



**New and Significant Information Review**  
**River Bend Station License Renewal Environmental Report**

**May 2016**

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## 1.0 INTRODUCTION

Entergy Louisiana, LLC and Entergy Operations, Inc. (hereafter referred to as “Entergy”), conducted a “new and significant” information review to support Appendix E to the license renewal application, the Environmental Report (ER), to review information related to Category 1 issues as identified in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, and other issues that may have not been addressed in Revision 1 to the Nuclear Regulatory Commission’s (NRC’s) *NUREG-1437, Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants*.

## 2.0 NEW AND SIGNIFICANT REVIEW PROCESS

During preparation of the River Bend Station Unit 1 (RBS) ER, Entergy reviewed the analyses of the Category 1 issues discussed in the GEIS that were applicable to the site, and the permits and reference materials listed in Table 9.1-1 and Chapter 10 of the RBS ER, respectively. Entergy also conducted meetings and consultations with those state and federal agencies having regulatory oversight of RBS, requesting their input on issues that should be considered in the ER.

Entergy also utilized its existing in-house process for reviewing and evaluating environmental issues which could potentially be new and significant information. This process provided an additional means for Entergy to ensure that any potential new and significant information related to renewal of the RBS operating license was identified, reviewed, and addressed as appropriate. This process is collectively conducted by departments within Entergy’s nuclear corporate group and members composed of technical personnel from all Entergy nuclear sites involved in environmental compliance, environmental monitoring, environmental planning, natural resource management, and health and safety issues. This process identifies issues relevant to environmental matters through several avenues as follows:

- Participation in industry utility groups such as Edison Electric Institute, Electric Power Research Institute, Nuclear Energy Institute, and Utility Solid Waste Activities Group.
- Participation in non-utility groups such as the Institute of Hazardous Materials Management and National Registry of Environmental Professionals.
- Routine interface with non-nuclear Entergy business units such as Fossil, Transmission, and Corporate.
- Routine interface with regulatory agencies having oversight of the facility.
- Periodic reviews of proposed regulatory and legislative changes.
- Review of plant and site activities that are evaluated by Entergy fleet procedure EN-EV-115 (Environmental Reviews and Evaluations).

### 3.0 REVIEW OF CATEGORY 1 ISSUES NOT APPLICABLE TO RBS

A review of the Category 1 environmental issues was performed with regard to applicability to RBS. Entergy has determined that, of the 60 Category 1 issues as listed in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, six are not applicable to the RBS site because they apply to design or operational features that do not exist at the facility. Table 3.0-1 lists Category 1 issues not applicable to RBS, the rationale for considering them not applicable, and the GEIS sections where these issues were addressed.

**Table 3.0-1: Category 1 Issues Not Applicable to RBS**

<b>Resource</b>	<b>Applicability Rationale</b>	<b>GEIS Section</b>
<b><i>Land Use</i></b>		
Offsite land use in transmission line right-of-ways	All in-scope transmission lines subject to the evaluation of environmental impacts for license renewal are located within the RBS site property.	4.2.1.1
<b><i>Surface Water Resources</i></b>		
Altered salinity gradients	RBS does not discharge to an estuary.	4.5.1.1
Altered thermal stratification of lakes	RBS is not located on a lake.	4.5.1.1
Surface water use conflicts (plants with once-through cooling systems)	RBS utilizes a closed-cycle cooling system equipped with mechanical draft cooling towers for condenser cooling purposes.	4.5.1.1
<b><i>Groundwater Resources</i></b>		
Groundwater quality degradation (plants with cooling ponds in salt marshes)	RBS is located on a freshwater body and does not utilize cooling ponds.	4.5.1.2
<b><i>Terrestrial Resources</i></b>		
Cooling system impacts on terrestrial resources (plants with once-through cooling systems or cooling ponds)	RBS utilizes a closed-cycle cooling system equipped with mechanical draft cooling towers for condenser cooling purposes.	4.6.1.1

### 4.0 REVIEW OF CATEGORY 1 ISSUES APPLICABLE TO RBS

For the Category 1 issues applicable to RBS, Entergy performed a review to identify potential new and significant information to ensure the GEIS conclusions remained valid with regard to RBS operations during the license renewal term. Discussions of the review of the Category 1 issues applicable to RBS are presented in the following sections.

As a note, the Category 1 issues listed below relating to land use, air quality, noise, geology and soils, socioeconomics, waste management, uranium fuel cycle, and termination of nuclear power plant operations and decommissioning are discussed in Chapter 4 of the RBS ER; they are not included in the detailed Category 1 discussions

that follow, because it has already been determined that no new and significant information exists for them.

- Onsite land use (Section 4.1.1)
- Offsite land use (Section 4.1.2)
- Visual resources (Section 4.1.4)
- Air quality impacts (all plants) (Section 4.2.1)
- Air quality effects of transmission lines (Section 4.2.2)
- Noise impacts (Section 4.3)
- Geology and soils (Section 4.4)
- Employment and income, recreation and tourism (Section 4.8.1)
- Tax revenues (Section 4.8.2)
- Community services and education (Section 4.8.3)
- Population and housing (Section 4.8.4)
- Transportation (Section 4.8.5)
- Low-level waste storage and disposal (Section 4.11.1)
- Onsite storage of spent nuclear fuel (Section 4.11.2)
- Offsite radiological Impacts of spent nuclear fuel and high-level waste disposal (Section 4.11.3)
- Mixed waste storage and disposal (Section 4.11.4)
- Nonradioactive waste storage and disposal (Section 4.11.5)
- Offsite radiological impacts—individual impacts from other than the disposal of spent fuel and high-level waste (Section 4.13.1)
- Offsite radiological impacts—collective impacts from other than the disposal of spent fuel and high-level waste (Section 4.13.2)
- Nonradiological impacts of the uranium fuel cycle (Section 4.13.3)
- Transportation of radiological waste (Section 4.13.4)
- Termination of nuclear power plant operations and decommissioning (Section 4.14)

#### 4.1 Surface Water Resources

Entergy reviewed Category 1 issues related to surface water resources and identified no new and significant information. Table 4.1-1 presents the surface water issues applicable to the renewal of the RBS operating license. The issues are discussed in greater detail following Table 4.1-1.

**Table 4.1-1: Surface Water Resources**

Item No.	Issue	GEIS Section
<b><i>Surface Water Resources</i></b>		
1.	Surface water use and quality (non-cooling system impacts)	4.5.1.1
2.	Altered current patterns at intake and discharge structures	4.5.1.1
3.	Scouring caused by discharged cooling water	4.5.1.1
4.	Discharge of metals in cooling system effluent	4.5.1.1
5.	Discharge of biocides, sanitary wastes, and minor chemical spills	4.5.1.1
6.	Effects of dredging on surface water quality	4.5.1.1
7.	Temperature effects on sediment transport capacity	4.5.1.1

##### Item 1: Surface water use and quality (non-cooling system impacts)

As discussed in Section 2.3 of the RBS ER, no license-renewal-related refurbishment activities have been identified; therefore, there would be no associated license-renewal-related refurbishment impacts. In addition, no license-renewal-related construction activities have been identified; however as discussed in Section 3.4.3.2 of the RBS ER, any earth-disturbing activities would require the issuance of a LDEQ construction stormwater permit which would specify best management practices to reduce erosion caused by stormwater runoff, therefore minimizing the risk of pollution from soil erosion and sediment, and potentially from other pollutants that the stormwater may contact. As discussed in Section 3.5.1.1.2 of the RBS ER, the site maintains and implements a stormwater pollution prevention plan associated with operational industrial activities that identifies potential sources of pollution that would reasonably be expected to affect the quality of stormwater, and identifies best management practices that will be used to prevent or reduce the pollutants in stormwater discharges. For management of chemicals, best management practices are established in Entergy fleet procedures and site-specific spill prevention plans to prevent and minimize the potential for chemical releases to the environment as discussed in Section 3.5.4.2.2 of the RBS ER.

Therefore, no change in effects on surface water use and quality is anticipated during the license renewal term.

#### Item 2: Altered current patterns at intake and discharge structures

As discussed in Section 3.5.1 of the RBS ER, during the period 1965-2015, the minimum and maximum flows recorded near the RBS site were 111,000 cubic feet per second (cfs) and 1,619,000 cfs, respectively, with the mean flow rate during this same period being 514,080 cfs. As discussed in Section 3.5.3.1 of the RBS ER, when assuming a flow of 100,000 cfs, RBS would withdraw only approximately 0.04 percent of the flow in the Mississippi River. As shown in Figure 2.2-1 of the RBS ER, the average discharge flow at the discharge structure is approximately 5.04 MGD (7.8 cfs). Therefore, the potential to alter current patterns at the intake and discharge structures from RBS's water withdrawals and discharges, when compared with the flow rate of the Mississippi River by the RBS facility, would be insignificant. Because no change in design and operation of the RBS's cooling system is planned for the license renewal term, no change in effects as it relates to altering current patterns is anticipated.

#### Item 3: Scouring caused by discharged cooling water

As discussed in Section 3.5.1 of the RBS ER, during the period 1965-2015, the minimum and maximum flows recorded near the RBS site were 111,000 cfs and 1,619,000 cfs, respectively, with the mean flow rate during this same period being 514,080 cfs. These high currents result in repeated scouring of the river bottom as discussed in Section 3.6.6.1 of the RBS ER. As previously discussed in Item 2 above, the average discharge flow at the discharge structure is approximately 5.04 MGD (7.8 cfs). Therefore, the potential for additional scouring from RBS thermal discharges when compared with the flow rate of the Mississippi River by the RBS facility would be insignificant. Because no change in design and operation of the RBS's cooling system is planned for the license renewal term, no change in effects as it relates to scouring is anticipated.

#### Item 4: Discharge of metals in cooling system effluent

As discussed in Section 3.5.1.2.1 of the RBS ER, Louisiana Pollutant Discharge Elimination System (LPDES) Outfall 301 (mobile metal cleaning wastewater), is permitted to receive metal cleaning wastewaters. There have been no discharges from this outfall since the permit was re-issued in 1999. Discharges of metal cleaning wastewaters are governed by conditions established in the RBS LPDES permit to be protective of Louisiana's water quality standards.

#### Item 5: Discharge of biocides, sanitary wastes, and minor chemical spills

RBS uses chemical additives that are approved by the Louisiana Department of Environmental Quality (LDEQ) in its plant systems that discharge to outfalls, and discharges are governed by conditions established in RBS's LPDES Permit LA0042731. The compliance status of RBS with its LPDES permit is discussed in Section 9.5.1.2 of the RBS ER. As discussed in Section 9.5.1.2 of the RBS ER, compliance for the past 5



years (2011–2015) has been excellent, as related to the permitted parameters identified in Table 3.5-1 of the RBS ER.

As discussed in Section 3.5.1.2.3 of the RBS ER, with the exception of two MO-DAD sanitary treatment units which utilize a leach-field system, sanitary wastewater from all plant locations is transferred to the onsite sanitary sewage treatment system where it is managed appropriately. Discharges of sanitary wastewaters (Outfall 201) are regulated by RBS's LPDES Permit LA0042731, prior to discharging either to the Mississippi River via LPDES Outfall 001 (cooling tower blowdown), or Grant's Bayou via Outfall 002 (stormwater runoff) when discharging a mixture of sanitary and maintenance wastewaters. The MO-DAD leach-field systems generate no surface wastewater discharges and are regulated under the Louisiana Department of Health and Hospitals (LDHH) Permit Numbers 1030185 and 1089509, as discussed in Section 9.5.1.4 of the RBS ER.

Section 3.5.4.2.2 of the RBS ER provides information on the various programs, procedures, and plans Entergy has implemented at RBS to manage chemicals, waste, and permitted releases to prevent contamination of the environment. These consist of waste management and chemical control program procedures, and site-specific stormwater pollution prevention and spill prevention plans. Chapter 9 of the RBS ER provides a detailed discussion which demonstrates that the site is in compliance with the various federal and state programs for wastewater discharges and spill prevention.

#### Item 6: Effects of dredging on surface water quality

As discussed in Section 3.5.1.2.4 of the RBS ER, RBS performs annual maintenance dredging for the removal of no greater than 125,000 cubic yards of silt accumulation around the intake screens in the Mississippi River in accordance with a USACE NOD-23 general permit. The dredging material is deposited back into deeper portions of the Mississippi River in accordance with the permit.

It was determined in Section 4.5.1.1 of the GEIS that dredging activities would be performed under permits issued by the U.S. Army Corps of Engineers, and possibly from state or local agencies, which by federal and state statutes under the Section 401 (Certification) and Section 404 (Permits) of the Clean Water Act would regulate the physical alteration of water bodies. Therefore, conditions established in the dredging permits and LPDES permit, if required, would ensure that impacts to water quality are minimized.

#### Item 7: Temperature effects on sediment transport capacity

As discussed in Section 2.2.2.2 of the RBS ER, the thermal plume in the Mississippi River associated with RBS's thermal discharges is expected to be minimal because RBS utilizes a closed-cycle cooling heat dissipation system. Additionally, the discharge flow rate (7.8 cfs) would be minor when compared with river flows exhibited by the Mississippi River. As discussed in Section 3.5.1 of the RBS ER, during the period 1965-

2015, the minimum and maximum flows recorded near the RBS site were 111,000 cfs and 1,619,000 cfs, respectively, with the mean flow rate during this same period being 514,080 cfs. Finally, the thermal discharge limitations established in RBS's LPDES Permit LA0042731 are a monthly average of 105°F with a daily maximum temperature of 110°F. Because no change in design and operation of RBS's cooling system is planned for the license renewal term, no change in effects as it relates to sediment transport capacity is anticipated.

#### **4.2 Groundwater Resources**

Entergy reviewed Category 1 issues related to groundwater resources and identified no new and significant information. Table 4.2-1 presents the groundwater issues applicable to the renewal of the RBS operating license. The issues are discussed in greater detail following Table 4.2-1.

**Table 4.2-1: Groundwater Resources**

<b>Item No.</b>	<b>Issue</b>	<b>GEIS Section</b>
<b><i>Groundwater Resources</i></b>		
1.	Groundwater contamination and use (non-cooling system impacts)	4.5.1.2
2.	Groundwater use conflicts (plants that withdraw less than 100 gallons per minute)	4.5.1.2
3.	Groundwater quality degradation resulting from water withdrawals.	4.5.1.2

##### Item 1: Groundwater contamination and use (non-cooling system impacts)

As discussed in Section 2.3 of the RBS ER, no license-renewal-related refurbishment activities have been identified; therefore, there would be no associated license-renewal-related refurbishment impacts. Sections 3.5.1.2 and 3.5.4.2.2 of the RBS ER provides information on the various programs, procedures, and plans that Entergy has implemented at RBS to manage chemicals, waste, and permitted releases to prevent contamination of the environment. These consist of waste management and chemical control program procedures, stormwater pollution prevention and spill prevention plans, and an LPDES permit that establishes conditions regarding LPDES-permitted discharges. Chapter 9 of the RBS ER provides a detailed discussion that demonstrates RBS is in compliance with the various federal and state programs for wastewater discharges and spill prevention.

##### Item 2: Groundwater use conflicts (plants that withdraw less than 100 gallons per minute)

As discussed in Section 3.5.3.2 of the RBS ER, there are four water supply wells at the existing RBS facility that are used for industrial purposes. Two of the wells (wells P-1A and P-1B) are screened within the tertiary Zone 3 aquifer (2,800 foot-sands) and are

used to supply water for general site purposes, including plant makeup water. A third well (Well BP-1) is screened in the tertiary Zone 1 aquifer (1,200 foot-sands) and is used for sanitary supply, air conditioning, and landscape maintenance. The fourth well (Well P-5) is screened within the Upper Terrace Aquifer (UTA) and is used for normal fire protection. There is also a monitoring well (MW-125) screened within the UTA that is currently being utilized to remediate tritium-contaminated water. Based on the previous five years (2011–2015), annual average water withdrawals from the five wells listed above have ranged from 7 to 42 gallons per minute (gpm) in the tertiary Zone 3 aquifer (2,800 foot sands), 0.3 to 2 gpm in the tertiary Zone 1 aquifer (1,200 foot-sands), and 1 to 4 gpm in the UTA. Due to the small withdrawal rates, Entergy is not aware of any conflicts with offsite groundwater users. Because no change in RBS’s groundwater withdrawals is planned for the license renewal term, no change in effects as it relates to groundwater use conflicts is anticipated.

Item 3: Groundwater quality degradation resulting from water withdrawals

The four groundwater wells utilized for industrial purposes that are listed in Item 2 above are not located near the Mississippi River as shown in Figure 3.5-7 of the RBS ER. These wells are identified in Figure 3.5-7 of the RBS as 125-246 (P-1B), 125-257 (P-1A), 125-256 (P-5) and 125-266 (BP-1). In addition, unlike the Ranney Well example discussed in Section 4.5.1.2 of the GEIS, annual average withdrawal rates associated with RBS’s four groundwater wells are significantly less than 100 gpm. Therefore, the probability of drawing lower-quality river water into the aquifer as a function of the interaction between groundwater and surface water are minimal.

Since the RBS facility is located on a freshwater body and not a coastal area, the potential to cause saltwater intrusion into an aquifer is nonexistent.

**4.3 Aquatic Resources**

Entergy reviewed Category 1 issues related to aquatic resources and identified no new and significant information. Table 4.3-1 presents the aquatic issues applicable to the renewal of the RBS operating license. The issues are discussed in greater detail following Table 4.3-1.

**Table 4.3-1: Aquatic Resources**

Item No.	Issue	GEIS Section
<b><i>Aquatic Resources</i></b>		
1.	Impingement and entrainment of aquatic organisms (plants with cooling towers)	4.6.1.2
2.	Entrainment of phytoplankton and zooplankton (all plants)	4.6.1.2

3.	Thermal impacts on aquatic organisms (plants with cooling towers)	4.6.1.2
4.	Infrequently reported thermal impacts (all plants)	4.6.1.2
5.	Effects of cooling water discharge on dissolved oxygen, gas supersaturation, and eutrophication	4.6.1.2
6.	Effects of nonradiological contaminants on aquatic organisms	4.6.1.2
7.	Exposure of aquatic organisms to radionuclides	4.6.1.2
8.	Effects of dredging on aquatic organisms	4.6.1.2
9.	Effects on aquatic resources (non-cooling system impacts)	4.6.1.2
10.	Impacts of transmission ROW management on aquatic resources	4.6.1.2
11.	Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses	4.6.1.2

Item 1: Impingement and entrainment of aquatic organisms (plants with cooling towers)

Because RBS utilizes a closed-cycle cooling system, impacts to aquatic organisms are expected to be small, consistent with the conclusion made in Section 4.6.1.2 of the GEIS.

As discussed in Section 2.2.2 of the RBS ER, the river intake screens are octagonal in shape (similar to wedge-wire screens) and are sized so that the average intake flow velocity is less than 0.5 feet per second; thereby, decreasing the possibility that aquatic organisms become impinged or entrained at the intake screens.

As discussed in Section 3.5.1 of the RBS ER, during the period 1965-2015, the minimum and maximum flows recorded near the RBS site were 111,000 cfs and 1,619,000 cfs, respectively, with the mean flow rate during this same period being 514,080 cfs. The probable minimum flow rate of the Mississippi River at RBS during the operating life of the station is not anticipated to be less than 100,000 cfs. As discussed in Section 2.2.2 of the RBS ER, RBS withdraws cooling water from the Mississippi River through two intake screens at a design flow rate of 16,000 gpm (23.04 million gallons per day). Although the lowest flow recorded over the previous 50 years (1965–2015) was 111,000 cfs as discussed above, when assuming a flow of 100,000 cfs, RBS would withdraw only approximately 0.04 percent of the flow in the Mississippi River.

Most studies of the Lower Mississippi River (LMR) show higher fish densities at the channel bank and backwaters compared to the main channel, where the RBS intake

screens are located. As discussed in Section 3.6.6.1.4 of the RBS ER, two major conclusions can be drawn from extensive literature review regarding fisheries in the Lower Mississippi River (LMR): (1) population density and diversity are higher in the channel border and backwaters than in the main channel, and (2) the overall fisheries in the LMR have not changed substantially since the 1970s.

Although there are no changes in the operation of the cooling system planned during the license renewal term, due to the quantity of water withdrawn from the Mississippi River in comparison to the quantity of water passing by the intake screens, and the absence of significant fish populations at the intake screens, it is anticipated that there will be no change in effects on impingement and entrainment aquatic organisms during the license renewal term.

#### Item 2: Entrainment of phytoplankton and zooplankton (all plants)

Distribution of phytoplankton within the river is extremely variable, although densities are usually greatest along the western shore (opposite the RBS site), particularly during low river stages as discussed in Section 3.6.6.1.2 of the RBS ER. As discussed in Section 3.6.6.1 of the RBS ER, the growth of phytoplankton is restricted due to very limited light penetration. Productivity of the phytoplankton is further limited by the high turbulence and mixing in the Mississippi River, which may prevent phytoplankton from remaining in the euphotic zone for sufficient lengths of time to effectively photosynthesize.

As discussed in Section 5.5.2.1 of the RBS Final Environmental Statement, about 46 percent of the zooplankton population occurs at the eastern side of the river. If one assumes that flow is equally proportioned across the river's width, approximately 0.09 percent of the total zooplankton population will be withdrawn under average operating conditions. During worst case conditions (low river flow and maximum intake volume), about 0.5 percent of the total zooplankton population could be entrained.

Because no change in design and operation of RBS's cooling system is planned for the license renewal term, and RBS withdraws only approximately 0.04 percent of the flow in the Mississippi River as discussed in Item 1 above, no change in effects on entrainment of phytoplankton and zooplankton during the license renewal term is anticipated.

#### Item 3: Thermal impacts on aquatic organisms (plant with cooling towers)

As discussed in Section 2.2.2.2 of the RBS ER, thermal discharges to the Mississippi River are continuously monitored by a recorder and plant monitoring computer that are located approximately 0.9 miles from the Mississippi River. Therefore, the temperature of the thermal discharge at the point it enters into the Mississippi River is anticipated to be less than recorded measurements.

The thermal plume in the Mississippi River associated with RBS's thermal discharges is expected to be minimal since the plant utilizes a closed-cycle cooling heat dissipation system, and the discharge flow rate (7.8 cfs) would be minor when compared with river flows exhibited by the Mississippi River. In addition, thermal discharge limitations are

established in RBS's LPDES Permit LA0042731 to ensure that water quality standards are met. These limitations are a monthly average of 105°F with a daily maximum temperature of 110°F. Based on review of records over the previous years (2011-2015), there have been no exceedances associated with these limitations.

Item 4: Infrequently reported thermal impacts (all plants)

As discussed in Section 3.5.1 of the RBS ER, during the period 1965-2015, the minimum and maximum flows recorded near the RBS site were 111,000 cfs and 1,619,000 cfs, respectively, with the mean flow rate during this same period being 514,080 cfs. The probable minimum flow rate of the Mississippi River at RBS during the operating life of the station is not anticipated to be less than 100,000 cfs. As discussed in Section 2.2.2.2 of the RBS ER, the thermal plume in the Mississippi River associated with RBS's thermal discharges is expected to be minimal because RBS utilizes a closed-cycle cooling heat dissipation system, and the discharge flow rate (7.8 cfs) would be minor when compared with river flows exhibited by the Mississippi River.

Because of the location of the discharge, it does not block the movement of fish, either upstream or downstream at the RBS plant. In addition, the LDEQ has set thermal discharge numerical temperature limits in RBS's LPDES Permit LA0042731 of 105°F monthly average with a daily maximum temperature of 110°F. No thermal exceedances have occurred over the previous five years (2011-2015).

Because no change in design and operation of the RBS cooling system is planned for the license renewal term, no change in effects as it relates to thermal impacts is anticipated.

Item 5: Effects of cooling water discharge on dissolved oxygen, gas supersaturation, and eutrophication

As discussed in Item 5 above, the cooling water discharge flow rate (7.8 cfs) is minor when compared with river flows exhibited by the Mississippi River. However based on the October 2011 RBS LPDES Permit LA0042731, there are no monitoring requirements for dissolved oxygen or other related monitoring requirements associated with cooling water discharges (Outfall 001). In addition, there are no monitoring requirements in the 2011 RBS LPDES Permit LA0042731 as it relates to gas supersaturation.

As discussed in Section 3.5.4.1 of the RBS ER, nutrient concentrations in the Mississippi River are believed to be primarily derived from nonpoint pollution sources such as runoff from the landscape, and not attributed to point-source, or end-of-the-pipe discharges. However, some nutrient load from the Mississippi River is vital to maintaining the productivity of the extremely valuable Gulf of Mexico fisheries. Approximately 40 percent of the U.S. fisheries landings come from this productive zone influenced by nutrient-rich Mississippi River outflow located in the north-central Gulf of Mexico. Public concern exists over the potential for nutrient pollution (eutrophication) where river water is used in coastal restoration projects. Yet, recent research suggests that under current flow regimes these inputs are rapidly assimilated.

Therefore, no change in effects as it relates to RBS's cooling water discharges on dissolved oxygen, gas supersaturation, and eutrophication during the license renewal term is anticipated.

#### Item 6: Effects of nonradiological contaminants on aquatic organisms

RBS uses chemical additives that are approved by the LDEQ in its plant systems that discharge to outfalls, and discharges are governed by conditions established in RBS's LPDES Permit LA0042731. The status of RBS's compliance with its LPDES permit is discussed in Section 9.5.1.2 of the RBS ER. As discussed in Section 9.5.1.2 of the ER, compliance for the past five years (2011–2015) has been excellent as related to the permitted parameters identified in Table 3.5-1 of the RBS ER.

As discussed in Section 3.5.1.2.1 of the RBS ER, LPDES Outfall 301 (mobile metal cleaning wastewater), is permitted to receive metal cleaning wastewaters. There have been no discharges from this outfall since the permit was re-issued in 1999. Discharges of metal cleaning wastewaters are governed by conditions established in the RBS LPDES permit to be protective of Louisiana's water quality standards.

As discussed in Section 3.5.1.2.3 of the RBS ER, with the exception of two MO-DAD sanitary treatment units which utilize a leach-field system, sanitary wastewater from all plant locations is transferred to the onsite sanitary sewage treatment system where it is managed appropriately. Discharges of sanitary wastewaters (Outfall 201) are regulated by RBS's LPDES Permit LA0042731, prior to discharging either to the Mississippi River via LPDES Outfall 001 (cooling tower blowdown), or Grant's Bayou via Outfall 002 (stormwater runoff) when discharging a mixture of sanitary and maintenance wastewaters. The MO-DAD leach-field systems generate no surface wastewater discharges and are regulated under the LDHH Permit Numbers 1030185 and 1089509, as discussed in Section 9.5.1.4 of the RBS ER.

Section 3.5.4.2.2 of the RBS ER provides information on the various programs, procedures, and plans Entergy has implemented at RBS to manage chemicals, waste, and permitted releases to prevent contamination of the environment. These consist of waste management and chemical control program procedures, and site-specific stormwater pollution prevention and spill prevention plans. Chapter 9 of the RBS ER provides a detailed discussion which demonstrates that the site is in compliance with the various federal and state programs for wastewater discharges and spill prevention.

Because no change in design and operation of the RBS is planned for the license renewal term, and discharges will continue to be subject to LPDES permitting requirements, no change in effects of contaminants on aquatic biota is anticipated.

#### Item 7: Exposure of aquatic organisms to radionuclides

Section 3.9.1.2 of the RBS ER presents information on the radiological environmental monitoring efforts around the RBS site. As discussed in Section 3.9.1.2 of the RBS ER, RBS has an ongoing radiological environmental monitoring program (REMP) that

includes sampling indicator and control locations to show any increases or buildup of radioactivity that might occur. The REMP includes monitoring the following exposure pathways: airborne, direct radiation, waterborne, and ingestion. As discussed in Section 3.9.1.2 of the RBS ER, based on 5 years of monitoring (2011–2015), RBS has observed no adverse trends (i.e., steadily increasing build-up of radioactivity levels) and no measurable impact to the environment from RBS operations. Therefore, no change in effects of radionuclides on aquatic biota during the license renewal term is anticipated.

#### Item 8: Effects of dredging on aquatic organisms

As discussed in Section 3.5.1.2.4 of the RBS ER, RBS performs annual maintenance dredging for the removal of no greater than 125,000 cubic yards of silt accumulation around the intake screens in the Mississippi River in accordance with a USACE NOD-23 general permit. The dredging material is deposited back into deeper portions of the Mississippi River in accordance with the permit.

It was determined in Section 4.5.1.1 of the GEIS that dredging activities would be performed under permits issued by the U.S. Army Corps of Engineers, and possibly from state or local agencies, which by federal and state statutes under the Section 401 (Certification) and Section 404 (Permits) of the Clean Water Act would regulate the physical alteration of water bodies. Therefore, conditions established in the dredging permits and LPDES permit, if required, would ensure that impacts to water quality are minimized.

#### Item 9: Effects on aquatic resources (non-cooling system impacts)

As discussed in Section 2.3 of the RBS ER, no license-renewal-related refurbishment activities have been identified; therefore, there would be no associated license-renewal-related refurbishment impacts.

No license-renewal-related construction activities have been identified; however as discussed in Section 3.4.3.2 of the RBS ER, any earth-disturbing activities would require the issuance of a LDEQ construction stormwater permit which would specify best management practices to reduce erosion caused by stormwater runoff, therefore minimizing the risk of pollution from soil erosion and sediment, and potentially from other pollutants that the stormwater may contact. As discussed in Section 3.5.1.1.2 of the RBS ER, the site maintains and implements a stormwater pollution prevention plan associated with operational industrial activities that identifies potential sources of pollution that would reasonably be expected to affect the quality of stormwater, and identifies best management practices that will be used to prevent or reduce the pollutants in stormwater discharges.

For management of chemicals, best management practices are established in Entergy fleet procedures and site-specific spill prevention plans to prevent and minimize the potential for chemical releases to the environment as discussed in Section 3.5.4.2.2 of the RBS ER.



As discussed in Section 3.6.9 of the RBS ER, Entergy relies on administrative controls and other regulatory programs to ensure that habitats are protected as a result of a change in plant operations or prior to ground-disturbing activities. The administrative controls, as discussed in Section 9.6 of the RBS ER, involve reviewing the change, identifying effects (if any) on the environmental resource area (i.e., habitat and wildlife), establishing best management practices, modifying existing permits, or acquiring new permits as needed to minimize impacts. Existing regulatory programs that the site is subject to, as discussed in Chapter 9 of the RBS ER, also ensure that habitats and wildlife are protected.

Because no license-renewal-related refurbishment or construction activities have been identified, and administrative and regulatory controls are in place, no change in non-cooling system effects on aquatic resources are anticipated.

#### Item 10: Impacts of transmission line ROW management on aquatic resources

In-scope transmission lines are shown in Figure 2.2-5 of the RBS ER. As discussed in Section 2.2.5.2 of the RBS ER, there is a limited amount of right-of-way (ROW) associated with the two in-scope transmission lines, because the lines cross the RBS industrial area, where vegetation is sparse. For the approximately 8 acres where a transmission line ROW exists, Entergy maintains the ROW by applying spot herbicide treatments to treat undesirable brush and woody vegetation on a 2-year cycle. Typical herbicides applied in the ROW away from areas near aquatic sites include Milestone®, while Rodeo® and Garlon® 3A are utilized in areas near aquatic sites. All chemical herbicide mixtures/formulations are applied according to label directions and/or manufacturer recommendations by licensed companies with qualified applicators, which ensure that proper protocols are followed when applying herbicides near streams or wetlands. Therefore, no change in effects on aquatic resources in the ROW is anticipated during the license renewal term.

#### Item 11: Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses

The thermal plume in the Mississippi River associated with RBS's thermal discharges is expected to be minimal because RBS utilizes a closed-cycle cooling heat dissipation system, and the discharge flow rate (7.8 cfs) would be minor when compared with river flows exhibited by the Mississippi River. Because of the location of the discharge, it does not block the movement of fish, either upstream or downstream at the RBS plant. In addition, the LDEQ has set thermal discharge numerical temperature limits in RBS's LPDES Permit LA0042731 of 105°F monthly average with a daily maximum temperature of 110°F. No thermal exceedances have occurred over the previous five years (2011-2015). Therefore, it is unlikely that RBS's thermal discharge would increase the susceptibility of fish to diseases and parasites.

#### 4.4 Terrestrial Resources

Entergy reviewed Category 1 issues related to terrestrial resources and identified no new and significant information. Table 4.4-1 presents the terrestrial issues applicable to the renewal of the RBS operating license. The issues are discussed in greater detail following Table 4.4-1.

**Table 4.4-1: Terrestrial Resources**

Item No.	Issue	GEIS Section
<b>Terrestrial Resources</b>		
1.	Exposure of terrestrial organisms to radionuclides	4.6.1.1
2.	Cooling tower impacts on vegetation (plants with cooling towers)	4.6.1.1
3.	Bird collisions with plant structures and transmission lines	4.6.1.1
4.	Transmission line ROW management impacts on terrestrial resources	4.6.1.1
5.	Electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock)	4.6.1.1

##### Item 1: Exposure of terrestrial organisms to radionuclides

Section 3.9.1.2 of the RBS ER presents information on the radiological environmental monitoring efforts around the RBS site. As discussed in Section 3.9.1.2 of the RBS ER, RBS has an ongoing radiological environmental monitoring program (REMP) that includes sampling indicator and control locations to show any increases or buildup of radioactivity that might occur. The REMP includes monitoring the following exposure pathways: airborne, direct radiation, waterborne, and ingestion. As discussed in Section 3.9.1.2 of the RBS ER, based on 5 years of monitoring (2011–2015), RBS has observed no adverse trends (i.e., steadily increasing build-up of radioactivity levels) and no measurable impact to the environment from RBS operations. Therefore, no change in effects of radionuclides on terrestrial biota during the license renewal term is anticipated.

##### Item 2: Cooling tower impacts on vegetation (plants with cooling towers)

As discussed in Section 5.14.1 of the RBS Final Environmental Statement, RBS was required to monitor the impacts of cooling tower drift using stereo false color infrared aerial photographs of the site. Photographs were taken during the two years preceding initiation of cooling tower operation, and during the following first and third years. Based on this monitoring study, no adverse effects were observed, and the study was deemed complete as specified in Section 4.2 (Environmental Monitoring) of the Environmental

Protection Plan (Appendix B to the RBS operating license), with no further monitoring required.

As discussed in Section 5.3.3.2.1 of the River Bend Station Unit 3 combined license application environmental report, monitoring results from a sample of nuclear plants, in conjunction with literature review and information provided by the natural resources agency and agricultural agencies in all states with nuclear power plants, have revealed no instances where cooling tower operation has resulted in measurable degradation of the health of natural plant communities.

As there are no planned changes in the design and operation of the RBS cooling towers during the license renewal term, no change in effects as it relates to cooling tower impacts on vegetation is anticipated.

### **Item 3: Bird collisions with plant structures and transmission lines**

Based on a review of site condition reporting records over the previous five years (2011–2015), which typically document observed bird deaths, there have been five documented events where dead birds were observed on site (CR-RBS-2011-05362; CR-RBS-2011-05783; CR-RBS-2012-03648; CR-RBS-2012-04683; CR-RBS-2015-08899). None of these events triggered any reporting requirements associated with Section 4.1 (Unusual or Important Environmental Events) of the Environmental Protection Plan (Appendix B to the RBS operating license).

Based on the discussion in the condition reports, none of the deaths were related to collisions with plant structures or transmission lines. Since there have been no adverse trend noted on the RBS site as it relates to bird deaths, no change in effects with bird collisions with plant structures and transmission lines are anticipated during the license renewal term.

### **Item 4: Transmission line ROW management impacts on terrestrial resources**

In-scope transmission lines are shown in Figure 2.2-5 of the RBS ER. As discussed in Section 2.2.5.2, there is a limited amount of ROW associated with the two in-scope transmission lines, because the lines cross the RBS industrial area, where vegetation is sparse. For the approximately 8 acres where a transmission line ROW exists, Entergy maintains the ROW by applying spot herbicide treatments to treat undesirable brush and woody vegetation on a 2-year cycle. All chemical herbicide mixtures/formulations are applied according to label directions and/or manufacturer recommendations by licensed companies with qualified applicators, which ensure that proper protocols are followed when applying herbicides near streams or wetlands. Therefore, no change in effects on terrestrial resources as it relates to ROW management activities are anticipated during the license renewal term.

Item 5: Electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock)

Section 4.6.1.1 of the GEIS re-affirmed, after literature review of the issue, no significant impacts of electromagnetic fields on terrestrial biota have been identified and the potential impact of electromagnetic fields on terrestrial biota is expected to be of small significance for all nuclear power plants. Furthermore, the NRC stated that the only potential mitigation would be to exclude plants and animals from the ROW, a measure with very severe impacts of its own.

As discussed in Section 2.2.5.1, all in-scope transmission lines are located completely within the Entergy-owned property; therefore, livestock are not present. In addition, in-scope transmission lines do not cross agricultural lands. As described above in Item 4, there is a limited amount of ROW associated with the two in-scope transmission lines, because the majority of the lines cross the RBS industrial area where vegetation is sparse. For the remaining ROW areas, it is anticipated that the presence of wildlife would be minimal because habitat is spotty. Therefore, no change in electromagnetic field effects on flora and fauna are anticipated during the license renewal period.

**4.5 Human Health**

Entergy reviewed Category 1 issues related to human health and identified no new and significant information. Table 4.5-1 presents the human health issues applicable to the renewal of the RBS operating license. The issues are discussed in greater detail following Table 4.5-1.

**Table 4.5-1: Human Health**

<b>Item No.</b>	<b>Issue</b>	<b>GEIS Section</b>
<b>Human Health</b>		
1.	Radiation exposures to the public	4.9.1.1.1
2.	Radiation exposures to the plant workers	4.9.1.1.1
3.	Human health impact from chemicals	4.9.1.1.2
4.	Microbiological hazards to plant workers	4.9.1.1.3
5.	Physical occupational hazards	4.9.1.1.5

Item 1: Radiation exposures to public

As discussed in Section 2.3 of the RBS ER, no license-renewal-related refurbishment activities have been identified; therefore, there would be no associated license-renewal-related refurbishment impacts. As discussed in Section 3.9.1.1 of the RBS ER, liquid and gaseous radioactive effluents are monitored as required by the RBS's Offsite Dose

Calculation Manual (ODCM). Based on monitoring conducted over the previous five years (2011–2015), all site boundary doses and dose rates, and all doses to members of the public due to effluent releases, were within the limits specified by the ODCM, 10 CFR Part 20, 40 CFR Part 190, and Appendix I to 10 CFR Part 50.

As discussed in Section 3.9.1.2 of the RBS ER, RBS has an ongoing REMP that includes sampling indicator and control locations to show any increases or buildup of radioactivity that might occur. As discussed in Section 3.9.1.2 of the RBS ER, the results of the REMP over the previous five years (2011–2015) indicate no significant or measurable radiological impact attributable to RBS operations. Therefore, no change in effects to radiation exposure to the public is anticipated during the license renewal term.

#### Item 2: Radiation exposures to plant workers

As discussed in Section 2.3 of the RBS ER, no license-renewal-related refurbishment activities have been identified; therefore, there would be no associated license-renewal-related refurbishment impacts. As discussed in Section 3.9.1.3 of the RBS ER, the NRC reviewed occupational exposure for all nuclear power reactors in NUREG-0713, indicating that the 3-year average (2010–2012) collective total effective dose equivalent (TEDE) (sum of dose for all exposed workers) for RBS was approximately 95 person-rem per reactor as compared to the national average collective dose for all boiling water reactors (BWRs) of approximately 133 person-rem for the same 3-year period. The average TEDE per RBS worker over this period (2010–2012) was 0.084 rem as compared to the national average of 0.123 rem for all BWRs. The average TEDE per megawatt generated per year was 0.10 rem for RBS as compared to the national average of 0.15 rem for BWRs.

In 2013, which was an outage year, the collective TEDE for RBS was approximately 188 person-rem and in 2014, a non-outage year, the collective TEDE was 16.1 person-rem. Based on NRC historical data published in Table 3.9-8 of the GEIS for the period 1993–2006, RBS's occupation radiation exposures fall within the range of those for other operating BWRs. As there are no expected increases in occupational exposure due to license renewal, no change in effects of radiation exposure to plant workers during the license renewal period is anticipated.

#### Item 3: Human health impact from chemicals

As discussed in Section 2.3 of the RBS ER, no license-renewal-related refurbishment activities have been identified; therefore, there would be no associated license-renewal-related refurbishment impacts. Section 3.5.4.2.2 of the RBS ER provides information on the various programs, procedures, and plans Entergy has implemented at RBS to manage chemicals, waste, and permitted releases to prevent contamination of the environment. These consist of waste management and chemical control program procedures, and site-specific stormwater pollution prevention and spill prevention plans. Chapter 9 of the RBS ER provides a detailed discussion which demonstrates that the site

is in compliance with the various federal and state programs for wastewater discharges and spill prevention.

RBS's discharges are governed by conditions established in RBS's LPDES Permit LA0042731. The status of RBS's compliance with its LDPEs permit is discussed in Section 9.5.1.2 of the RBS ER. Compliance for the past 5 years (2011–2015) has been excellent as related to the permitted parameters identified in Table 3.5-1 of the RBS ER.

As discussed in Item 5 below, RBS's recordable cases with regard to occupational illnesses and injury indicate that RBS's occupational health and safety programs are effective in protecting workers for all hazards, including chemical hazards.

Because no changes in RBS's operation is planned for the license renewal term, and discharges will continue to be subject to LPDES permitting requirements, no change in effects on human health impact from chemicals is anticipated.

#### Item 4: Microbiological hazards to plant workers

As discussed in Section 3.9.2 of the RBS ER, exposure to *Legionella* spp. from power plant operations is a potential problem for a subset of the workforce. Plant personnel most likely to come in contact with *Legionella* aerosols would be workers who dislodge biofilms, where *Legionella* are often concentrated, such as during the cleaning of condenser tubes and cooling towers. During such cleaning activities, plant workers are protected by an industrial hygiene fleet procedure that provides a standard methodology for identifying industrial hazards prior to performance of jobs. Under this procedure, possible factors that may influence safe execution of the job, including chemical and biological hazards, would be considered and appropriate worker protection measures would be designated for use during performance of the work. Therefore, no change in effects of microbiological hazards to plant workers during the license renewal term is anticipated.

#### Item 5: Physical occupational hazards

As discussed in Section 4.9.1.1.5 of the GEIS, the utility industry has an occupational safety record that is better than other industry sectors in the United States. Based on Entergy Nuclear's Fleet Scorecards for 2014 and 2015, RBS's average rate for non-fatal occupational illnesses and injuries per 200,000 worker-hours was 0.12 in 2014 and 0.0 in 2015. The 2014 incidence rate for the electric power generation section based on the Bureau of Labor Statistics was 2.1 (<http://www.bls.gov/iif/oshwc/osh/os/ostb4343.pdf>). Therefore, RBS's incidence rate compares favorably to the national average for the electric power generation sector.

### **4.6 Postulated Accidents**

Entergy reviewed Category 1 issues related to postulated accidents and identified no new and significant information. Table 4.6-1 presents the postulated accident issues applicable

to the renewal of the RBS operating license. The issues are discussed in greater detail following Table 4.6-1.

**Table 4.6-1: Postulated Accidents**

Item No.	Issue	GEIS Section
<b><i>Postulated Accidents</i></b>		
1.	Design-basis accidents	4.9.1.2

Item 1: Design basis accidents

Design basis accidents are those that both the licensee and the NRC staff evaluate to ensure that the plant meets acceptable design and performance criteria. During the integrated plant assessment, the license renewal team evaluated RBS systems, structures, and components (SSCs) and conducted a time-limited aging analyses to ensure that SSCs remain capable of performing their functions consistent with existing plant design and performance criteria specified in the RBS licensing basis (see Appendix B of the RBS License Renewal Application). The current design and performance criteria will be maintained during the license renewal term; therefore, the conclusion of small impacts in the GEIS remains valid.

**5.0 Consultations**

Entergy consulted with the tribal, federal, and state agencies listed below. During these consultations, no information was obtained from the agencies which would be classified as new and significant.

Tribal

- Chitimacha Tribe of Louisiana
- Choctaw Nation of Oklahoma
- Coushatta Tribe of Louisiana
- Jena Band of Choctaw Indians
- Mississippi Band of Choctaw Indians
- Tunica-Biloxi Tribe of Louisiana

Federal

- U.S. Fish and Wildlife Service (Louisiana Field Office)

State

- Louisiana Natural Heritage Program

- Louisiana Office of Historic Preservation
- Louisiana Department of Environmental Quality

## **6.0 SUMMARY**

As a result of the new and significant information review, Entergy did not identify any new and significant information in the context of 10 CFR 51.53(c)(3)(iv) regarding the environmental impacts of license renewal associated with the continued operation of RBS during the license renewal period.