



Callaway Plant

July 08, 2015

ULNRC-06231

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

10 CFR 51

Ladies and Gentlemen:

**DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
UNION ELECTRIC CO.  
RENEWED FACILITY OPERATING LICENSE NPF-30  
RENEWED NPDES DISCHARGE PERMIT**

In accordance with Callaway Plant Operating License NPF-30, Appendix B, Section 3.2, Union Electric Company (Ameren Missouri) hereby submits the enclosed renewed National Pollutant Discharge Elimination System (NPDES) Discharge Permit for the Callaway Plant. The revised permit became effective on July 1, 2015.

This letter does not contain new commitments.

If there are any questions, please contact Mr. Tom Elwood at 314-225-1905.

Sincerely,

A handwritten signature in blue ink that reads "Scott A. Maglio" followed by a large, stylized flourish.

Scott A. Maglio  
Manager, Regulatory Affairs

Enclosure

ULNRC-06231

July 08, 2015

Page 2

cc: Mr. Marc L. Dapas  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region IV  
1600 East Lamar Boulevard  
Arlington, TX 76011-4511

Senior Resident Inspector  
Callaway Resident Office  
U.S. Nuclear Regulatory Commission  
8201 NRC Road  
Steedman, MO 65077

Mr. L. John Klos  
Project Manager, Callaway Plant  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Mail Stop O-8B1  
Washington, DC 20555-2738

**Index and send hardcopy to QA File A160.0761**

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NSRB Secretary

Mr. Greg Voss, REP Manager (SEMA)

STARS Regulatory Affairs

Mr. John O'Neill (Pillsbury Winthrop Shaw Pittman LLP)

Ms. Leanne Tippet-Mosby (DNR)

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**  
MISSOURI CLEAN WATER COMMISSION



**MISSOURI STATE OPERATING PERMIT**

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92<sup>nd</sup> Congress) as amended,

Permit No. MO-0098001

Owner: Ameren Missouri  
Address: P.O. Box 66149, MC-602, St. Louis, MO 63166-6149

Continuing Authority: Same as above  
Address: Same as above

Facility Name: Ameren Missouri-Callaway Energy Center  
Facility Address: PO Box 620, Fulton, MO 65251

Legal Description: See Pages Two through Four (2-4)  
UTM Coordinates: See Pages Two through Four (2-4)

Receiving Stream: See Pages Two through Four (2-4)  
First Classified Stream and ID: See Pages Two through Four (2-4)  
USGS Basin & Sub-watershed No.: (13000102-1605)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

**FACILITY DESCRIPTION**

See Pages 2-4 for facility description. Ameren Missouri-Callaway Energy Center is a steam electrical generation plant primarily engaged in the generation of electricity for distribution and sale. The plant consists of one generating unit with a capability of 1,190 megawatts (MW). Annual production is 9.8-10.7 million MW-hours. This facility has twelve (12) permitted features. The Callaway Power Plant combined discharge line (Outfalls #001, #002, #016) has a cumulative daily average flow of 7.74 MGD and a daily maximum flow of 14.4 MGD. The facility is located in Callaway County. A certified operator not required for this facility. SIC # 4911

This permit authorizes only wastewater and stormwater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Sections 640.013, 621.250, and 644.051.6 of the Law.

July 1, 2015  
Effective Date

  
Sara Parker Pauley, Director, Department of Natural Resources

June 30, 2020  
Expiration Date

  
John Madros, Director, Water Protection Program

**FACILITY DESCRIPTION (continued):**

**Outfall #001: Radwaste Treatment System - SIC #4911 (Piped to Missouri River)**

This liquid radwaste system serves to collect, process, store, recycle and discharge treated waste water generated at Callaway. In addition, radioactive solids removed by this system are prepared for disposal and transported to a licensed off- site disposal facility.

The Boron Recycle System receives reactor coolant for the purpose of recovering the boric acid for reuse in the plant. Boric acid is used as a neutron absorber/moderator in the primary loop. The Liquid Radwaste System collects and processes floor and equipment drains from the containment, auxiliary building, fuel building and radwaste buildings during normal operation. The Laundry and Hot Shower system collects waste generated from washing radioactively contaminated protective gear and clothing and personnel decontamination shower wastewater. These wastes are then transferred to the liquid Radwaste system for treatment. The Secondary Liquid Waste system is used to process condensate demineralizer regeneration wastes and potentially radioactive liquid waste collected from the turbine building. The condensate demineralizer regeneration waste is divided into two waste streams; High TDS waste from the acid and caustic rinses used when chemically regenerating spent resin, and low TDS waste which results from the initial backflushing of unregenerated resin and the final rinsing of the regenerated resin to remove acid and caustic substances.

Steam Generator Blowdown is normally recycled back to the main condenser for reuse in the secondary cycle. Provisions also exist to discharge the treated blowdown via #001. The following wastewater treatment systems are used as required to treat this waste stream for recycle or discharge in compliance with NRC requirements and are also available as auxiliary or backup treatment systems to treat this discharge for compliance with NPDES permit limitations: Evaporation and/or Mixing and/or Filtration and/or Carbon Absorption and/or Ion Exchange and/or Neutralization and/or Reuse/Recycle of Treated Effluent. All processing in the Radwaste Treatment System is done on a batch basis except steam generator blowdown. After monitoring for radioactive content, release rates are controlled administratively to ensure the "as low as practicable" radioactive discharge criteria are met.

Design flow is 0.190 MGD

Daily average flow is 0.054 MGD.

UTM Coordinates: X= 606040; Y= 4291049

Legal Description: NE ¼, NE ¼, Sec. 14, T46N, R8W, Callaway

Receiving Stream: Missouri River (P)

First Classified Stream and ID: Missouri River (P) (00701)

USGS Basin & Sub-watershed No.: (10300102-1605)

**Outfall #002: - Cooling Tower Blowdown (Piped to Missouri River)**

This outfall consists of water from the Circulating Water System, the Service Water System, and the Essential Service Water (ESW) System. Blowdown from the cooling tower is necessary to maintain the dissolved solids concentration in the recirculating water system within acceptable operating limits. The ESW System is not routinely used, however water from the ESW System does mix with the other systems as it is periodically run to demonstrate operability. Additionally, the ESW System can be used to maintain proper freeboard in the ultimate heat sink pond (Outfall #017) by transferring water to the Service Water System.

Design flow is 14.4 MGD.

Daily average flow is 5.37 MGD.

UTM Coordinates: X= 606218; Y= 4291158

Legal Description: NW ¼, NW ¼, Sec. 13, T46N, R8W, Callaway

Receiving Stream: Missouri River (P)

First Classified Stream and ID: Missouri River (P) (00701)

USGS Basin & Sub-watershed No.: (10300102-1605)

**Outfall #003: Water Treatment Plant Wastes (Piped to Missouri River)**

Outfall #003 consists of supernatant from a wastewater treatment lagoon that treats wastewater to remove solids. The wastewater that is treated in the lagoon is mainly from the blowdown of accumulated river solids in the water treatment plant clarifiers. The sand and carbon filter backwash, oil water separator and demineralizer system wastewater is also routed to this treatment lagoon. The oil water separator flow consists of wastewater from some plant sumps as well as flow from an oil recovery well that is being used to remediate a historic on-site release. Outfall #003 is normally recycled by routing it back to the head of the water treatment plant, averaging 0.42 MGD.

Design flow is 1.645 MGD.

Daily average flow is 0.0 MGD.

UTM Coordinates: X= 606183; Y= 4289944

Legal Description: SW ¼, SW ¼, Sec. 13, T46N, R8W, Callaway

Receiving Stream: Missouri River (P)

First Classified Stream and ID: Missouri (P) (00701)

USGS Basin & Sub-watershed No.: (10300102-1606)

FACILITY DESCRIPTION (continued):

Outfall #004: Demineralizer System Wastes was rerouted to Outfall #003, removed prior to the 1996 permit renewal.

Outfall #007 – 3 Cell Flow Through Lagoon (Piped to Missouri River)

This outfall consists of a 3-cell lagoon designed to receive only sanitary, on-site cafeteria, and laboratory waste from the plant. Sludge will be stored in the lagoon. The effluent will then be discharged to a constructed wetland. The monitoring location will be at the third treatment cell. Outfall #007 is normally recycled by routing it to the water treatment plant headworks, averaging 0.025 MGD.

Design flow is 0.040 MGD.

Design Population Equivalent is 400.

Daily average flow is 0.0 MGD.

UTM Coordinates: X= 606400; Y=4290125

Legal Description: SW ¼, SW ¼, Sec. 13, T46N, R8W, Callaway

Receiving Stream: Missouri River (P)

First Classified Stream and ID: Missouri (P) (00701)

USGS Basin & Sub-watershed No.: (10300102-1606)

Outfall #009: Intake Heater Blowdown (Located right on Missouri River)

The river intake structure contains two recirculating electric heaters which are used to prevent ice formation on the intake bar screens during the winter months. Outfall #009 consists of discharges from the infrequent blowdown or drainage of these boilers.

Design flow is 0.006 MGD.

Daily average flow 0 MGD.

UTM Coordinates: X=609694; Y=4284633

Legal Description: NW ¼, NW ¼, Sec. 5, T45N, R7W, Callaway

Receiving Stream: Missouri River (P)

First Classified Stream and ID: Missouri River (P) (00701)

USGS Basin & Sub-watershed No.: (10300102-1606)

Outfalls #010, #011, #012, #014 and #015 - Stormwater Runoff

Once in 10 year rainfall event is 38.5 MGD.

Average rainfall event is 0.7 MGD.

"Non-process" discharges that will be discharged to stormwater ponds include three intermittent sources. Two sources are the quarterly testing of the fire protection drains and the infrequent draining of the demineralized water storage tank. The third source is the pumping of manholes, transformer and tank containments at the plant.

Outfall #010:

Stormwater settling pond drains 108 acres, 16.2 acres of which is impervious surface. Drainage area includes the cooling water chemical control building, the quality control building, the former Unit #2 excavation and the area of the plant west of the radwaste system. The pond has a retention time greater than 24 hours.

Design flow is 4.6 MGD

Daily average flow is dependent on precipitation.

UTM Coordinates: X=606515; Y= 4291869

Legal Description: SW ¼, SW ¼, Sec. 12, T46N, R8W, Callaway

Receiving Stream: Tributary to Logan Creek (U)

First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)

USGS Basin & Sub-watershed No.: (10300102-1605)

Outfall #011:

Stormwater settling pond drains 425 acres, 8.5 acres of which is impervious surface. Drainage area includes the water treatment plant, radwaste building, operation support facility, demineralizer portable water building and the circulating and service water pumphouse. The pond has retention time of less than 24 hours.

Design storm flow is 19.7 MGD

Daily average flow is dependent on precipitation.

UTM Coordinates: X= 607139; Y= 4291930

Legal Description: NW ¼, SE ¼, Sec. 12, T46N, R8W, Callaway

Receiving Stream: Tributary to Logan Creek

First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)

USGS Basin & Sub-watershed No.: (10300102-1605)

FACILITY DESCRIPTION (continued):

Outfall #012:

Stormwater settling pond drains 87 acres, 22 acres of which is impervious surface. Drainage area includes most of the plant area including the parking lots, office buildings, switch yards, the turbine building, the outage maintenance building, and the Stores I building. The pond has retention time of less than 24 hours.

Design storm flow is 6.6 MGD

Daily average flow is dependent on precipitation.

UTM Coordinates: X= 605884; Y= 4290257

Legal Description: NE ¼, SE ¼, Sec. 14, T46N, R8W, Callaway

Receiving Stream: Tributary to Mud Creek

First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)

USGS Basin & Sub-watershed No.: (10300102-1606)

Outfall #013: terminated in 2009 permit renewal.

Outfall #014:

Stormwater settling pond drains 100 acres, 4 acres of which is impervious surface. Drainage area includes half of the construction parking lot, the Stores II building, and the maintenance shop annex. The pond has a retention time less than 24 hours.

Daily average flow is dependent on precipitation.

Design storm flow is 4.8 MGD

UTM Coordinates: X=605569; Y= 4291979

Legal Description: NW ¼, SE ¼, Sec. 11, T46N, R8W, Callaway

Receiving Stream: Tributary to Cow Branch

First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)

USGS Basin & Sub-watershed No.: (10300102-1504)

Outfall #015: Stormwater

Stormwater settling pond drains 60 acres, 0.6 acres of which is impervious surface. Drainage area includes paved roadways. The pond has a retention time greater than 24 hours.

Design storm flow is 2.8 MGD

Daily average flow is dependent on precipitation.

UTM Coordinates: X= 605918; Y= 4292305

Legal Description: SE ¼, NE ¼, Sec. 11, T46N, R8W, Callaway

Receiving Stream: Tributary to Cow Branch

First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)

USGS Basin & Sub-watershed No.: (10300102-1504)

Outfall #016: Cooling Tower Bypass (piped to Missouri River)

This outfall consists of clarified river water and wastewater that has been recycled through the water treatment plant. It is used to moderate flow through the water treatment plant and to provide carrier water in the discharge line when discharging from Outfall #001.

Design flow is 14.4 MGD.

Daily average flow is 2.32 MGD.

Legal Description: NW ¼, NW ¼, Sec. 13, T46N, R8W, Callaway

UTM Coordinates: X=606175; Y= 4290754

Receiving Stream: Missouri River (P)

First Classified Stream and ID: Missouri (P) (00701)

USGS Basin & Sub-watershed No.: (10300102-1605)

Outfall #017 - Ultimate Heat Sink

No Discharge. The Ultimate Heat Sink is a cooling pond that can provide cooling water to various plant systems during other than normal conditions. Outfall #017 is the overflow from the Ultimate Heat Sink to Stormwater Retention Basin at Outfall #011.

UTM Coordinates: X=606094; Y= 4290861

Legal Description: SE ¼, NE ¼, Sec. 14, T46N, R8W, Callaway

Receiving Stream: Tributary to Logan Creek

First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)

USGS Basin & Sub-watershed No.: (10300102-280004)

# A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001	<b>TABLE A-1 Radwaste System. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS</b>	Page Number 5 of 13
		Permit Number. MO-0098001

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **July 1, 2015** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/daily per each batch	each batch total
Boron, Total Recoverable	mg/L	*		*	once/daily per each batch	grab
Total Suspended Solids	mg/L	45		30	once/daily per each batch	grab
pH	SU	**		**	once/daily per each batch	grab
Total Residual Chlorine (Note 1)	µg/L	200		104	once/month	grab
Temperature	°F	*			once/month	grab
Biochemical Oxygen Demand <sub>5</sub>	mg/L	*		*	once/quarter***	grab
Oil & Grease	mg/L	15		10	once/quarter***	grab

MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE OCTOBER 28, 2015. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

\* Monitoring requirement only.

\*\* pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units

\*\*\* See table below for quarterly sampling.

Minimum Sampling Requirements			
Quarter	Months	Effluent Parameters	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 <sup>th</sup>
Second	April, May, June	Sample at least once during any month of the quarter	July 28 <sup>th</sup>
Third	July, August, September	Sample at least once during any month of the quarter	October 28 <sup>th</sup>
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 <sup>th</sup>

Note 1: This permit contains a Total Residual Chlorine (TRC) limit. This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The Department has determined the current acceptable ML for total residual chlorine to be 130 µg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits stated in the permit.



OUTFALL #002	TABLE A-2. Cooling Tower Blowdown FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS				Page Number 6 of 13	
					Permit Number. MO-0098001	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on <b>July 1, 2015</b> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/day	24 hr. total
Temperature	°F	*		*	once/day	grab
Total Suspended Solids	mg/L	*		*	once/week	grab
Total Dissolved Solids	mg/L	*		*	once/week	grab
Total Residual Chlorine (Note 1)	µg/L	200		104	once/week	grab
Total Phosphorus	mg/L	*		*	once/ quarter***	grab
Total Nitrogen	mg/L	*		*	once/ quarter***	grab
Oil & Grease	mg/L	15		10	once/quarter***	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2015</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
pH (Note 2)	SU	**		**	continuous	24 hr
pH – Minutes of Exceedances (Note 2)	minutes			446	continuous	continuous
pH – Number of excursions (Note 2)	Count			0	continuous	continuous
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2015</u> .						
Chronic Whole Effluent Toxicity (Note 3)	TUc	*			once/year	24 hr. composite
<u>WET TEST</u> REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2016</u> .						

\* Monitoring requirement only

\*\* pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units

\*\*\* See table on page 8 for quarterly sampling.

Note 1: This permit contains a Total Residual Chlorine (TRC) limit. This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The Department has determined the current acceptable ML for total residual chlorine to be 130 µg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits stated in the permit.

Note 2: Callaway Energy Center has continuous pH measurement on Outfalls #002. With continuous pH measurement, the facility may have excursions of the set pH for up to 446 minutes (7 hours, 26 minutes) in any calendar month; however the facility is not allowed to have an individual excursion lasting more than 60 minutes. The permittee shall report the minutes per month exceeding the pH effluent limits, along with number of excursions lasting sixty (60) minutes or more.

Note 3: Outfall #002 is not required to conduct regularly scheduled Whole Effluent Toxicity (WET) Testing. However, in the event that the permittee determines they must use a molluscicide or other toxic pollutants to remove organisms from intake structures, WET testing shall be conducted once per year, when the molluscicide is used, as described in the terms and conditions for WET testing for Outfall #002, which is contained in Special Condition #21, on page 12 of 13 of this operating permit

OUTFALLS #003-#015	TABLE A-3. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS				Page Number 7 of 13	
					Permit Number. MO-0098001	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on <b>July 1, 2015</b> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #003-Water Treatment Plant						
Flow	gpd	*		*	once/month when discharging	24 hr. total
Total Suspended Solids	mg/L	100		30	once/ month when discharging	grab
Oil & Grease	mg/L	15		10	once/ month when discharging	grab
Total Residual Chlorine (Note 1)	µg/L	200		104	once/ month when discharging	grab
pH	SU	**		**	once/ month when discharging	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2015</u> .						
Outfall #007-Sanitary Waste						
Flow	gpd	*		*	once/quarter when discharging***	24 hr. total
Biochemical Oxygen Demand <sup>5</sup>	mg/L		65	45	once/quarter when discharging***	grab
Total Suspended Solids	mg/L		110	70	once/quarter when discharging***	grab
Ammonia as N	mg/L	*		*	once/quarter when discharging***	grab
Oil & Grease	mg/L	15		10	once/quarter when discharging***	grab
E. Coli	#colonies/ 100mL	*		*	once/quarter when discharging***	grab
pH	SU	**		**	once/quarter when discharging***	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2015</u> .						
Outfall #009-Intake Heater Blowdown						
Flow	gpd	*		*	once/week when discharging	24 hr. total
Total Suspended Solids	mg/L	100		30	once/week when discharging	grab
Oil & Grease	mg/L	15		10	once/week when discharging	grab
pH	SU	**		**	once/week when discharging	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2015</u> .						
Outfalls #010-#012, #014 and #015- Stormwater, See Special Condition #13-#15						
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> , THE FIRST REPORT IS DUE <u>OCTOBER 28, 2015</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

\* Monitoring requirement only

\*\* pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.

\*\*\* See table on Page 8 for quarterly sampling.

OUTFALL #016	TABLE A-4. Cooling Tower Bypass FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS				Page Number 8 of 13	
					Permit Number. MO-0098001	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on <u>Effective Date</u> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/quarter***	24 hr. total
Total Suspended Solids	mg/L	100		30	once/quarter***	grab
Total Residual Chlorine (Note 1)	µg/L	200		104	once/quarter***	grab
Temperature	°F	*		*	once/quarter***	grab
Oil & Grease	mg/L	15		10	once/quarter***	grab
Total Phosphorus	mg/L	*		*	once/quarter***	grab
Total Nitrogen	mg/L	*		*	once/quarter***	grab
pH	SU	**		**	once/quarter***	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2015</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Chronic Whole Effluent Toxicity	TUc	*			once/year	24 hr. composite
WET TEST REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2016</u> .						

\* Monitoring requirement only.

\*\* pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.

\*\*\* See table below for quarterly sampling.

Minimum Sampling Requirements			
Quarter	Months	Effluent Parameters	Report is Due
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Second	April, May, June	Sample at least once during any month of the quarter	July 28 <sup>th</sup>
Third	July, August, September	Sample at least once during any month of the quarter	October 28 <sup>th</sup>
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 <sup>th</sup>

Note 1: This permit contains a Total Residual Chlorine (TRC) limit. This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The Department has determined the current acceptable ML for total residual chlorine to be 130 µg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits stated in the permit.

#### B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached PART I standard conditions dated AUGUST 1, 2014, and hereby incorporated as though fully set forth herein.

### C. SPECIAL CONDITIONS

1. In issuing this permit, the Missouri Clean Water Commission and the Missouri Department of Natural Resources has not determined whether or not the radioactive discharges from this plant will affect waters of the state. Radioactive discharges are the responsibility of the Nuclear Regulatory Commission, and any discharges of these constituents will be under their regulation
2. Outfall #017: There shall be no discharge from this outfall to waters of the State of Missouri.
3. This permit may be reopened and modified, or alternatively revoked and reissued, to:
  - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
    - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
    - (2) controls any pollutant not limited in the permit.
  - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
  - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.
4. All outfalls must be clearly marked in the field
5. Water Quality Standards
  - (a) To the extent required by law, discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
  - (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
    - (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
    - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
    - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
    - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
    - (5) There shall be no significant human health hazard from incidental contact with the water;
    - (6) There shall be no acute toxicity to livestock or wildlife watering;
    - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
    - (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.
6. Changes in Discharges of Toxic Substances  
The permittee shall notify the Director as soon as it knows or has reason to believe:
  - (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
    - (1) One hundred micrograms per liter (100 µg/L);
    - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
    - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
    - (4) The level established by the Director in accordance with 40 CFR 122.44(f).
  - (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

C. SPECIAL CONDITIONS (continued)

7. Report as no-discharge when a discharge does not occur during the report period
8. There shall be no discharge of polychlorinated biphenyl (PCB) compounds such as those commonly used for transformer fluid
9. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).
10. 40 CFR 125.98(b)(1): "Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act."
11. Reporting of Non-Detects
  - (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
  - (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
  - (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
  - (d) The permittee shall use one-half of the detection limit for the non-detect result when calculating and reporting monthly averages.
  - (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
12. Any pesticide discharge from any point source shall comply with the requirements of Federal Insecticide, Fungicide and Rodenticide Act, as amended (7 U.S.C. 136 ET. SEQ.) and the use of such pesticides shall be in a manner consistent with its label.
13. The permittee shall implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must be prepared and implemented upon-permit issuance. The SWPPP must be kept on-site and should not be sent to the department unless specifically requested. The SWPPP must be reviewed and updated, if needed, every five (5) years or as site conditions change. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in the following document: Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators, (Document number EPA 833-B-09-002) published by the United States Environmental Protection Agency (USEPA) in February 2009. The SWPPP must include the following:
  - (a) A listing of specific Best Management Practices (BMPs) and a narrative explaining how BMPs will be implemented to control and minimize the amount of potential contaminants that may enter stormwater. The BMPs at the facility should be designed to meet this value during rainfall event up to the 10 year, 24 hour rain event.
  - (b) The SWPPP must include a schedule for quarterly site inspections and brief written reports. The inspection report must include precipitation information for the entire period since last inspection, as well as observations and evaluations of BMP effectiveness. Deficiencies must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report, including photographs. Inspection reports must be kept on site with the SWPPP and maintained for a period of five (5) years. These must be made available to department personnel upon request.
  - (c) A provision for designating an individual to be responsible for environmental matters.
  - (d) A provision for providing training to all personnel involved in material handling and storage, and housekeeping of maintenance and cleaning areas. Proof of training shall be submitted on request of the department.
14. Permittee shall adhere to the following minimum Best Management Practices (BMPs):
  - (a) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, or warehouse activities and thereby prevent the contamination of storm water from these substances.
  - (b) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
  - (c) Store all paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so that these materials are not exposed to storm water or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of storm water with container contents. Commingled water may not be discharged under this permit. Provide spill prevention control, and/or management sufficient to prevent any spills of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.
  - (d) Provide good housekeeping practices on the site to keep trash from entry into waters of the state.

C. SPECIAL CONDITIONS (continued)

15. Best Management Practices (continued)

- (e) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property. This could include the use of straw bales, silt fences, or sediment basins, if needed, to comply with effluent limits.
- (f) Ensure that adequate provisions are provided to prevent surface water intrusion into the storage basin, to divert stormwater runoff around the storage basin, and to protect embankments from erosion.

16. Outfalls #010-#012, #014, and #015: This permit stipulates pollutant benchmarks applicable to Callaway Energy Center stormwater discharges. The benchmarks do not constitute direct numeric effluent limitations; therefore, a benchmark exceedance alone is not a permit violation. Benchmark monitoring and visual inspections shall be used to determine the overall effectiveness of SWPPP and to assist in knowing when additional corrective action may be necessary to protect water quality. Benchmark sampling must occur a minimum of quarterly sampling. Sampling results must be submitted by April 28<sup>th</sup>, July 28<sup>th</sup>, October 28<sup>th</sup>, and January 28<sup>th</sup> for the preceding quarterly sampling event. Visual inspections must occur at a minimum of quarterly, as designated in Special Condition #13.

Outfalls #010-012, #014, #015		
Parameter	Units	Daily Maximum Benchmark
Settleable Solids	mL/L/hr	1.5
Chemical Oxygen Demand	mg/L	90
pH	SU	6.5-9.0
Oil and Grease	mg/L	10

Any time a benchmark exceedance occurs a Corrective Action Report (CAR) must be completed. A CAR is a document that records the efforts undertaken by the facility to improve BMPs to meet benchmarks in future samples. CARs must be retained with the SWPPP and available to the department upon request. If the efforts taken by the facility are not sufficient and subsequent exceedances of a benchmark occur, the facility must contact the department if a benchmark value cannot be achieved. Failure to take corrective action to address a benchmark exceedance and failure to make measureable progress towards achieving the benchmarks is a permit violation.

17. Before releasing water that has accumulated in secondary containment areas containing petroleum products, it must be examined for hydrocarbon odor and presence of a sheen. On-site remediation may take place prior to testing. If the presence of hydrocarbons is indicated, this water must be tested for Total Petroleum Hydrocarbons (TPH). The analytical method for testing TPH must comply with EPA approved testing methods listed in [40 CFR 136] and the water must be tested prior to release to ensure compliance with water quality standards. If the concentration for TPH exceeds 10mg/L, the water shall be taken to a WWTP for treatment, treated onsite, or hauled off by a contract hauler.
18. Release of a hazardous substance must be reported to the department in accordance with 10 CSR 24-3.010. A record of each reportable spill shall be retained with the SWPPP and made available to the department upon request.
19. The department may also require sampling and reporting as a result of illegal discharges, compliance issues, complaint investigations, or evidence of off-site impacts from activities from this facility. If such an action is needed, the department will specify in writing the sampling requirement, including such information as location and extent. It is a violation of this permit to fail to comply with said written notification to sample.
20. Substances, regulated by federal law under the Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), that are transported, stored, or used for maintenance, cleaning or repair, shall be managed according to RCRA and CERCLA. Ameren is exempt from Clean Water Act, Section 311, reporting for sodium hydroxide, sodium hypochlorite, sulfuric acid and hydrazine as per 40 CFR 117.12.
21. 316(b) Cooling Water Intake Structure
- (a) Ameren is required to continue operating the makeup water intake structure per the Department's approval dated April 15, 1987. Ameren has installed closed cycle cooling at the Callaway Energy Center, which per 40 CFR 122.21(r), represents the best technology available.
  - (b) Ameren shall continue to operate in a manner that minimizes impingement and entrainment.
  - (c) Ameren is required to submit the following studies under 40 CFR 122.21(r);
    - (1) Source Water Physical Data Report, 40 CFR 122.21(r)(2);
    - (2) Cooling Water Intake Structure Data Report, 40 CFR 122.21(r)(3);
    - (3) Source Water Baseline Biological Characterization Data Report, 40 CFR 122.21(r)(4);
    - (4) Cooling Water System Data Report, 40 CFR 122.21(r)(5); and
    - (5) Operational Status, 40 CFR 122.21(r)(8)

C. SPECIAL CONDITIONS (continued)

21. 316(b) Cooling Water Intake Structure (continued)

- (d) Ameren shall submit annual status reports by February 28 each year, detailing the progress of the previous year in completing the required studies.
- (e) Six months prior to permit expiration, Ameren shall submit their application for 316(b) detailing the results of the studies listed above.
- (f) This permit may be reopened and modified, or alternatively revoked and reissued to: incorporate new or modified requirements applicable to existing cooling water intake structures under Section 316(b) of the Clean Water Act. In the event that, it is necessary for this permit to be reopened and modified, or alternatively revoked and reissued, permittee shall comply with any such new or modified requirements or standards applicable to existing cooling water intake structures under 316(b) of the Clean Water Act.

22. Chronic Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF CHRONIC WET TESTING FOR THIS PERMIT					
OUTFALL	AEC	Chronic Toxic Unit (TU <sub>c</sub> )	FREQUENCY	SAMPLE TYPE	MONTH
002	10%	*	Unscheduled	24 hr. composite	any
016	10%	*	once/year	24 hr. composite	any

\*Monitoring only

Dilution Series						
100%	50%	25%	10%	5%	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water

a) Freshwater Species and Test Methods

- i. Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the fourth edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 7-day, static, renewal toxicity tests with the following vertebrate species:

- The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).

And the following invertebrate species:

- The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).

- ii. Chemical and physical analysis of an upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available, synthetic laboratory control water may be used.
- iii. Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
- iv. Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analysis performed upon any other effluent concentration.
- v. All chemical analyses shall be performed and results shall be recorded in the appropriate field of the report form. The parameters for chemical analysis include, but are not limited to Temperature (°C), pH (SU), Conductivity (µMohs), Dissolved Oxygen (mg/L), Total Residual Chlorine (mg/L), Un-ionized Ammonia (mg/L), Total Alkalinity (mg/L), and Total Hardness (mg/L).

b) Reporting of Chronic Toxicity Monitoring Results

- i. WET test results shall be submitted by eDMR, or to the Northeast Regional Office, with the permittee's Discharge Monitoring Reports by January, 28, 2016. The submittal shall include:
  - 1. A full laboratory report for all toxicity testing.
  - 2. Copies of chain-of-custody forms.
  - 3. The WET form provided by the Department upon permit issuance.
- ii. The report must include a quantification of chronic toxic units (TU<sub>c</sub> = 100 IC<sub>25</sub>) reported according to the *Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* chapter on report preparation and test review. The 25 percent Inhibition Effect Concentration (IC<sub>25</sub>) is the toxic or effluent concentration that would cause 25 percent reduction in mean young per female or in growth for the test populations.

C. SPECIAL CONDITIONS (continued)

23. WET Test (continued)

c) Permit Reopener for Chronic Toxicity

In accordance with 40 CFR Parts 122 and 124, this permit may be modified to include effluent limitations or permit conditions to address chronic toxicity in the effluent or receiving waterbody, as a result of the discharge; or to implement new, revised, or newly interpreted water quality standards applicable to chronic toxicity.

24. Callaway shall sample the following discharges from liquid radwaste discharge, along with the surface water and drinking water supply. The results of the monitoring programs shall be reported to the Department by supplying a copy of the Annual Radiological Environmental Operating Report per Technical Specification 5.6.2 and the Annual Radioactive Effluent Release Report per Technical Specification 5.6.3 by May 1, at the same time the reports are supplied to NRC. All data information shall be available for inspection during normal working hours. The permittee shall conduct the following radiological monitoring:

a) Liquid Radwaste discharge, surface water and drinking water supply:

Location	Frequency	Sample Type	Parameters
Radwaste –batch releases	prior to each batch	representative grab sample of each batch discharge	Batch: tritium, I-131, gamma isotopic;
Radwaste-steam generator blowdown	once per day when discharging	grab	Quarterly composite of each batch: Sr-89, Sr-90, and Fe-55
Upstream of the Discharge Line	once/month	grab	tritium , gamma isotopic
Downstream of the Discharge Line at Portland, MO	daily with monthly composite analysis	composite	tritium , gamma isotopic

- b) Aquatic biota - semiannual sampling of the edible flesh of up to five commercially or recreationally important species of fish of sufficient quantity to yield a sufficient sample. Samples are to be taken at the locations specified upstream of the discharge line and downstream of the discharge line at Portland, MO. Samples are to be analyzed by gamma isotopic analysis. Catfish need not be included in sample.
- c) Bottom Sediment - semiannual samples of bottom sediment from the locations specified in upstream of the discharge line and downstream of the discharge line at Portland, MO. Samples are to be analyzed by gamma isotopic analysis.
- d) The Department of Natural Resources of the State of Missouri, and any other state agency or officer designated in the State's emergency response plan or any other plan to protect its citizens from radioactive liquid discharge from the Callaway Energy Center, shall receive within one hour of the event, notice of any unplanned or uncontrolled liquid radioactive release in accordance with 10 CFR 50.72(a) and notification of reportable events per 10 CFR 20.2203 that involve off-site releases of liquid radioactive material.



**MISSOURI DEPARTMENT OF NATURAL RESOURCES  
FACT SHEET  
FOR THE PURPOSE OF RENEWAL & MODIFICATION  
OF  
MO-0098001  
AMEREN MISSOURI-CALLAWAY ENERGY CENTER**

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of storm water from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below. A factsheet is not an enforceable part of an operating permit. Major ☒; Industrial Facility ☒; and/or permit with widespread public interest ☒.

**Part I – Facility Information**

Facility Type: Industrial Facility SIC Code(s): 4911-Electrical Power Generation

**FACILITY DESCRIPTION:**

Ameren Missouri-Callaway Energy Center is a steam electrical generation plant primarily engaged in the generation of electricity for distribution and sale. The Callaway Energy Center is located outside Fulton, MO on 7,200 acres. Ameren leases 6,300 acres of their property to the Missouri Department of Conservation for the Reform Conservation Area. The plant consists of one generating unit with a capability of 1,190 megawatts (MW). Annual production is 9.8-10.7 million MW-hours. This facility has twelve (12) permitted features. Callaway Energy Center pipes its major discharges back to the Missouri River, approximately 5 miles away. Intake water comes from the Missouri River at Mile Marker 115.4.

Callaway Energy Center uses a Standardized Nuclear Unit Power Plant System (SNUPPS), using a Westinghouse four-loop pressurized water reactor and a Alstom turbine-generator. The plant went fully operational in 1984. For more information is available on the NRC webpages: <http://www.nrc.gov/info-finder/reactor/call.html> and <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/call.html>.

Other environmental permits and identification numbers associated with Ameren Callaway Energy Center, include:

- Title V Air Permit from the department's Air Pollution Control Program (2907100003)
- Small Quantity Hazardous Waste Generator under the department's Hazardous Waste Program (MOD079933198)
- Major Water User from the department's Water Resources Program (071300005)
- EPA identifies Ameren Callaway with the following EPA ID number: 110017986759
- NRC facility operating license NPF-30

The Annual Environmental Operating Report and the Annual Radiological Effluent Report for the calendar year 2014 were submitted April 30, 2015. Appendix C provides a summary of the 2014 Annual Environmental Operating Report related to water and sediment. Appendix D provides information on the leak discovered on August 1, 2014 at manhole 86-2, the following site investigation, and the remediation steps taken to repair the line, including injecting hydrophobic foam and building a line to bypass the manhole. Additional monitoring were installed and monitored to verify that the leak was stopped. The Annual Reports are available on the NRC webpage: <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/call.html>.

### Chemical Usage at the Plant

In the renewal application, Ameren provided a list of chemicals used or stored onsite at Callaway. All chemicals used are covered under the facility's Spill Prevention Control and Countermeasures Plan. Ameren may want to incorporate the spill plan in with the stormwater prevention pollution plan, to ensure accidental releases are controlled onsite.

### **Outfall #001: Radwaste Treatment System**

The Radwaste Treatment System is made up of five subsystems: the boron recycle system, the liquid radwaste system, the laundry and hot shower system, secondary liquid waste, and the steam generator blowdown.

- This liquid radwaste system serves to collect, process, store, recycle and discharge treated waste water generated at Callaway. In addition, radioactive solids removed by this system are prepared for disposal and transported to a licensed off-site disposal facility. Five general sub-systems can be defined as described below.
  - The Boron Recycle System receives reactor coolant for the purpose of recovering the boric acid for reuse in the plant. Boric acid is used as a neutron absorber/moderator in the primary loop.
  - The Liquid Radwaste System collects and processes floor and equipment drains from the containment, auxiliary building, fuel building and radwaste buildings during normal operation.
  - The Laundry and Hot Shower system collects waste generated from washing radioactively contaminated protective gear and clothing and personnel decontamination shower wastewater. These wastes are then transferred to the liquid Radwaste system for treatment.
  - The Secondary Liquid Waste system is used to process condensate demineralizer regeneration wastes and potentially radioactive liquid waste collected from the turbine building. The condensate demineralizer regeneration waste is divided into two waste streams; High TDS waste from the acid and caustic rinses used when chemically regenerating spent resin, and low TDS waste which results from the initial backflushing of unregenerated resin and the final rinsing of the regenerated resin to remove acid and caustic.
  - Steam Generator Blowdown is normally recycled back to the main condenser for reuse in the secondary cycle. Provisions also exist to discharge the treated blowdown via #001.

The following wastewater treatment systems are used as required to treat this waste stream for recycle or discharge in compliance with NRC requirements and are also available as auxiliary or backup treatment systems to treat this discharge for compliance with NPDES permit limitations: Evaporation and/or Mixing and/or Filtration and/or Carbon Absorption and/or Ion Exchange and/or Neutralization and/or Reuse/Recycle of Treated Effluent. All processing in the Radwaste Treatment System is done on a batch basis except steam generator blowdown. After monitoring for radioactive content, release rates are controlled administratively to ensure the "as low as practicable" radioactive discharge criteria are met.

The radwaste system is designed for flexibility to achieve Nuclear Regulatory Commission (NRC) limits. Actual treatment of any batch of wastewater is determined by

1. the level of radiological contamination and corresponding NRC mandated discharge criteria;
2. NPDES permit discharge limits;
3. the most effective waste treatment scheme that will give the smallest volume of solid radwaste;
4. overall wastestream management; and
5. the need, feasibility, and economics of recycle vs. discharge.

### **Outfall #002: Cooling Tower**

The cooling tower at Callaway is 553 feet tall and 430 feet in diameter at the base. It cools approximately 585,000 gallons of water per minute when the facility is operating at full power. About 11,000 gallons per minute are lost from the top through evaporation, and up to another 5,000 gallons per minute are sent to the Missouri River as "blowdown" to flush suspended solids from the cooling tower basin. This water is replaced with water from the river, which is five miles south of the energy center. The cooling tower basin holds 11 million gallons of water. The water is 12 feet deep under the tower, and 20 feet deep at the intake to the circulating water pumps that pump the water through the energy center. The temperature of the water going into the tower is 125 °Fahrenheit. The tower cools it to 95°Fahrenheit.

#### **Outfall #003: Water Treatment Plant**

The water treatment plant clarifies Missouri River water for cooling tower makeup and other plant cooling water systems. Sludge from the clarification process is routed through the sedimentation lagoon for solids removal. There are currently 4 sedimentation basins, the fourth being built in 2000 (CP-MO26-3351). Callaway submitted a construction permit application December 2014 to build two more sedimentation basins (CP0001707). Demineralizer system waste streams and oil/water separator discharges are routed to the sedimentation basin. The demineralizer waste stream includes wastes generated from resin regeneration; sand and carbon filter backwash, floor drains, and wet well overflows. Outfall #003 has been recycled for more than 15 years by routing back to the head of the water treatment plant. Previously the permit required scheduled monitoring; however this permit reduces the monitoring frequency to when discharging.

With the construction of the new sedimentation lagoons, the discharge and design flow is not expected to increase. The construction permit was issued June 6, 2015. Appendix A-2 contains the flow diagram for Outfall #003.

#### **Outfall #007: Sanitary Wastewater Treatment Plant**

Primary treatment is provided in a three-cell lagoon. Effluent from the final cell is routed (in series) through two wetland basins. Both the wetlands are constructed wetlands created by conversion of filled water treatment plant sedimentation lagoons. The connection from the discharge of the final wetland to the pump station was made in conjunction with the construction of the sedimentation lagoon #4. Outfall #007 is recycled back to the head of the water treatment plant. Previously the permit required scheduled monitoring; however this permit reduces the monitoring frequency to when discharging.

#### **Outfall #009: Intake Heater Blowdown**

The river intake structure contains two recirculating electric heaters, which are used to prevent ice formation on the intake bar screens during winter months. This discharge would contain blowdown or drainage from the boilers; however the boilers are currently in dry lay-up and no discharge has occurred in the last 25 years. This outfall remains permitted in case, the boilers were reinstalled, in use, and would need to discharge. Previously the permit required scheduled monitoring; however this permit reduces the monitoring frequency to when discharging.

#### **Outfall #010: Stormwater**

Stormwater settling pond drains 108 acres, 16.2 acres of which is impervious surface. Drainage area includes the cooling water chemical control building, the quality control building, the former Unit #2 excavation and the area of the plant west of the radwaste system. The pond has a retention time greater than 24 hours. Non-stormwater sources of intermittent water include fire water testing, manhole discharges, eye wash showers, and Unit 2 basin discharge.

#### **Outfall #011: Stormwater**

Stormwater settling pond drains 425 acres, 8.5 acres of which is impervious surface. Drainage area includes the water treatment plant, radwaste building, operation support facility, demineralizer portable water building and the circulating and service water pumphouse. The pond has retention time of less than 24 hours. Non-stormwater sources of intermittent water include fire water test and tank drain, manhole discharges, eye wash/shower, and air conditioning condensate

#### **Outfall #012: Stormwater**

Stormwater settling pond drains 87 acres, 22 acres of which is impervious surface. Drainage area includes most of the plant area including the parking lots, office buildings, switch yards, the turbine building, the outage maintenance building, and the Stores I building. The pond has retention time of less than 24 hours. Non-stormwater sources intermittent water include fire water test, manhole discharges, eye wash/shower, and air conditioning condensate

#### **Outfall #014: Stormwater**

Stormwater settling pond drains 100 acres, 4 acres of which is impervious surface. Drainage area includes half of the construction parking lot, the Stores II building, and the maintenance shop annex. The pond has a retention time less than 24 hours. Non-stormwater sources intermittent water include fire water test and air conditioning condensate

#### **Outfall #015: Stormwater**

Stormwater settling pond drains 60 acres, 0.6 acres of which is impervious surface. Drainage area includes paved roadways. The pond has a retention time greater than 24 hours.

#### **Outfall #016: Cooling Tower Bypass**

Outfall #016 consists of clarified river water and wastewater that has been recycled through the water treatment plant. It is used to moderate flow through the water treatment plant and to provide carrier water in the discharge line, if necessary. Outfall #016 is an intermittent discharge.

### Outfall #017: Ultimate Heat Sink

The ultimate heat sink is a cooling pond that has the ability to provide cooling water to various plant systems during other than normal conditions. This is operated as a no-discharge outfall.

Application Date: 08/06/2013 CP Application date: 12/16/2014 Expiration Date: 02/14/2014  
Last Inspection: 06/06/2013

#### FACILITY COMMENTS:

- Outfalls #001, #002, and #016 are the only process outfalls that discharge; however Ameren wants to main the ability to discharge through Outfalls #003, #007, and #009 if the need exists.
- Outfalls #003 and #007 are recycled back through the plant. Since Outfalls #003 and #007 are operated with recycle, monitoring was changed from scheduled to unscheduled, as a discharge is not expected to occur, the same was done with Outfall #009.
- Oil and grease effluent limits were reduced to match the Water Quality Standard of 10 mg/L monthly average. In review of the discharge monitoring reports, the facility could already meet the 10 mg/L limit.
- Total residual chlorine effluent limits were converted to micrograms per liter reporting rather than milligrams per liter reporting.
- As Outfall #002 as continuous pH monitoring, the provisions from 40 CFR 401.17 which allows for 446 minutes per calendar month of exceedance of pH values, with no individual excursion lasting more than 60 minutes.
- Total Nitrogen and Total Phosphorus monitoring were added on Outfalls #002 and #016 per 10 CSR 20-7.015(9)(D)7.
- Stormwater monitoring was reestablished in this permit cycle to verify the best management practices are in place and are being maintained.
- For Outfall #001, BOD<sub>5</sub> and Oil and Grease monitoring was reduced to quarterly.
- For Outfall #002, Oil and Grease monitoring was reduced to quarterly.
- There was a typo present in the public notice for BOD<sub>5</sub>, monitoring only remains on Outfall #001 for BOD<sub>5</sub>.
- Total Residual Chlorine for Outfall #001's monitoring frequency was adjusted to once/week.
- Total Nitrogen and Total Phosphorus monitoring frequency was reduced from the draft operating permit to the minimum required in 10 CSR 20-7.015 on a quarterly basis.
- Special condition #16 was updated from the public notice version to reflect that the testing for petroleum products needs to occur on secondary containment containing petroleum products.

#### OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (MGD)	TREATMENT LEVEL	EFFLUENT TYPE
#001	0.190	Ion exchange/Multimedia filtration/Neutralization	Radwaste system
#002	14.40	Disinfection/Cooling water	Cooling tower blowdown
#003	1.6	Sedimentation/Filtration/Separation and Recycle	Water Treatment Plant
#007	0.05	Equivalent to Secondary/Recycle	Domestic Wastewater
#009	0.006	Neutralization/No discharge	Process wastewater
#010*	4.6	BMPS, settling	Stormwater, incidental process wastewater
#011*	19.7	BMPS, settling	Stormwater, incidental process wastewater
#012*	6.6	BMPS, settling	Stormwater, incidental process wastewater
#014*	4.8	BMPS, settling	Stormwater, incidental process wastewater
#015*	2.8	BMPS, settling	Stormwater, incidental process wastewater
#016	14.4	Recycle cooling water	Cooling tower bypass
#017	0	No discharge	Cooling water

\*Based on 1 in 10 year storm event, is the design flow

## Part II – Receiving Stream Information

### APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

As per Missouri's Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall's Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section. As per Missouri's Stormwater Regulations [10 CSR 20.6.200(6)(B)2.], the department shall establish effluent limits as necessary to protect waters of the state. Effluent limitations for stormwater are established using best professional judgment based on the category and designated uses of the receiving stream.

Missouri or Mississippi River: ☒  
All Other Waters: ☒

10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1<sup>st</sup> classified receiving stream's beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

### RECEIVING STREAM(S) TABLE:

OUTFALL	WATERBODY NAME	CLASS	WBID	DESIGNATED USES	DISTANCE TO CLASSIFIED SEGMENT	12-DIGIT HUC
#001	Missouri River (piped)	P	701	AQL, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1605
#002	Missouri River (piped)	P	701	AQL, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1605
#003	Missouri River (piped)	P	701	AQL, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1606
#007	Missouri River (piped)	P	701	AQL, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1606
#009	Missouri River (piped)	P	701	AQL, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1606
#010	Tributary to Logan Creek	--	--	General Criteria	0.58	10300102-1605
#011	Tributary to Logan Creek	C	3906	AQL, HHP, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1605
#012	Tributary to Mud Creek	C	3906	AQL, HHP, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1606
#014	Tributary to Cow Branch	--	--	General Criteria	0.95	10300102-1504
#015	Tributary to Cow Branch	--	3906	AQL, HHP, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1504
#016	Missouri River (piped)	P	701	AQL, IRR, IND, LWW, SCR, WBC(B)	0.0	10300102-1605
#017	Tributary to Logan Creek	--	--	General Criteria	1.3	10300102-1605

AQL= Protection of Warm Water Aquatic Life and Human Health-Fish Consumption; C= Streams may cease flow in dry periods; CDF= Cold Water Fishery; CLF= Cool Water Fishery; DWS= Drinking Water Supply; E= Ephemeral stream; GEN= General; GRW = Groundwater; HUC= Hydrologic Unit Code; IND= Industrial; IRR=Irrigation; LWW= Livestock & Wildlife Watering; P= Permanent; SCR= Secondary Contact Recreation; W= Wetland; WBC= Whole Body Contact Recreation; WBID= Water Body Identification Number

### RECEIVING STREAM(S) LOW-FLOW VALUES:

RECEIVING STREAM	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Tributary to Mud Creek, Cow Branch, Logan Creek	0.0	0.0	0.0
8-20-13 MUDD V1.0 (C) (3906)	0.0	0.0	0.1
Missouri River (P)(701) <sup>a</sup>	23,337	39,013	55,169

<sup>a</sup> Missouri River flow data is from USGS Gaging station 06934500 at Hermann, MO from July 1969 to July 2012.

#### **MIXING CONSIDERATIONS - THERMAL:**

Missouri's Water Quality Standards [10 CSR 20-7.031(4)(A)1.], specifically state that mixing considerations for toxics do not apply to thermal mixing considerations and that thermal mixing considerations are located in [10 CSR 20-7.031(4)(D)6.], which states thermal mixing considerations are limited to 25% of the cross-sectional area or volume of a river, unless a biological survey performed in accordance with 316(a) of the Clean Water Act indicate no significant adverse effect on aquatic life. For the purpose of mixing considerations, the department typically uses the 25% of the daily flow vs cross-sectional area.

#### **RECEIVING STREAM MONITORING REQUIREMENTS:**

Ameren conducts upstream and downstream monitoring as part of their environmental commitments with NRC. Information from that sampling is available in the annual report, <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/call.html>.

### **Part III – Rationale and Derivation of Effluent Limitations & Permit Conditions**

#### **ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:**

As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

- ✓ Not Applicable; The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

#### **ANTI-BACKSLIDING:**

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

- ✓ Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.
  - ✓ The Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).
    - This permit changes WET test requirements for the facility from a pass/fail requirement to monitoring only for toxic units. This change reflects modifications to Missouri's Effluent Regulation found at 10 CSR 20-7.015. 40 CFR 122.44(d)(1)(ii) requires the department to establish effluent limitations that control all parameters which have the reasonable potential to cause or contribute to an excursion above any state water quality standard, including state narrative criteria. The previous permit imposed a pass/fail limitation without collecting sufficient data to make a reasonable potential determination. Furthermore, the method of reporting associated with the pass/fail limitation prevented the department from gathering the data necessary to make a finding of reasonable potential. Implementation of the toxic unit monitoring requirement will allow the department to implement numeric acute criteria in accordance with water quality standards established under §303 of the CWA.
    - The WET test from Outfall #001 was removed as there is not a lab available to perform the tests.
    - Outfalls #003 and #007 are operated in recycle mode and have not discharged in 15 years, monitoring was changed from scheduled to unscheduled, as a discharge is not expected to occur, the same was done with Outfall #009 as it has not discharged in 25 years.
    - Monitoring for oil and grease was reduced from monthly to quarterly, as a review of the previous permit discharge monitoring reports do not show an exceedance of the effluent limits.
    - Biochemical Oxygen Demand<sub>5</sub> was reduced from monthly to quarterly on Outfall #001, as Outfall #001 does not receive sanitary waste and the BOD<sub>5</sub> effluent limit is an indicator parameter. The facility is in compliance with their BOD<sub>5</sub> effluent limit.

#### **ANTIDEGRADATION:**

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

- ✓ Renewal no degradation proposed and no further review necessary.

**BIOSOLIDS & SEWAGE SLUDGE:**

Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works. Additional information regarding biosolids and sludge is located at the following web address: <http://extension.missouri.edu/main/DisplayCategory.aspx?C=74>, items WQ422 through WQ449.

✓ Not applicable; this condition is not applicable to the permittee for this facility.

**COMPLIANCE AND ENFORCEMENT:**

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

✓ Not Applicable. The permittee/facility is not currently under Water Protection Program enforcement action.

**EFFLUENT LIMIT GUIDELINES:**

The EPA in 2009 published the "Steam Electrical Power Generating Point Source Category: Final Detailed Study Report (2009 Final Report)". The 2009 Final Report summarizes data collected and analyzed from the EPA to review discharges from steam electrical power generating industry and to determine whether the current effluent guidelines (ELGs) for this industry should be revised. From the 2009 Final Report, it determined a need existed to update the current effluent regulations specific to Steam Electrical Power Generating Point Sources [40 CFR Part 423]. The 2009 Final Report also concluded the last updated version of this 1982 regulation does not adequately address the pollutants being discharged and have not kept pace with changes that have occurred in the power industry. EPA published a draft rule for comment in 2013. EPA has indicated that it will be finalized in September 2015. Nuclear power is included in the Steam Electric Guidelines.

**GROUNDWATER MONITORING:**

Groundwater Monitoring at Callaway is covered by the NRC environmental plans. Callaway Energy Center has an extensive groundwater monitoring network meeting the industry standard established in NEI 07-07

(<http://pbadupws.nrc.gov/docs/ML0726/ML072610036.pdf>). Numerous groundwater monitoring wells have been installed surrounding the power block area to monitor plant systems, structures, and components. In addition, monitoring wells have been installed along the discharge line and elsewhere on the plant site. Monitoring wells are sampled for tritium and gamma emitters. Additional information about groundwater monitoring at Callaway is available online through the NRC:

<http://pbadupws.nrc.gov/docs/ML0831/ML083150703.pdf>

**INDUSTRIAL SLUDGE:**

Industrial sludge is solids, semi-solids, or liquid residue generated during the treatment of industrial process wastewater in a treatment works; including but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment process; scum and solids filtered from water supplies and backwashed; and a material derived from industrial sludge.

✓ Not applicable. This condition is not applicable to the permittee for this facility.

**INTAKE WATER CREDITS (NET LIMITS):**

In accordance with federal regulation 40 CFR 122.45(g), technology-based effluent limitations or standards shall be adjusted to reflect credit for pollutants in the discharge's intake water if: (1) The applicable effluent limitations and standards contained in 40 CFR subchapter N specifically provide that they shall be applied on a net basis; or (2) The discharger demonstrates that the control system it proposes or uses to meet applicable technology-based limitations and standards would, if properly installed and operated, meet the limitations and standards in the absence of pollutants in the intake waters. Additionally, credit for conventional pollutants such as biochemical oxygen demand (BOD) or total suspended solids (TSS) should not be granted unless the permittee demonstrates that the constituents of the generic measure in the effluent are substantially similar to the constituents of the generic measure in the intake water or unless appropriate additional limits are placed on process water pollutants either at the outfall or elsewhere. Credit shall be granted only to the extent necessary to meet the applicable limitation or standard, up to a maximum value equal to the influent value. Additional monitoring may be necessary to determine eligibility for credits and compliance with permit limits. Credit (Net Limits) do not apply to the discharge of raw water clarifier sludge generated from the treatment of intake water.

As Ameren continuously recycles water through the system, net intake credits are not being granted for Outfalls #001, #002, #003, #009 or #016. Based on the reasonable potential analysis completed for Outfalls #001, #002, #009 and #016, the facility can meet the effluent previously established without intake credit provisions.

#### **REASONABLE POTENTIAL ANALYSIS (RPA):**

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard. In accordance with [40 CFR Part 122.44(d)(1)(iii)] if the permit writer determines that any give pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

✓ Applicable; a RPA was conducted on appropriate parameters. Please see **APPENDIX B: RPA RESULTS**.

#### Pollutants Typically Associated with Steam Electric Industry Discharges:

The US EPA *Interim Detailed Study Report for the Steam Electric Power Generating Point Source Category* (Interim Study Report) utilized available data to characterize the waste streams discharged from steam electric facilities, as well as the technologies and practices used in the industry to control the discharge of waste pollutants (Chapter 5). EPA is expected to release the updated effluent limit guidelines in September 2015. Table 5-1 in Chapter 5 of the Interim Study Report presents an overview of the types of pollutants associated with the various waste streams. Pollutants contained in the Interim Study Report are based on data previously collected by the EPA during the 1974 and 1982 rulemaking efforts and the 1996 Preliminary Data Summary, data provided by the Utility Water Act Group (UWAG) and Electric Power Research Institute (EPRI). Staff has reviewed the Discharge Monitoring Reports (DMRs) and renewal applications Forms C and D for each of the outfalls in this operating permit. Effluent testing results contained in Forms C and D for each outfall were compared directly with pollutants associated with the various waste streams for each of the outfalls. Below is the list of pollutants based on process waste streams for this facility:

- Cooling Water: Once-Through or Cooling Tower Blowdown (Outfall #002):  
Chlorine, Iron, Copper, Nickel, Aluminum, Boron, Chlorinated Organic Compounds, Suspended Solids, Brominated Compounds, and Non-Oxidizing Biocides.
- Other Low-Volume Waste Streams (Outfall #001):  
Suspended Solids, Dissolved Solids, Oil and Grease, Phosphates, Surfactants, Acidity, Methylene Chloride, Phthalates, BOD<sub>5</sub>, COD, Fecal Coliform and Nitrates.

For the above pollutants, staff drafting this operating permit only compared the applicable pollutants based on Missouri's Water Quality Standards criteria and designated uses. For any of the outfalls that do not contain one of the process wastewater types above, these pollutants were not reviewed (i.e., Outfalls #003 - #015). For stormwater outfalls, staff drafting this permit and fact sheet reviewed the applicable Forms 2F, C, and D to determine if effluent from this outfall had potential to exceed Missouri's Water Quality Standards for the tested pollutants.

#### **SCHEDULE OF COMPLIANCE (SOC):**

A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit.

✓ Not Applicable. This permit does not contain a SOC.

#### **SPILL REPORTING:**

Per 10 CSR 24-3.010, any emergency involving a hazardous substance must be reported to the department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply whether or not the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the Noncompliance Reporting requirement found in Standard Conditions Part I.

#### **STORM WATER POLLUTION PREVENTION PLAN (SWPPP):**

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of storm water discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure. Additionally in accordance with the Storm Water Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of storm water discharges.



- ✓ Applicable. A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the Department with jurisdiction, incorporate erosion control practices specific to site conditions, and provide for maintenance and adherence to the plan.
  - Quarterly monitoring and sampling for benchmarks is established in this permit, as under the previous permit cycle, stormwater monitoring was waived. The quarterly monitoring frequency is developed based on the guidance provided in the Department's Permit Writer's Manual Section 6.1.2 ([http://dnr.mo.gov/env/wpp/permits/manual/docs/6\\_1\\_2.pdf](http://dnr.mo.gov/env/wpp/permits/manual/docs/6_1_2.pdf)) and in EPA's multi-sector general permit- Sections 6.1 and 6.2 (pgs. 32-35). ([http://water.epa.gov/polwaste/npdes/stormwater/upload/msgp2013\\_proposedpermit1-7.pdf](http://water.epa.gov/polwaste/npdes/stormwater/upload/msgp2013_proposedpermit1-7.pdf))
  - The stormwater retention ponds have been in operation more than 35 years and often times there is little or no discharge during a normal storm event, which is why this permit does not contain the condition to sample within 60 minutes of the first flush or the start of a precipitation event. The stormwater ponds have the capacity to have retention times of 24 hours or longer.

### 303(d) List:

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

- ✓ Not Applicable. This facility does not discharge to a 303(d) listed stream.

### Total Maximum Daily Load (TMDL):

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation.

- ✓ Not Applicable. This facility is not associated with a TMDL.

### VARIANCE:

As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

- ✓ Not applicable. This operating permit is not drafted under premises of a petition for variance.

### WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

- ✓ Applicable. Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where

- C = downstream concentration
- C<sub>s</sub> = upstream concentration
- Q<sub>s</sub> = upstream flow
- C<sub>e</sub> = effluent concentration
- Q<sub>e</sub> = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID). Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA 505/2-90-001).

**Number of Samples “n”:** In accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance which should be, at a minimum, targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally be used to determine the value of “n” for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for “n” must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is “n = 4” at a minimum. For Total Ammonia as Nitrogen, “n = 30” is used.

#### WLA MODELING:

There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

✓ Not applicable. A WLA study was either not submitted or determined not applicable by Department staff.

#### WATER QUALITY STANDARDS:

Per [10 CSR 20-7.031(4)], general criteria shall be applicable to all waters of the state at all times including mixing zones.

Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

#### WHOLE EFFLUENT TOXICITY (WET) TEST:

A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

✓ Applicable. Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A)7. and the Water Quality Standards 10 CSR 20-7.031(4)(D),(F),(G),(I)2.A & B are being met. Under [10 CSR 20-6.010(8)(A)4], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc...); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by ALL facilities meeting the following criteria:

- ☒ Facility is a designated Major.
- ☐ Facility continuously or routinely exceeds its design flow.
- ☒ Facility (whether primarily domestic or industrial) that alters its production process throughout the year.
- ☒ Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- ☒ Facility has Water Quality-Based Effluent Limitations for toxic substances (other than NH<sub>3</sub>)
- ☐ Facility is a municipality with a Design Flow ≥ 22,500 gpd.

- The WET Test from #001 was removed as there is not a Lab available to conduct the test on the radiological test.
- Outfalls #002 is an unscheduled chronic WET test if they must use a molluscicide or other toxic pollutants to remove organisms from intake structures, WET testing shall be conducted once per year.
- Outfall #016 is an annual chronic WET test.
- WET test were not established for Outfalls #003, #007, and #009 because these outfalls do not discharge as they are operated in recycle mode.

#### TEMPERATURE LIMITS CONSIDERATIONS:

Missouri's Water Quality Standards establish Temperature Criteria that provide several forms of protection from the impacts of heat energy on receiving water bodies. The purpose of the Temperature Limit Guidance is to provide an approach to help both permit writers and the public understand the Temperature Criteria and how temperature requirements are applied in Missouri State Operating Permits. This approach assumes that the receiving water consumes 100% of the heat energy being discharged. At any time the permittee has reason to believe the discharge may exceed their permit temperature limits or if the permittee does exceed their permit limit, the permittee may determine it necessary to take action that may include, but is not limited to, seeking a 316(a) Variance, a Mixing Zone Study, or conducting a “Heat Model”. If action is taken by the permittee that warrants a modification to this operating permit, then the permittee will need to submit an application for a permit modification. Submitting an application for permit modification does not guarantee approval of said action and does not directly indicate that the result of said action will be implemented into an operating permit. A Quality Assurance Project Plan (QAPP) must be submitted for any alternative compliance approach.

Temperature monitoring is being maintained. The results of the RPA demonstrate that there is not reasonable potential to exceed the water quality standard of 90°F or the  $\pm 5^\circ\text{f}$  at the edge of the mixing zone. However as this is an energy center discharging water at 95°F prior to mixing, the monitoring requirement will remain at monthly monitoring.

### **316(b) COOLING WATER INTAKE STRUCTURE**

Section 316(b) of the Clean Water Act (CWA) applies to new or existing facilities operating a cooling water intake structure (CWIS). Section 316(b) requires that location, design, construction, and capacity of CWISs reflect the best technology available (BTA) for minimizing adverse environmental impacts (AEI). Under current regulations, existing facilities are subject to section 316(b) conditions that reflect BTA for minimizing AEI on a case-by-case, best professional judgment (BPJ) basis.

The Environmental Protection Agency's (EPA) Phase II Section 316(b) Existing Facilities Rule was remanded to the EPA in *Riverkeeper, Inc. et al. v EPA* 475 F.3d 83 (2d Cir. 2007). The Federal Water Pollution Control Act Amendments of 1972 require cooling water intake structures to reflect the best technology available for minimizing adverse environmental impact. Best technology available must consider intake design, location, construction, and capacity. The EPA has finalized the 316(b) standards and they became effective on October 16, 2014 (<http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/index.cfm>).

The Ameren Callaway Energy Center is located about 5 miles inland with an intake structure on the north bank of the Missouri River at river mile 115.4. The intake structure is located directly on the bank of the river. The main channel and greatest depth of the river occur immediately offshore of the intake structure.

When Callaway was built, the technology decision in 1984 established closed cycle cooling as the best achievable technology. In the 2014, final 316(b) rules, closed cycle cooling is still the best achievable technology. Closed cycle cooling is considered the best achievable technology under the new 316(b) regulations, 40 CFR 122.21(r) and 40 CFR 125. The original CWA 316b demonstration for Callaway Energy Center was approved by the department by letter dated August 1987 as "Best Technology Available". The report concluded that the estimated annual number of fish lost to impingement had no impact on the ecology or sport fishery of the Missouri River with respect to maintaining a balanced indigenous fish population. One reason for the relatively low numbers of fish collected during the impingement study was the location of the plant intake structure (i.e., main channel). This area of the river is characterized by swift current and shifting substratum which does not present a preferred fish habitat. Because the intake structure equipment and operation are essentially the same as the time of the original study, Ameren believes that the conclusion of the 1984 and 1986 studies are still valid.

EPA consulted with the US Fish and Wildlife Service and the National Marine Fisheries Service under the Endangered Species Act rules. The Services concluded that the new 316(b) rule is not likely to jeopardize the continued existence of listed species or result in adverse modification of designated critical habitat. However the Services added a number of conditions to the final rule. The rules requires that facilities identify all Federally-listed threatened and endangered species and designated critical habitat that are present in the zone of influence area of the intake. This condition includes all listed species not just fish and shellfish. Additional control measures, monitoring and reporting requirements may be established to minimize incidental take. The Services will have 60 days to review and comment on measures related to listed species and critical habitat.

This operating permit contain language indicating that the permit may be reopened and modified, or alternatively revoked and reissued to: incorporate new or modified requirements applicable to existing cooling water intake structures under Section 316(b) of the Clean Water Act consistent with any standard established pursuant to section 1311 or section 1316 of 33 USC 1326. In the event that, it is necessary for this permit to be reopened and modified, or alternatively revoked and reissued, permittee shall comply with any such new or modified requirements or standards applicable to existing cooling water intake structures under 316(b) of the Clean Water Act.

To meet the 316(b) requirements, Ameren will be required to conduct some of the studies required under 40 CFR 122.21(r). As the intake is less than 125 MGD, the entrainment decision is a best professional judgment decision not requiring all the studies. For impingement, Callaway has already installed one of the approved technologies, cooling towers. With the installed cooling towers, that is one of the approved methods for showing compliance with the Impingement Mortality requirements in 40 CFR 122.21(r).

As part of the request for NRC license renewal under the Environmental Impact Section, Ameren agreed to conduct impingement and entrainment studies at Callaway for the 2015 and 2016. As a result of those studies, along with the other studies required with 316(b), if recommendations are made for operational changes that are in compliance with the NRC regulations, they will be incorporated upon permit renewal. Ameren Missouri will perform a one-year pallid sturgeon entrainment and impingement study for the Callaway Plant Unit 1 closed-cycle make-up water intake structure. The impingement study will consist of a once-per-week sample over a 52 consecutive week period. The sample will be obtained from the traveling screen wash trough of the plant closed cycle make-up water intake structure, with the exception that three (3) samples per week will be obtained and processed during May through July. Samples will be taken on nonconsecutive days, when possible.

The entrainment study will be conducted in either 2015 or 2016 and will require a weekly sample to be obtained and processed in the second half of March, April, August, and September. In addition, three (3) samples per week will be obtained and processed throughout May through July. Samples will be taken on non-consecutive days, when possible. Entrainment samples will be obtained and processed from the plant closed-cycle make-up water intake structure on the discharge side of the traveling screens. Missouri River sampling will be conducted at three (3) locations opposite the intake structure during four (4) consecutive weeks (during May or June based on monitored water temperatures favorable for sturgeon spawning) on a once per week basis. A final report documenting the study results will be provided by March 31, 2017. (submitted by Ameren to the NRC on October 31, 2014).

Based on the results of the studies being conducted as part of the NRC license renewal, and the additional studies required under 40 CFR 122.21(r), operational changes may be recommended at permit renewal for protection of aquatic life. However any changes may require the NRC's approval to ensure safety remains high.

Under 40 CFR 122.21, the required studies at Callaway will include:

- i. **Source Water Physical Data Report, 40 CFR 122.21(r)(2):** This report requires a description and scaled drawings showing the physical configuration of the water body, including areal dimensions, depths, and temperature regimes, identification and characterization of the source waterbody's hydrological and geomorphological features, estimate the intake's area of influence within the waterbody and locational maps.
- ii. **Cooling Water Intake Structure Data Report, 40 CFR 122.21(r)(3):** This report requires information on the design of the intake structure and its location in the water column. It includes design intake flows, daily hours of operation, number of days of the year in operation and seasonal changes, if applicable; a flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges, and engineering drawings of the cooling water intake structure.
- iii. **Source Water Baseline Biological Characterization Data Report, 40 CFR 122.21(r)(4):** This report characterizes the biological community in the vicinity of the cooling water intake structure.
- iv. **Cooling Water System Data Report, 40 CFR 122.21(r)(5):** This report provides information on the operation of the cooling water system including descriptions of reductions in water withdrawals, recycled water, proportion of the source waterbody withdrawn.
- v. **Operational Status, 40 CFR 122.21(r)(8):** The operational status report includes descriptions of each unit's operating status including age of the unit, capacity utilization for the previous 5 years, and any major upgrades completed within the last 15 years, including boiler replacement, condenser replacement, turbine replacement, fuel change.

## Part IV – Effluent Limits Determination

### Outfall #001 – Main Facility Outfall

**Radwaste Treatment System - SIC #4911 (Piped to Missouri River)** Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

#### #001 EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMIT	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*		*	NO	SAME
BOD <sub>5</sub>	MG/L	1	*		*	NO	SAME
TSS	MG/L	1	45		30	NO	SAME
PH	SU	1	6-9		6-9	NO	SAME
CHLORINE, TOTAL RESIDUAL	µG/L	3	200		104	NO	0.2/0.1 MG/L
OIL & GREASE	MG/L	1,2	15		10	YES	20/15
BORON, TOTAL RECOVERABLE	MG/L	3	*		*	NO	SAME
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

\*Monitoring only

#### Basis for Limitations Codes:

- |  |                                   |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law       | 5. Water Quality Model            |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment     |
| 3. Water Quality Based Effluent Limits   | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy         | 8. WET Test Policy                |

#### OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **Boron, total recoverable.** Monitoring only retained from previous permit, and is deemed to be protective. While RP does not exist, Appendix B, as one of the main treatment systems uses boron, monitoring is maintained.
- **Biochemical Oxygen Demand (BOD<sub>5</sub>).** Monitoring only. Effluent limitations have been retained from previous state operating permit, and is deemed to be protective.
- **Total Suspended Solids (TSS).** Limit from 40 CFR 423 .13. Effluent limitations have been retained from previous state operating permit and is deemed to be protective.
- **pH.** Limit from 40 CFR 423.13. Effluent limitations have been retained from previous state operating permit, and is deemed to be protective. Water Quality Standard is 6.5-9.0. Piped to the Missouri River, mixing considerations are applicable, thus pH is limited to 6.0-9.0 SU.
- **Total Residual Chlorine (TRC).** 40 CFR 423 governs this analyte in addition to the calculated limits below. Effluent limitations have been retained from previous state operating permit, and are deemed to be protective. Total Residual Chlorine water quality based effluent limits are 209 µg/L daily maximum, 104 µg/L monthly average. Since limits at 40 CFR 423 are more protective than the 209 µg/L, the limit of 200 µg/L will be used for daily.

- **Oil & Grease.** 40 CFR 423.13 sets the effluent limit at 20 mg/L maximum daily and 15 mg/L monthly average. The water quality standard is 10 mg/L monthly average. The water quality standard is more protective than the Effluent Limit Guideline. Average monthly effluent limit= 10 mg/L; maximum daily effluent limit = 15 mg/L.
- **Temperature.** Monitoring Only, change from °C to °F reporting. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. The facility employs best available control technology with cooling towers; which after the water leaves the cooling towers, the water is stored for reuse at the plant or for discharge back to the Missouri River. 10 CSR 20-7.031(4)(D)5 states that temperature shall not exceed the monthly temperature criteria established of 90°F at the edge of the mixing zone.
- **Minimum Sampling and Reporting Frequency Requirements.** Sampling and reporting frequency requirements have been retained from previous state operating permit, except for BOD<sub>5</sub> and oil and grease monitoring was reduced to quarterly for Total Residual Chlorine. TRC monitoring frequency was reduced from daily to once/week.
- **Parameter Removed:** Whole Effluent Toxicity test removed from Outfall #001, as there are no labs available to conduct the test.

**Outfall #002 - Cooling Tower Blowdown: (Piped to Missouri River)**

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

**#002 EFFLUENT LIMITATIONS TABLE:**

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	GPD	1	*		*	NO	
TOTAL SUSPENDED SOLIDS	MG/L	1	*		*	NO	
TOTAL DISSOLVED SOLIDS	MG/L	1	*		*	NO	
PH	SU	1	6-9		6-9	NO	
PH	MIN	1			446	YES	***
PH	COUNT	1			0	YES	***
OIL & GREASE	MG/L	1,3	15		10	YES	20/15
TOTAL RESIDUAL CHLORINE	mg/L	2,3	200		104	NO	0.2/0.1 MG/L
TOTAL PHOSPHORUS	mg/L	2	*		*	YES	***
TOTAL NITROGEN	mg/L	2	*		*	YES	***
CHRONIC WET	TUc	8	*			YES	%SURVIVAL
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

\* - Monitoring requirement only

\*\*\* - Parameter not previously established in previous state operating permit.

**Basis for Limitations Codes:**

- |  |                                   |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law       | 5. Water Quality Model            |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment     |
| 3. Water Quality Based Effluent Limits   | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy         | 8. WET Test Policy                |

**OUTFALL #002 – DERIVATION AND DISCUSSION OF LIMITS:**

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **Total Dissolved Solids.** Monitoring retained from previous permit, and is deemed to be protective.
- **Total Suspended Solids (TSS).** Monitoring only to determine contribution. Effluent limitations have been retained from previous state operating permit, and is deemed to be protective.
- **pH.** 6.0-9.0 SU. Technology based limits [10 CSR 20-7.015 and 40 CFR 423.13] are protective of the water quality standard [10 CSR 20-7.031(4)(E)], due to the buffering capacity of the mixing zone. Previous permit did not require the reporting of the minutes above the Water Quality Standard and the number of excursions lasting sixty or more minutes; the permittee shall report the minimum and maximum pH of the month.
- **pH- Minutes of Exceedance per month.** Callaway Energy Center has continuous pH measurement on Outfall 002. With continuous pH measurement, the facility may have excursions of the set pH for up to 446 minutes (7 hrs, 26 minutes) in any calendar month, per 40 CFR 401.17
- **pH- Number of Excursion of pH effluent limits.** Number of pH excursions lasting sixty or more minutes. Under 40 CFR 401.17, the permittee shall not have an individual pH excursion lasting sixty (60) minutes or more.
- **Oil & Grease.** 40 CFR 423.13 sets the effluent limit at 20 mg/L maximum daily and 15 mg/L monthly average. The water quality standard is 10 mg/L monthly average. The water quality standard is more protective than the Effluent Limit Guideline. Average monthly effluent limit= 10 mg/L; maximum daily effluent limit = 15 mg/L.
- **Temperature.** Monitoring Only. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. The facility employs best available control technology with cooling towers; which after the water leaves the cooling towers, the water is stored for reuse at the plant or for discharge back to the Missouri River. 10 CSR 20-7.031(4)(D)5 states that temperature shall not exceed the monthly temperature criteria established of 90°F at the edge of the mixing zone.
- **Total Residual Chlorine (TRC).** 40 CFR 423 governs this analyte in addition to the calculated limits below. Effluent limitations have been retained from previous state operating permit, and are deemed to be protective. Total Residual Chlorine water quality based effluent limits are 209 µg/L daily maximum, 104 µg/L monthly average. Since limits at 40 CFR 423 are more protective than the 209 µg/L, the limit of 200 µg/L will be used for daily.
- **Total Phosphorus and Total Nitrogen.** Monitoring required for facilities greater than 100,000 gpd design flow per 10 CSR 20-7.015(9)(D)7. Total Nitrogen shall be determined by testing for Total Kjeldahl Nitrogen (TKN) and Nitrate + Nitrite and reporting the sum of the results (reported as N). Nitrate + Nitrite can be analyzed together or separately.
- **Outfall #002 WET Tests.** Unscheduled WET test when molluscides are used. WET Testing schedules and intervals are established in accordance with the department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.
  - ☒ Chronic
  - ☒ No less than **ONCE/YEAR:**
    - ☒ Facility is designated as a Major facility or has a design flow  $\geq$  1.0 MGD.
- **Minimum Sampling and Reporting Frequency Requirements.** Sampling and reporting frequency requirements have been retained from previous state operating permit, except oil and grease monitoring was reduced to quarterly and total residual chlorine was reduced from daily to weekly monitoring. Total Phosphorus and Total Nitrogen shall have quarterly monitoring, as required in 10 CSR 20-7.015(9)(D)7.

### Outfall #003 - Water Treatment Plant Wastes (Piped to the Missouri River)

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

#003 EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	GPD	1	*		*	NO	
TOTAL SUSPENDED SOLIDS	MG/L	1	100		30	NO	
PH	SU	1	6-9		6-9	NO	
OIL & GREASE (MG/L)	MG/L	1,3	15		10	YES	20/15
TOTAL RESIDUAL CHLORINE	µG/L	1,3	200		104	NO	0.2/0.1 MG/L
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

\* - Monitoring only

Basis for Limitations Codes:

- |  |                                   |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law       | 5. Water Quality Model            |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment     |
| 3. Water Quality Based Effluent Limits   | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy         | 8. WET Test Policy                |

### OUTFALL #003 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **Total Suspended Solids (TSS).** Limit from 423.13. Effluent limitations have been retained from previous state operating permit, and is deemed to be protective.
- **pH.** 6.0-9.0 SU. Technology based limits [10 CSR 20-7.015 and 40 CFR 423.13] are protective of the water quality standard [10 CSR 20-7.031(4)(E)], due to the buffering capacity of the mixing zone.
- **Total Residual Chlorine (TRC).** 40 CFR 423 governs this analyte in addition to the calculated limits below. Effluent limitations have been retained from previous state operating permit, and are deemed to be protective. Total Residual Chlorine water quality based effluent limits are 209 µg/L daily maximum, 104 µg/L monthly average. Since limits at 40 CFR 423 are more protective than the 209 µg/L, the limit of 200 µg/L will be used for daily.
- **Oil & Grease.** 40 CFR 423.13 sets the effluent limit at 20 mg/L maximum daily and 15 mg/L monthly average. The water quality standard is 10 mg/L monthly average. The water quality standard is more protective than the Effluent Limit Guideline. Average monthly effluent limit= 10 mg/L; maximum daily effluent limit = 15 mg/L.
- **Minimum Sampling and Reporting Frequency Requirements.** Sampling and reporting frequency requirements have been retained from previous state operating permit but have been made an unscheduled event as a discharge has not occurred in over 15 years from the Outfall.



### Outfall #007 – Sanitary Waste; 3 Cell Flow Through Lagoon (Piped to the Missouri River)

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

#### #007 EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	GPD	1	*		*	No	
BOD <sub>5</sub>	MG/L	1		65	45	No	
TSS	MG/L	1		110	70	No	
OIL AND GREASE	MG/L		15		10	No	
PH	SU	1	6.0-9.0		6.0-9.0	No	
AMMONIA AS N	MG/L	2	*		*	No	
ESCHERICHIA COLI FORM	**	1,2,3	Please see Escherichia Coli (E. coli) in the Derivation and Discussion Section below.			YES	***/FECAL COLIFORM
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.					No	

\* - Monitoring requirement only.

\*\* - # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.

\*\*\* - Parameter not previously established in previous state operating permit.

#### Basis for Limitations Codes:

- |  |                                   |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law       | 5. Water Quality Model            |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment     |
| 3. Water Quality Based Effluent Limits   | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy         | 8. WET Test Policy                |

#### OUTFALL #007– DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD<sub>5</sub>).** 65 mg/L weekly effluent limit; 45 mg/L average monthly limit. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information**.
- **Total Suspended Solids (TSS).** 110 mg/L weekly average effluent limit; 70 mg/L average monthly limit. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information**.
- **pH.** 6.0-9.0 SU. Technology based limits [10 CSR 20-7.015] are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the buffering capacity of the mixing zone.
- **Total Ammonia Nitrogen.** Monitoring only. As the outfall #007 does not normally discharge, effluent limits are not being applied. However if the flows are not recycled and a discharge occurs, the facility must sample for ammonia as N concentrations. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C.] default pH 7.8 SU. Background total ammonia nitrogen = 0.03 mg/L in the Missouri River.
- **Escherichia coliform (E. coli).** Monitoring only. As the outfall #007 does not normally discharge, effluent limits are not being applied. However if the flows are not recycled and a discharge occurs, the facility must sample for E. Coli concentrations during the Recreational Season (April 1 – October 31), to protect Whole Body Contact Recreation (B) designated use of the receiving

stream, as per 10 CSR 20-7.031(4)(C). Design flow of the treatment plant is less than 100,000 gpd, thus the monitoring frequency is equal to the other parameters of once per quarter.

- **Minimum Sampling and Reporting Frequency Requirements.** Sampling and reporting frequency requirements have been retained from previous state operating permit but have been made an unscheduled event as a discharge has not occurred in over 15 years from the Outfall.

#### **Outfall #009 - Intake Heater Blowdown: (Located on Missouri River)**

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

#### **#009 EFFLUENT LIMITATIONS TABLE:**

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*		*	NO	
TOTAL SUSPENDED SOLIDS	MG/L	1	100		30	NO	
PH	SU	1	6-9		6-9	NO	
OIL & GREASE	MG/L	1	15		10	YES	20/15
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

\* - Monitoring requirement only

#### **Basis for Limitations Codes:**

- |  |                                   |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law       | 5. Water Quality Model            |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment     |
| 3. Water Quality Based Effluent Limits   | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy         | 8. WET Test Policy                |

#### **OUTFALL #009 – DERIVATION AND DISCUSSION OF LIMITS:**

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **Total Suspended Solids (TSS).** Limit from 423.13. Effluent limitations have been retained from previous state operating permit, and is deemed to be protective.
- **pH.** 6.0-9.0 SU. Technology based limits [10 CSR 20-7.015 and 40 CFR 423.13] are protective of the water quality standard [10 CSR 20-7.031(4)(E)], due to the buffering capacity of the mixing zone.
- **Oil & Grease.** 40 CFR 423.13 sets the effluent limit at 20 mg/L maximum daily and 15 mg/L monthly average. The water quality standard is 10 mg/L monthly average. The water quality standard is more protective than the Effluent Limit Guideline. Average monthly effluent limit= 10 mg/L; maximum daily effluent limit = 15 mg/L
- **Minimum Sampling and Reporting Frequency Requirements.** Sampling and reporting frequency requirements have been retained from previous state operating permit but have been made an unscheduled event as a discharge has not occurred in over 15 years from the Outfall.

#### **Outfalls #010, #011, #012, #014, #015 and #017 - Storm Water Runoff**

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

Due to the nature of the discharges from these outfalls being stormwater, only a maximum daily limit (MDL) or monitoring requirement will be implemented for many of the parameters listed below. Stormwater events are acute occurrences that result in the greatest concentrations of pollutants being discharged in the first part of the runoff. This first flush can best be represented by a grab sample within the first hours of runoff. Additionally, stormwater events are highly variable. Recording an average monthly limit (AML) is not representative of the nature of these discharges. Many of these parameters that require just a MDL monitoring only requirement will now have a benchmark value associated with that monitoring only requirement. These benchmark values will be listed under the individual discussion and derivation of each parameter containing such a value.

#### BENCHMARKS

Benchmark concentrations are **not** effluent limitations; benchmark exceedance, therefore, is not a permit violation. Benchmark monitoring data is used to determine the overall effectiveness of control measures and to assist the permittee in knowing when additional corrective action(s) may be necessary to comply with the technology based effluent limitations (TBEL). Failure to take corrective action is a violation of the permit. Benchmark exceedance alone is not a permit violation.

The benchmarks listed in the derivation discussion below have been determined to be feasible, affordable and protective of water quality. These benchmark values are consistent with other stormwater permits including the EPA MSGP. The facility will be required to monitor for all these parameters and if the benchmarks are exceeded at all in the following permit cycle, then the permit writer will use best professional judgment to determine if effluent limitations will be necessary to protect water quality.

#### Outfalls #010 - #012, #014, & #015 – Stormwater Runoff, benchmarks

#### EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM BENCHMARK	MODIFIED	PREVIOUS PERMIT LIMITATIONS
COD	MG/L	1,2,3	90	YES	**
SETTLABLE SOLIDS	ML/L/HR	1,2,3	1.5	YES	**
pH	SU	1	6.5-9.0	YES	**
OIL & GREASE	MG/L	1	10	YES	**
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.				

\* - Monitoring requirement only.

\*\* - Parameter not previously established in previous state operating permit.

#### Basis for Limitations Codes:

- |  |                                   |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law       | 5. Water Quality Model            |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment     |
| 3. Water Quality Based Effluent Limits   | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy         | 8. WET Test Policy                |

#### OUTFALLS #010 - #012, #014, & #015 – DERIVATION AND DISCUSSION OF LIMITS:

- Chemical Oxygen Demand (COD<sub>5</sub>).** Based on data submitted on Form 2F of the application for renewal, monitoring is included using the permit writer's best professional judgment. There is no water quality standard for COD; however, increased oxygen demand may impact instream water quality. COD is also a valuable indicator parameter. COD monitoring allows the permittee to identify increases in COD that may indicate materials/chemicals coming into contact with stormwater that cause an increase in oxygen demand. Increases in COD may indicate a need for maintenance or improvement of BMPs. Additionally, a benchmark value will be implemented for this parameter. The benchmark value will be set at 90 mg/L. This value falls within the range of values implemented in other permits that have similar industrial activities and the Environmental Protection Agency's (EPA's) *Multi-Sector General Permit For Stormwater Discharges Associated With Industrial Activity* (MSGP).
- Settleable Solids.** Effluent limitations from the previous state operating permit have been reassessed. Monitoring remains on the stormwater outfalls for settleable solids to ensure the best management practices are maintained and operating correctly. The permittee is required to develop and implement a SWPPP and adhere to Best Management Practices (BMPs).
- pH.** pH shall be maintained within the range from 6.5 to 9.0 Standard Units (SU) as per 10 CSR 20-7.031(4)(E).
- Oil & Grease.** 40 CFR 423.13 sets the effluent limit at 20 mg/L maximum daily and 15 mg/L monthly average. The water quality standard is 10 mg/L monthly average. The water quality standard is more protective than the Effluent Limit Guideline. Average monthly effluent limit= 10 mg/L; maximum daily effluent limit = 15 mg/L.

- **Minimum Sampling and Reporting Frequency Requirements.** Sampling will be required at a minimum of quarterly to verify that the best management practices are being maintained and operated correctly. Reporting frequency will be quarterly. As its stormwater water, grab samples will be collected.

#### Outfall #016 - Cooling Tower Bypass (Piped to Missouri River)

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

**#016 EFFLUENT LIMITATIONS TABLE:**

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	GPD	1	*		*	NO	
TOTAL SUSPENDED SOLIDS	MG/L	1	100		30	NO	
PH	SU	1,3	6-9		6-9	NO	
OIL & GREASE	MG/L	1	15		10	YES	20/15
TOTAL RESIDUAL CHLORINE	µG/L	1,3	200		104	NO	0.2/0.104 MG/L
TOTAL PHOSPHORUS	MG/L	2	*		*	YES	**
TOTAL NITROGEN	MG/L	2	*		*	YES	**
TEMPERATURE	°F	1,3	*		*	NO	°C
CHRONIC WHOLE EFFLUENT TOXICITY	TUc	8	*			YES	%SURVIVAL
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

\* - Monitoring requirement only

\*\* - Parameter not previously established in previous state operating permit.

#### Basis for Limitations Codes:

- |  |                                   |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law       | 5. Water Quality Model            |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment     |
| 3. Water Quality Based Effluent Limits   | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy         | 8. WET Test Policy                |

#### OUTFALL #016 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **Total Suspended Solids (TSS).** Limit from 423.13. Effluent limitations have been retained from previous state operating permit, and is deemed to be protective.
- **Total Residual Chlorine (TRC).** 40 CFR 423 governs this analyte in addition to the calculated limits below. Effluent limitations have been retained from previous state operating permit, and are deemed to be protective. Total Residual Chlorine water quality based effluent limits are 209 µg/L daily maximum, 104 µg/L monthly average. Since limits at 40 CFR 423 are more protective than the 209 µg/L, the limit of 200 µg/L will be used for daily.
- **pH.** 6.0-9.0 SU. Technology based limits [10 CSR 20-7.015 and 40 CFR 423.13] are protective of the water quality standard [10 CSR 20-7.031(4)(E)], due to the buffering capacity of the mixing zone.
- **Oil & Grease.** 40 CFR 423.13 sets the effluent limit at 20 mg/L maximum daily and 15 mg/L monthly average. The water quality standard is 10 mg/L monthly average. The water quality standard is more protective than the Effluent Limit Guideline. Average monthly effluent limit= 10 mg/L; maximum daily effluent limit = 15 mg/L.

- **Temperature.** Monitoring Only. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. The facility employs best available control technology with cooling towers; which after the water leaves the cooling towers, the water is stored for reuse at the plant or for discharge back to the Missouri River. 10 CSR 20-7.031(4)(D)5 states that temperature shall not exceed the monthly temperature criteria established of 90°F at the edge of the mixing zone.
- **Total Phosphorus and Total Nitrogen.** Monitoring required for facilities greater than 100,000 gpd design flow per 10 CSR 20-7.015(9)(D)7. Total Nitrogen shall be determined by testing for Total Kjeldahl Nitrogen (TKN) and Nitrate + Nitrite and reporting the sum of the results (reported as N). Nitrate + Nitrite can be analyzed together or separately.
- **WET Test, Chronic.** Monitoring requirement only; monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards. WET Testing schedules and intervals are established in accordance with the Department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.
  - ☒ - **NO LESS THAN ONCE/YEAR:**
  - ☒ - Industrial dischargers with toxic parameters in the discharge; that may alter production processes; or facilities which handle large quantities of toxic substances or substances that are toxic in large amounts shall conduct chronic WET test at a frequency annually. It will be reevaluated at permit renewal.  
$$(22.32 \text{ cfs}) / ((15,250 \text{ cfs} \times 0.25 \times 0.1) + 22.32 \text{ cfs}) = 0.055 = 5.5\% = 10\%.$$
- **Minimum Sampling and Reporting Frequency Requirements.** Sampling and reporting frequency requirements have been retained from previous state operating permit, and is deemed to be protective. Total Phosphorus and Total Nitrogen shall have quarterly monitoring, as required in 10 CSR 20-7.015(9)(D)7.

## **Part V – Compliance with SWPPP Requirements to Achieve Benchmark Values**

The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate pollution of stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged with during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values discussed in Part IV above. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure that will assist in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit. Additional information can be found in EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009].

In order to effectively control the pollutants being discharged in stormwater runoff, potential stormwater pollution sources must be identified. Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). The pollutants of concern that have already been identified in Part IV above can be used to assist in identifying potential sources. Once these potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed, employ the control measures that have been determined to be adequate to achieve the benchmark values discussed above. Conduct monitoring and inspections of the BMPs to ensure they are working properly. Re-evaluate any BMP that is not achieving compliance with permitting requirements. For example, if sample results from either outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action should be taken to repair, improve or replace the failing BMP. This internal evaluation is required at least once per month but should be continued more frequently if BMPs continue to fail. If failures do occur, continue this trial and error process until appropriate BMPs have been established. If failures continue to occur and the permittee feels there are no practicable or cost-effective BMPs that will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the permittee can submit a request to re-evaluate the benchmark values. This request needs to include a detailed explanation of why the facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values. Provide financial data of the company and documentation of cost associated with BMPs for review. This will allow the department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request should also include the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. The request shall be submitted in the form of an operating permit modification application. Appropriate application forms can be found on the Department's website: <http://dnr.mo.gov/forms/index.html>.

## **Part VI – Administrative Requirements**

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

### **PERMIT SYNCHRONIZATION:**

The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together and all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than three years old, that data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit.

### **PUBLIC NOTICE:**

The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing.

The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit. For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

☒ - The Public Notice period for this operating permit was from May 21, 2015 to June 21, 2015. No responses received.

**DATE OF FACT SHEET:** MARCH 11, 2015

### **COMPLETED BY:**

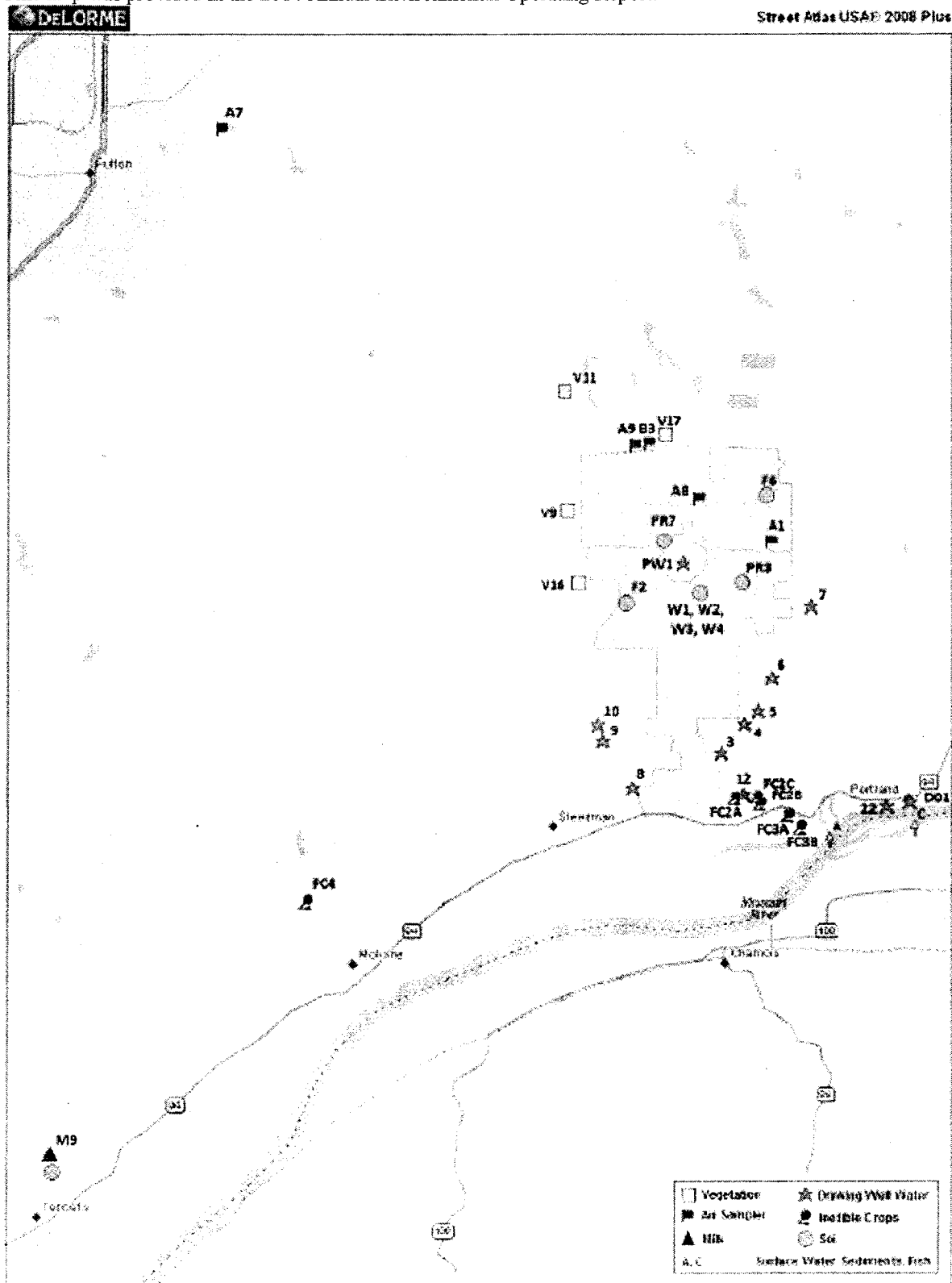
LEASUE MEYERS, EI  
MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
[leasue.meyers@dnr.mo.gov](mailto:leasue.meyers@dnr.mo.gov)

**APPENDIX A: FACILITY DIAGRAM**

**APPENDIX A-1: FACILITY MAP**



**APPENDIX A-2: FACILITY MONITORING LOCATIONS FOR GROUNDWATER, SOIL, VEGETATION AND ATMOSPHERIC MONITORING.**  
 This map was provided in the 2014 Annual Environmental Operating Report.

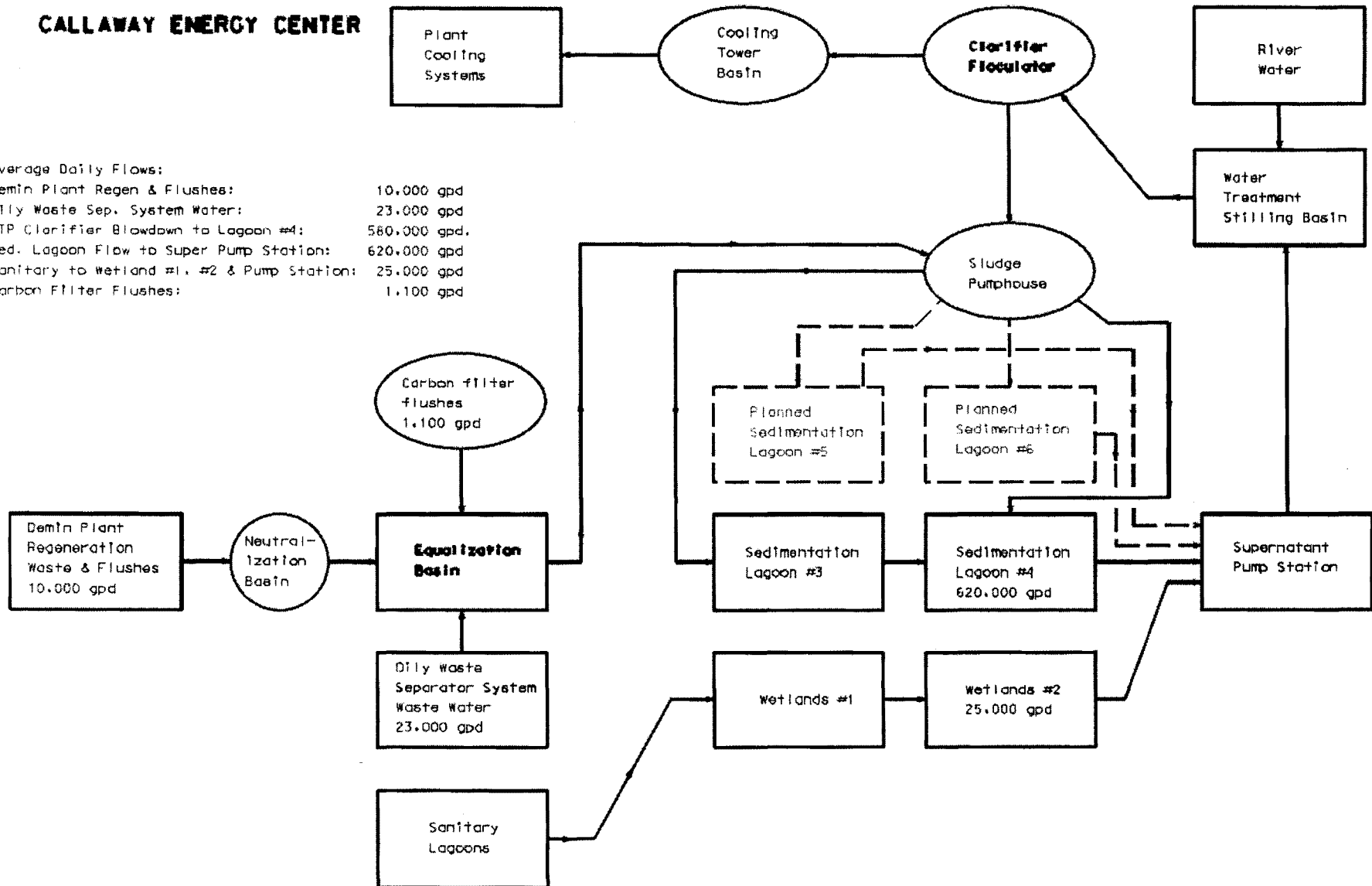




APPENDIX A-3: FLOW DIAGRAM FOR OUTFALL #003

# CALLAWAY ENERGY CENTER

Average Daily Flows:  
 Demin Plant Regen & Flushes: 10,000 gpd  
 Dily Waste Sep. System Water: 23,000 gpd  
 WTP Clarifier Blowdown to Lagoon #4: 560,000 gpd.  
 Sed. Lagoon Flow to Super Pump Station: 620,000 gpd  
 Sanitary to Wetland #1, #2 & Pump Station: 25,000 gpd  
 Carbon Filter Flushes: 1,100 gpd



## APPENDIX B: RPA RESULTS

### RPA RESULTS FOR OUTFALL #001:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Boron, Total Recoverable	2000	158.54	NA	NA	68	773/0.5	1.30	2.26	No
Chlorine, Total Residual	19	27.93	10	0.01	67	150/10	1.07	2.05	Yes

### RPA RESULTS FOR OUTFALL #002:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Chlorine, Total Residual	19	27.93	10	0.01	68	280/20	0.57	1.54	Yes

### RPA RESULTS FOR OUTFALL #016:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Chlorine, Total Residual	19	27.93	10	0.01	23	400/20	1.20	3.82	Yes

N/A – Not Applicable

\* - Units are (µg/L) unless otherwise noted.

\*\* - If the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent.

\*\*\* - Coefficient of Variation (CV) is calculated by dividing the Standard Deviation of the sample set by the Mean of the same sample set.

RWC – Receiving Water Concentration. It is the concentration of a toxicant or the parameter toxicity in the receiving water after mixing (if applicable).

n – Is the number of samples.

MF – Multiplying Factor. 99% Confidence Level and 99% Probability Basis.

RP – Reasonable Potential. It is where an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).

Reasonable Potential Analysis is conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version including calculations of this RPA is available upon request.