNR	Federal Water Pollution Control Act, Section 402; 10 CSR 20-6	National Pollution Discharge Elimination System (NPDES) Permit	--(a)	--(a)	Discharge of industrial wastewater and stormwater during operation	Ongoing
MDNR	10 CSR 20-6. 200	General NPDES Permit for Stormwater associated with Construction Activity	--(a)	--(a)	Discharge of stormwater during construction	Ongoing
MDNR	Title 10, Division 20-6	Waterway and 100-Year Floodplain Permits	--(a)	--(a)	Any activity that changes the course, current, or cross-section of a non-tidal stream or body of water, including the 100-year floodplain	Ongoing
MDNR	Title 10, Division 20-6	Land Disturbance Permit	--(a)	--(a)	Land clearing, grading, or other earth disturbance (construction)	Ongoing
MDNR	Title 10, Division 20-6	SWPPP	--(a)	--(a)	Land development activity (construction and operation)	Ongoing

Table 1.3-1 —{Federal, State and Local Authorizations}
(Page 3 of 4)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Anticipated Application Submittal Date
U.S. Environmental Protection Agency (USEPA)	40 CFR 262.12	Hazardous Waste Generator Registration (USEPA Identification Number)	--(a)	--(a)	Generation and storage of hazardous waste for ≤90 days	Ongoing
MDNR	Title 10, Division 25-6	State Radioactive Materials License	--(a)	--(a)	Possession, use, acquisition, ownership, transfer of radioactive materials not regulated by NRC	Ongoing
MDNR	Title 10, Division 80	Solid Waste Disposal Facility Permit	--(a)	--(a)	On-site disposal of land-clearing and construction debris	Ongoing
MDNR	Title 10, Div. 20-10.010 Title 10, Div. 20-10.074	Oil Operations Permit	--(a)	--(a)	Storage of oil in aboveground storage tanks ≥10,000 gal and/or >1,000 gal of used oil	Ongoing
MDNR	Title 10, Division 10 Title 4, Div. 240-2.060 Title 4, Div. 240-2.170	State Air Permit to Construct - Construction Phase	--(a)	--(a)	Construction of construction phase air pollutant emission sources	Ongoing
MDNR	40 CFR 52.21; Title 10, Division 10 Title 4, Div. 240-2.060 Title 4, Div. 240-2.170	Prevention of Significant Deterioration (PSD) – Construction Phase	--(a)	--(a)	Construction and operation of construction-phase major stationary sources of attainment pollutants.	Ongoing
MDNR	Title 10, Div. 10-6.060	New Source Review (NSR) – Construction Phase	--(a)	--(a)	Construction of construction-phase major stationary sources of nonattainment pollutants.	Ongoing
MDNR	Title 10, Div. 10-6.065	State Air Permit to Operate	--(a)	--(a)	Operation of construction phase air pollutant emission sources	Ongoing
MDNR	10 CSR 10-6.060	State Air Permit to Construct – Operational Phase	--(a)	--(a)	Construction of operational phase air pollutant emission sources	Ongoing
MDNR	40 CFR 52.21; Title 10-6 Title 4, Div. 240-2.060 Title 4, Div. 240-2.170	Prevention of Significant Deterioration (PSD) – Operational Phase	--(a)	--(a)	Construction of major stationary sources of attainment pollutants for operational phase facilities.	Ongoing

Table 1.3-1 —{Federal, State and Local Authorizations}
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Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Anticipated Application Submittal Date
MDNR	Title 10, Division 6.060	New Source Review (NSR) – Operational Phase)	--(a)	--(a)	Construction of major stationary sources of attainment pollutants for operational phase facilities.	2010 or later (prior to activity)
MDNR	Title 10, Div. 10-6.065	Title V Operating Permit	--(a)	--(a)	Operation of facility with major stationary sources of air emissions	2010 or later (prior to activity)
MoDOT	Title 7	Highway Access Permit	--(a)	--(a)	Construction of new or modified entrances on state highways	2010 or later (prior to activity)
USEPA	40 CFR 82.162	Ozone-Depleting Substance (ODS) Compliance Certification	--(a)	--(a)	Recovery and recycling of ODS	2010 or later (prior to activity)
US Department of Transportation	49 CFR 107, Subpart G	Certificate of Registration	--(a)	--(a)	Transportation of hazardous materials	2010 or later (prior to activity)
(b)	Conservation Rule 1200-2-10.32		--(a)	--(a)	transportation of radioactive waste	

Notes:

- (a) Data not available. Applications for permits will be made before the beginning of construction or during construction, as required.
(b) State in which radioactive waste is delivered - to be determined.

1.4 REFERENCES

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