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, 92nd Congress) as amended,

Permit No.	MO-0000353
Owner:	Ameren Missouri
Address:	1901 Chouteau Avenue, P.O. Box 66149, MC-602, St. Louis, MO 63166-6149
Continuing Authority:	same as above
Address:	same as above
Facility Name:	Ameren Missouri Sioux Energy Center
Facility Address:	8501 North State Route 94, West Alton, MO 63386-1009
Legal Description:	see pages two and three; St. Charles Co.
UTM Coordinates:	see pages two and three
Receiving Stream:	see pages two and three
First Classified Stream and ID:	see pages two and three
USGS Basin & Sub-watershed No.:	see pages two and three

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

FACILITY DESCRIPTION

This facility is a power generating facility primarily involved in the production and sale of electricity from coal. See pages two through four for outfall descriptions. This facility does not require a certified wastewater operator.

(continued below)

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.

April 1, 2017
Effective Date

November 1, 2020
Modification Date

Edward B. Galbraith, Director, Division of Environmental Quality

March 31, 2022
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (CONTINUED)

OUTFALL #001 – Power Plant – SIC # 4911, NAICS # 221112
Non-contact cooling water; Unit 1 and 2 condensers, condensate coolers, jacket water coolers, flows from Outfall #009

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734877, Y = 4311058
Receiving Stream:	Mississippi River, Mile 209.5
First Classified Stream and ID:	Upper Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	City of Alton-Mississippi River - 07110009-0402
Design Flow:	724.3 MGD
Average Flow:	645 MGD

OUTFALL #002 – Power Plant – SIC # 4911
Ash pond #1; bottom ash system, combined drain sump, bottom ash system overflow, sewage treatment plant (Outfall #02A), boiler drain line, exciter & control room HVAC cooling tower, precipitation, stormwater

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734273, Y = 4310597
Receiving Waterbody:	Poeling Lake
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Design Flow:	15.8 MGD
Average Flow:	3.8 MGD

OUTFALL #02A – Power Plant – SIC # 4911
Rerouted to outfall #09A with the process line changes and construction covered under CP001942. Inactivated with October 2020 modification.

OUTFALL #003 – Power Plant – SIC # 4911
Combined drain sump-emergency overflow. Discharges from this outfall is not authorized, and shall be subject to 40 CFR 122.41(m) and reported according to 40 CFR 122.41(m)(3)(i) & (ii).

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 73888, Y = 4311039
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	City of Alton-Mississippi River - 07110009-0402
Design Flow:	3.48 MGD
Average Flow:	0 MGD

OUTFALL #004 – Stormwater
Stormwater, discharges in to the cooling water intake structure canal

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734711, Y = 4310878
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Actual Flow:	dependent upon precipitation
Area of Impervious Surface:	0.2 acres
Total Drainage Area:	0.6 acres

(continued below)

FACILITY DESCRIPTION (CONTINUED)

OUTFALL #005 – Stormwater
Stormwater, roadway south of facility between south ash pond and Poeling Lake

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734408, Y = 4310020
Receiving Waterbody:	Poeling Lake
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Actual Flow:	dependent upon precipitation
Area of Impervious Surface:	0.05 acres
Total Drainage Area:	0.2 acres

OUTFALL #006 – Power Plant – SIC # 4911
Ash pond #2; flue gas conditioning heat exchanger, coal handling sumps, air heater wash, economizer ash system, precipitator ash removal system, precipitator pad sumps, regeneration wastes, char hopper, precipitation, decanting, dewatering, stormwater

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734716, Y = 4310212
Receiving Waterbody:	Poeling Lake
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Design Flow:	10.8 MGD
Average Flow:	4.6 MGD

OUTFALL #007 – Power Plant – SIC # 4911
Emergency overflow structure for no-discharge recycle pond. Mechanical evaporation., Discharges from this outfall is not authorized, and shall be subject to 40 CFR 122.41(m) and reported according to 40 CFR 122.41(m)(3)(i) & (ii).

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734392, Y = 4309811
Receiving Waterbody:	discharge would exit the western side of the recycle pond and enter an agricultural field; then would likely travel south until meeting Dwiggins Road; likely it would travel under Dwiggins Road and the rail road tracks at the jurisdictional seep then would follow general field drainage patterns south to the Missouri River.
First Classified Stream and ID:	Missouri River (P) (1604)
USGS Basin & Sub-watershed No.:	Outlet Missouri River - 10300200-0804
Design Flow:	1378 MGD
Average Flow:	0 MGD

PERMITTED FEATURE #008 – Power Plant – SIC # 4911
Intake structure (new feature this permit), samples are taken at the Raw Water Treatment building (X=735020, Y=4310964)

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734746, Y = 4310918
Withdrawing Stream:	Upper Mississippi River (P) (3700) at mile 209.5
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Withdrawal:	202,201,000,000 gallons in 2014 (202,201 MGD)

OUTFALL #009 – Power Plant – SIC # 4911
Low Volume waste treatment earthen basins, receiving flows from north and south area sumps, stormwater, bottom ash quench, coal pile runoff, domestic wastewater from sewage treatment plant (#09A),

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734745, Y = 4310891
Receiving Waterbody:	Intake Canal -Mississippi River (P) (3700)
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Design Flow:	8.2 MGD
Average Flow:	2.84 MGD (expected)

OUTFALL #09A – Power Plant – SIC # 4911

Rerouted with the process line changes, formerly Outfall #02A. Package Sewage Treatment Plant (flow equalization, extended aeration, activated sludge, uv disinfection, sludge holding tank; sludge removed by contract hauler)

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 735056, Y = 4310964
Receiving Waterbody:	Poeling Lake
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Design Flow:	0.039 MGD
Average Flow:	0.013 MGD

OUTFALL #010 – Power Plant – SIC # 4911

Emergency overflow structure for low volume waste, normally discharges through Outfall #009 for additional settling and pH adjustment

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734597, Y = 4310554
Receiving Waterbody:	Mississippi River (P) (3700)
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Design Flow:	25.1 MGD
Average Flow:	0.0 MGD

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001
Cooling Water

TABLE A-1
INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective on **April 1, 2017** and remain in effect through **March 31, 2019**. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETERS	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	daily	24 hr. total
Thermal Discharge	Btu/hr	5.5×10^9		*	daily	calculation
Effluent Flow (Q_e)	cfs	*		*	daily	measured
Effluent Temperature (T_e)	°F	*		*	daily	measured
Stream Flow (Q_s)	cfs	*		*	daily	measured
Stream Temperature (T_s)	°F	*		*	daily	measured
ΔT (Note 3)	°F	*		*	daily	calculation
T_{emz} (Note 4)	°F	*		*	daily	calculation
Time of Deviation-Month (Note 4)	hours			*	monthly	calculation
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MAY 28, 2017. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Total Time of Deviation (Note 4)	hours/year	*			yearly sum	calculation
MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2018. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 *Cooling Water*	**TABLE A-2** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

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 **April 1, 2019** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	daily	24 hr. total
Effluent Flow (Q_e)	cfs	*		*	daily	measured
Effluent Temperature (T_e)	°F	*		*	daily	measured
Stream Flow (Q_s)	cfs	*		*	daily	measured
Stream Temperature (T_s)	°F	*		*	daily	measured
ΔT (Note 3)	°F	5		*	daily	calculation
T_{cap} (Note 4)						
January	°F	45		*	daily	calculation
February	°F	45		*	daily	calculation
March	°F	57		*	daily	calculation
April	°F	68		*	daily	calculation
May	°F	78		*	daily	calculation
June	°F	86		*	daily	calculation
July	°F	88		*	daily	calculation
August	°F	88		*	daily	calculation
September	°F	86		*	daily	calculation
October	°F	75		*	daily	calculation
November	°F	65		*	daily	calculation
December	°F	52		*	daily	calculation
T_{dev} (Note 4)						
January	°F	48		*	daily	calculation
February	°F	48		*	daily	calculation
March	°F	60		*	daily	calculation
April	°F	71		*	daily	calculation
May	°F	81		*	daily	calculation
June	°F	89		*	daily	calculation
July	°F	91		*	daily	calculation
August	°F	91		*	daily	calculation
September	°F	89		*	daily	calculation
October	°F	78		*	daily	calculation
November	°F	68		*	daily	calculation
December	°F	55		*	daily	calculation
Time of Deviation-Month (Note 4)	hours			*	monthly	calculation
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MAY 28, 2019. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Total Time of Deviation (Note 4)	hours/year	438			yearly sum	calculation
MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 *Cooling Water*	**TABLE A-3** **FINAL EFFLUENT LIMITATIONS AND CONDITIONAL MONITORING REQUIREMENTS**					
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 **April 1, 2017** and remain in effect until expiration of the permit. Testing for the following parameters will occur concurrently of each use of chlorine or biocides. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
CONDITIONAL MONITORING						
Chlorine, Free Available ǂ	µg/L	500		200	conditional	grab
Chlorine, Total Residual ǂ	µg/L	200			conditional	grab
Whole Effluent Toxicity, Acute ǂ See Special Condition #C19	TU_a	*			conditional	grab
MONITORING REPORTS SHALL BE SUBMITTED NO MORE THAN 30 DAYS FROM USE OF BIOCIDES OR CHLORINE PRODUCTS THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Yearly Chlorine & Biocide/ Molluskicide Report ǂ See Special Condition #C22					report	report
Yearly SOC Report					report	report
REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2018.						

ǂ (a) To comply with yearly reporting, each year, even if chlorine or biocides/molluskicides are not used, the facility will submit a short report to the St. Louis Regional Office. The report must detail each chemical used, the dosing concentration, and the time applied to the system. The facility must sample for free available chlorine and total residual chlorine upon every occasion (daily, concurrently) of chlorine use. The facility is not required to sample for chlorine if the biocide/molluskicide used is not chlorine based. The facility has no plans to use chlorine-based agents in the once-through system but limitations remain in the permit.

(b) The facility must collect a sample for WET testing if any biocide/molluskicide is used. The facility believes they will add molluskicide once per year.

(c) See also special condition #3 limiting chlorine discharges.

* Monitoring requirement only.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALLS #002, & #006 *Ash Ponds*	**TABLE A-4** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**				
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 **April 1, 2017** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	once/week	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	15		10	once/month	grab
pH (Note 1)	SU	6.5 to 9.0		6.5 to 9.0	once/week	grab
Total Suspended Solids (Actual)	mg/L	*		*	once/week	grab
Net Total Suspended Solids	mg/L	100		30	once/week	Grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MAY 28, 2017. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
CONVENTIONAL						
Cyanide Amenable to Chlorination	µg/L	*			once/quarter ◊	Grab
METALS						
Aluminum, Total Recoverable	µg/L	*			once/quarter ◊	grab
Arsenic, Total Recoverable	µg/L	*			once/quarter ◊	grab
Boron, Total Recoverable	µg/L	*			once/quarter ◊	grab
Chromium VI, Dissolved	µg/L	*			once/quarter ◊	grab
Iron, Total Recoverable	µg/L	*			once/quarter ◊	grab
Molybdenum, Total Recoverable	µg/L	*			once/quarter ◊	grab
Selenium, Total Recoverable	µg/L	*			once/quarter ◊	grab
Titanium, Total Recoverable	µg/L	*			once/quarter ◊	grab
NUTRIENTS						
Ammonia as N	mg/L	*			once/quarter ◊	grab
Kjeldahl Nitrogen, Total (TKN)	mg/L	*			once/quarter ◊	grab
Nitrate plus Nitrite as Nitrogen (N)	mg/L	*			once/quarter ◊	grab
Nitrogen, Total (TN)	mg/L	*			once/quarter ◊	grab
Phosphorus, Total (TP)	mg/L	*			once/quarter ◊	grab
OTHER						
Chloride	mg/L	*			once/quarter ◊	grab
Fluoride	mg/L	*			once/quarter ◊	grab
Sulfate	mg/L	*			once/quarter ◊	grab
Sulfate plus Chloride	mg/L	*			once/quarter ◊	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2017. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity, Chronic See Special Condition #C19	TU_c	*			once/year	grab
MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2018. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

INTERNAL MONITORING #09A *Domestic Wastewater*	**TABLE A-5 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**					
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 **November 1, 2020** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	once/quarter	24 hr. total
CONVENTIONAL						
Biochemical Oxygen Demand$_5$	mg/L	45		30	once/quarter	grab
E. coli (Note 2)	#/100 mL	630		126	once/quarter	grab
pH (Note 1)	SU	6.0 to 9.0		6.0 to 9.0	once/quarter	grab
Total Suspended Solids	mg/L	45		30	once/quarter	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JANUARY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

Note 2: The quarterly average for *E. coli* is expressed as a geometric mean; sample only during the recreational season from April 1 through October 31; quarterly samples required; a sample in October will be required.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

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OUTFALLS #003 & #010 *Emergency Discharges from Sump & Low Volume Wastewater*	**TABLE A-6** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The permittee is not 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 **April 1, 2017** and remain in effect until permit expiration. Any discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*			once/day/discharge	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	*			once/day/discharge	grab
pH (Note 1)	SU	*			once/day/discharge	grab
Total Suspended Solids	mg/L	*			once/day/discharge	grab
NUTRIENTS:						
Nitrogen, Total (TN)	mg/L	*			once/day/discharge	grab
Phosphorus, Total (TP)	mg/L	*			once/day/discharge	grab
OTHER						
Chloride	mg/L	*			once/day/discharge	grab
Hardness	mg/L	*			once/day/discharge	grab
Sulfate	mg/L	*			once/day/discharge	grab
Sulfate plus Chloride	mg/L	*			once/day/discharge	grab

MONITORING REPORTS SHALL BE SUBMITTED NO MORE THAN 30 DAYS FROM DATE OF DISCHARGE;
THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALLS #007 *Emergency Discharge*	**TABLE A-7** **INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The permittee is not authorized to discharge from this outfall. The final effluent limitations shall become effective on **April 1, 2017** and remain in effect until **October 31, 2018**. Discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT PARAMETERS	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*			once/day/discharge	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	*			once/day/discharge	grab
pH (Note 1)	SU	*			once/day/discharge	grab
Total Suspended Solids	mg/L	*			once/day/discharge	grab
FGD WASTEWATER ELG						
Arsenic, Total	µg/L	*		*	once/day/discharge	grab
Mercury, Total	ng/L	*		*	once/day/discharge	grab
Selenium, Total	µg/L	*		*	once/day/discharge	grab
Nitrate/Nitrite as N	mg/L	*		*	once/day/discharge	grab
NUTRIENTS:						
Nitrogen, Total (TN)	mg/L	*			once/day/discharge	grab
Phosphorus, Total (TP)	mg/L	*			once/day/discharge	grab
OTHER						
Chloride	mg/L	*			once/day/discharge	grab
Hardness	mg/L	*			once/day/discharge	grab
Sulfate	mg/L	*			once/day/discharge	grab
Sulfate plus Chloride	mg/L	*			once/day/discharge	grab

MONITORING REPORTS SHALL BE SUBMITTED NO MORE THAN 30 DAYS FROM DATE OF DISCHARGE;
THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALLS #007 *Emergency Discharge*	**TABLE A-8** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The permittee is not authorized to discharge from this outfall. The final effluent limitations shall become effective on **November 1, 2018** and remain in effect until expiration of the permit. Discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*			once/day/discharge	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	*			once/day/discharge	grab
pH (Note 1)	SU	*			once/day/discharge	grab
Total Suspended Solids	mg/L	*			once/day/discharge	grab
FGD WASTEWATER ELG						
Arsenic, Total	µg/L	11		8	once/day/discharge	grab
Mercury, Total	ng/L	788		356	once/day/discharge	grab
Selenium, Total	µg/L	23		12	once/day/discharge	grab
Nitrate/Nitrite as N	mg/L	17.0		4.4	once/day/discharge	grab
NUTRIENTS:						
Nitrogen, Total (TN)	mg/L	*			once/day/discharge	grab
Phosphorus, Total (TP)	mg/L	*			once/day/discharge	grab
OTHER						
Chloride	mg/L	*			once/day/discharge	grab
Sulfate	mg/L	*			once/day/discharge	grab
Sulfate plus Chloride	mg/L	*			once/day/discharge	grab

MONITORING REPORTS SHALL BE SUBMITTED NO MORE THAN 30 DAYS FROM DATE OF DISCHARGE;
THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALLS #009 *Low Volume Waste Basin*	**TABLE A-9** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**				
The permittee is not authorized to discharge from this outfall. The final effluent limitations shall become effective on **November 1, 2020** and remain in effect until expiration of the permit. Discharges shall be limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	once/week	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	15		10	once/month	grab
pH (Note 1)	SU	6.0 to 9.0		6.0 to 9.0	once/week	grab
Total Suspended Solids (Actual)	mg/L	*		*	once/week	grab
Net Total Suspended Solids	mg/L	100		30	once/week	grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE DECEMBER 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
CONVENTIONAL						
Cyanide Amenable to Chlorination	µg/L	*			once/quarter ◊	grab
METALS						
Aluminum, Total Recoverable	µg/L	*			once/quarter ◊	grab
Arsenic, Total Recoverable	µg/L	*			once/quarter ◊	grab
Boron, Total Recoverable	µg/L	*			once/quarter ◊	grab
Chromium VI, Dissolved	µg/L	*			once/quarter ◊	grab
Iron, Total Recoverable	µg/L	*			once/quarter ◊	grab
Molybdenum, Total Recoverable	µg/L	*			once/quarter ◊	grab
Selenium, Total Recoverable	µg/L	*			once/quarter ◊	grab
Titanium, Total Recoverable	µg/L	*			once/quarter ◊	grab
NUTRIENTS						
Ammonia as N	mg/L	*			once/quarter ◊	grab
Kjeldahl Nitrogen, Total (TKN)	mg/L	*			once/quarter ◊	grab
Nitrate plus Nitrite as Nitrogen (N)	mg/L	*			once/quarter ◊	grab
Nitrogen, Total (TN)	mg/L	*			once/quarter ◊	grab
Phosphorus, Total (TP)	mg/L	*			once/quarter ◊	grab
OTHER						
Chloride	mg/L	*			once/quarter ◊	grab
Fluoride	mg/L	*			once/quarter ◊	grab
Sulfate	mg/L	*			once/quarter ◊	grab
Sulfate plus Chloride	mg/L	*			once/quarter ◊	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JANUARY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity, Chronic See Special Condition #C19	TU_c	*			once/year	grab
MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2022. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

Note 2: The quarterly average for *E. coli* is expressed as a geometric mean; sample only during the recreational season from April 1 through October 31; quarterly samples required; a sample in October will be required.

Note 3: $\Delta T = [((Q_s/4)T_s + Q_eT_e) / ((Q_s/4) + Q_e)] - T_s$

Where:

ΔT	the change in temperature in °F at the edge of the thermal mixing zone
$Q_s/4$	the receiving stream flow in cfs divided by 4
Q_e	effluent flow in cfs
T_s	measured stream temperature
T_e	measured temperature of effluent

Note 4: To calculate the temperature of the stream at the edge of the mixing zone, the facility will use the following equation: Designated as T_{emz} in the equation below, the facility can determine compliance with T_{dev}, T_{cap}, and percent time deviation allowance.

$T_{emz} = [((Q_s/4)T_s + Q_eT_e) / ((Q_s/4) + Q_e))]$

Where:

T_{emz}	the temperature of the receiving stream at the edge of the thermal mixing zone
$Q_s/4$	the receiving stream flow in cfs divided by 4
Q_e	effluent flow in cfs
T_s	measured stream temperature
T_e	measured temperature of effluent

Temperature cap (designated as T_{cap} in Table A-2 of the permit) is the effluent temperature limitation applicable in the receiving stream at the edge of the thermal mixing zone. It may be exceeded for no more than 5% of the year (438 hours).

Temperature deviation (designated as T_{dev} in Table A-2 of the permit) is the maximum effluent temperature limit at the edge of the thermal mixing zone which may not be exceeded. MoCWIS is set up to receive one value for the thermal limitations for each month. The facility will violate the thermal limit if the value entered in MoCWIS is above the T_{dev} value for the month.

Percent Time Deviation Allowance: Missouri's Water Quality Standards allows permittees to exceed their applicable T_{cap} criteria (but not the T_{dev} criteria) for 5% of the year in Zone 1B along the Mississippi River. The time of deviation allowance shall be tracked in hours per year <u>any</u> time their calculated temperature values exceeds the month's daily maximum T_{cap} effluent limit. The permittee is required to monitor and report the total monthly exceedance time (not an average).

a) If T_{emz} is less than T_{cap} then the permittee records "0" hours deviation.
b) Any time T_{emz} is above T_{cap} then the facility reports the number of hours of deviation.
c) The permittee shall report on January 28th of each year the total number of hours the facility exceeded their temperature cap effluent limits for the entire year.

A violation occurs if:

a) The percent time deviation allowance is above 5% (438 hours) for the calendar year; and/or
b) The T_{emz} value reported is above the T_{dev} monthly limitation.

◊ Quarterly sampling

MINIMUM QUARTERLY SAMPLING REQUIREMENTS			
QUARTER	**MONTHS**	**EFFLUENT PARAMETERS**	**REPORT IS DUE**
First	January, February, March	Sample at least once during any month of the quarter; an *E. coli* sample is not required this quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	October 28th
Fourth	October, November, December	Sample at least once during any month of the quarter; for *E. coli*, a sample must be collected in October	January 28th

B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I and Part II standard conditions dated August 1, 2014 and August 1, 2019, and hereby incorporated as though fully set forth herein.

C. SPECIAL CONDITIONS

1. 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.

2. All outfalls and permitted features must be clearly marked in the field. The permittee will have 180 days from date of issuance to place signs on newly identified permitted features, Outfall #007, and Permitted Feature #008. For the new modified outfalls, #009, #09A, #010 must be marked and will be authorized with the issuance of the modification.

3. 40 CFR 423.13(c)(2): "Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the [state] the units in a particular location cannot operate at or below this level of chlorination."

4. 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."

5. 40 CFR 423.13(a): There shall be no discharge of polychlorinated biphenyl compounds (PCBs) such as those commonly [historically] used for transformer fluid.

6. 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.

C. SPECIAL CONDITIONS (CONTINUED)

7. Changes in Discharges of Toxic Pollutant
   In addition to the reporting requirements under §122.41(1), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
   (a) That an activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, 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;
      (3) Five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol;
      (4) One milligram per liter (1 mg/L) for antimony;
      (5) Five (5) times the maximum concentration value reported for the pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
      (6) The notification level established by the department in accordance with 40 CFR 122.44(f).
   (b) That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
      (1) Five hundred micrograms per liter (500 µg/l);
      (2) One milligram per liter (1 mg/L) for antimony;
      (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with §122.21(g)(7).
      (4) The level established by the Director in accordance with §122.44(f).

8. Report as no-discharge when a discharge does not occur during the report period.

9. 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) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When a parameter is not detected above ML, the permittee must report the data qualifier signifying less than ML for that parameter (e.g., < 50 µg/L, if the ML for the parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" for all non-detects for that reporting period and report the average of all the results.

10. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

11. 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.

12. The purpose of the SWPPP and the BMPs listed herein is the prevention of pollution of waters of the state. A deficiency of a BMP means it was not effective in preventing pollution [10 CSR 20-2.010(56)] of waters of the state, and corrective actions means the facility took steps to eliminate the deficiency.

C. SPECIAL CONDITIONS (CONTINUED)

13. The facility's SIC codes found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2) indicate they shall implement a SWPPP which 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 every five (5) years or as site conditions change (see Rationale and Derivation: antidegradation analysis, and SWPPP in the fact sheet). 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: *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002) published by the EPA in February 2009 (www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf). In addition to areas with industrial exposure, the facility must include the barge area, the road intended to transport dry-handled ash to the utility waste landfill, the railroad, outfall #004, and outfall #005 in the SWPPP. The SWPPP must include:
    (a) A listing of specific contaminants and their control measures (or BMPs) and a narrative explaining how BMPs are implemented to control and minimize the amount of contaminants potentially entering stormwater. The BMPs should be designed to treat the stormwater up to the 10 year, 24 hour rain event.
    (b) For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. Failure to implement and maintain the chosen BMP is a permit violation. For further guidance, consult the antidegradation implementation procedure at http://dnr.mo.gov/env/wpp/docs/AIP050212.pdf .
    (c) The SWPPP must include a schedule for once per month 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. Throughout coverage under this permit, the facility must perform ongoing SWPPP review and revision to incorporate any site condition changes.
        i. Operational deficiencies must be corrected within seven (7) calendar days.
        ii. Minor structural deficiencies must be corrected within fourteen (14) calendar days.
        iii. Major structural deficiencies must be reported to the regional office within seven (7) days of discovery. The initial report shall consist of the deficiency noted, the proposed remedies, the interim or temporary remedies (including the general timing of the placement of the interim measures), and an estimate of the timeframe needed to wholly complete the repairs or construction. The permittee will work with the regional office to determine the best course of action, including but not limited to temporary structures to control stormwater runoff. The facility shall correct the major structural deficiency as soon as reasonably achievable.
        iv. All actions taken to correct the deficiencies shall be included with the written report, including photographs.
        v. 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 and EPA personnel upon request.
    (d) A provision for designating an individual to be responsible for environmental matters.
    (e) 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.

C. SPECIAL CONDITIONS (CONTINUED)

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 stormwater 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 these materials are not exposed to stormwater or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of stormwater 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.
    (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 or benchmarks.
    (f) Ensure 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.

15. To protect the general criteria found at 10 CSR 20-7.031(4), before releasing water accumulated in secondary containment areas which contain petroleum products, it must be examined for hydrocarbon odor and presence of sheen. If the presence of odor or sheen is indicated, the water shall be treated using an appropriate method or disposed of in accordance with legally approved methods, such as being sent to a wastewater treatment facility. Following treatment, the water shall be tested for oil and grease, benzene, toluene, ethylbenzene, and xylene using 40 CFR part 136 methods. All pollutant levels must be below the most protective, applicable standards for the receiving stream, found in 10 CSR 20-7.031 Table A. Records of all testing and treatment of water accumulated in secondary containment shall be stored in the SWPPP to be available on demand to DNR and EPA personnel.

16. 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.

17. Impingement and Entrainment: CWA§ 316(b) Cooling Water Intake Structure
    (a) The facility is required to continue operating in a manner minimizing impingement and entrainment until the permittee has submitted the renewal application required in 40 CFR 122.21 and 40 CFR 125 Subpart J and best technology available is established in accordance with Clean Water Act §316(b) regulations. CWA § 316(b) regulations require modifications to reduce impingement and entrainment caused by intake structures.
    (b) The facility shall follow 40 CFR 122.21 and 40 CFR 125 Subpart J regulations regarding reduction in impingement and entrainment and performing their associated studies.
    (c) The facility shall submit annual status reports by February 28 each year, detailing the progress of the previous year.
    (d) Six months prior to permit expiration, the facility shall submit their application for 316(b) detailing the results of the biomonitoring studies and the selected path forward for implementing impingement and entrainment modifications at the intake structure.
    (e) 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 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.

C. SPECIAL CONDITIONS (CONTINUED)

18. Groundwater Monitoring Program: The permittee shall implement an effective groundwater monitoring program designed to determine if the coal ash impoundments have/had an impact on groundwater quality. The monitoring system must be capable of comparing up-gradient to down-gradient water quality in the first continuous water-bearing zone beneath the impoundment. The monitoring system must be based upon a thorough hydrogeological characterization of the impoundment area that determines the appropriate hydrostratigraphic unit to monitor, its groundwater gradient(s) and any seasonal variations in its gradient(s). Any hydrogeological characterization conducted for the design of the groundwater monitoring program shall be approved by the department's Missouri Geological Survey and must be conducted under the guidance of a geologist registered in the State of Missouri. The number of monitoring wells required for the groundwater monitoring program shall be based on site-specific hydrogeologic conditions and sufficient for effective monitoring of the site. To complete the following work plans and reports, the Water Protection Program recommends using applicable portions of the document issued by the Missouri Geological Survey (MGS), dated December 10, 2010 (or newer), *(Draft) Guidance for Conducting a Detailed Hydrogeologic Site Characterization and Designing a Groundwater Monitoring Program* as guidance. The plans shall be submitted as two hard copies and one electronic copy to the Missouri Department of Natural Resources central office: The Water Protection Program at P.O. Box 176, Jefferson City MO 65102-9920. In order to accomplish this, the permittee shall:
    (a) By 6 months from the date of issuance of this permit (or sooner), submit a Site Characterization Workplan to the Central Office for approval.
    (b) By 27 months from the date of issuance of this permit (or sooner) submit a Site Characterization Report detailing the findings from completion of the Site Characterization Workplan to the Central Office for verification of conclusions.
    (c) By 30 months from the date of issuance of this permit (or sooner) submit a draft Groundwater Monitoring, Sampling, and Analysis Plan (GMSAP) to the Central Office for approval.
    (d) By 36 months from the date of issuance of this permit (or sooner) submit a final Groundwater Monitoring, Sampling, and Analysis Plan (GMSAP) to the Central Office for approval. The design of the groundwater monitoring network should be approved by the department prior to installation. However, if installation occurs prior to approval, the WPP and MGS reserves the right to insist on additional wells or changes to the network.
    (e) By 48 months from the date of issuance of this permit (or sooner) have all elements of the GMSAP fully implemented. The facility shall collect groundwater quality samples at a discrete interval (usually quarterly) which must demonstrate each sample is independent and representative of the groundwater being monitored. A minimum of 8 groundwater quality samples must be collected prior to the expiration of the permit.

19. Whole Effluent Toxicity (WET) Tests shall be conducted as follows:
    - For outfall #001 (acute test), the AEC is 66%; the dilution series is 83%, 66%, 53%, 42%, and 34%.
    - WET tests on outfall #001 must be conducted concurrently of biocide use.
    - For outfalls #002, #006, and #009 (chronic tests), the AEC is 100%; the dilution series is: 100%, 50%, 25%, 12.5%, and 6.25%.

    Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows: (Outfall #001)
    (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the most recent edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 48-hour, static, non-renewal toxicity tests with the following species:
        - The fathead minnow, *Pimephales promelas* (Acute Toxicity EPA Test Method 2000.0).
        - The daphnid, *Ceriodaphnia dubia* (Acute Toxicity EPA Test Method 2002.0).
    (b) Chemical and physical analysis of the 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 or known to be toxic, other approved control water may be used.
    (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
    (d) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
    (e) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of acute toxic units ($TU_a = 100/LC_{50}$) reported according to the test methods manual chapter on report preparation and test review. The Lethal Concentration 50 Percent (LC_{50}) is the effluent concentration that would cause death in 50 percent of the test organisms at a specific time.

C. SPECIAL CONDITIONS (CONTINUED)

Chronic Whole Effluent Toxicity (WET) tests shall be conducted as follows: (Outfalls #002, #006, and #009)

(a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the most recent edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013; Table IA, 40 CFR Part 136).* The permittee shall concurrently conduct 7-day, static, renewal toxicity tests with the following species:
   - The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).
   - The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).

(b) Chemical and physical analysis of the 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 or known to be toxic, other approved control water may be used.

(c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.

(d) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.

(e) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of chronic toxic units (TUc = 100/IC25) 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 (IC25) is the toxic or effluent concentration that would cause 25 percent reduction in mean young per female or in growth for the test populations.

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. The facility shall not discharge chemical metal cleaning wastes [40 CFR 423.13(e)] to waters of the state.

22. The facility shall submit a report characterizing the use of chlorine and biocides in the cooling system of the plant. The report will be submitted to the St. Louis Regional Office. See address below. A report will be required yearly even in the absence of chlorine/biocide use. The report will describe the quantity, duration, WET test results, and final concentration values of any sampling as required by Table A-3 and accompanying notes.

23. 40 CFR 423.13(h)(1)(i) and (k)(1)(i): The facility shall not discharge ash transport water [40 CFR 423.11(p)] which is not legacy wastewater as soon as possible; and shall not discharge ash transport water on or after May 1, 2021. Legacy wastewater [FR Vol. 80 No. 212: 11/3/2015; preamble p. 67854, sec. VIII. C. 8.] is any bottom ash transport water, fly ash transport water, and FGD wastewater generated before May 1, 2021.

C. SPECIAL CONDITIONS (CONTINUED)

24. Electronic Discharge Monitoring Report (eDMR) Submission System. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
    (a) eDMR Registration Requirements. The permittee must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at https://dnr.mo.gov/mogem. Information about the eDMR system can be found at https://dnr.mo.gov/env/wpp/edmr.htm. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
    (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://apps5.mo.gov/mogems/welcome.action. If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
    (c) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.

D. SCHEDULE OF COMPLIANCE

Schedules of compliance are allowed under 40 CFR 122.47. The facility shall attain compliance with final effluent limitations established in this permit as soon as reasonably achievable:

1. The facility shall attain compliance with final effluent limitations for temperature at outfall #001 as soon as reasonably achievable or no later than two years from the effective date.

2. The permittee shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits every calendar year. The first report is due January 28, 2018.

Please submit progress reports via the Electronic Discharge Monitoring Report (eDMR) Submission System.

Missouri Department of Natural Resources
Factsheet Addendum
For Construction Permit/Modification
MO-0000353
Ameren Missouri-Sioux Energy Center

This addendum gives pertinent information regarding minor/simple modification(s) to the above listed operating permit for a public comment process. An addendum is not an enforceable part of a Missouri State Operating Permit.

Proposed Construction

This modification will not be issued until construction is complete of the new low volume waste treatment system. The proposed construction covered in this permit modification is the construction of low volume wastewater treatment basins, and supporting equipment/structures to manage stormwater and process water generated at the Ameren Missouri Sioux Energy Center. Construction activities on site will include the new North and South Area sumps, replacement of the existing coal pile runoff pumps, off-site polisher demineralizer regeneration and the new low volume wastewater. The construction of the low volume wastewater basins is what triggers the construction permit requirements, which was handled under CP0001942. The Department received notification that construction was substantially complete on September 11, 2020 and the Statement of Work Complete for CP0001942 was received September 29, 2020. Additionally there will be the establishment of three new outfalls:

- Outfall #009 will be the process outfall handling water from the low volume wastewater treatment basins.
- Outfall #09A will be the new internal monitoring for the domestic wastewater plant due to the changes in internal piping onsite. No changes are planned to the domestic wastewater treatment plant.
- Outfall #010 will be the emergency spillway on the low volume wastewater basin.

The following changes were made to the operating permit since the 2018 public notice prior to construction and the 2019 permit modification:

- The special condition relating to using the Department's edmr system was updated;
- The reporting on non-detects condition was updated;
- Permitted Feature #007's, which is the no-discharge recycle pond, facility description was updated to include the new mechanical evaporation units that were installed;
- Standard Conditions Part III was updated to the most recent version, and
- Permitted Feature #09A's facility description was updated to include the UV disinfection that was installed under CP0001989, which the Department received a Statement of Work Complete on January 17, 2020.

Coal Pile Runoff Pump Upgrades
The existing basin which collects stormwater runoff from the coal pile and process flow from coal handling areas contains pumps which will be replaced with two pumps each with a capacity of 2,000 gpm.

Outfall #009-New Low Volume Wastewater Treatment Basins
The low volume wastewater treatment will consist of a series of basins that will provide coagulation and settling prior to discharge. During normal operation, a single basin ("primary") will receive flows from the new North Area Sump and process wastewater from the new South Area Sump with a smaller basin ("secondary") serving to treat coal pile runoff and stormwater flows from the new South Area Sump. One or both of the basins can be operated to receive and treat wastewater for subsequent discharge via the Polishing Basin. Each of the basins will contain a separate rapid mix cell with the two basins designed to promote intimate solids/polymer contact with an integrated settling zone for solids settlement. After treatment in the two larger basins, treated water will gravity flow to a final polishing basin for additional settlement prior to gravity discharge into the Sioux Intake Canal on the Mississippi River.

Outfall 010-Emergency Spillway from Low Volume Basins
The emergency overflow is to provide berm protection during extreme events and as such, discharges are not expected from outfall #010. Based on the maximum hydraulic flows, the maximum discharge volume would be 25.1 MGD.

Reason for the Modification

This operating permit is modified to include the establishment of one new discharge outfall, relocation of an internal monitoring outfall, and one no-discharge outfall. Changes to the operating permit include:

- The permit was issued in 2017 with updated effluent monitoring and limits, as such no new parameters have been identified. This permit modification reflects the changes in operational processes and the creation of new outfalls. Tables A-4 and A-6 were updated to include the new outfalls.
- The establishment of monitoring requirements and effluent limits for outfalls #009, #09A, and #010.
- Outfall #010 was established in Table A-7, with the same parameters as Outfall #003 as they are both emergency discharges with monitoring only.
- Net TSS limits on outfall #009, as that will receive the process wastewater with the closure of the ash ponds.
- Outfall #001's facility description was updated to include the comingled flows from outfall #009 that will be part of the intake water used in plant processes.
- Added WET testing to outfall #009 as that outfall will receive process wastewater upon completion of construction.
- Removed "forms" requirement for acute and chronic WET tests to be consistent with more recently issued permits.
- Outfalls #002 and #006 will not receive process wastewater after the wastewater and ash management projects are fully operational. Stormwater directly contributory to the ash ponds will be the only water to be received.
    - For outfall #002, stormwater discharges are expected to be intermittent with variable flow dependent on weather conditions such as precipitation and evaporation, from 0.0 MGD to the design maximum 15.8 MGD. Conservatively assuming no precipitation is absorbed by the solids within the impoundment, the 25-year 24-hour precipitation event of 5.34" is calculated to result in 6.82 MG of rainfall.
    - For outfall #006, stormwater discharges are expected to be intermittent with variable flow dependent on weather conditions such as precipitation and evaporation, from 0.0 MGD to the design maximum 10.8 MGD. Conservatively assuming no precipitation is absorbed by the solids within the impoundment, the 25-year 24-hour precipitation event of 5.34" is calculated to result in 8.70 MG of rainfall.
- The process and water balance diagrams were updated, see Appendix A and B of the modification.

Antidegradation Review

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.

☒ - No degradation proposed and no further review necessary. With the changes to the federal effluent limit guideline, the methods of treating process wastewater from the generation of steam power are required to change. No new pollutants of concern are being introduced to the process; ultimately there will be a reduction of flows through Outfalls #002 and #006 when the ash ponds are closed. When the Sioux Energy Center wastewater and ash management project is fully operational, all process wastewater will be received and treated in the low volume wastewater treatment basins. The new low volume treatment basins are designed to use polymer/coagulant and quiescent flow areas to promote settling and are expected to have lower effluent concentrations than those currently at the combined outfalls #002 and #006, see summary table below. Outfall #009 will be effectively recycled and effluent quality anticipated providing a concentration and mass reduction in the discharge than the existing combined outfall #002 and #006 process wastewater discharges. Process water design average discharges are expected to decrease from 26.6 mgd from outfalls #002 and #006 to 8.2 mgd from outfall #009.

	Outfall 009		2008 Outfalls 002 & 006		
Constituent	**mg/L**	**lbs/day**	**mg/L**	**lbs/day**	**Change**
Sulfate	52	1236	368	25756	Concentration and mass reduction
Antimony	0.0004	<0.10	<0.003	<0.2	Concentration and mass reduction
Arsenic	0.0016	<0.10	0.014	1.0	Concentration and mass reduction
Beryllium	0.0003	<0.10	<0.003	<0.2	Concentration and mass reduction
Boron	0.108	2.6	1400	98.0	Concentration and mass reduction
Cadmium	0.0002	<0.10	0.0021	0.11	Concentration and mass reduction
Chromium, total	0.0019	<0.10	0.0108	0.75	Concentration and mass reduction
Copper	0.0038	<0.10	0.0022	0.15	Mass reduction
Lead	0.001	<0.10	0.0017	0.12	Concentration and mass reduction
Magnesium	19.774	472	20.261	1419	Concentration and mass reduction
Mercury	0.00002	<0.10	<0.0002	<0.10	Mass reduction
Molybdenum	0.018	0.4	0.129	9.0	Concentration and mass reduction
Nickel	0.0057	0.1	0.010	0.7	Concentration and mass reduction
Selenium	0.0019	<0.10	0.014	1.0	Concentration and mass reduction
Silver	0.00004	<0.10	0.011	0.8	Concentration and mass reduction
Thallium	0.0001	<0.10	0.006	0.4	Concentration and mass reduction
Tin	0.031	0.7	0.005	0.3	
Titanium	0.043	1.0	0.050	3.5	Concentration and mass reduction
Zinc	0.010	0.2	0.027	1.9	Concentration and mass reduction

Effluent Limits Determination

OUTFALLS #009: LOW VOLUME WASTE BASIN

EFFLUENT LIMITATIONS TABLE:

PARAMETERS OUTFALLS #009	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*	*	NEW	ONCE/WEEK	ONCE/MONTH	24 HR. TOT
CONVENTIONAL								
CYANIDE-AMENABLE (CATC)	µg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
OIL & GREASE	mg/L	1, 3	15	10	NEW	ONCE/MONTH	ONCE/MONTH	GRAB
pH ǂ	SU	1, 3	6.0TO 9.0	6.0 to 9.0	NEW	ONCE/WEEK	ONCE/MONTH	GRAB
TSS (ACTUAL)	mg/L	4	*	*	NEW	ONCE/WEEK	ONCE/MONTH	GRAB
TSS (NET)	mg/L	1	100	30	NEW	ONCE/WEEK	ONCE/MONTH	GRAB
METALS								
ALUMINUM, TOTAL RECOV.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
ARSENIC, TOTAL RECOVER.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
BORON, TOTAL RECOVER.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
CHROMIUM IV, DISSOLVED	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
IRON, TOTAL RECOVERABLE	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
MOLYBDENUM, TOTAL REC.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SELENIUM, TOTAL RECOVER.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
TITANIUM, TOTAL RECOVER.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NUTRIENTS								
AMMONIA AS N	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
KJELDAHL NITROGEN (TKN)	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NITRATE+ NITRITE AS N	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NITROGEN, TOTAL N (TN)	mg/L	1	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
PHOSPHORUS, TOTAL P (TP)	mg/L	1	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
OTHER								
CHLORIDE	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
FLUORIDE	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SULFATES	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SULFATES + CHLORIDES	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
WET TEST, CHRONIC	TUc	8	*	-	PASS/FAIL	ONCE/YEAR	ONCE/YEAR	GRAB

* - Monitoring requirement only
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
NEW - Parameter not established in previous state operating permit
I – interim limits
F – final limits

Basis for Limitations Codes:

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

PHYSICAL:
The permittee reported color was believed absent at these outfalls. The permittee reported temperature associated with summer and winter discharges at these outfalls. The permit writer has determined temperature is not a pollutant of concern at these outfalls.

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. The facility will report the total flow in millions of gallons per day (MGD). Weekly sampling required; continued from previous permit.

CONVENTIONAL:
The facility reported 4 mg/L at outfall #002, and 4 mg/L at outfall #006 for 5-Day Biochemical Oxygen Demand (BOD_5). The permit writer has determined BOD_5 is not a contaminant of concern at these outfalls. The facility reported 18 mg/L at outfall #002, and 10 mg/L at outfall #006 for chemical oxygen demand (COD). The permit writer has determined COD is not a contaminant of concern at these outfalls. The facility reported 6 mg/L at outfall #002, and 1.3 mg/L at outfall #006 for total organic carbon (TOC). The permit writer has determined TOC is not a pollutant of concern at these outfalls. The facility reported 198 CFU/100mL at outfall #002, and 10 CFU/100mL at outfall #006 for fecal coliform. While fecal coliform and *E. coli* measure distinctively different organisms, the permit writer sees them as related. There are no water quality standards for fecal coliform, but there are for *E. coli*. See outfall #09A.

Chlorine, Total Residual (TRC)
The facility submitted data from December 13, 2007 through May 8, 2008 showing no detections of TRC from outfall #002. The permit writer has determined no reasonable potential for this parameter. Permit renewal testing showed 0.08 mg/L at outfall #002, and 0.06 mg/L at outfall #006; both significantly below the ML. Because outfall #009 is essentially similar for this parameter, the permit writer has determined no reasonable potential for both outfalls for TRC.

Cyanide, Amenable to Chlorination (CATC)
The permit renewal materials showed total cyanide at <50 µg/L at outfall #002, and at 50 µg/L at outfall #006. The permit writer has determined additional testing is required for CATC. Missouri's water quality standards are for CATC, not total cyanides therefore the cyanides present in the effluent may have been overestimated using the total cyanide testing method. Typically, effluent limits in permits are below the accepted minimum quantification level (ML). The department has determined the current acceptable ML for Cyanide Amenable to Chlorination (CATC) to be 10 µg/L when using SM 4500-CN^- G. Cyanides Amenable to Chlorination after Distillation in *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values equal to or greater than the minimum quantification level of 10 µg/L would be considered violations of the permit and values less than the minimum quantification level of 10 µg/L would be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of CATC in excess of the effluent limits. However, this permit establishes monitoring only, new requirement this permit, quarterly sampling and reporting.

Oil & Grease
Conventional pollutant, in accordance with 10 CSR 20-7.031 Table A: *Criteria for Designated Uses*; 10 mg/L monthly average (chronic standard). The daily maximum was calculated using the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001). Section 5.4.2 indicates the waste load allocation can be set to the chronic standard. When the chronic standard is multiplied by 1.5, the daily maximum can be calculated. Hence, 10 * 1.5 = 15 mg/L for the daily maximum. The ELG allows discharge of 20 mg/L daily maximum and 15 mg/L monthly average. However, these limits are not protective enough of the receiving lake therefore water quality limits will be used. Monthly sampling and reporting; continued from previous permit.

pH.
6.0-9.0 SU. pH limitations [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 Suspended Solids (TSS)
The effluent limit guidelines (ELG) for steam electric point source category for fly & bottom ash transport water BPT [40 CFR 423.12(b)(4)] is 100 mg/L daily maximum, and 30 mg/L monthly average. Facility will report total and net. Net limitations allowed; see *Part III Rationale and Derivation of Permit Limits; Intake Credits*. Weekly sampling and reporting; continued from previous permit.

METALS:
The facility tested for all of the metals on Missouri Forms C and D for permit renewal. The following table shows the best professional judgment method to determine which metals should be included in the permit using water quality standards as the guide (this differs from the TBEL POC analysis). Additionally, the facility retested for the parameters where more than one number is below. The permit writer asked the permittee to resample as the testing performed in 2008 when the permit renewal was due is outdated compared to current analytical procedures. The second number below was provided on March 4, 2016 and was used to make the final reasonable potential determination. An "X" means a sample was not collected.

WQBEL DETERMINATION:

METAL, TOTAL RECOVERABLE	OUTFALL #002 µG/L	OUTFALL #006 µG/L	USE	PRP OUTFALL #009 BEST PROFESSIONAL JUDGEMENT DECISION
Aluminum	**2800, 1120**	**400, 418**	**AQL**	**YES**
Antimony	<5, <1	<5, <1	DW	no
Arsenic	**<5, 1.4**	**33, 17.1**	**AQL**	**YES**
Barium	100, 93	480, 556	DW	no
Beryllium	<5, <1	<5, <1	AQL	no
Boron	700, 51	2600, 1890	IRR	no*
Cadmium	<5, <0.4	<5, <0.4	AQL	no
Chromium	<5, 1.4	22	AQL	no
Chromium III	X, <10	X, <10	AQL	no
Chromium IV	**X, <5**	**X, 15**	**AQL**	**YES**
Cobalt	<5, <1	<5, 3	NWQS	no
Copper	5, 1	<5, <1	AQL	no
Iron	**2500, 923**	**80, 315**	**AQL**	**no**
Lead	5, 0.9	<5, 1	AQL	no
Magnesium	1360, 2150	1760, 2740	NWQS	no
Molybdenum	40, 5	280, 154	NWQS	no
Manganese	80, 50	10, 29	NWQS	no
Mercury	<0.2, <0.2	<0.2, <0.2	AQL	no
Nickel	12, <1	18, 9	AQL	no
Selenium	**5, 1.3**	**26, 20.8**	**AQL**	**YES**
Silver	12, <0.4	30, <0.4	AQL	no
Thallium	6, <1	15, <1	DW	no
Tin	<5, 5	<5, 9	NWQS	no
Titanium	100, 70	7, 34	NWQS	no
Zinc	44, 19	24, 21	AQL	no

<	Below detection limit (analytical method used showed no legitimate observation above the value reported)
*	See parameter discussion
AQL	Protection of Aquatic Life Water Quality Standard (also known as WWH)
DW:	Drinking Water Quality Standard; the Mississippi River is designated as a drinking water supply
IRR:	Irrigation Water Quality Standard; the newly classified "C" stream is designated as an irrigation water
NWQS:	No applicable Missouri Water Quality Standard (WQS) for the parameter
PRP:	Potential Reasonable Potential
Yes:	Additional sampling required to determine if RP exists
No:	Additional sampling not required. The permit writer has used best professional judgment to determine the values submitted for the purposes of permit renewal are reasonably below the Missouri water quality standards therefore have no RP to violate Missouri WQS.

The facility must use sufficiently sensitive methods as found in 40 CFR 136. No metals were addressed in any permit at either of the ash pond outfalls in the past. All requirements found below are new. All metals found below will be required to sample and report quarterly for each ash pond outfall.

Aluminum, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Arsenic, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Boron, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams; however, these protections are only afforded to parameters deemed toxic to aquatic life, watering animals, and humans. Boron has not been identified as a toxic parameter as only an irrigation use exists for surface waters; toxicity to terrestrial plants has not been included in the general criteria protection directive. However, this parameter was identified as a TBEL POC at Outfalls #002 and #006, thus monitoring is added for Outfall #009. Additional monitoring will determine if technology based limits are appropriate for this parameter.

Copper, Total Recoverable
The facility does not discharge chemical metal cleaning wastes to waters of the state therefore the BPT ELG 40 CFR 423.12(b)(5) does not apply. The facility does not have reasonable potential to cause an excursion above in-stream water-quality limitations. No monitoring required. See special condition #21.

Chromium, Hexavalent, Dissolved
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. The facility must use a sufficiently sensitive analytical method (5 µg/L was used for the renewal application resampling which is an appropriate level) to show the effluent's true concentration is below the water quality standard. Resampling on 1/27/2015 reported 15 µg/L dissolved hexavalent chromium. The acute WQS is 15 µg/L, and the chronic WQS is 10 µg/L. Monthly monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Iron, Total Recoverable
The facility does not discharge chemical metal cleaning wastes to waters of the state therefore the BPT ELG 40 CFR 423.12(b)(5) does not apply. However, the facility may have reasonable potential from Outfalls #002 and #006 to cause an excursion above in-stream water-quality limitations and has also been identified as a TBEL for monitoring on Outfall #009.

Molybdenum, Total Recoverable
This parameter was identified as a TBEL POC from Outfalls #002 and #006 and is monitoring is recommended for Outfall #009.

Selenium, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Titanium, Total Recoverable
This parameter was identified as a TBEL POC from Outfalls #002 and #006 and is monitoring is recommended for Outfall #009.

NUTRIENTS:
The following nutrients will be evaluated quarterly by the permittee. All nutrients are new for this permit.

Ammonia as N
The facility reported 0.5 mg/L at outfall #002, and 5.6 mg/L at outfall #006 for ammonia as nitrogen. The TBEL evaluation has determined Ammonia as N is a pollutant of concern for the facility.

Kjeldahl Nitrogen, Total (TKN)
Added using the permit writer's best professional judgment. TKN is the sum of ammonia-nitrogen plus organically bound nitrogen but does not include nitrate-nitrogen or nitrite-nitrogen. The department is asking the facility to also provide this data.

Nitrate plus Nitrite as Nitrogen
The TBEL evaluation has determined nitrate plus nitrite as N is a pollutant of concern for the facility. The facility reported 2 mg/L at outfall #002, and 25 mg/L at outfall #006.

Nitrogen, Total N (TN)
The facility reported 2.2 mg/L at outfall #002 and 0.07 mg/L at outfall #006 of total nitrogen. Total Nitrogen (TN) is the sum of nitrate-nitrogen (NO_3-N), nitrite-nitrogen (NO_2-N), ammonia-nitrogen (NH_3-N) and organically bonded nitrogen. Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

Phosphorous, Total P (TN)
The facility indicated phosphorus was not present in either outfall. However, per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

OTHER:
The facility tested for sulfide, sulfite, and surfactants at these outfalls however, no water quality standards exist for these parameters therefore the permit writer has used best professional judgment to not include these parameters in the permit. The facility sampled for alpha radioactivity and both outfalls showed below detection limits. No RP. The facility sampled for total radium and radium 226, all samples were below detection limits; no RP. The facility reported a non-detect value at outfall #002, and 16.8 pCi/L at outfall #006 for beta radioactivity. The federal primary drinking water standards to which DNR regulations refer at 10 CSR 20-7.03(5)(I) are written in mrem/year. EPA 816-F-00-002 *Implementation Guidance for Radionuclides* describes how β concentration values must be converted to roentgen equivalent man (rem) per year (yr) to determine the cancer causing exposure rate which is how the drinking water standard is written. However, the facility did not supply each isotope of each element which was emitting β radiation therefore the calculation cannot be completed. However, if the heaviest beta-emitting element (^{40}K) was used to convert 100% of the analytical value into drinking water units, then 16.8 pCi/L * 730 L/y [= standard maximal exposure] * $1.88e^{-5}$ mrem/pCi [of ^{40}K] = 0.23 mrem/year, a value well below the standard of 4 mrem/yr; additional monitoring will not be required at this time.

Quarterly monitoring and reporting is required for all parameters below (except WET testing).

Chloride
The facility has indicated sulfates are present in the discharge; because Missouri water quality standards are written for the inclusion of chloride with sulfates, the facility must monitor for this parameter. New parameter this permit, monthly monitoring and reporting required.

Fluoride
The facility reported fluoride at 0.3 mg/L at outfall #002, and 1.9 mg/L at outfall #006. The TBEL POC analysis has identified this parameter is a POC at Outfalls #002 and #006, thus monitoring is required for Outfall #009. Currently, the discharge does not appear to have reasonable potential to cause or contribute to exceedances of in-stream water quality standards.

Sulfates
The facility reported 54 mg/L at outfall #002, and 640 mg/L at outfall #006. Current water quality standards indicate sulfates must be added to chlorides to determine compliance. Monitoring only for Outfall #009

Sulfates Plus Chlorides
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state. The facility will measure sulfates and chlorides individually and report the sum total.

WET Test, Chronic
Yearly monitoring requirement only; monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards. Several new toxic parameters have been identified in these effluents therefore WET testing is required. There is no dilution of the receiving waterbody therefore a chronic test is more appropriate than the acute test. A chronic test will better characterize actual in-lake conditions because there is no mixing. Previous permit limits were pass/fail, however, the department has concluded pass/fail requirements cannot effectively measured reasonable potential.

The chronic allowable effluent concentration (AEC) for facilities discharging to unclassified, Class C, Class P (with default mixing considerations), or lakes [10 CSR 20-7.031(4)(A)4.B.(IV)(b)] is 100%.

The dilution series is standardized as 100%, 50%, 25%, 12.5%, & 6.25%.

The previous permit required only a 10% AEC. As the lake does not provide mixing, this was assuredly a typographical error and should have been 100%. The previous permit limitations also only required a single dilution test. The department's current WET testing policy indicates all WET tests performed shall be of multiple dilution series and thus the permit requirement is amended.

INTERNAL MONITORING POINT #09A: DOMESTIC WASTEWATER (PREVIOUSLY OUTFALL #02A)

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*	*	*, *	ONCE/QUARTER	ONCE/QUARTER	24 HR. TOT
CONVENTIONAL								
BOD_5	MG/L	1, 2	45	30	45, 30	ONCE/QUARTER	ONCE/QUARTER	GRAB
E. COLI	#/100 ML	1, 6	*	*	I - NEW	ONCE/QUARTER	ONCE/MONTH	GRAB
E. COLI	#/100 ML	1, 6	630	126	F - NEW	ONCE/QUARTER	ONCE/MONTH	GRAB
PH ǂ	SU	1, 2	6..0 TO 9.0	6.0 TO 9.0	6.0 TO 9.0	ONCE/QUARTER	ONCE/QUARTER	GRAB
TSS	MG/L	1, 2	45	30	45, 30	ONCE/QUARTER	ONCE/QUARTER	GRAB

* Monitoring requirement only
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.

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

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

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. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Biochemical Oxygen Demand (BOD_5)
Effluent limitations from the previous state operating permit have been revised. Previous limitations: 45 mg/L weekly average; 30 mg/L monthly average. However, daily maximum and monthly average limitations required per 40 CFR 122.45(d); weekly and monthly averages not applicable as this discharge is not from a POTW [40 CFR 122.45(d)(2)]. Technology based limits from 10 CSR 20-7.015 applied as daily maximum 45 mg/L, monthly average 30 mg/L. Water quality limitations are not applicable at this outfall as this is an internal monitoring point.

Escherichia coli (E. coli)
The facility reported 198 CFU/100 mL at outfall #002, and 10 CFU/100 mL at outfall #006 for fecal coliform. While fecal coliform and *E. coli* measure distinctively different organisms, the permit writer sees them as related. There are no water quality standards for fecal coliform, but there are for *E. coli*. Additionally, there are no recreational uses for Poeling Lake, however, Poeling Lake discharges to backwater chutes of the Mississippi River having recreational uses. Because the discharge is within two miles [10 CSR 20-7.015(9)(B)1.D], the facility must sample for this parameter. By the nature of the discharge, reasonable potential exists. Per 10 CSR 20-7.015(9)(D)6.C. the facility must report daily maximums and monthly averages to the department during recreational season. The recreational season is defined as April 1 through October 31 per 10 CSR 20-7.031 Table A.

Averages are to be the geometric mean should the facility sample more than one time per month. The geometric mean is calculated by multiplying all of the data points and then taking the n^{th} root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 5, 6, and 10 (#/100 mL). Geometric mean = 5^{th} root of (1)(4)(5)(6)(10) = 5^{th} root of 1,200 = 4.1 #/100 mL.

The facility is currently not equipped to disinfect. The facility will have a two year schedule of compliance to meet water quality limitations for WBC-A which are 630 #/100 mL daily maximum per 10 CSR 20-7.015(9)(B)1.E. and 126 #/100 mL monthly average per 10 CSR 20-7.031 Table A.

pH

6.0 to 9.0 SU; continued from previous permit. Technology based limits at 10 CSR 20-7.015 are protective as this is an internal monitoring point. The facility will measure and report the minimum and maximum values; pH is not to be averaged. Water quality limitations are not applicable at this outfall for this parameter as this is an internal monitoring point.

Total Suspended Solids (TSS)

Effluent limitations from the previous state operating permit have been revised. Previous limitations: 45 mg/L weekly average; 30 mg/L monthly average. However, daily maximum and monthly average limitations required per 40 CFR 122.45(d); weekly and monthly averages not applicable as this discharge is not from a POTW [40 CFR 122.45(d)(2)]. Technology based limits from 10 CSR 20-7.015 applied as daily maximum 45 mg/L, monthly average 30 mg/L. Water quality limitations are not applicable at this outfall as this is an internal monitoring point.

OUTFALL #010 - EMERGENCY DISCHARGE SUMP

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*		NEW	ONCE/DAY/DISCHARGE	¤	24 HR. TOT
CONVENTIONAL								
OIL & GREASE	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
PH ǂ	SU	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
TSS	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
NUTRIENTS								
NITROGEN, TOTAL N (TN)	mg/L	1	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
PHOSPHORUS, TOT. P (TP)	mg/L	1	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
OTHER:								
CHLORIDES	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
SULFATES	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
CHLORIDE + SULFATE	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB

¤ - The facility must report the analytical findings no more than 30 days from the day of discharge.
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
New – new requirement

Basis for Limitations Codes:

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

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

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. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Oil & Grease
Sampling required when discharging.

pH
Sampling required when discharging.

Total Suspended Solids (TSS)
Sampling required when discharging.

NUTRIENTS:

Nitrogen, Total N (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

Phosphorous, Total P (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

OTHER:

Chloride
The facility must sample for chlorides when the emergency discharge structure is discharging.

Sulfate
The facility must sample for sulfate when the emergency discharge structure is discharging.

Chlorides Plus Sulfates
The facility must report sulfate plus chloride when the emergency discharge structure is discharging.

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 February 16 ,2018 to March 19, 2019. One comment from Ameren was received on the locational data for 5 of the outfalls. The locational data was corrected, see response in Appendix 2018-C

Date of addendum: January 22, 2018, updated September 29, 2020.

Completed by:
Lease Meyers, Environmental Engineer
Engineering Section
Water Protection Program
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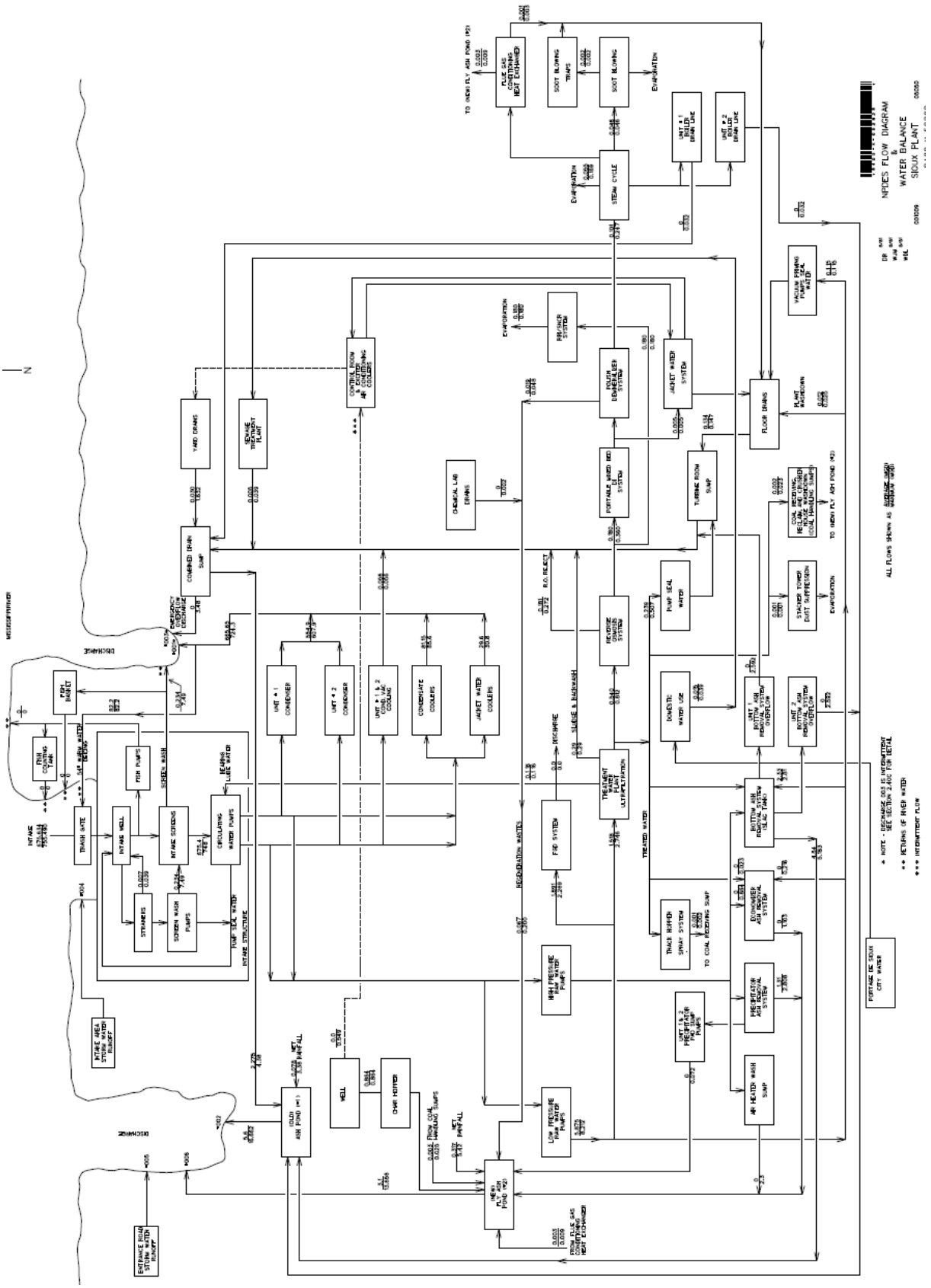
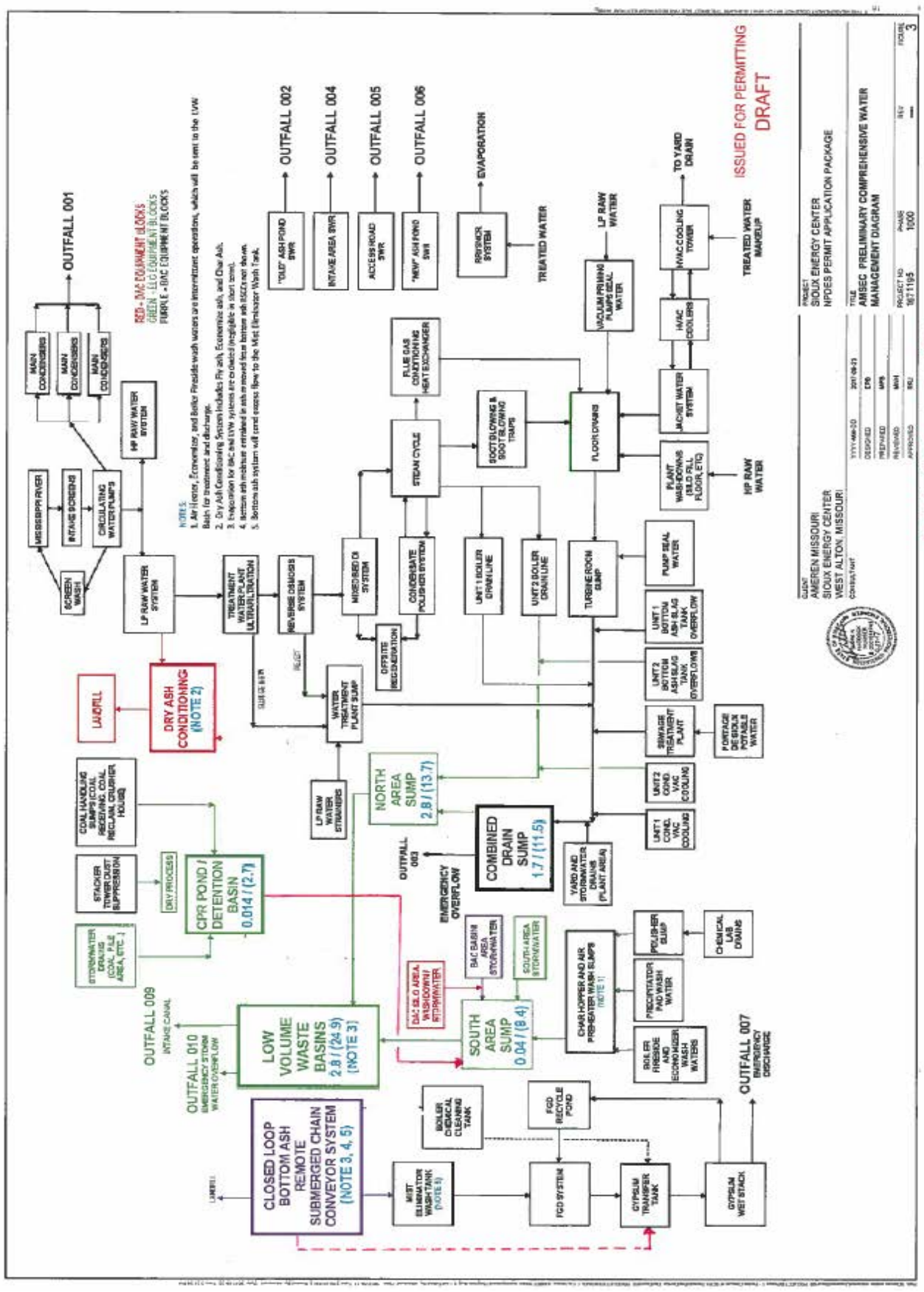
Appendices

Appendix 2018-A: Existing Process Flow Diagram



Appendix 2018- B: New Low Volume Waste TREATMENT & STORMWATER MANAGEMENT FLOW DIAGRAM



APPENDIX 2018-C: RESPONSE TO PUBLIC NOTICE COMMENTS

Only one comment letter and comment was received on the public notice and it was from Ameren correcting the UTM coordinates for 5 of the outfalls.

Ameren's Comment: Per out review of the proposed permit, we believe the following Outfalls should have their respective UTM Coordinates revised based on values obtained from the Missouri Department of Natural resources Geographic Information System.

Outfall	X (Easting)	Y (Northing)	Note
003	734888	4311039	End of overflow pipe to cooling water discharge canal.
008	734746	7310918	Intake structure bar rack center. Note that the samples are obtained at the Raw Water Treatment Building with coordinates X=735020, Y=4310964.
009	734745 (no change)	4310891	
09A	735056	4310964	Sewage Treatment Plant effluent.
010	734597	4310554	

Response: The UTM coordinates on the permit, pages two through four have been updated with the information provided. For Outfall #008, the UTM northing coordinates are 4310918.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
STATEMENT OF BASIS
MO-0000353
AMEREN MISSOURI – SIOUX ENERGY CENTER

This Statement of Basis (Statement) gives pertinent information regarding modification to the above listed operating permit. A Statement is not an enforceable part of a Missouri State Operating Permit.

Part I – Facility Information

See fact sheet below.

Part II – Modification Rationale

This operating permit is hereby modified to reflect the addition of Standard Conditions Part III to Part B of the permit. No other changes were made at this time.

STANDARD CONDITIONS:
The standard conditions Part I attached to this permit incorporate all sections of 40 CFR 122.41(a) through (n) by reference as required by law. These conditions, in addition to the conditions enumerated within the standard conditions should be reviewed by the permittee to ascertain compliance with this permit, state regulations, state statues, federal regulations, and the Clean Water Act. Standard conditions Part III incorporate all requirements dealing with sludges.

Part III – 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 subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

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. Public comments shall pertain directly to the changes made to the permit.

☒ - The Public Notice period for this operating permit was from 2/8/2019 to 3/11/2019; no comments were received.

DATE OF FACT SHEET: 3/12/2019

COMPLETED BY:
PAM HACKLER, ENVIRONMENTAL SCIENTIST
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MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0000353
AMEREN MISSOURI – SIOUX 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 stormwater 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 for less.

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 (MSOP or operating permit) listed below. A factsheet is not an enforceable part of an operating permit.

Facility Information

Facility Type:	Major Categorical Industry
Facility SIC Code(s):	4911
Facility NAICS Code:	221112
Application Date:	10/20/2008
Expiration Date:	05/15/2009
Last Inspection:	01/28/2015 - in compliance

FACILITY DESCRIPTION:
The Sioux Energy Center is a power generating facility primarily involved in the generation and sale of electricity. As one of four Ameren owned coal-fired power plants in Missouri, it is currently the only one with air scrubbers installed. Located on the south shore (descending bank) of the Mississippi River between mile 209 and 210, the facility powers two coal fired electrical generating units. Nameplate generating capacity is 1099 megawatts (MW). Sioux is a two-unit, 986-megawatt coal-fired power plant, which was completed in 1968. Each boiler is equipped with 10 cyclone burners-essentially a 10-foot diameter barrel into which crushed coal and air are introduced. This process requires less equipment and less horsepower to crush the coal, versus grinding the coal into the consistency of talcum powder as is done with other types of boilers. Combustion occurs in a swirling motion within the cyclone burners; in more conventional boilers, pulverized coal is blown into the main furnace along with air and burned in suspension in the furnace. The plant's boilers are more efficiency than conventional boilers because they operated at a higher pressure (supercritical). Sioux's air permit allows them to burn in excess of 20,000 tons of tire chips annually, the equivalent of 25,000 tons of coal per year, providing electricity for more than 4,000 residential customers. This would consume more than 2.5 million discarded used tires a year if they choose to use this fuel source. Sioux's maximum burn is 12,000 tons of coal over 24 hours, about 3.0 million tons of coal annually. Construction of the scrubbers for each generating unit began in 2006. As hot flu gas passes through each scrubber, a slurry of crushed limestone and water is sprayed into it. The limestone in the slurry reacts with sulfur in the flue gas, creating synthetic gypsum - an inert material captured and stored in the new landfill on plant property. Gypsum is the main component of wallboard.

The facility operates a coal terminal port facility (barge unloading station) located at mile 209.6 on the right descending bank of the Upper Mississippi River approximately 3 miles below Portage De Sioux and 9 miles above Lock and Dam No. 26. A series of 60-inch conveyors extend to a storage area in rear: one 1,242-foot and one 693-foot, each with capacity for 3,000 tons per hour or total capacity for 430,000 tons. Coal delivered by barge is deposited via dry conveyor 1,255 feet to the coal pile on the northeastern side of the facility.

PERMITTED FEATURES TABLE:

FEATURE	AVERAGE FLOW (MGD)	DESIGN FLOW (MGD)	TREATMENT LEVEL	EFFLUENT TYPE
#001	78.0 540.0 27.0 **645.0**	85.6 607.9 30.8 **724.3**	none	condensate coolers unit 1 and 2 condensers jacket water coolers TOTAL
#002	1.24 2.47 0 0.013 0.003 0 0.078 **3.8**	4.38 5.183 2.59 0.039 0.004 0.032 3.38 **15.8**	(Ash Pond #1) sedimentation and neutralization	combined drain sump bottom ash removal system bottom ash system overflow domestic sewage exciter & control room HVAC unit 2 boiler drain line stormwater TOTAL
#02A	0.013	0.039	activated sludge	domestic wastewater
#003	0	3.48	none	emergency discharge of combined drain sump
#006	0.003 0.003 0 0 3.35 0 0.067 0.864 0.317 **4.6**	0.025 0.025 2.3 1.10 2.81 0.072 0.2 0.864 5.42 **10.8**	(Ash Pond #2) sedimentation and neutralization	flue gas conditioning heat exchanger coal handling sumps air heater wash economizer ash system precipitator ash removal system precipitator pad sumps regeneration wastes char hopper precipitation TOTAL
#007	0	1378	none	UWL recycle pond
#008	675.6	755.5	intake	intake

PERMITTED FEATURES, DESCRIPTIONS, AND SUPPLEMENTARY INFORMATION:
The facility's NPDES permit contains seven designated and permitted features; each described below.

OUTFALL #001 – NON-CONTACT ONCE-THROUGH COOLING WATER
Outfall #001 is the discharge from the once-through cooling water system. Water is withdrawn from the Mississippi River, passed through condensers and other heat exchanges, and returned to the river. Portions of the cooling water system are intermittently treated with biocides. The treated water is used to lubricate the circulating water pump bearings within the intake structure. This lube water mixes with the normal pump flow and is a component of the discharge. The total flow of this treated water is about 80 gpm. Wastewater sources of outfall #001 are once-through cooling water, circulating water pumps for unit 1 condenser, unit 2 condenser, condensate coolers, and jacket water coolers. See *Part III Rationale and Derivation of Permit Limits and Conditions; Impingement and Entrainment at CWIS; CWA § 316(b).*

Macroinvertebrate Control:
Sioux power plant has a monitoring program to detect the presence and growth of zebra mussels within systems vulnerable to fouling. Currently, biocide treatments are not scheduled but occur before fouling occurs. While various approaches have been considered and evaluated, the facility's currents strategy consists of molluskicide treatment of intake structure cells, auxiliary coolers (condensate, condenser, and jacket water coolers), and high and low pressure untreated (raw) water systems, using one of the following commercial chemical products or their equivalents:

GE-Betz Spectrus CT 1300, dosed at 5-10 ppm; or
Calgon H-130, dosed at approx. 5 ppm; or
Buckman Laboratories Bulab 6086, dosed at 5-10 ppm.

To comply with yearly reporting, each year, even if chlorine or biocides/molluskicides are not used, the facility will submit a short report to the St. Louis Regional Office. The report must detail each chemical used, the dosing concentration, and the time applied to the system. The facility must sample for free available chlorine, total residual chlorine, and whole effluent toxicity, on a conditional schedule. The facility is not required to sample for chlorine if the biocide/molluskicide used is not chlorine based; however, the facility must still collect a sample for WET testing if any biocide/molluskicide is used.

OUTFALL #002 – ASH POND #1 (OLD ASH POND)
Outfall #002 is the discharge from one of the plant's two wastewater treatment ponds containing bottom ash and fly ash. The pond was commissioned in 1967. This unit is 47 acres with a maximum height above grade of 27 feet. The total storage capacity is 2,100 acre-feet. The volume of ash stored is approximately 1,859 acre-feet.

Ash pond #1 provides treatment for bottom ash (boiler slag), low volume wastes, sewage treatment plant effluent, control room and exciter HVAC cooling tower, and stormwater runoff. Combined drain sump sources are: Unit 1 and 2 conditioner vacuum cooling, vacuum priming pumps seal water, floor drains, turbine room sump, flue gas conditioning heat exchanger, soot blowing traps, units 1 boiler drain line, domestic sewage, yard drains, control room cooler, Exciter HVAC cooler, HVAC cooling tower, unit 1 bottom ash removal system overflow, and finally, reject and backwash from the ultrafiltration system and the reverse osmosis system. The HVAC system is only used when building cooling is needed from late spring through early fall. The discharges are to Poeling Lake, a non-classified waterbody therefore no toxics mixing is afforded.

INTERNAL MONITORING POINT (IMP) #02A – SEWAGE TREATMENT PLANT
This is the discharge from the extended aeration package sewage treatment plant. Domestic wastewater throughout the facility is processed in the STP, prior to discharge into ash pond #1, then discharged to waters of the state through outfall #002. Sludge is removed by a contract hauler.

OUTFALL #003 – EMERGENCY OVERFLOW FROM THE COMBINED DRAIN SUMP
This outfall is an emergency discharge point for the combined drain sump (CDS). During normal operations, the CDS collects various low volume waste streams from the plant for transfer to ash pond #1 (outfall #002). During emergency conditions, a manually operated valve may be opened to allow discharge from the CDS to outfall #003. See outfall #002 under combined drain sump for sources of the wastewater. This outfall did not discharge in the last five years. Daily maximums and monthly averages are required under 40 CFR 122.45(d)(1) for continuous discharges not from a POTW. However, the facility has stated this is an emergency discharge outfall therefore will only receive daily monitoring requirements. Monitoring will occur each day the facility discharges. Monitoring is unscheduled therefore the facility need only report those days when the outfall discharges. Monitoring for precipitation is inappropriate for these outfalls. To discharge via outfall #003, a valve (which is normally closed) must be opened, which would only occur in response to critical (and unexpected) system failure(s).

OUTFALL #006 – ASH POND #2 (NEW ASH POND)
Outfall #006 is the discharge from the plant's second wastewater treatment pond. This pond was commissioned in 1994. This unit is 60 acres with a maximum height of 22 feet. The total storage capacity is 960 acre-feet. The volume of ash stored is approximately 376 acre-feet. Low volume waste sources and subsystems include: track hopper spray system, coal handling sumps, flue gas conditioning heat exchanger, precipitator pad sump pumps, precipitator ash removal system, precipitator pad sumps, air heater wash sump, economizer ash removal system, chemical lab drains, low pressure raw water pumps, unit 2 boiler drain line, condensate polisher, demineralizer regeneration wastes, char hopper, and stormwater. Ash pond #2 provides treatment for fly ash, economizer ash, low volume wastes, and stormwater runoff. The ash pond effluent pH is continuously monitored during discharge. As necessary, carbon dioxide is injected into the discharge line to lower effluent pH. The system is equipped with an alarm system which alerts personnel of low pond elevation, pH out of range, and pH monitor failure. The discharges are to Poeling Lake, a non-classified waterbody therefore no toxics mixing is afforded. The ash pond also receives runoff from the northeast transformer pad.

OUTFALL #007 – DECANT RECYCLE POND EMERGENCY OVERFLOW
This outfall is identified per DNR NPDES Construction Permit 22-7667 and represents the emergency overflow from the no-discharge recycle pond. The recycle pond receives stormwater and decants water from the on-site gypsum stack and utility waste landfill. The emergency overflow functions to protect the integrity of the recycle pond berms per Dam Safety regulations. The facility has asked this outfall be removed from the permit. The permit writer has used best professional judgment to leave the outfall in the permit. Should wastewater discharge from this outfall, the permittee will be required to sample several parameters. Discharge is not rainfall dependent. The elevation is maintained through pumps and controls (automatic and/or manual). The pond elevation is continuously monitored, so rainfall monitoring provides no real indication of potential or actual discharge via this outfall.

The utility waste landfill (UWL) was constructed on 212 acres just south of the power plant. The UWL does not occupy the entire acreage. From 1959 through 1973 the area was designated as agricultural lands. From 1973 to 1999, the area was designated flood plain. In 1999, the area was rezoned to describe the lands better as agricultural with floodway fringe and density floodway overlay districts. Because of this floodway designation, a 100 foot buffer strip is required on all four sides of the UWL and the maximum height is 525 feet above sea level. Ground levels at the site are about 420 feet above sea level. The area was re-zoned on May 30, 2006 to solid waste disposal district with floodway fringe and density floodway overlay by the St. Charles County Planning and Zoning Commission prior to construction commencing.

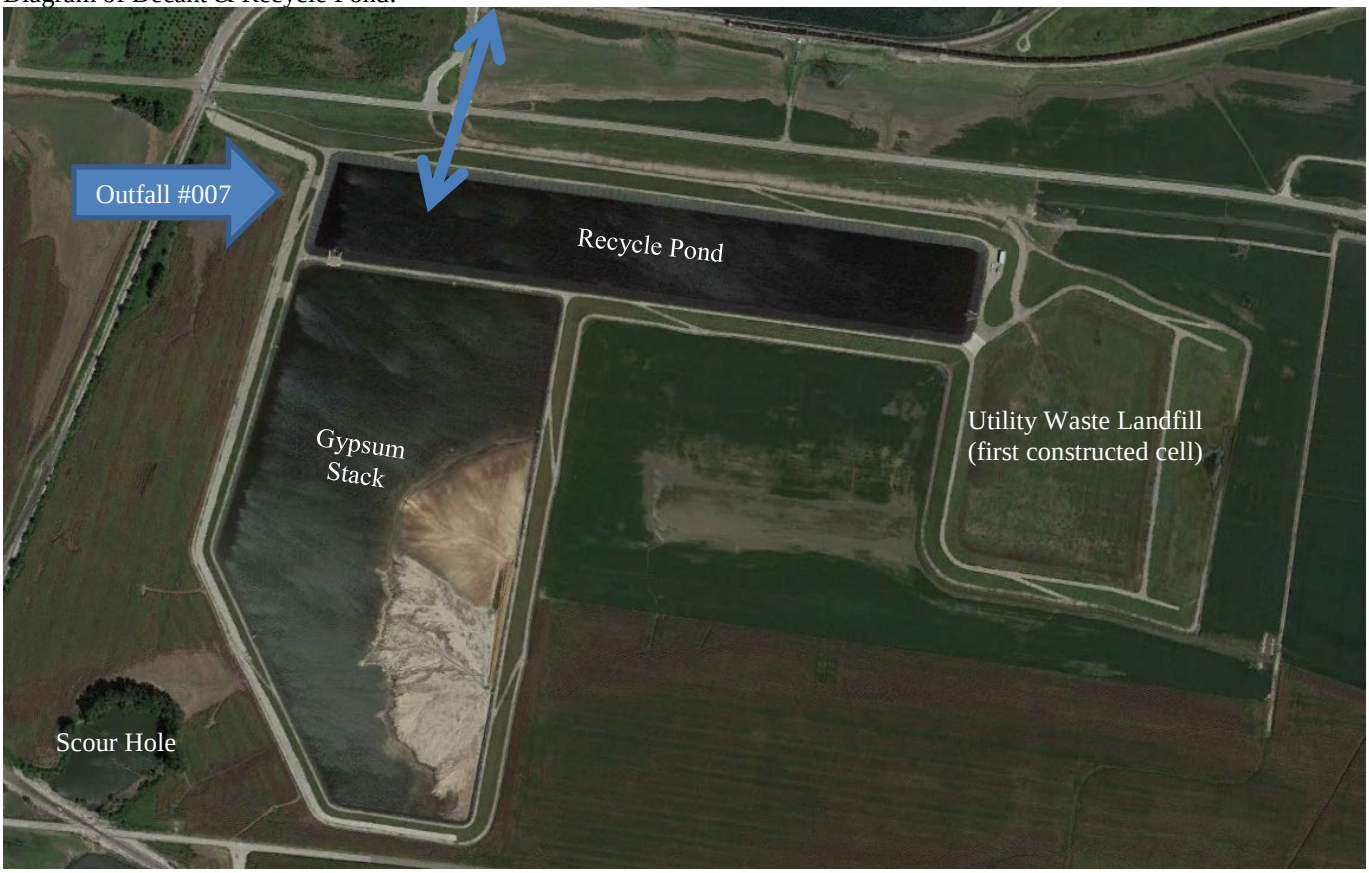
The pond was designed with a two foot thick compacted clay liner with a maximum permeability of $1x10^{-7}$ cm/sec hydraulic conductivity. The clay liner was overlain with an 80 millimeter thick high-density polyethylene (HDPE) liner. The recycle pond operates in a closed loop manner. The slurry line from the wet flue gas desulphurization (WFGD) deposits the slurry to the recycle gypsum stack. The stack of gypsum presses out the water which decants to the recycle pond. When the gypsum stack has met the maximum height or filled the stack basin, the solids are transferred to the utility waste landfill. From the UWL, the recycle pond receives decant water, consolidation water and stormwater runoff. The water contained in the recycle pond sump is returned to the WFGD scrubber to be used again. Three adjacent 6-foot wide by 3-foot tall box culverts are designed to convey water from the perimeter ditch of the UWL into the recycle pond. The pond has been designed to the 100 year-1 hour storm event which is 3.3 inches of rain for this site.

With both WFGD scrubber units running, approximately 970 gallons per minute (gpm) [1.39 MGD or 2.16 cfs] of slurry is pumped to the UWL. A portion of the process water is lost with the deposition of the waste. The maximum process water flow of 970 gpm is a small flow in the perimeter ditch which is sized for a maximum flow of about 100 cfs at the culverts. In the recycle pond, the storage requirement of 970 gpm is about half of the design volume (123 acre-feet) and is set aside for process management. Water in the recycle pond is pumped back to the plant's WFGD scrubber system to be reused. The leachate collection system wastewater is also reused in the wet scrubber system. Water can be pumped between the recycle pond and the gypsum stack area to equalize flows if needed to regulate stormwater.

FGD wastes accumulate at rates according to the power generated at the facility and the type of coal used to power the facility. When using low sulfur coal (as compared to Eastern Illinois coal which has a much higher sulfur content) less gypsum is produced, about one-tenth of higher sulfur coal. The more power generated at the facility, the more exhaust is produced, consequently the wet scrubbers must clean more air, and hence more gypsum is produced.

Any discharges from this outfall will, according to the Geohydrologic Evaluation of Liquid Waste Treatment Site (project #21407; 05/03/2007), eventually discharge to the Missouri River, a classified "P" stream. The report also indicated there were likely not any sinkholes in this area. Prior to reaching the Missouri River, the wastewater may encounter a jurisdictional scour hole, as identified by the United States Army Corps of Engineers (USACE). The wetland is located at the southwest corner of the utility waste landfill at 734176 meters north, and 4309239 meters east in UTM Zone 15. The scour hole was created during the flood of 1993.

Diagram of Decant & Recycle Pond:



The bi-directional arrow shows the transfer of water between the recycle pond and the facility using the reclaimed water.

Daily maximums and monthly averages are required under 40 CFR 122.45(d)(1) for continuous discharges not from a POTW. However, the facility has stated this is an emergency discharge outfall therefore will receive daily monitoring requirements occurring each day the facility discharges. Monitoring is unscheduled hence the facility need only report those days when the outfall discharges. The facility did not undergo an antidegradation analysis, partly because the permit renewal was submitted prior to Missouri requiring an official antidegradation review on new discharges. Secondly, the outfall is emergency discharge only, therefore, it is in itself a violation to discharge.

PERMITTED FEATURE (PF) #008 – COOLING WATER INTAKE STRUCTURE (CWIS)

Due to newly promulgated regulations regarding impingement and entrainment at cooling water intake structures, the department has determined identifying each structure is germane. The water is withdrawn from the river through a 0.32 mile (1,623 foot) long canal. Water first passes through a trash gate, into the cement-lined intake well, through the intake screens and is extracted by the circulating water pumps. Water is divided and then transferred to the Unit 1 condenser, Unit 2 condenser, condensate coolers, jacket water coolers, Unit 1 and 2 conditioner vacuum cooling, high pressure raw water pumps, and low pressure raw water pumps. Outfall #004 discharges to the CWIS.

This facility is required by the Clean Water Act § 316(b) to provide information, data, and summaries to the department regarding fish and shellfish impingement and entrainment at the next permit renewal. See *Part III Rationale and Derivation of Effluent Limits and Permit Conditions; Impingement and Entrainment.* Also see special condition # 17 for the permit requirements. Establishment of this permitted feature is required to track submissions required by the rule.

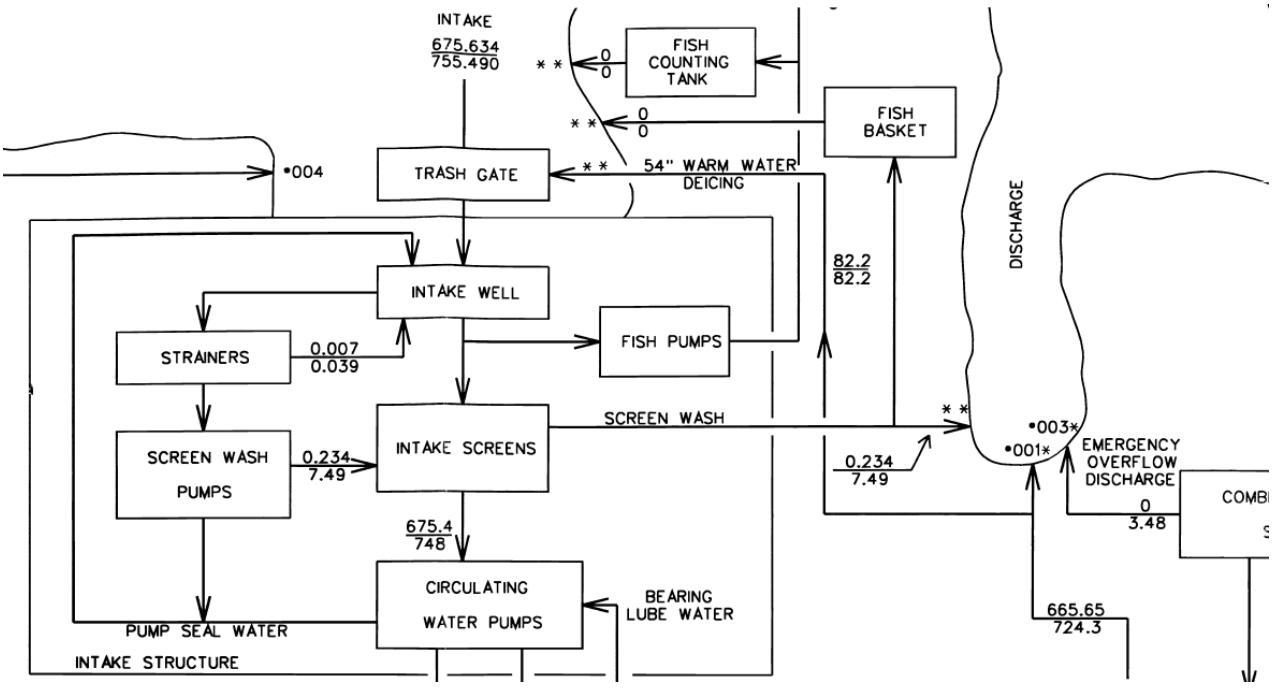
Return of River Water:

The Sioux Power Plant has four points at which Mississippi River water is returned to the Mississippi River and are not designated as outfalls. These outfalls are all subject to the general criteria found at 10 CSR 20-7.031(4) and may not violate narrative water quality criteria such as causing a color change or increase in turbidity. All are associated with the plant intake structure; none of the following sources have been determined to add pollutants to the Mississippi River:

- Deicing line: this line is an alternative routing for a portion of the flow through Outfall #001 (non-contact cooling water). During winter months (as ambient temperature may dictate), a portion of this outfall is diverted through the deicing line and is discharged at the face of the intake structure to prevent ice formation on the intake screens and trash racks. This system may also be used infrequently, throughout the year for other operational needs.
- Fish pump: this system was designed to reduce fish impingement on the intake screens. When operating, water and fish from in front of the screens is pumped from the intake structure and returned to the river just downstream of the intake canal.
- Fish basket and fish counting tank: a return of river water used to wash traveling screens at the intake. Water from the intake screen and fish counting tank is released into the cooling water discharge canal.

Intake Water Use Diagram:

The following diagram shows how water at the intake is used. In the diagram "**" is a return of river water. See *Part III: Rationale and Derivation of Permit Limits and Conditions; Impingement and Entrainment at CWIS; CWA §316(b).*



Major Water User:
The facility is registered as a major water user, No. 42244946. The facility withdrew 202,201,000,000 gallons (202.2 billion gallons) from the Mississippi River in 2014. Much of the water is returned to the river through outfall #001. The facility used no groundwater.

STORMWATER DISCHARGES

- The facility also has two designated stormwater outfalls and three locations where designated outfalls are not required. The majority of the stormwater on site is discharged through outfalls #002 and #006, the ash pond outfalls. Outfalls #002 and #006 are considered process water and are regulated as such.
- Other stormwater discharges (such as from roadways and the rail loop) are vegetated areas or are sheet flow. This permit will not require any additional sampling however, inclusion in the SWPPP and BMP monitoring is required. Should the discharges change in any manner impacting waters of the state from industrial activity, the facility must report changes to the department and, if required, submit an application for permit modification per 10 CSR 20-6.010(8)(A)9.
- The permittee has asked outfalls #004 and #005 be removed from the permit. In the past, the facility has not had to perform any monitoring at these outfalls. The previous permit only identified these outfalls by number and stated "these outfalls still exist but are not currently being monitored due to implementation of best management practices and minimal risk to waters of the state." See below.

<u>OUTFALL #004 – STORMWATER RUNOFF WITHIN INTAKE CANAL</u>
This outfall is representative of various similar channel erosion conduits along the plant's intake canal. The facility has not been required to perform analytical monitoring at this outfall in the last permit. Roof drains from the intake structure and a small storage building are also within this drainage area. Large rock and gravel have been placed in the ditches to control excess erosion. Stormwater runoff from this area is discharged directly into the intake canal, through the cooling water system, and back to the Mississippi River. The drainage area ground cover is a combination of heavily vegetated and graveled zones. Drainage to this outfall is separate from primary portions of the plant. BMPs are implemented to prevent contamination of stormwater runoff and ensure appropriate and timely responses to spills and other unanticipated events.
Intake Canal and Water Course Diagram:

Outfall #004 determination: The permit writer has determined the permittees request to continue not sampling this outfall is appropriate and this permit will not require analytical monitoring of the outfall. The above photo shows an overlay of the elevation contour lines for the site. The light blue line shows elevation 420. An 11 acre area of impervious surface was measured (areas in white and within the 420 foot boundary). Industrial water runoff will flow towards the southwest and into the ash pond because of established berms around the northern portion of the facility. The canal is bermed and any stormwater runoff within the canal area will be utilized by the intake for the cooling water, used throughout the cooling system, then discharged to the Mississippi River. EPA's

Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, (EPA 833-D-96-001), states "If the permitting authority determines that, through implementation of appropriate BMPs required by the NPDES storm water permit, the discharges have the necessary controls to provide for attainment of WQS and any technology-based requirements, additional controls need not be included in the permit". The BMPs included in the SWPPP are appropriate controlling mechanisms for this discharge.

OUTFALL #005 – STORMWATER RUNOFF FROM ROADWAY

This outfall is representative of several similar discharges along the plant access road to State Highway 94. Stormwater runoff from the paved access road and the narrow gravel lined drainage swale between the access road and the railroad tracks is discharged from corrugated pipes placed beneath the rail line. Several of these pipes drain to a low lying area bordered by the elevated plant access road and Highway 94, effectively forming a basin. The basin then drains via a single pipe to a small Mississippi River backwater pond identified as Poeling Lake. BMPs are implemented to help prevent contamination of stormwater runoff and ensure appropriate and timely responses to spills and other unanticipated events and this area must be included in the SWPPP.

Outfall #005 determination: Outfall #005 appears to continue to have no industrial exposure. The drainage area is minimal. The permit writer has concluded a *de minimis* determination is acceptable and the BMPs included in the SWPPP are appropriate for this discharge.

RAIL SPUR STORMWATER RUNOFF

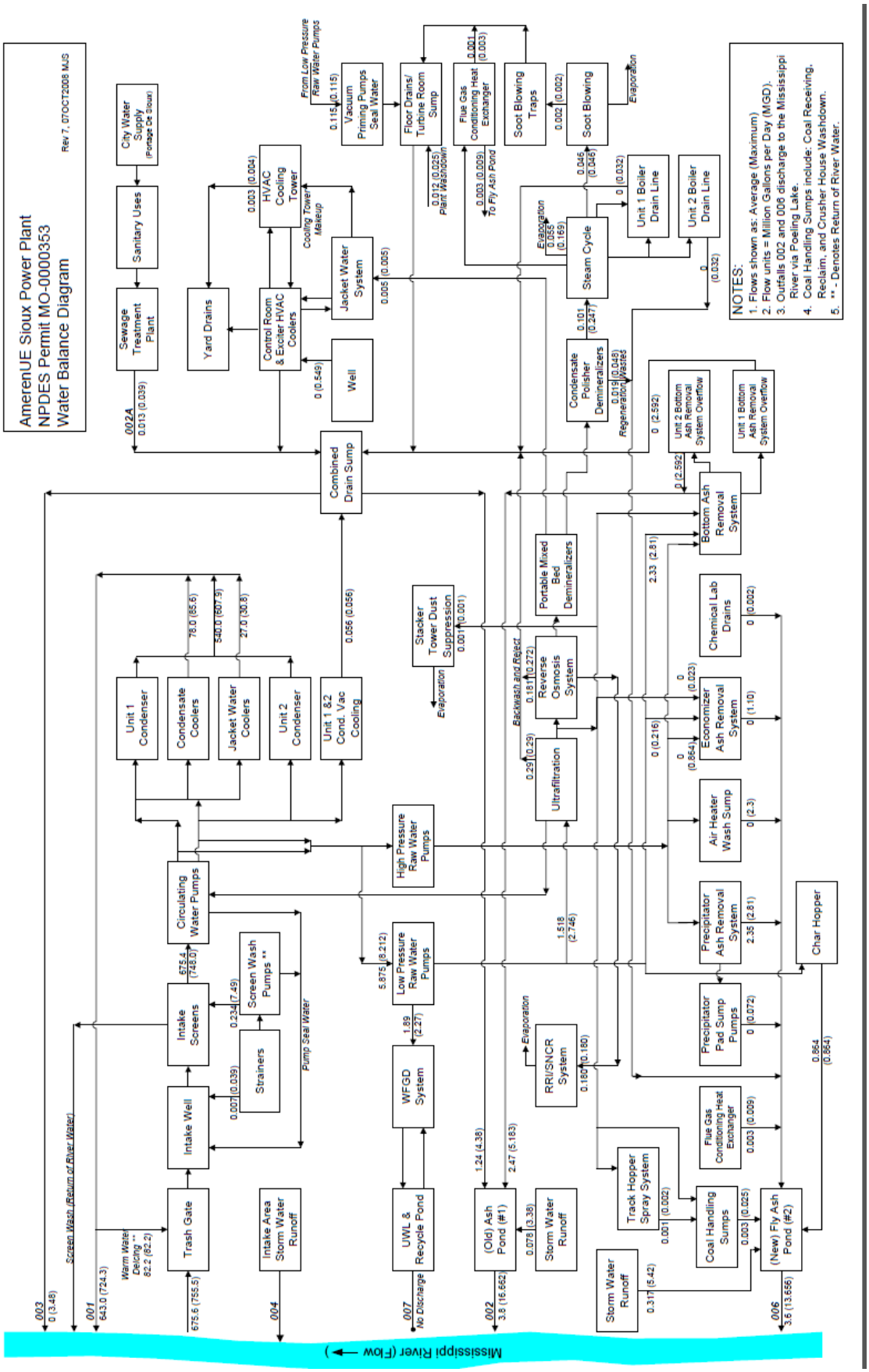
Additional drainage pipes are buried beneath the railroad tracks on the company owned rail spurs connecting the track loop (on the plant site) to the Burlington Northern Railroad. These are similar to those identified as outfall #005. However these pipes drain to adjacent farm fields, located behind flood control levees, and is therefore not considered to be a point source discharge to waters of the state. The discharge has been determined to be *de minimis* but must still be covered by the SWPPP.

BARGE UNLOADING FACILITY

During barge unloading operations, stormwater accumulated at the barge unloading facility is directed to a spare storage barge. As necessary, stormwater from this spare barge is removed by a vacuum truck and transported to the coal storage area. There is no designated outfall for the barge unloading facility however this portion of the facility must be covered by the SWPPP.

FACILITY MAP:

WATER BALANCE DIAGRAM:



ASH MANAGEMENT UNITS:

Management Unit	Year Commissioned	Surface Area (acres)	Total Storage capacity (acre-ft)	Volume of Stored Ash (acre-ft)	Maximum Height of Unit (ft)	Liner
Fly Ash Pond	1994	~ 60	960	376	22	Yes
Bottom Ash Pond	1967	~ 47	2,100	1,859	27	No
Landfill	2010	~ 58	unknown	unknown	unknown	Yes

FACILITY PERFORMANCE HISTORY & COMMENTS:
The electronic discharge monitoring reports were reviewed for the last five years. An inspection was completed on January 28, 2015; the facility was in compliance.

The following table shows the permit exceedances from December 2010 to August 2016.

PF No.	Monitoring Period	Parameter Description	Monitoring Location	Units	Limit	Limit	Reported Value	Limit	Limit	Reported Value
006	09/30/2013	Total Suspended Solids (TSS)	Effluent Net	mg/L	30	Monthly Avg.	75.0	100	Daily Max.	375.0
02A	11/30/2015	Total Suspended Solids (TSS)	End of Pipe	mg/L	30	Monthly Avg.	73	45	Weekly Avg.	111
02A	05/31/2012	Total Suspended Solids (TSS)	End of Pipe	mg/L	30	Monthly Avg.	42	45	Weekly Avg.	50
02A	11/30/2011	Total Suspended Solids (TSS)	End of Pipe	mg/L	30	Monthly Avg.	26.0	45	Weekly Avg.	51.0

Outfall #006 is ash pond #2; technology based net limitations.
Outfall #02A is the wastewater treatment facility; technology based limitations.

COMBUSTION CONTROL EQUIPMENT:
Currently, two systems are operable to reduce air emissions from the two Sioux Power Plant boilers and are summarized below.

- *Wet Flue Gas Desulphurization:* The WFGD functions to reduce SO_x emissions via absorption with limestone. See *Environmental Projects* in this part.
- *Rich Reagent Injection & Selective Non-Catalytic Reduction (RRI-SNCR):* RRI-SNCR equipment was installed during November 2006 at the Sioux Power Plant. The Purpose of the RRI-SNCR systems is to reduce the emission of NO_x to the atmosphere from Sioux boilers 1 and 2. The installation of the RRI-SNCR systems was part of Ameren's plan to comply with new air pollution control regulations. The RRI and SNCR function to convert NO_x in the boiler into nitrogen by injecting a urea solution into each of the two Sioux Power Plant boilers. Upon completion of modifications for the Unit 1 RRI-SNCR system, both boilers will have 30 RRI injection ports at five different boiler elevations and 9 SNCR injection ports at two different boiler elevations.

ENVIRONMENTAL PROJECTS:

- Ash Sales: The facility produces approximately 100,000 tons of bottom ash (boiler slag) and 40,000 tons of fly ash per year. Boiler slag is reclaimed from the pond and utilized as blasting grit and as roofing shingle material. Approximately 65,000 tons per year are provided to these markets. Fly ash was reused as structural fill for a limestone haul road and was also used for construction of the on-site utility waste landfill.
- Wetlands Development: The facility has conveyed and deeded about 25 acres of the plant property bordering the Mississippi River for wetland preservation. This land contains bottomland hardwood trees.
- Combustion Control Equipment:
  - Wet Flue Gas Desulphurization (WFGD):
    - Raw Water Treatment Plant: Constructed to provide cleaner Mississippi River water to plant processes. The plant membrane filters, then ultrafiltration, then reverse osmosis. Chlorine is used in the RO treatment to prevent scaling. The treatment waste is discharged through outfall #002. The facility provided 56 points of data which showed outfall #002 had below the detection limit (ML 130 µg/L) of total residual chlorine.
    - WFGD Limestone Storage: The facility constructed two storage domes on the eastern side of the facility to contain powdered limestone for the system.

- Utility Waste Landfill: The facility has constructed a UWL south of the generating station on the south side of Highway 94. The UWL has a 183.5 acre "wet gypsum stack" with decant water directed to a recycle pond. The department regulates the gypsum stack through the solid waste program.
  Gypsum Slurry containing about 20% solids is pumped from the WFGD system to the gypsum stack where the solids separate out and remain in the stack. Decant water flows to the recycle pond which functions to control surge volumes and contain gypsum stack stormwater runoff. Water from the recycle pons is returned for reuse by the WFGD system. The construction permit 22-7667 was issued on August 5, 2008.

o Rich Reagent Injection and Selective Non-Catalytic Reduction (RRI-SNCR): RRI-SNCR equipment was replaced in November of 2006. These systems reduce emission of nitrogen oxides (NOx) to the atmosphere from boilers 1 and 2.The systems convert NOx into nitrogen by injecting urea into ports in the boiler. Urea injection concentrations vary between 10 and 50%. Some urea injected into the boiler does not react fully with the NOx and results in excess ammonia ("slip") and ultimately ammonia can be discharged to the ash ponds. Use of the RRI-SNCR equipment is dependent upon several factors. The specific NOx controls were implemented in response to the Missouri NOx Budget Trading Program regulations during ozone season (May through September) and additional Missouri air regulations necessary to comply with the federal Clean Air Interstate Rule (CAIR). Since inception, the CAIR regulations have been vacated. Urea usage rates are highly variable but a maximum usage rate is 30,000 gallons of 50% aqueous urea per day. The fly ash pond (outfall #006) is then estimated to mass load at about 3 to 25 pounds per hour.

- Intake Pump Replacement: The four intake pumps at the cooling water intake structure were replaced with four higher capacity intake pumps to provide make-up water for the WFGD system. The previous four pumps were each rated at 116,650 gallons per minute (GPM). They were replaced with 130,000 GPM pumps. The facility has determined thermal discharge will not be changed with this increase.
- Utility Waste Landfill and Recycle Pond: Construction permit # 22-7667 effective August 5, 2008 and expired August 4, 2010 allowed construction of a no-discharge recycle pond and utility waste landfill. This created outfall #007 as an emergency discharge (no allowed discharge) for safety purposes. The WFGD system is designed to operate with a maximum of 50,000 mg/L of chlorides therefore this system cannot direct discharge to waters of the state without violating water quality standards. The UWL consists of a 183.5 acre "wet gypsum stack" with decant water directed to a "recycle pond".

CHEMICAL USAGE & SIGNIFICANT MATERIALS STORED ON SITE:
The following table outlines the chemicals and materials used or stored at the facility and how each chemical is controlled or limited through the permit.

CHEMICAL/MATERIAL	USES/STORAGE	DISCHARGE	PERMIT CONTROL
Aluminum Chlorohydrate (50%)	Used as a coagulant in raw water treatment; usage of 5,000 gallons/year; stored in a 5,000 gallon tank located at the raw water treatment plant. There is a containment structure for this tank.	ash pond #1 (outfall #002)	WET testing
Ammonium Hydroxide (28% as NH4OH)	Used as a boiler treatment chemical in makeup water and for condensate polisher regenerations; usage: 202,000 lbs/year; stored in a 5,800 gallon above ground tank. Plant procedures limit total inventory to less than 3,000 gallons.	ash pond #1 (outfall #002) via the combined drain sump	ammonia as N monitoring, WET testing
Anticorrosion Chemical (Quality Water Treatment 1590, or equivalent)	used for corrosion control in the Control Room HVAC cooling tower; usage of 600 gallons/year	ash pond #1 (outfall #002)	WET testing
GE-Betz Hypersperse MDC 220, or equivalent	used as an antiscalant in raw water treatment; usage of 5,000 gallons/year	ash pond #1 (outfall #002)	WET testing
GEBetz NX1106 and NX1103, or equivalent	biocide used to control jacket water quality; usage of 135 gallons/year	ash pond #1 (outfall #002) via the combined drain sump	WET testing
Boiler Chemical Cleaning	Occurs approximately every six years. Boiler chemical cleaning wastes are not discharged but are thermally treated at the plant by injecting them into an operating boiler. Boilers are cleaned with a solution of formic and hydroxyacetic acids. The chemicals are brought on site in portable tanks. The boiler cleaning wastewater is stored in a 50,000 gallon tank, until it is thermally treated in an operating boiler.	no discharge	special condition #22
Bromine (Quality Water Treatment 2130, or equivalent)	used for bacteriological control in the control room HVAC cooling tower; usage of 30 gallons/year	ash pond #1 (outfall #002)	WET testing

<table>
<tr><th>CHEMICAL/MATERIAL</th><th>USES/STORAGE</th><th>DISCHARGE</th><th>PERMIT CONTROL</th></tr>
<tr><td>Carbon dioxide</td><td>used for neutralization of ash pond #2 effluent and as an inert gas in generator systems; usage of 305,900 lbs/year; liquid carbon dioxide is stored in two tanks: a 12,000 pound capacity tank in the plant's gas tank and a 52,000-pound capacity tank at the fly ash pond discharge structure</td><td>outfall #006</td><td>pH limits</td></tr>
<tr><td>Chlorine tablets (Quality Water Treatment T30, or equivalent)</td><td>used for bacteriological control in the Control Room HVAC cooling tower; usage of 1 pail/year</td><td>ash pond #1 (outfall #002)</td><td>WET testing</td></tr>
<tr><td>Citric Acid</td><td>a low pH reverse osmosis cleaning chemical in raw water treatment; 24 gallons/year</td><td>discharged to ash pond #1 (outfall #002)</td><td>pH limits, WET testing</td></tr>
<tr><td>Citric Acid (50%)</td><td>low pH Ultrafiltration Membrane cleaning chemical in raw water treatment; usage of 1,000 gallons/year</td><td>ash pond #1 (outfall #002)</td><td>pH limitations</td></tr>
<tr><td>Coal</td><td>fuel to generate electricity; stored outside uncovered; delivered by train, truck, or barge and unloaded at the coal receiving area stormwater runoff</td><td>outfall #006</td><td>ELG; SWPPP</td></tr>
<tr><td>Coal Dust Suppression Agents & Coal Treatment Chemicals</td><td>treat coal or coal combustion systems; Benetech products; BT-205W (5,000 gallons/year), BT-415 or 515 (45,000 gallons/year) and BT100F2 (61,000 gallons/year); surfactants – all are used for coal dust suppression
These can be used in coal handling systems; small amount of these products may be discharged from the ash ponds; three dust suppressant products are stored on site, in five above ground tanks located near the crusher house and coal receiving hoppers. Each tank sits within a concrete retention berm which is designated to hold the entire contents of the tank. Deliveries are made directly to the tanks.</td><td>outfalls #002 and #006</td><td>WET testing; narrative conditions; SWPPP</td></tr>
<tr><td>Coal Freeze Conditioning Agents</td><td>Applied to coal (at the point of shipment) during severe winter weather; consist of various mixtures of ethylene glycol, diethylene glycol, propylene glycol, calcium chloride, and/or sodium chloride. When used, freeze-conditioning agents are applied at a rate of approx. 2 pints per ton of coal. Freeze-conditioning agents may also be used in the coal handling systems at Sioux Plant. Ethylene glycol solutions (50%) – used as an antifreeze agent on coal and as a coolant in mobile equipment; usage of 12,000 lbs/yr.</td><td>outfall #002</td><td>WET testing</td></tr>
<tr><td>Ethylene Glycol</td><td>stored in 55-gallon drums. It is mixed 50/50 with water and used as an anti-slip agent on coal conveyors</td><td>outfall #002</td><td>WET testing</td></tr>
<tr><td>Ferric Sulfate Solution (45%)</td><td>used as a precipitating agent in raw water treatment; infrequent usage</td><td>ash pond #1 (outfall #002)</td><td>iron monitoring</td></tr>
<tr><td>Fuel Oil</td><td>stored in two above ground tanks, with 30,000 and 15,000 gallon capacities. They are located within earthen dikes, which are designated to hold 33,000 and 16,500 gallons respectively. Fuel oil is loaded directly into the tanks. Note at times, there are also one to three railroad car tankers on site, with a holding capacity of 21,000 gallons each</td><td>no discharge; outfall #002, barge dock, stormwater outfalls</td><td>oil and grease limitations, SWPPP, OPA*</td></tr>
<tr><td>High pH Reverse Osmosis Cleaning Chemical (GE-Betz AK110, or equivalent)</td><td>used as a high pH RO cleaning chemical in raw water treatment; usage of 3,600 lbs/year</td><td>ash pond #1 (outfall #002)</td><td>pH limitations</td></tr>
<tr><td>Hydrogen Gas</td><td>stored in two high-pressure cylinder located in the plant's gas yard and a 52,000 pound capacity tank at the fly ash pond discharge structure.</td><td>n/a (volatilization upon release)</td><td>n/a</td></tr>
<tr><td>Laboratory Reagents</td><td>lab drains which may include spent reagents; only trace levels are anticipated
<table><tr><th>CHEMICAL</th><th>CAS NUMBER</th></tr><tr><td>Methylene chloride</td><td>75-09-2</td></tr><tr><td>Tetrachloroethylene</td><td>127-18-4</td></tr><tr><td>Toluene</td><td>108-88-3</td></tr><tr><td>Trichloroethane</td><td>71-55-6</td></tr><tr><td>Trichloroethene</td><td>79-01-6</td></tr><tr><td>Methyl chloride</td><td>74-87-3</td></tr><tr><td>Ethyl benzene</td><td>100-41-4</td></tr></table></td><td>ash pond #2 (outfall #006)</td><td>WET testing</td></tr>
<tr><td>Lime (Calcium Oxide)</td><td>used in raw water treatment; infrequent usage</td><td>ash pond #1 (outfall #002)</td><td>pH limitations</td></tr>
<tr><td>Nitrogen, Liquid</td><td>Stored in a high-pressure cylinder located in the plant's gas yard, with a total capacity of approx. 10,600 pounds.</td><td>n/a (volatilization upon release)</td><td>ammonia as N monitoring</td></tr>
</table>

CHEMICAL/MATERIAL	USES/STORAGE	DISCHARGE	PERMIT CONTROL
Petroleum (Pet) Coke	supplemental fuel; the facility may use up to a 15% feed rate of pet coke; stored on a portion of the coal pile; not currently used by the facility as supplemental fuel; none stored at this time	outfall #002	WET testing
Phosphoric Acid (75%)	used as a low pH Reverse Osmosis cleaning in raw water treatment; usage of 24 gallons/year	discharged to ash pond #1 (outfall #002)	pH limitations, WET testing
Polymer	settling agent in raw water treatment; infrequent usage	ash pond #2 (outfall #006)	WET testing; Standard Conditions Part I
Propylene Glycol Solution (50%)	source is from residuals in piping; usage of approx. 25 gallons/year	ash pond #1 (outfall #002)	WET testing
Reverse Osmosis Biocide (GE-Betz BioMate MBC 2881, or equivalent)	used as an RO system biocide chemical in raw water treatment; usage of 500 gallons/year	ash pond #1 (outfall #002)	WET testing
Sodium Bisulfite (43%)	used as a neutralizing agent in raw water treatment; usage of 5,000 gallons/year	ash pond #1 (outfall #002)	pH limitations
Sodium Chloride	Used to brine-treat demineralizer anion resin; infrequent usage; stored in several plant areas during winter months. It is used on roadways, sidewalks and parking lots for deicing, as required.	ash pond #1 (outfall #002)	chloride monitoring
Sodium Hydroxide (solid)	jacket water system additive; usage of 1,100 lbs/year	ash pond #1 (outfall #002) via the combined drain sump	pH limitations
Sodium Hydroxide Solution (50%)	used for raw water treatment and polisher demineralizer regeneration (alternatively to neutralize Ash Pond #1) – usage of 2,310 lbs/year; stored in a 4,000-gallon tank located at the raw water treatment plant	ash pond #1 and #2 (outfalls #002 and #006)	pH limitations
Sodium Hypochlorite Solution (10%)	used as a disinfectant in raw water treatment; usage of 12,000 gallons/year	ash pond #1 (outfall #002)	pH limitations
Sodium Molybdate Dehydrate (practical grade)	jacket water system chemical additive; 20,000 lbs/year	ash pond #1 (outfall #002) via the combined drain sump	WET testing
Sodium Tolytriazole Solution (50%)	jacket water system chemical additive; usage of 500 gallons/year	ash pond #1 (outfall #002) via the combined drain sump	WET testing
Sulfur, Molten	stored in a 70 ton tank located south of the Power Building	no discharge	WET testing
Sulfuric Acid (93%)	raw water treatment and polisher regeneration (alternatively to neutralize ash pond #1); usage of 6,485 lbs/year; stored in a 15,000-gallon above ground tank; there is a concrete retaining basin under the tank for containment in the event of a spill; there is also a 300-gallon tank located at the raw water treatment plant	discharged to ash pond #1 and #2	pH limits, WET testing
Tires, Shredded	alternative fuel; stored outside in an uncovered area; discarded tires are burned to recover the energy and reduce coal fuel consumption; the maximum storage is 1,000 tons; not currently used as alternative fuel; none stored at this time	outfall #002	WET testing
Transformers	Oil filed transformers are located on site; oil is used for cooling and insulation. These transformers have drains dischargeing to the combined drain sump.	outfall #002 (bottom ash pond)	oil and grease limitations
Unleaded Gasoline	stored in a UL-Listed 1,000-gallon above ground storage tank	no discharge	special condition #15, OPA*
Urea Liquor (50%)	stored in a 400,000 gallon tank with secondary containment	no discharge	ammonia as N monitoring

CHEMICAL/MATERIAL	USES/STORAGE	DISCHARGE	PERMIT CONTROL
Used Oil	Non-electrical & electrical waste oil are stored in a 4,000 gallon tank located immediately southeast of the Unit 2 stack. This tank and its transfer equipment are located within a concrete dike of sufficient volume to contain a complete loss of the oil and solvent mixture, plus substantial rainfall.	no discharge	oil and grease limitations; special condition #15, OPA*

* OPA = Oil Pollution Act of 1990; any discharge of petroleum products to waters of the United States is prohibited and any amount spilled into such waters must be reported to the Coast Guard's National Response Center immediately upon discovery.

Receiving Stream Information

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

✓ As per Missouri's Effluent Regulations [10 CSR 20-7.015(1)(B)], the waters of the state are divided into the following seven 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.

- Missouri or Mississippi River: ☒
- Lake or Reservoir: ☒
- Losing: ☐
- Metropolitan No-Discharge: ☐
- Special Stream: ☐
- Subsurface Water: ☐
- All Other Waters: ☒

RECEIVING WATER BODY'S WATER QUALITY:

- The Mississippi River is the major river located just north of the facility. Once-through cooling water discharges directly to this river from outfall #001.
- Poeling Lake is the first receiving waterbody for several of the outfalls. See the waterbody table on the following page in this section. This lake is not classified but general water quality criteria [10 CSR 20-7.031(4)] apply. There are no concurrent biological or water quality data available for this lake.
- The Missouri River was identified as the discharge point for the utility waste landfill's recycle pond emergency overflow discharge; outfall #007.

303(D) LIST:

Section 303(d) of the federal Clean Water Act requires each state identify waters 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 impaired waters but not addressed by normal water pollution control programs. http://dnr.mo.gov/env/wpp/waterquality/303d/303d.htm

✓ Not applicable; The Mississippi River was listed on the 2002 Missouri 303(d) list for chlordane and PCBs. It was removed from the 303(d) List when a TMDL was approved. The TMDL is still effective.

✓ The Missouri River is listed on the 2016 CWA §303(d) for *E. coli*. The facility is not considered a source of the impairment as domestic wastewater is discharged to the Mississippi.

TOTAL MAXIMUM DAILY LOAD (TMDL):

A TMDL is a calculation of the maximum amount of a given pollutant a body of water can absorb before its water quality is affected; hence, the purpose of a TMDL is to determine the pollutant loading a specific waterbody can assimilate without exceeding water quality standards. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed which shall include the TMDL calculation. http://dnr.mo.gov/env/wpp/tmdl/

✓ This facility may be considered a source of, or had the potential to contribute to PCB pollution listed in the 2002 TMDL for the Mississippi River and the 2006 TMDL for the Missouri River. In 1991, the facility noted they cleaned up PCB contaminated soil from between the air heater wash basin and the road as a result of previous releases of transformer oil. The facility was not specifically mentioned in either TMDL therefore there are no wasteload associations.

- PCBs were used in transformer oil because of their excellent heat dispersion capabilities. On August 25, 1982, EPA issued a final rule governing the use and servicing of electrical equipment containing PCBs (47 FR 37342). This final rule was issued as a result of the Court's decision to strike down the May 1979 rule's classification of transformers, capacitors, and electromagnets as "totally enclosed." In the August 25, 1982 rule, EPA authorized the use of electrical equipment containing PCBs with certain conditions and restrictions intended to minimize human and environmental exposures to PCBs. On

October 21, 1982, EPA issued part one of a two-part rule to address the 50 ppm regulatory cutoff (47 FR 46980). This final rule addressed closed and controlled waste manufacturing processes. EPA submitted a plan to the Court on November 1, 1982, that requested a further extension of the stay of mandate for the 50 ppm cutoff and presented plans for the completion of the rulemaking on this issue. (The October 21, 1982 rule was superseded later by the "Uncontrolled PCB's Rule" issued on July 10, 1984.). Since then, utilities have been retrofitting all transformers and filling with mineral oil which does not contain PCBs. It is unknown if Sioux has any remaining transformers which may have PCBs or if spills of PCBs occurred on site.

WATERBODY TABLE:

OUTFALL	WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	DISTANCE TO SEGMENT	12-DIGIT HUC
#001	Mississippi River	P	3700	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.0 mi	07110009-0402 City of Alton-Mississippi River
#002	Poeling Lake	n/a	n/a	GEN	0.0	07110009-0401 Marais Temps Clair-Mississippi River
	Tributary to the Mississippi River (8-20-13 MUDD V1.0)	C	3960	IRR, LWP (LWW), SCR, WWH (AQL)	0.2 mi	
#02A	Poeling Lake via Outfall #002	n/a	n/a	GEN	0.0 mi	
	Backwater chutes of the Mississippi River	C	3960	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.2 mi	
#003	Mississippi River	P	3700	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.0 mi	07110009-0402 City of Alton-Mississippi River
#004	Mississippi River	P	3700	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.0 mi	07110009-0401 Marais Temps Clair-Mississippi River
#005	Poeling Lake	n/a	n/a	GEN	0.0 mi	
	Backwater chutes of the Mississippi River	C	3960	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.6 mi	
#006	Poeling Lake	n/a	n/a	GEN	0.0 mi	
	Backwater chutes of the Mississippi River	C	3960	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.6 mi	
#007	Tributary to Jurisdictional Scour Hole	n/a	n/a	GEN	0.3 mi	10300200-0804 Outlet Missouri River
	Missouri River	P	1604	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-B, WWH (AQL)	0.7 mi	
#008	Mississippi River	P	3700	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.0 mi	07110009-0401 Marais Temps Clair-Mississippi River

n/a not applicable
WBID = Waterbody IDentification: Missouri Use Designation Dataset 8-20-13 MUDD V1.0 data can be found as an ArcGIS shapefile on MSDIS at ftp://msdis.missouri.edu/pub/Inland_Water_Resources/MO_2014_WQS_Stream_Classifications_and_Use_shp.zip
* As per 10 CSR 20-7.031 Missouri Water Quality Standards, the department defines the Clean Water Commission's water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1st classified receiving stream's beneficial water uses to be maintained are in the receiving stream table in accordance with [10 CSR 20-7.031(1)(C)].

Uses which may be found in the receiving streams table, above:
10 CSR 20-7.031(1)(C)1.:
AQL = Protection of aquatic life (Current narrative use(s) are defined to ensure the protection and propagation of fish shellfish and wildlife, which is further subcategorized as: WWH = Warm Water Habitat; CLH = Cool Water Habitat; CDH = Cold Water Habitat; EAH = Ephemeral Aquatic Habitat; MAH = Modified Aquatic Habitat; LAH = Limited Aquatic Habitat. This permit uses AQL effluent limitations in 10 CSR 20-7.031 Table A for all habitat designations unless otherwise specified.)
10 CSR 20-7.031(1)(C)2.: Recreation in and on the water
WBC = Whole Body Contact recreation where the entire body is capable of being submerged;
WBC-A = Whole body contact recreation supporting swimming uses and has public access;
WBC-B = Whole body contact recreation supporting swimming;
SCR = Secondary Contact Recreation (like fishing, wading, and boating).

10 CSR 20-7.031(1)(C)3. to 7.:
HHP (formerly HHF) = Human Health Protection as it relates to the consumption of fish;
IRR = Irrigation for use on crops utilized for human or livestock consumption;
LWW = Livestock and wildlife watering (Current narrative use is defined as LWP = Livestock and Wildlife Protection);
DWS = Drinking Water Supply;
IND = Industrial water supply
10 CSR 20-7.031(1)(C)8-11.: Wetlands (10 CSR 20-7.031 Table A currently does not have corresponding habitat use criteria for these defined uses)
WSA = Storm- and flood-water storage and attenuation; WHP = Habitat for resident and migratory wildlife species;
WRC = Recreational, cultural, educational, scientific, and natural aesthetic values and uses; WHC = Hydrologic cycle maintenance.
10 CSR 20-7.031(6): GRW = Groundwater

RECEIVING STREAM LOW-FLOW VALUES:

OUTFALL	RECEIVING STREAM (C, P)	LOW-FLOW VALUES (CFS)		
		1Q10	7Q10	30Q10
#001	Mississippi River (P)	18,287	23,385	28,180

To calculate 7Q10, values were obtained 01/01/1970 to 05/31/2015 from 1) Mississippi river at Keokuk Iowa (USGS 05474500) and 2) the Fox River at Wayland, MO (USGS 05495000) and 3) the Des Moines River at St. Francisville, MO (USGS 05490600) and 4) the Illinois River by Valley City, IL (USGS 05586100) were added together as these flows enter the Mississippi River upstream of the facility.

MIXING CONSIDERATIONS TABLE: MISSISSIPPI RIVER (CLASS P)

MIXING ZONE (CFS) (CHRONIC) [10 CSR 20-7.031(5)(A)4.B.(II)(a)]			ZONE OF INITIAL DILUTION (CFS) (ACUTE) [10 CSR 20-7.031(5)(A)4.B.(II)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
4571 cfs	5846 cfs	7045 cfs	457 cfs	585 cfs	705 cfs

ZID cannot be more than 10 times the facility design flow. (DF_{cfs} = 1121 CFS)

STREAM MIXING CONSIDERATIONS FOR OUTFALLS #003, #004, AND #007:
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(b)]
Mixing Zone: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)]

LAKE MIXING CONSIDERATIONS FOR OUTFALLS #002, #02A, #005, AND #006:
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(IV)(b)]
Mixing Zone: Not allowed [10 CSR 20-7.031(5)(D) and (E)]

THERMAL MIXING CONSIDERATIONS:
The facility is subject to thermal limitations and is allowed mixing considerations per 10 CSR 20-7.031(5)(D)(5) & (6). See *Part V Effluent Limit Determination; Derivation and Discussion of Limits; Outfall #001*.

RECEIVING STREAM MONITORING REQUIREMENTS:
- The department is establishing temperature limits for outfall #001, once through cooling water. This necessitates the facility determine stream temperature and velocity. The department does not specify how the facility is to do this, but the information obtained must be reliable and scientifically supportable.
- The facility is to perform biological studies to monitor for impingement and entrainment. The department also does not dictate the exact methods or sites where these studies are to be performed. See *Part III: Rationale and Derivation of Permit Limits and Condition; Impingement and Entrainment at CWIS; CWA § 316(b).*

Rationale and Derivation of Permit Limits and 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)] requires a reissued permit to be as stringent as the previous permit with some exceptions.

- ✓ All limits in this operating permit are at least as protective as those previously established; therefore, backsliding does not apply.
- ✓ 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.
- ✓ Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation.
  - The facility has indicated two outfalls are emergency discharges. Outfall #003 was permitted in the previous permit with daily and monthly limits for TSS, O&G, and pH. These limits have been removed as it is a violation of this permit to discharge from these outfalls under 40 CFR 122.41(m) and reported according to 40 CFR 122.41(m)(3)(i) & (ii). The receiving waterbody is still protected using these measures. Outfall #007 is newly established therefore no backsliding has occurred.
- ✓ The Department determined 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 controlling 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 an analytical finding of reasonable potential. Implementation of the toxic unit monitoring requirement will allow the department to produce numeric criteria in accordance with water quality standards established under §303 of the CWA.
  - This permit removes the special condition C.4. "Discharge of wastewater from this facility must not alone or in combination with other sources cause the receiving stream to violate the following (a) Water temperatures and temperature differentials specified in Missouri water quality standards shall be met." The department has determined this statement was not enforceable as written and was capriciously enacted.

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 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.

BENCHMARKS:
When a permitted feature or outfall consists of only stormwater, a benchmark may be implemented at the discretion of the permit writer. Benchmarks require the facility to monitor, and if necessary, replace and update stormwater control measures. Benchmark concentrations are not effluent limitations. A benchmark is a technology-based threshold. A benchmark exceedance, therefore, is not a permit violation; however, failure to take corrective action is a violation of the permit. Benchmark monitoring data is used to determine the overall effectiveness of control measures and to assist the permittee in knowing when additional corrective actions may be necessary to comply with the technology based effluent limitations (TBEL).

Because of the fleeting nature of stormwater discharges, the department, under the direction of EPA guidance, has determined monthly averages are capricious measures of stormwater discharges. The *Technical Support Document for Water Quality Based Toxics Control* (EPA/505/2-90-001; 1991) Section 3.1 indicates most procedures within the document apply only to water quality based approaches, not end-of-pipe technology-based controls. Hence, stormwater outfalls will only contain a maximum daily limit (MDL), benchmark, or monitoring requirement determined by the site specific conditions including the receiving water's current quality. While inspection of the stormwater BMPs occurs monthly, facilities with no compliance issues are usually expected to sample stormwater quarterly.

Numeric benchmark values are based on other stormwater permits including the Environmental Protection Agency's (EPA's) *Multi-Sector General Permit For Stormwater Discharges Associated With Industrial Activity* (MSGP) or water quality standards. Because precipitation events are sudden and momentary, benchmarks based on state or federal standards or recommendations use the Criteria Maximum Concentration (CMC) value, or acute standard. The CMC is the estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. The CMC for aquatic life is intended to be protective of the vast majority of the aquatic communities in the United States.

✓ Not applicable; this facility has stormwater-only outfalls but there are no benchmark constraints.

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.

COAL COMBUSTION RESIDUALS (CCR):

Coal Combustion Residuals (CCR), often referred to as coal ash, are currently considered solid waste, not hazardous waste, under an amendment to RCRA, the Resource Conservation and Recovery Act. Coal ash is residue from the combustion of coal in power plants and compounds captured by pollution control technologies, like precipitators or scrubbers. Potential environmental concerns from coal ash pertain to pollution from impoundments and landfills leaching into groundwater and structural failures of impoundments.

The US EPA is promulgating the first-ever national rules to ensure the safe disposal and management of coal ash from coal-fired power plants under the nation's primary law for regulating solid waste, the Resource Conservation and Recovery Act (RCRA) under Subtitle D. EPA published the final rule on April 17, 2015 in the Federal Register. http://www2.epa.gov/coalash/coal-ash-rule. The department is currently reviewing the rule.

While the rule mentioned above is geared towards solid waste, the water protection program has begun to consider implications to groundwater of the state. Studies on which the rule is based indicate impacts occur to groundwater when ponds are unlined or not adequately lined. This permit does not regulate the fate of coal ash, this operating permit contains a special condition to address concerns regarding ash ponds/impoundments at this facility and their potential to impact groundwater. Missouri Water Quality Standard 10 CSR 20-7.031(5)(A) states, "Water contaminants shall not cause or contribute to exceedances of Table A, groundwater limits in aquifers and caves..." The established special condition will allow the department to (1) determine if groundwater is being impacted from either the coal ash impoundments, and (2) establish controls, limits, management strategies, and/or groundwater cleanup criteria. See *Groundwater Monitoring* below.

Assessment:

On September 30, 2010, the United States Environmental Protection Agency and its engineering contractors conducted a CCR site assessment at the Sioux Power Plant. The purpose of the visit was to assess the structural stability of the impoundments or other similar management units containing "wet" handled CCRs. Due to newly promulgated regulations for CCR, the facility is moving to a dry handling system of CCR disposal.

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 LIMITATION GUIDELINE:

Effluent Limitation Guidelines, or ELGs, are found at 40 CFR 400-499. These are limitations established by the EPA based on the SIC code and the type of work a facility is conducting. Most ELGs are for process wastewater and some address stormwater. All are technology based limitations which must be met by the applicable facility at all times.

✓ The new Steam Electrical Power Generating Point Sources [40 CFR Part 423] ELG became effective on January 4, 2016 and is incorporated herein.

✓ The facility has an associated Effluent Limit Guideline (ELG) which is applicable to the wastewater and stormwater discharge at this facility. The following table shows the limits in the ELG at 40 CFR 423. Should water-quality derived effluent limits be more protective of the receiving water's quality, the WQS will be used as the limiting factor.

✓ BPT is best practicable control technology applicable to all facilities at all times; 423.12

- ✓ BAT is best available technology economically achievable applicable to this facility; 423.13
- ✓ 40 CFR 423.13(g)(1)(i) is best available technology (BAT) for FGD scrubber wastewater and becomes effective on November 1, 2018

PARAMETER	40 CFR 423	DAILY MAXIMUM	MONTHLY AVERAGE
Arsenic, Total	BAT – FGD Wastewater	11 µg/L	8 µg/L
Chlorine, Free Available	BPT – Cooling Tower Blowdown BPT – Once Through Cooling Water BAT – Once Through Cooling Water <25 MW	0.5 mg/L	0.2 mg/L
Chlorine, Total Residual	BAT – Once Through Cooling Water BPT – Once Through Cooling Water >25 MW	0.2 mg/L	n/a
Chromium	BAT – Cooling Tower Blowdown	0.2 mg/L	0.2 mg/L
Copper	BPT – Metal Cleaning Wastes	1 mg/L	1 mg/L
Iron	BPT – Metal Cleaning Wastes	1 mg/L	1 mg/L
Mercury	BAT – FGD Wastewater	0.788 µg/L	0.356 µg/L
Nitrate plus Nitrite as N	BAT – FGD Wastewater	17.0 mg/L	4.4 mg/L
Oil and Grease	BPT – Low volume wastes, ash transport water, metal cleaning wastes	20 mg/L	15 mg/L
Selenium	BAT – FGD Wastewater	23 µg/L	12 µg/L
Total Suspended Solids (TSS)	BPT – Low volume wastes, ash transport water, metal cleaning wastes BPT – Coal Pile Runoff	100 mg/L 50 mg/L	30 mg/L -
Zinc	BAT – Cooling Tower Blowdown	1 mg/L	1 mg/L

- ✓ The new rule defines bottom ash transport water, fly ash transport water, and FGD scrubber wastes as wastewaters which cannot be discharged after December 21, 2023. Interim targets require the department to use the November 1, 2018 date if the facility already has the capabilities of transporting ash using dry handling methods and requiring zero liquid discharge of FGD wastes. See special condition #23. The facility will cease discharging ash sluice wastewater on or before May 1, 2021.

The facility is preparing to close the ash ponds in accordance with 40 CFR 257. The facility submitted the timeline below. See special condition #C.23. Replacement Wastewater Treatment Device – Tentative Schedule:

DATES	SCHEDULED ITEM
November 2015 – January 2018	preliminary engineering design
February 2018	submit NPDES construction and modification package to DNR
February 2019 – April 2021	construction permits issued and initial operations performed
May 2021	commence operations of all new ash and wastewater management facilities

See also *Part III Rationale and Derivation of Permit Limits and Conditions; Coal Combustion Residuals (CCR)*, and *Groundwater Monitoring*.

FLUE GAS DESULFURIZATION (FGD):
Sioux Generating Station has FGD scrubbers on the air stacks. The FGD scrubbers are wet scrubbers which remove up to 90% of the oxides of sulfur (SO_x) emissions from the air. This feature sends the wastewater to the gypsum stack onsite. The main components of the wastewater associated with FGD is an alkaline slurry made up of lime, limestone, or sodium hydroxide; the wastewater also contains the sulfur removed from the air. Both units have scrubbers. FGD wastewater is limited in the new effluent limit guideline for the steam-electric point source category. Limits become effective on November 1, 2018.

GROUNDWATER MONITORING:
Groundwater is a water of the state according to 10 CSR 20-7.015(7) and 10 CSR 20-7.031(6) and must be protected accordingly.
- ✓ Applicable.

While the state does not have explicit regulation requirements pertaining to groundwater monitoring for coal fired power plant facilities, groundwater is considered a "water of the state" and therefore, it is within the department's authority to consider groundwater when issuing permits. Both lined and unlined ash ponds will be evaluated to determine potential impacts to groundwater. As additional permits for coal-fired power plants with surface impoundments for CCR's are renewed, all will be evaluated for the need for similar requirements and further characterization of the ash ponds and their toxicity. Much of the information about leachates entering groundwater is obtained from the department’s Solid Waste Management Program (10 CSR 80-11.010) for utility waste landfills and documents authored by the EPA and the Electric Power Research Institute (EPRI).

The adequacy of a groundwater monitoring program depends greatly on the quality of the detailed hydrogeologic site characterization used to design the program. Only after a complete understanding of the underlying geology and hydrology has been achieved, can the implementation of a groundwater monitoring program begin. The time schedule provided in the permit is to provide time for the utility companies, their consultants, and the department to evaluate and develop a groundwater monitoring plan which is correct for the site-specific conditions of each coal ash pond. Additionally, this time frame is striving to mirror the federal rule regarding in-situ CCR in impoundments.

A groundwater monitoring plan is required to be developed and implemented to examine potential discharges to groundwater from the former and existing ash ponds. The department envisions samples collected quarterly at the UWL for RCRA monitoring to suffice for groundwater monitoring of the UWL portion of the facility. However, groundwater monitoring is being implemented on the ash pond areas as the department wishes to explore any impacts the unlined/inadequately lined ash ponds exhibit in the groundwater. The groundwater monitoring plan should describe not only the groundwater monitoring program, but also the strategy for effectively monitoring groundwater at the facility. The plan typically details the standard operation and procedures related to field sampling, laboratory analysis, and data presentation. Groundwater investigations will include an intrusive field program that involves drilling, hydrological monitoring, and groundwater sampling. The magnitude of such investigations is a function of the size and complexity of the facility.

In this permit renewal, the facility is being required to work with the Missouri Geological Survey to establish a groundwater monitoring program having the capacity to observe and characterize groundwater movement and potential contamination, and determines the proper location and installation of monitoring wells to fully characterize any areas currently or formerly holding ash—both open and closed, or out of use. Monitoring will occur upgradient and downgradient of the ash ponds (or former ash ponds, capped, or not capped) in multiple locations. The department does not consider closure or inactivity per the new CCR regulations as a method of relieving or dismissing of these groundwater monitoring conditions.

The facility can expect to submit quarterly data for the following constituents (at a minimum):

Metals	Metals (continued)	Organics
Aluminum	Lead	Sulfate, as SO_4
Antimony	Lithium	Total Organic Carbon (TOC)
Arsenic	Magnesium	Total Organic Halogens (TOX)
Barium	Manganese	Field Parameters
Beryllium	Mercury	pH
Boron	Molybdenum	Specific conductance
Cadmium	Nickel	Oxidation/Reduction Potential (ORP)
Chromium III	Selenium	Radionuclides
Chromium VI	Silver	Radium 226 (^{226}Ra)
Cobalt	Sodium	Radium 228 (^{228}Ra)
Copper	Thallium	Other
Iron	Zinc	Chemical Oxygen Demand (COD)
		Chloride
		Fluoride
		Hardness, as $CaCO_3$
		Total Dissolved Solids (TDS)

Parameters for consideration in the development of the monitoring plan are based on EPA's *Characterization of Coal Combustion Residues from Electric Utilities – Leaching and Characterization Data*, the new CCR rule at 40 CFR 257 appendices III and IV, and 10 CSR 80-11.

Any hydrogeologic evaluation and groundwater data collection completed prior to the issuance of the NPDES permit and the approval of a detailed site investigation will be voluntary as it pertains to the NPDES permit.

This permit is to comply with the requirements in RSMo 644.143 and to establish a long term approach and stewardship of the site and the beneficial uses of the groundwater on this site. 40 CFR 257 is a self-implementing rule and covered under RCRA; this permit does not implement the federal CCR rule. This permit does not shield a facility from the CCR requirements. Compliance with the terms and conditions of this permit identical to or more stringent than the requirements in the federal CCR rule may constitute compliance with the federal CCR rule although not guaranteed.

The department realizes there are two different timelines associated with this permit for groundwater monitoring. One is driven solely by the effective date of 40 CFR 257, where the permittee will publish the results from eight statistically independent groundwater samples accurately representing background water quality and the quality of the groundwater surrounding the ash ponds pursuant to 40 CFR 257.93. The other is solely water protection program requirements and the permittee will be required to report that data to the water protection program. While the two have different dates and reporting requirements, the department will allow, if appropriate, the same monitoring well network and quarterly sampling data to be used for the two different requirements. All investigations and reports for the water protection program must be approved by the water protection program and Missouri Geological Survey. Any data gathered by the facility prior to WPP approval may or may not be acknowledged as appropriate monitoring. Data and submittals driven by 40 CFR 257 are not approved by the water protection program.

IMPINGEMENT AND ENTRAINMENT AT CWIS; CWA § 316(b):
The Clean Water Act (CWA) Section 316(b) provides for protection of aquatic life from cooling water intake structures (CWIS) where the facility withdraws more than 2 MGD. Sioux can withdraw over 125 MGD of water from the Missouri River therefore is subject to all impingement and entrainment studies and reviews as promulgated in 40 CFR 122.21(r) *et seq.* and 40 CFR Subpart J. The facility is expected to submit all new studies and required information with the application materials six months prior to expiration of the permit. The facility should refer to https://www.epa.gov/sites/production/files/2015-04/documents/cooling-water_esa-instructional-memo_12-11-2014.pdf for additional information.

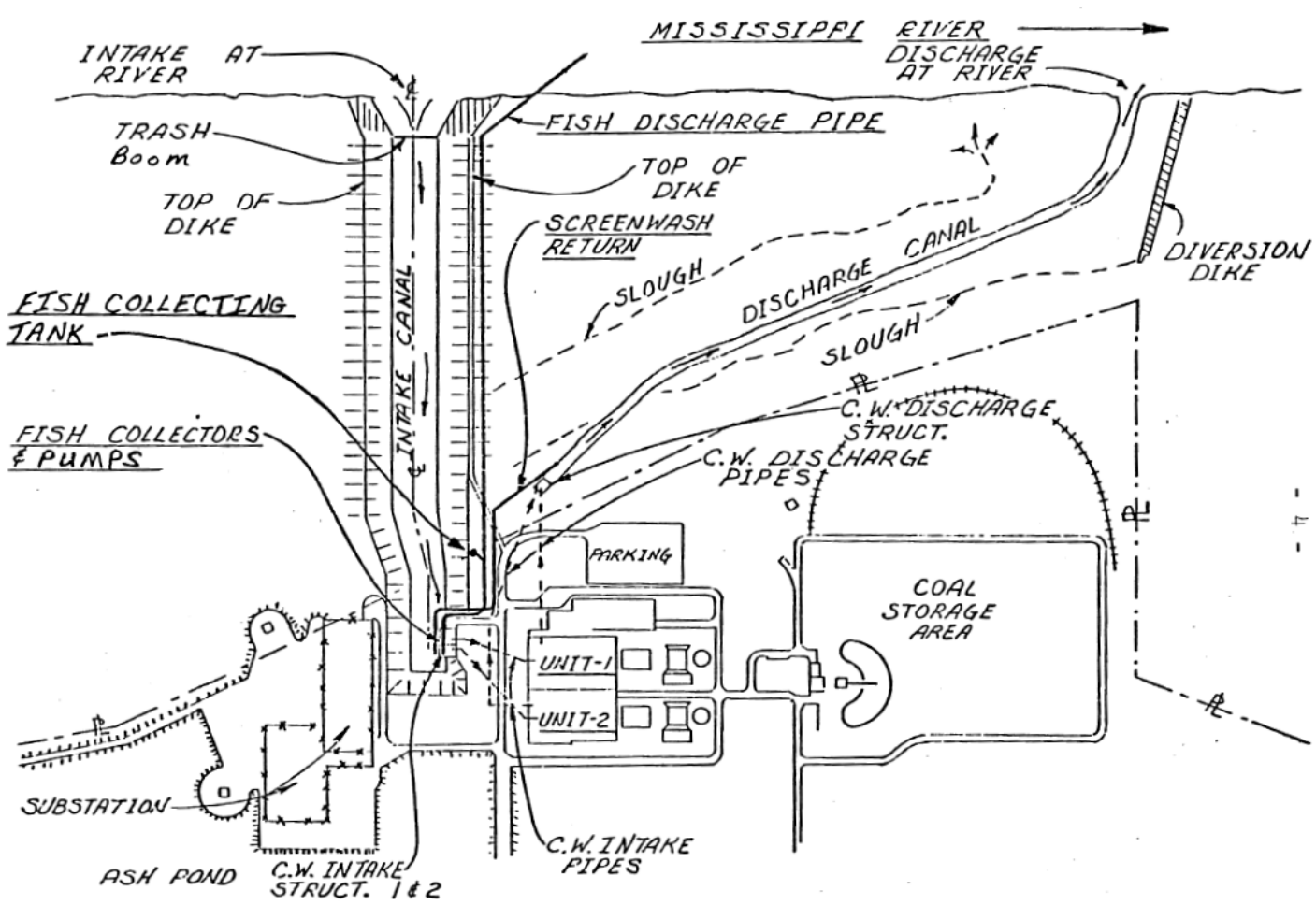
COOLING WATER INTAKE STRUCTURE REQUIREMENTS:
The intake structure at Sioux is located at the end of 1,600-foot long intake canal that extends south from the Mississippi River. In 1980, a fish pump was installed to reduce impingement associated with the plant's intake system. Openings in the face of the structure are protected with "bar racks" to exclude large debris. To enter the intake pump bays, water must pass through conventional traveling screens, which consist of horizontal metal panels faced with 3/8" mesh openings. The panels rotate (vertically) based on either manual timer settings or differential pressure across the screen (which is affected by debris loading). In 1980 a fish pump system was installed to remove fish from the area between the bar racks and travelling screens, and transfer them to the River, downstream of the intake canal. The system ceased operations in 1997. Correspondence dating from 1999 through 2000, with DNR and USEPA Region 7, document the justification and decision to discontinue its use.

FISH RETURN SYSTEM:
In 1983, the facility supplied to the department an *Evaluation of the Sioux Power Plant Fish Return System*. This document describes how the fish return system (FRS) was being used at the facility and how the fish return system was selected to satisfy Best Available Technology (BAT) requirement at that time (1977). The FRS fish collectors are mounted horizontally in each screen's well facing the traveling screens. The fish and water are pumped at a rate of 1,678 gallons per minute (2.4 MGD) back to the Mississippi River. The pipe is a 16 inch diameter polyethylene pipe and must travel approximately 1,700 feet to get back to the Mississippi River. The fish are placed about 10 feet below the surface of the water just downstream of the intake structure. The following diagram shows the design of the fish return system as installed in the 1980s.

The Department approved the Sioux fish pump system in August 1977 as satisfactory meeting the requirement of Section 316(b) of the federal Clean Water Act at that time. With the exception of the intake pumps and fish return system operation as discussed below, there have been no significant changes to the intake structure since this approval.

Impingement monitoring was conducted for 52 consecutive weeks during 2005-2006.

(see diagram next page)



INITIAL I&E ASSESSMENT:
In March and December of 1981, 35,398 fish were collected. This covered 12 families and 30 species. 46% of the fish were recovered by the FRS, but 54% were impinged upon the screens. Gizzard shad was the most frequently collected species at 93%. Unfortunately, one shovelnose sturgeon was collected and did not survive the FRS. The study also noted high seasonal variability. The study did not indicate any mussels, or any other organism type was impinged or entrained, but only included cordate aquatic gill-bearing fish.

REASSESSMENTS:

- During a previous NPDES permit submittal process, the company expressed an interest in providing the State with additional information to reassess the need for continued operation of the fish return system. This action was prompted by a re-examination of fishery data by the company and consideration of the need for a major overhaul of the fish return system components to support continued operation. Subsequent to this request, DNR required the company to submit a report by September 1, 1999. The purpose of this report was to reassess the conclusions of the original 316(b) study regarding fish impingement through a re-evaluation of previous 316(b) studies, supplemented with more recent data generated by Ameren and various other sources. The intention of the request was narrowly focused to have the department either reaffirm the need for continued operation of the fish return system, or make an affirmative determination that the existing intake design reflects best technology for minimizing adverse environmental impact, less the fish return system.
- On August 25, 1999, the company submitted a report titled *A Re-Evaluation of Water Intake Impingement Impacts at the Ameren Sioux Power Plant* to DNR. In this report, the company based its conclusion of "no adverse impact" on three major points:
  1. Various facts and data provide justification to discount any adverse impact associated with the high impingement rates for gizzard shad;
  2. Impingement of important commercial and recreational fish are relatively low, and
  3. Long-term fishery data supports the conclusion that a healthy community exists in Pool 26.

- In late January 2000, the company received a letter from USEPA Region 7 which approved generalized comments in the report. The company formally responded to USEPA's comments in correspondence dated July 14, 2000. No further comments or determinations were received by the company following the response.

- On July 16, 2004, the 316(b) Phase II Rulemaking was published in the Federal Register and became effective on September 14, 2004. Several actions were taken in accordance with the currently suspended USEPA 316(b) Phase II rulemaking. A "Proposal for Information Collection" was submitted and approved by the DNR for conducting an updated assessment of impingement mortality at the Sioux Power Plant cooling water intake structure. This new data collected served to reaffirm historic impingement mortality studies. The 2005-2006 study concluded that nearly 98% of the data organisms collected were gizzard shad and drum. The 1974-1975 study concluded that 99% of the organisms collected were gizzard and drum.
- The Phase II rulemaking also required submittal of a "Comprehensive Demonstration Study" that would provide the measures to be used for compliance with the currently suspended Phase II rulemaking performance standards. These measures were to include an appropriate range of technologies, operational, and/or restoration components; subject to cost-cost and/or cost-benefit criteria and the potential procurement of a site-specific standard, in accordance with the Phase II rulemaking. Due to the suspension of the Phase II rulemaking, the impingement mortality study was the only task completed as all other activities associated with the Comprehensive Demonstration Study were terminated.

OPERATIONAL OPTIMIZATION:
There is the capacity for potentially minor design and operational changes which would optimize the current technology and could reduce impingement mortality that the Ameren should evaluate and implement, if found to be effective. These design and operational changes may include the following:

- Recirculate warm water to the intake structure only when necessary to prevent ice formation.
- Scheduled plant outages should be timed to the extent possible to coincide with periods of greatest impingement.
- Operate screens continuously and at high speed during periods when impingement is greatest.
- Shape fish buckets or baskets to minimize hydrodynamic turbulence within the bucket or basket. Use smooth-woven screen mesh in the buckets or baskets to minimize descaling.
- Evaluate whether the high pressure and low pressure washes can be operated at lower pressures to reduce damage and stress to fish while not interfering with plant operations.
- Optimize location of screen wash sprays to provide a more gentle fish transfer from screen to fish return trough.
- Minimize turbulence in the fish return system.

NEW 316(b) REQUIREMENTS:
To meet the newly promulgated CWA §316(b) requirements, the facility will be required to meet one of the identified impingement BTA technologies, however as the facility withdraws more than 125 MGD for cooling water needs, will also need to address entrainment. The implementation of impingement technology is delayed until the required entrainment studies are complete. The applicability can be found in 40 CFR 122.21 (r)(1) studies include:

a. **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.
b. **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.
c. **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.
d. **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.
e. **Chosen Method of Compliance with Impingement Mortality Standard, 40 CFR 122.21(r)(6).** Ameren must identify their chosen compliance method and if applicant chooses to comply with a technology option that requires the Impingement Technology Optimization Study, the study must be submitted.
f. **Performance Studies, 40 CFR 122.21(r)(7):** This rule section requires a summary of biological survival studies conducted at the facility and a summary of any conclusions or results, including; site-specific studies addressing technology efficacy, entrainment survival, and other impingement and entrainment mortality studies. If using data more than 10 years old, applicant must explain why the data is still relevant and representative.
g. **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, and fuel change.

h. **Entrainment Characterization Study, 40 CFR 122.21(r)(9)**:Facilities that withdraw 125 MGD or more must develop for submission to the Director that includes 2 years of entrainment data. Entrainment Data Collection Method must identify and document the data collection period and frequency; identify all organisms collected to lowest taxon possible of all life stages of fish that are in the vicinity of the intake structure; identify threatened or endangered species, identify and document how the location of the intake structure in the waterbody are accounted for in data collection. The Biological Entrainment Characterization must describe all life stages including a description of their abundance and their temporal and spatial characteristics in the vicinity of the intake structure, based on sufficient data to characterize annual, seasonal, and diel variation in entrainment including variations related to climate, weather difference, feeding, and water column migration; may include historical data that is representative of the current operation of the facility; identification of all life stages of fish must represent both motile and non-motile life stages Analysis and Support Documentation of current entrainment of all life stages, may include historical data that is representative of current operation of the facility and of biological conditions at the site. Data to support the calculations must be collected during period of representative operational flows and flows associated with data collection must be documented. The method for determining latent mortality along with specific organism mortality or survival must be identified; the facility must identify and document all assumptions and calculation to determine total entrainment, along with all methods and QA/QC procedures.

i. **Comprehensive Technical Feasibility and Cost Evaluation Study, 40 CFR 122.21(r)(10):** Facilities that withdraw 125 MGD or more must develop for submission an engineering study of the technical feasibility and costs of entrainment technology options. Technical Feasibility must include closed cycle recirculation discussion, fine mesh screens with mesh size of 2 mm or smaller, water reuse or alternate sources of cooling water; description of all technologies and operational measures considered; land availability, including evaluation of adjacent and acres potentially available due to generating unit retirements, potential repurposing of areas devoted to ponds, coal piles, rail yards, transmission yards, and parking lots; discussion of available sources of process water, grey water, wastewater, reclaimed water or other waters of appropriate quantity and quality; and documentation of factors other than cost that may make a candidate technology impractical or infeasible. The cost evaluations must include estimates for all technologies considered; must be adjusted to estimate social costs; all costs must be represented in net present value and annual value; cost clearly labeled as compliance or social costs; separately discuss facility level costs and social costs; compliance costs are calculated after-tax, include administrative costs, permit costs, any outages, downtime; and social costs adjustment includes Director's administrative cost.

j. **Benefits Valuation Study, 40 CFR 122.21(r)(11):** Facilities withdrawing 125 MGD or more must develop an evaluation of the entrainment technology and operational measure benefits. Each category of benefit must be described narratively and benefits should be quantified in physical or biological units and monetized using appropriate economic valuation methods. Must use the Entrainment Characterization Study. Benefit Valuation Study must include: incremental changes in number of individual fish lost due to impingement mortality and entrainment for all life stages; description of basis for any estimates of changes in the stock size or harvest levels of commercial and recreational fish; description of basis for any monetized values assigned to changes in the stock size of commercial and recreational fish, and to any other ecosystem or non-use benefits; discussion of mitigation efforts completed before October 2014; discussion with quantification and monetization, where possible any other benefits expected to accrue, including improvements for mammals, birds, other organisms and aquatic habitats; and discussion of benefits expected to result from reductions in thermal discharges from entrainment technologies (closed-cycle cooling).

k. **Non-Water Quality Impacts Assessment, 40 CFR 122.21(r)(12):** Facilities that withdraw 125 MGD or more must develop for submission to the Director a detailed site-specific discussion of changes in non-water quality environmental and other impacts attributed to each technology and operational measure, both increases and decreases. Must include discussion of estimate in change in energy consumption, estimate of air pollutant emissions and of human health environmental impacts, estimates in change in noise, discussion of impacts to safety, including potential plumes, icing and availability of emergency cooling water, discussion of facility reliability, impacts to production based on process unit, reliability due to cooling water availability; significant changes in consumption of water, including comparison of evaporative losses of both once through and closed cycle recirculation, documentation of impacts attributable to changes in water consumption, and discussion of all attempts to mitigate each of these factors.

l. **Additional measures to protect federally listed threatened and endangered species and designated critical habitat, 40 CFR 125.94(g)**. The Director may establish additional permit control measures, monitoring requirements, reporting requirements than the minimum established to minimize incidental take, reduce or remove detrimental effects, or such control measures may include measures identified by the US Fish and Wildlife Field Office during their 60 day review. When the Director requires additional measures for federally listed species, monitoring is required, 40 CFR 125.96(g) and may require additional studies and monitoring if threatened or endangered species identified in the vicinity of the intake, 40 CFR 125.98(d).

m. **Peer Review, 40 CFR 122.21(r)(13):** The Non-Water Quality Impacts Assessment, Benefits Valuation Study, and Comprehensive Technical Feasibility and Cost Evaluation Study require peer review. Facility must submit the studies for external peer review. Facility selects the peer reviewers and must notify the Department in advance of the peer review. The Director can disapprove a peer reviewer or require additional peer reviewers. The Director may confer with EPA, US Fish and Wildlife, MDC, and PSC to determine which peer review comments must be addressed. Ameren must provide an explanation for any significant reviewer comment not accepted.

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 CREDIT (NET LIMITS):
In accordance with federal regulation 40 CFR 122.45(g), pollutants in intake water (1) technology-based effluent limitations or standards shall be adjusted to reflect credit for pollutants in the discharge's intake water if: (i) the applicable effluent limitations and standards contained in 40 CFR subchapter N specifically provide they shall be applied on a net basis; or (ii) the discharger demonstrates 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. (2) Credit for generic 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. (3) 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. (4) Credit shall be granted only if the discharger demonstrates that the intake water is drawn from the same body of water into which the discharge is made. The Director may waive this requirement if [the state] finds no environmental degradation will result. (5) Credits do not apply to the discharge of raw water clarifier sludge generated from the treatment of intake water.

✓ Applicable. Water used in processing ash is withdrawn from the Mississippi River, traverses through outfall #002 (ash pond #1) or outfall #006 (ash pond #2) and then is discharged to Poeling Lake which then discharges to backwater chutes of the Mississippi River. Per 40 CFR 122.45(g)(4), the director may waive identical-waterbody requirements as the facility has made a demonstration the net TSS credits will not negatively impact Poeling Lake. In the previous permit, the department allowed net total suspended solids at outfalls #002 and #006; this permit will do the same.

✓ The newly approved MUDD dataset erroneously identifies Mississippi backwater chutes as "C" (WBID #3960) streams therefore the first classified stream for outfalls #002, #02A, and #006 is actually the Mississippi River.

✓ To allow a net limit, the facility must provide a justification for being allowed net limitations when the discharge is not to the same stream (although in this case it is to the same classified stream). The facility has presented information that additional degradation is not occurring on Poeling Lake due to net limitations. The submitted rationale complies with 40 CFR 122.45(g).

✓ Characteristics of Poeling Lake include a very small drainage area and raised berms to the east of the lake. Also, the lake is not in 10 CSR 20-7.031 Table G. If the facility no longer discharges through outfall #002 and/or #006, it is likely the lake would be completely dry during drought conditions. Conversely, as evidenced by satellite imagery (1/1/2016, 1/4/2016; Google Earth) Poeling Lake is inundated by flood waters of the Mississippi and Missouri Rivers.

✓ There are no water quality limits for TSS; the discharge to the lake is not new or expanded (no antidegradation review is required), and fish kills have not been reported at this location indicating the waterbody does not cause toxicity.

✓ The ash basins will be closed in the next 2 to 4 years therefore the discharge from outfalls #002 and #006 will completely eliminate ash sluice water.

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 (RP) to cause or contribute to an in-stream excursion above narrative or numeric water quality standard (WQS). 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.

✓ Not applicable; the Reasonable Potential Analysis typically conducted per (TSD, EPA/505/2-90-001, Section 3.3.2). was not completed due to the following reasons:

- Outfall #001: this outfall pertains to thermal discharge. Temperature data was reviewed for the past five years; however, there is no TSD method to determine RP for temperature data. The permit writer has determined the facility does have reasonable potential to exceed Mississippi temperature allowances.
- Outfall #002 & #006: ash ponds receive "net" total suspended solids; there is no water quality standard for TSS applicable to this wastestream at this outfall. The ash pond outfalls have been monitoring for sulfates. However, Missouri's water quality standards are written with the sum of sulfates plus chlorides. No analytical RP was performed; the permit writer used best professional judgment to determine the facility may have RP for sulfates as it is a parameter of concern for the industry. Whole Effluent Toxicity tests were performed once per year at a 10% allowable effluent concentration. However, the permit writer has determined the outfalls discharge to a lake which cannot allow any toxic mixing considerations therefore no dilution should have been considered for WET testing. The permit writer has used best professional judgment to determine WET testing is still warranted.
- Outfall #02A: This outfall contains technology-based effluent limits, no RPA is warranted. The parameters on this outfall must remain regardless of RP.

- Emergency outfalls #003 & #007: The permit writer has determined the emergency outfalls are non-discharging structures therefore no RP technically exists. However, should these outfalls discharge, certain parameters must be sampled.
- Stormwater outfalls: RP using an analytical RPA for stormwater is not advised because the TSD is for continuously discharging facilities per section 3.1 of EPA/505/2-90-001; not for end-of-pipe technology based controls.

SANITARY SEWER OVERFLOWS (SSO) AND INFLOW AND INFILTRATION (I&I):
Sanitary Sewer Overflows (SSOs) are defined as untreated sewage releases and are considered bypassing under state regulation [10 CSR 20-2.010(11)] and should not be confused with the federal definition of bypass. SSOs result from a variety of causes including blockages, line breaks, and sewer defects that can either allow wastewater to backup within the collection system during dry weather conditions or allow excess stormwater and groundwater to enter and overload the collection system during wet weather conditions. SSOs can also result from lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs include overflows out of manholes, cleanouts, broken pipes, and other into waters of the state and onto city streets, sidewalks, and other terrestrial locations.

Inflow and Infiltration (I&I) is defined as unwanted intrusion of stormwater or groundwater into a collection system. This can occur from points of direct connection such as sump pumps, roof drain downspouts, foundation drains, and storm drain cross-connections or through cracks, holes, joint failures, faulty line connections, damaged manholes, and other openings in the collection system itself. I&I results from a variety of causes including line breaks, improperly sealed connections, cracks caused by soil erosion/settling, penetration of vegetative roots, and other sewer defects. In addition, excess stormwater and groundwater entering the collection system from line breaks and sewer defects have the potential to negatively impact the treatment facility.

Missouri RSMo §644.026.1.(13) mandates the department issue permits for discharges of water contaminants into the waters of this state, and also for the operation of sewer systems. Such permit conditions shall ensure compliance with all requirements as established by sections 644.006 to 644.141. Standard Conditions Part I, referenced in the permit, contains provisions requiring proper operation and maintenance of all facilities and systems of treatment and control. Missouri RSMo §644.026.1.(15) instructs the department to require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities. To ensure that public health and the environment are protected, any noncompliance which may endanger public health or the environment must be reported to the department within 24 hours of the time the permittee becomes aware of the noncompliance. Standard Conditions Part I, referenced in the permit, contains the reporting requirements for the permittee when bypasses and upsets occur. The permit also contains requirements for permittees to develop and implement a program for maintenance and repair of the collection system. The permit requires that the permittee submit an annual report to the department for the previous calendar year that contains a list of all SSOs and building backups (locations, features of collection system where the SSO/building backup occurred, volumes, durations, receiving stream, causes, mitigation efforts, and actions to prevent reoccurrences), a summary of efforts taken by the permittee to locate and eliminate sources of excess I&I, a summary of general maintenance and repairs to the collection system, and a summary of any planned maintenance and repairs to the collection system for the upcoming calendar year.

✓ This facility is not required to develop or implement a program for maintenance and repair of the collection system; however, it is a violation of Missouri state environmental laws and regulations to allow untreated domestic wastewater to discharge to waters of the state.

SCHEDULE OF COMPLIANCE (SOC):
A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, effluent limits, 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. SOCs are allowed under 40 CFR 122.47 providing certain conditions are met.

✓ Applicable; the time given for effluent limitations of this permit listed under Interim Effluent Limitation and Final Effluent Limitations were established in accordance with [10 CSR 20-7.031(12)]. The facility has been given a schedule of compliance to meet final effluent limits for temperature at outfall #001. Previous permit limits instituted thermal discharge as an internal energy increase and was reported in btu/hr (British Thermal Units). However, Missouri water quality standards are written to consider the temperature of the receiving stream and the actual discharge of the effluent. Temperature is considered a water contaminant per 10 CSR 20-7.031(5)(D) and must be regulated as such.

SECONDARY CONTAINMENT STRUCTURES SPECIAL CONDITION:
The previous permit's special conditions required sampling of total petroleum hydrocarbons (TPH) under the decision model to discharge stormwater having a sheen in secondary containment. The special condition has been revised in all permits beginning in 2015 to include oil and grease and BTEX (benzene, toluene, ethylbenzene, and xylene) sampling of the potentially contaminated stormwater in secondary containment. This change was due to 1) no water quality standards for TPH; and 2) there are no approved methods found in 40 CFR 136 for TPH. The facility need only sample for these constituents prior to release when a sheen or petroleum odor is present.

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. http://dnr.mo.gov/env/esp/spillbill.htm

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):
In accordance with 40 CFR 122.44(k), Best Management Practices (BMPs) must be used 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 stormwater 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 waters of the state from a permitted facility. BMPs may take the form of a process, activity, or physical structure. Additionally in accordance with the Stormwater 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.

A SWPPP must be prepared by the permittee if the SIC code is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2). A SWPPP may be required of other facilities where stormwater has been identified as necessitating better management. The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged 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 or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the 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 the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an 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.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. Failure to implement and maintain the chosen BMP is a permit violation. For further guidance, consult the antidegradation implementation procedure (http://dnr.mo.gov/env/wpp/docs/AIP050212.pdf).

Alternative Analysis (AA) evaluation of the BMPs is a structured evaluation of BMPs that are reasonable and cost effective. The AA evaluation should include practices that are designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of AIP defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The AA evaluation must demonstrate why "no discharge" or "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure* (AIP), Section II.B.

If parameter-specific numeric exceedances continue to occur and the permittee feels there are no practicable or cost-effective BMPs which 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 1) 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; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. 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 shall be submitted in the form of an operating permit modification; the application is found at: http://dnr.mo.gov/forms/index.html.

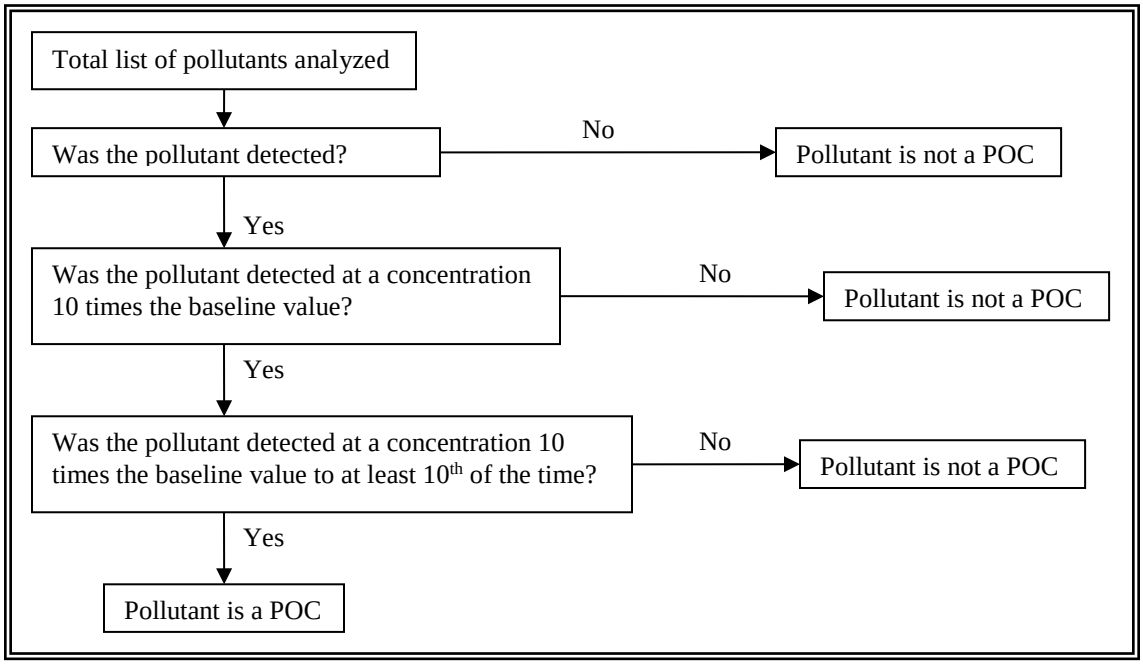
✓ Applicable; a SWPPP shall be developed and implemented for this facility.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS (TBEL):

One of the major strategies of the Clean Water Act (CWA) in making "reasonable further progress toward the national goal of eliminating the discharge of all pollutants" is to require effluent limitations based on the capabilities of the technologies available to control those discharges. Technology-based effluent limitations (TBELs) aim to prevent pollution by requiring a minimum level of effluent quality attainable using demonstrated technologies for reducing discharges of pollutants or pollution into the waters of the United States. TBELs are developed independently of the potential impact of a discharge on the receiving water, which is addressed through water quality standards and water quality-based effluent limitations (WQBELs). The NPDES regulations at Title 40 of the Code of Federal Regulations (CFR) 125.3(a) require NPDES permit writers to develop technology-based treatment requirements, consistent with CWA § 301(b) and § 402(a)(1), represent the minimum level of control that must be imposed in a permit. The regulation also indicates that permit writers must include in permits additional or more stringent effluent limitations and conditions, including those necessary to protect water quality. Regardless of the technology chosen to be the basis for limitations, the facility is not required to install the technology, only to meet the established TBEL.

Case-by-case TBELs are developed pursuant to CWA section 402(a)(1), which authorizes the administrator to issue a permit meeting either, 1) all applicable requirements developed under the authority of other sections of the CWA (e.g., technology-based treatment standards, water quality standards) or, 2) before taking the necessary implementing actions related to those requirements, "such conditions as the administrator determines are necessary to carry out the provisions of this Act." The regulation at §125.3(c)(2) specifically cite this section of the CWA, stating technology-based treatment requirements may be imposed in a permit "on a case-by-case basis under section 402(a)(1) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable." Further, §125.3(c)(3) indicates "where promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis to carry out the provisions of the act." When establishing case-by-case effluent limitations using best professional judgment, the permit writer should cite in the fact sheet or statement of basis both the approach used to develop the limitations, discussed below, and how the limitations carry out the intent and requirements of the CWA and the NPDES regulations.

Baselines to determine contaminants of concern are found in the *Development Document for Effluent Limitations Guidelines and Standards for the Centralized Waste Treatment Industry – Final* (EPA 821-R-00-020; August 2000). The baselines represent the treatable concentration of model technology which would effectually treat a pollutant. Chapter 6 Table 6-1 directs the permit writer to multiply the baseline by ten to determine if the parameter is a pollutant of concern. The following table determines the parameters for which a TBEL must be considered; baseline values are retrieved from chapter six.



When developing TBELs for industrial facilities, the permit writer must consider all applicable technology standards and requirements for all pollutants discharged above baseline level. Without applicable effluent guidelines for the discharge or pollutant, permit writers must identify any needed TBELs on a case-by-case basis, in accordance with the statutory factors specified in CWA sections 301(b)(2) and 304(b). The site-specific TBELs reflect the BPJ of the permit writer, taking into account the same statutory factors EPA would use in promulgating a national effluent guideline regulation, but they are applied to the circumstances relating to the applicant. The permit writer also should identify whether state laws or regulations govern TBELs and might require more stringent performance standards than those required by federal regulations. In some cases, a single permit could have TBELs based on effluent guidelines, best professional judgment, state law, and WQBELs based on water quality standards.

For BPT requirements (all pollutants)

- The age of equipment and facilities involved*
- The process(es) employed*
- The engineering aspects of the application of various types of control techniques*
- Process changes*
- Non-water quality environmental impact including energy requirements*
- The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application

For BCT requirements (conventional pollutants)

- All items in the BPT requirements indicated by an asterisk (*) above
- The reasonableness of the relationship between the costs of attaining a reduction in effluent and the derived effluent reduction benefits
- The comparison of the cost and level of reduction of such pollutants from the discharge of POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources

For BAT requirements (toxic and non-conventional pollutants)

- All items in the BPT requirements indicated by an asterisk (*) above
- The cost of achieving such effluent reduction

Best Practicable Control Technology Currently Available (BPT) is the first level of technology-based effluent controls for direct dischargers and it applies to all types of pollutants (conventional, nonconventional, and toxic). The Federal Water Pollution Control Act (FWPCA) amendments of 1972 require when EPA establishes BPT standards, it must consider the industry-wide cost of implementing the technology in relation to the pollutant-reduction benefits. EPA also must consider the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA §304(b)(1)(B)]. Traditionally, EPA establishes BPT effluent limitations on the basis of the average of the best performance of well-operated facilities in each industrial category or subcategory. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the agency determines the technology can be practically applied. See CWA

sections 301(b)(1)(A) and 304(b)(1)(B). Because the EPA has not promulgated TBELs for the pollutants identified as POCs, the permit writer follows the same format to establish site-specific TBELs. Although the numerical effluent limitations and standards are based on specific processes or treatment technologies to control pollutant discharges, EPA does not require dischargers to use these technologies. Individual facilities may meet the numerical requirements using whatever types of treatment technologies, process changes, and waste management practices they choose.

For each parameter, group of parameters, or outfall treatment process, the facility will summarize the relevant factors below in facility-specific (or waste-stream specific) case-by-case TBEL development. The permittee will supply the required information to the department so a technology based effluent limitation can be applied in the permit if applicable.

✓ Applicable; this operating permit has identified TBELs.
✓ Some TBELs are governed by an ELG.

TEMPERATURE: 316(a) COOLING WATER INTAKE STRUCTURE REQUIREMENTS:

The Sioux Plant cooling water discharge and the thermal plume were studied extensively during the late 1970s and early 1980s. The discharge is a wide mouth, low velocity outlet into an open channel connected to the Mississippi River. During normal river stage, the river is approx. 3,200 feet wide at this location and is lacustrine (pool-like), due to the Corps of Engineers' Lock and Dam 26 (at Alton). Neither plant operations nor river flow conditions have changed significantly since the original studies were performed, thus the facility does not contemplate revision of the 316(a) studies; however the results of the required 316(b) studies and changes to the river may cause a reevaluation of the studies or additional studies. See *Part V Effluent Limits Determination; outfall #001; TBEL determination* and *Part III Rationale and Derivation of Permit Limits and Conditions; 316(b) requirements*.

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 WLA is the amount of pollutant each discharger is allowed 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 relevant using water quality criteria or water quality model results and by applying the dilution equation:

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = effluent flow

- Acute wasteload allocations (daily maximum limits) 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).
- Chronic wasteload allocations (monthly average limits) 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).
- Water quality based daily maximum (MDL) and monthly average (AML) effluent limitations were calculated using methods and procedures outlined in USEPA's *Technical Support Document For Water Quality-based Toxics Control* or "TSD" (EPA/505/2-90-001; March 1991).
- 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:

Permittees may submit site specific studies to better determine the site specific wasteload allocations applied in permits.
✓ 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 a Major

2013 Water Quality Criteria for Ammonia

Upcoming changes to the Water Quality Standard for ammonia may require significant upgrades to wastewater treatment facilities.

On August 22, 2013, the U.S. Environmental Protection Agency (EPA) finalized new water quality criteria for ammonia, based on toxicity studies of mussels and gill breathing snails. Missouri's current ammonia criteria are based on toxicity testing of several species, but did not include data from mussels or gill breathing snails. Missouri is home to 69 of North America's mussel species, which are spread across the state. According to the Missouri Department of Conservation nearly two-thirds of the mussel species in Missouri are considered to be "of conservation concern". Nine species are listed as federally endangered, with an additional species currently proposed as endangered and another species proposed as threatened.

The adult forms of mussels that are seen in rivers, lakes, and streams are sensitive to pollutants because they are sedentary filter feeders. They vacuum up many pollutants with the food they bring in and cannot escape to new habitats, so they can accumulate toxins in their bodies and die. But very young mussels, called glochidia, are exceptionally sensitive to ammonia in water. As a result of a citizen suit, the EPA was compelled to conduct toxicity testing and develop ammonia water quality criteria that would be protective if young mussels may be present in a waterbody. These new criteria will apply to any discharge with ammonia levels that may pose a reasonable potential to violate the standards. Nearly all discharging domestic wastewater treatment facilities (cities, subdivisions, mobile home parks, etc.), as well as certain industrial and stormwater dischargers with ammonia in their effluent, will be affected by this change in the regulations.

When new water quality criteria are established by the EPA, states must adopt them into their regulations in order to keep their authorization to issue permits under the National Pollutant Discharge Elimination System (NPDES). States are required to review their water quality standards every three years, and if new criteria have been developed they must be adopted. States may be more protective than the Federal requirements, but not less protective. Missouri does not have the resources to conduct the studies necessary for developing new water quality standards, and therefore our standards mirror those developed by the EPA; however, we will utilize any available flexibility based on actual species of mussels that are native to Missouri and their sensitivity to ammonia.

Many treatment facilities in Missouri are currently scheduled to be upgraded to comply with the current water quality standards. But these new ammonia standards may require a different treatment technology than the one being considered by the permittee. It is important that permittees discuss any new and upcoming requirements with their consulting engineers to ensure that their treatment systems are capable of complying with the new requirements. The Department encourages permittees to construct treatment technologies that can attain effluent quality that supports the EPA ammonia criteria.

Ammonia toxicity varies by temperature and by pH of the water. Assuming a stable pH value, but taking into account winter and summer temperatures, Missouri includes two seasons of ammonia effluent limitations. Effluent limitations in this permit would be:

Summer – 3.6 mg/L daily maximum, 1.4 mg/L monthly average
Winter – 7.5 mg/L daily maximum, 2.9 mg/L monthly average

Under the new EPA criteria, where mussels of the family Unionidae are present or expected to be present, the estimated effluent limitations for a facility in a location such as this that discharges to a receiving stream with no mixing consideration listed in Part V of the Fact Sheet will be: Summer – 1.7 mg/L daily maximum, 0.6 mg/L monthly average.
Winter – 5.6 mg/L daily maximum, 2.1 mg/L monthly average.
Actual effluent limits will depend in part on the actual performance of the facility.

Operating permits for facilities in Missouri must be written based on current statutes and regulations. Therefore permits will be written with the existing effluent limitations until the new standards are adopted. To aid permittees in decision making, an advisory will be added to permit Fact Sheets notifying permittees of the expected effluent limitations for ammonia. When setting schedules of compliance for ammonia effluent limitations, consideration will be given to facilities that have recently constructed upgraded facilities to meet the current ammonia limitations. For more information on this topic feel free to contact the Missouri Department of Natural Resources, Water Protection Program, Water Pollution Control Branch, Operating Permits Section at (573) 751-1300.

Effluent Limits Determination

- Effluent limitations, benchmarks, and permit conditions derived and established in the below effluent limitations tables 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.
- Daily maximums and monthly averages are required under 40 CFR 122.45(d)(1) for continuous discharges not from a POTW.
- The nearest drinking water intake is located at St. Louis. Therefore the drinking water (DW) use is in effect and DW limits may apply if they are more stringent and applicable than other uses' limits.
- Technology based limitations apply to this facility.

OUTFALL #001: ONCE-THROUGH COOLING WATER

The minimum frequency the department is allowed to apply sampling requirements for a facility is yearly per 40 CFR 122.44(i)(iv)(A)(2). Table A-3 in the permit describes conditional sampling. Each year, even if chlorine or biocides are not used, to comply with yearly reporting, the facility will submit a short report to the St. Louis Regional Office. The facility must collect samples and analyze for free available chlorine, total residual chlorine, upon every occasion (daily, concurrently) of chlorine use. The facility is not required to sample for chlorine if the biocide used is not chlorine based. However, the facility must still collect a sample for WET testing (daily, concurrently) upon biocide/molluskicide use.

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQ.	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*	*	SAME	DAILY	MONTHLY	24 HR. TOT
THERMAL DISCHARGE	BTU/HR	1, 6	5.50×10^9	*	I, SAME	DAILY	MONTHLY	GRAB
EFFLUENT FLOW (Q_E)	cfs	6	*	*	NEW	DAILY	MONTHLY	MEAS.
EFFLUENT TEMPERATURE (T_E)	°F	6	*	*	NEW	DAILY	MONTHLY	MEAS.
STREAM FLOW (Q_S)	cfs	6	*	*	NEW	DAILY	MONTHLY	MEAS.
STREAM TEMPERATURE (T_S)	°F	6	*	*	NEW	DAILY	MONTHLY	MEAS.
ΔT (NOTE 3)	°F	1, 6	*	*	I, NEW	DAILY	MONTHLY	CALC.
ΔT (NOTE 3)	°F	1, 2, 3	5	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} JANUARY (NOTE 4)	°F	1, 2, 3	45	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} JANUARY (NOTE 4)	°F	1, 2, 3	48	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} FEBRUARY (NOTE 4)	°F	1, 2, 3	45	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} FEBRUARY (NOTE 4)	°F	1, 2, 3	48	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} MARCH (NOTE 4)	°F	1, 2, 3	57	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} MARCH (NOTE 4)	°F	1, 2, 3	60	*	F, NEW	DAILY	MONTHLY	CALC.

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQ.	SAMPLE TYPE
T_{CAP} APRIL (NOTE 4)	°F	1, 2, 3	68	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} APRIL (NOTE 4)	°F	1, 2, 3	71	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} MAY (NOTE 4)	°F	1, 2, 3	78	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} MAY (NOTE 4)	°F	1, 2, 3	81	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} JUNE (NOTE 4)	°F	1, 2, 3	86	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} JUNE (NOTE 4)	°F	1, 2, 3	89	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} JULY (NOTE 4)	°F	1, 2, 3	88	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} JULY (NOTE 4)	°F	1, 2, 3	91	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} AUGUST (NOTE 4)	°F	1, 2, 3	88	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} AUGUST (NOTE 4)	°F	1, 2, 3	91	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} SEPTEMBER (NOTE 4)	°F	1, 2, 3	86	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} SEPTEMBER (NOTE 4)	°F	1, 2, 3	89	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} OCTOBER (NOTE 4)	°F	1, 2, 3	75	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} OCTOBER (NOTE 4)	°F	1, 2, 3	78	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} NOVEMBER (NOTE 4)	°F	1, 2, 3	65	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} NOVEMBER (NOTE 4)	°F	1, 2, 3	68	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} DECEMBER (NOTE 4)	°F	1, 2, 3	52	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} DECEMBER (NOTE 4)	°F	1, 2, 3	55	*	F, NEW	DAILY	MONTHLY	CALC.
TIME OF DEVIATION-MONTH (NOTE 4)	hours	6	*	*	I, NEW	DAILY	MONTHLY	CALC.
TOTAL TIME OF DEVIATION (NOTE 4)	hours	1, 3	*	*	I, NEW	DAILY	YEARLY	CALC.
TOTAL TIME OF DEVIATION (NOTE 4)	hours	1, 2, 3	438 HRS/YR	*	F, NEW	DAILY	YEARLY	CALC.
CONVENTIONAL								
CHLORINE, FREE AVAILABLE	µg/L	1	500	200	NEW	COND.	COND.	GRAB
CHLORINE, TOTAL RESIDUAL	µg/L	1	200	-	NEW	COND.	COND.	GRAB
OTHER								
WET TEST ACUTE	TUa	1, 3, 8	*	-	PASS/FAIL	COND.	COND.	GRAB

* - monitoring requirement only
I = interim limit
F = final limit
new - parameter not in previous permit
calc. – calculation
meas. – measured
cond. – conditional

Basis for Limitations Codes:

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

Note 3: $\Delta T = [((Q_s/4)T_s + Q_eT_e) / ((Q_s/4) + Q_e)] - T_s$

Where:

ΔT the change in temperature in °F at the edge of the thermal mixing zone
$Q_s/4$ the receiving stream flow in cfs divided by 4
Q_e effluent flow in cfs
T_s measured stream temperature
T_e measured temperature of effluent

Note 4: To calculate the temperature of the stream at the edge of the mixing zone, the facility will use the following equation: Designated as T_{emz} in the equation below, the facility can determine compliance with T_{dev}, T_{cap}, and percent time deviation allowance.

$$T_{emz} = [(((Q_s/4)T_s + Q_eT_e) / ((Q_s/4) + Q_e))]$$

Where:

T_{emz}	the temperature of the receiving stream at the edge of the thermal mixing zone
$Q_s/4$	the receiving stream flow in cfs divided by 4
Q_e	effluent flow in cfs
T_s	measured stream temperature
T_e	measured temperature of effluent

Temperature cap (designated as T_{cap} in Table A-2 of the permit and the Effluent Limitations Table of the fact sheet) is the effluent temperature in the receiving stream at the edge of the thermal mixing zone. It may be exceeded for no more than 5% of the year (438 hours).

Temperature deviation (designated as T_{dev} in Table A-2 of the permit and the Effluent Limitations Table of the fact sheet) is the maximum effluent temperature limit applicable in the receiving stream at the edge of the thermal mixing zone which may not be exceeded. MoCWIS is set up to receive one value for the thermal limitations for each month. The facility will violate the thermal limit if the value entered in MoCWIS is above the T_{dev} value for the month.

Percent Time Deviation Allowance: Missouri's Water Quality Standards allows permittees to exceed their applicable T_{cap} criteria (but not the T_{dev} criteria) for 5% of the year in Zone 1B along the Mississippi River. The time of deviation allowance shall be tracked in hours per year <u>any</u> time their calculated temperature values exceed a specific month's daily maximum T_{cap} effluent limit. The permittee is required to monitor and report the total monthly exceedance time.

a) If T_{emz} is less than T_{cap} then the permittee records "0" hours deviation.
b) Any time T_{emz} is above T_{cap} then the facility reports the number of hours of deviation.
c) The permittee shall report on January 28th of each year the total number of hours the facility exceeded their temperature cap effluent limits for the entire year.

A violation occurs if:

a. The percent time deviation allowance is above 5% (438 hours) for the calendar year; and/or
b. The T_{emz} value reported is above the T_{dev} limitation.

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:
The facility reported color was believed absent. No additional sampling will be required at this time.

<u>Flow</u>
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. The facility will report the total flow in millions of gallons per day (MGD).

<u>Temperature</u>
The department considered thermal discharge a pollutant of concern for this facility as is required by the CWA. While water quality standards exist, the department must also formulate a review of the technology, limitations associated with that technology, the age of the equipment, and the processes involved at the facility. Please see both sections below; Water Quality Limitations and Technology Based Effluent Limitations.

WATER QUALITY LIMITATIONS:
In accordance with 10 CSR 20-7.031(5)(D)5. water contaminant sources shall not cause or contribute to Mississippi River temperature in excess of the temperatures listed in the effluent limitations table. The facility is located between Lock and Dam No. 25 and Lock and Dam No. 26, therefore the facility is in Zone 1B. Missouri's WQS temperature criteria [10 CSR 20-7.031(5)(D)1. through (5)(D)6.] establish two main areas of compliance for all habitats. The first compliance requirement deals with the change of temperature in degrees Fahrenheit stated as delta temperature (or ΔT). The second compliance requirement deals with the result of a calculation of the receiving stream's temperature not to exceed (T_{dev}) at the edge of the thermal mixing zone.

Missouri's WQS temperature criteria for warm water habitats (WWH) [10 CSR 20-7.031(5)(D)1.] establishes thermal discharges cannot cause a change in the receiving stream's temperature (ΔT) of more than five (5) degrees and a T_{cap} of 90°F. Missouri's WQS establishes specific T_{cap} values for discharges to the Mississippi River in [10 CSR 20-7.031(5)(D)5.] to which this facility applies. The regulation also establishes a percent, in time, deviation allowance from the established T_{cap} for the Mississippi River as well as a maximum temperature not to exceed (T_{dev}) of T_{cap} +3°F.

Both compliance requirements (ΔT and $T_{cap/dev}$) are to be established at the edge of the thermal mixing zone (designated as T_{emz}). Thermal mixing zones are established on permanent (P) streams or other streams where available. Mixing zone regulations are contained in [10 CSR 20-7.031(5)(D)6.]. Streams with no mixing considerations must meet ΔT and T_{cap} at the end of the pipe. Similar to Missouri's WQS's toxic mixing considerations which use low-flow considerations (i.e. 7Q10), the temperature regulations require the department establish a thermal mixing zone limited to either 25% of the cross-sectional area or 25% volume of a river. This approach assumes the receiving water is able to consume 100% of the heat energy being discharged. Volume of discharge (for the river and the facility) is measured in cubic feet per second (ft^3/sec, or cfs). Typically discharge is obtained from a nearby upstream United States Geological Survey (USGS) or United States Army Corps of Engineers (USACE) gauging station. If there is a significant distance from the facility to the nearest upstream gauging station, it may be in the best interest of the permittee to fund a new gauging station. Additionally, the department will only use gauging station data as a viable source of receiving stream flow. Meaning effluent flows from other point sources may not be considered (i.e. added) to the flow determination. If there is a near-by gauging station downstream of the facility, then the permittee can use this data but must subtract their daily effluent discharge from the receiving stream flow. The department may also have the permittee subtract other inputs as necessary.

There are no regulatory requirements to determine a monthly average value for temperature as the regulations are written as short-term maximums. However, the department has determined reporting monthly average for T_{cap} (T_{dev} if applicable) and ΔT to be an important measure of trends.

Meanings of Equations and Variables:
Variables and calculations which may be included in this permit are described as follows. Not all variables will be used in all calculations.

- **Q_e** is effluent flow and reported in cubic feet per second ("ft^3/sec" or cfs).
- **Q_s** is the ambient up-stream stream flow in cfs. It is the department's expectation the permittee will obtain the Q_s data from an appropriate and nearest upstream United States Geological Survey (USGS) or United States Army Corps of Engineers (USACE) gauging stations.
- **T_s** is the upstream in-stream temperature and reported in °F. For most facilities, the ambient stream temperature should be used. However, temperature at the intake may also be used to determine T_s. The permittee only need inform the department which temperature they are using. Additional justification may be required if the facility is using intake temperature and recirculation water is used for cleaning fish screens or melting ice. The permittee must accurately calculate compliance with the receiving stream's temperature at the edge of the thermal mixing zone.
- **T_e** is the effluent temperature and reported in °F. This is a direct measure of the temperature of the effluent.
- **ΔT** is the calculation of the amount of change in temperature, as compared to the upstream temperature, at the edge of the allowed thermal mixing zone.
- **T_{emz}** is the calculation of the receiving stream's temperature at the edge of the allowed thermal mixing zone.
- **T_{cap}** and **T_{dev}** are thermal compliance points for the facility.

Compliance Determination with ΔT°F for a Warm Water Habitat:
Missouri's WQS temperature criteria [10 CSR 20-7.031(5)(D)1.] establishes point sources discharging thermal pollution to WWH streams in Missouri shall not raise or lower the temperature of the receiving stream by 5°F. Because this is a WQS, these criteria can be applied at the edge of the thermal mixing zone. In the determination of compliance with the temperature criteria of ΔT, several variables must be obtained as described below. The following calculation determines compliance with the Δ5°F. If the ΔT is greater than 5°F, the facility is in non-compliance. All facilities are subject to the ΔT requirement unless there is no upstream available for measuring.

Compliance Determination with Mississippi River Temperature Cap Criteria:
Missouri WQS temperature criteria [10 CSR 20-7.031(5)(D)5.] establishes point sources discharging to the Mississippi River shall not cause or contribute to the receiving stream's temperature in excess of a monthly temperature criteria. The methodology for the determination of compliance is similar to the T_{cap} for 90°F established above. However, the fundamental difference is the monthly temperature not to be exceeded. Thus, the criteria are established per calendar month and per Mississippi River Zone, as follows:

Month	MISSISSIPPI RIVER USGS ZONE TEMPERATURES			
	ZONE 1A (AREA A) OR ZONE 1B (AREA B)		ZONE 2 (AREA C)	
	T_{cap} in °F	*Temperature Deviation* T_{dev} in °F	T_{cap} in °F	*Temperature Deviation* T_{dev} in °F
January	45	48	50	53
February	45	48	50	53
March	57	60	60	63
April	68	71	70	73
May	78	81	80	83
June	86	89	87	90
July	88	91	89	92
August	88	91	89	92
September	86	89	87	90
October	75	78	78	81
November	65	68	70	73
December	52	55	57	60

Area A = USGS Zone 1A: Des Moines River to Lock and Dam No. 25.
Area B = USGS Zone 1B: Lock and Dam No. 25 to Lock and Dam No. 26.
Area C = USGS Zone 2: Lock and Dam No. 26 to the Missouri-Arkansas state line.

Compliance Determination with Mississippi River Deviation Allowance Criteria:
Compliance with deviation allowances are a two-step process established at [10 CSR 20-7.031(5)(D)5.]. First, the facility calculates the temperature at the edge of the mixing zone [T_{emz}]. If the calculated temperature is below the T_{cap}, the facility is in compliance. If the calculated temperature has exceeded the T_{cap}, then the T_{dev} limit is reviewed. See above table for temperature deviation allowances. $T_{dev} = T_{cap} + 3°F$. For example, a facility located in Area C is discharging their cooling water during the month of January, their T_{cap} limit would be 50°F and their T_{dev} limit would be 53°F. The T_{cap} and T_{dev} calculations are identical (T_{emz}), however, the compliance point (permit limit) is different. The T_{dev} is also called a temperature maximum and is never to be exceeded.

Secondly, if the T_{cap} has been exceeded, the facility must then determine the amount of time the T_{cap} was exceeded. Regardless if the T_{dev} is being exceeded or not, the time (in hours) of T_{cap} exceedance is still reported. The time deviation allowance, based on the USGS Zone, provides a specific aggregate of hours per year a facility can exceed their monthly T_{cap} limit. The site-specific criteria for the Mississippi River allows the permittee to exceed their applicable criteria either 1% of the year for Zone 1A and 2A; and 5% of the year for Zone 1B. It has been determined this percent exceedances allowance should be tracked in hours for a calendar year.

Zone 1A (Area A) and Zone 2 (Area C) is 1% = [(365)(24)(0.01)] = 87.6 hours (87 hours and 36 minutes) allowed per year. Zone 1B (Area B) is 5% = [(365)(24)(0.05)] = 438 hours allowed per year. The facility is within 1B.

Tracking of time used for percent time deviation allowance, can be captured and tracked via an effluent limit in MoCWIS. Any time a facility exceeds T_{cap} the time deviation allowance "clock" is running. For every episode the permittee uses their available time, the operating permit shall require the permittee submit the time with their monthly discharge monitoring report (DMR) to state they exceeded their T_{cap}.

Permit Record of Thermal Limitations:
The original NPDES operating permit was issued to the Sioux Energy Center (SEC; then called the Sioux Power Plant) on October 3, 1975 with thermal discharge limitations of 109 °F. In December of 1981, the application for renewal stated the permittee could operate better if the limitations were in the form of a heat rejection limitation and requested 4327.0 $x10^6$ Btu/hr. The subsequent permit issued July 23, 1982 removed the maximum temperature in degrees Fahrenheit requirement and established the alternate effluent limitation of 4.33 x 10^9 Btu/hr. The permit was renewed March 28, 1986 and again July 31, 1987 with the same limitations. In a public notice comment dated December 2, 1992 from the permittee, they requested the thermal discharge limitation be increased by 6% to allow the use of a new method of estimating the thermal discharge from the plant. In

the permit issued February 4, 1994, the limit was again changed, and elevated to 4.6 x 10^9 Btu/hr to allow for the new calculation as the water quality based effluent limit, was founded on a revised means of calculating heat rejection from the plant electrical load. According to a water quality review sheet, the department revised the limitations, this time because of "current mixing zone regulations". This equation incorporated mixing for the thermal discharge. The new permit limit applied on January 15, 1999 was 5.50 x 10^9 Btu/hr as it currently stands as the interim limitation before the final effluent limitations based on water quality standards are established in this permit.

Prior to this permit, and in the interim, the facility is maintaining WQS for ΔT by using the following calculation:

$H = Cp * \rho * Q * \Delta T$

Where: H = BTU/hr
Cp = specific heat = 1 BTU/lb°F {water}
ρ = density = 8.345 lb/gal = 62.429 lb/ft^3 {water}
Q = flow rate gal/hr or gal/min * 60 min/hr
ΔT = change or difference in temperature

Re-arranging to calculate ΔT from BTU and flow: $\Delta T = H / [Cp * \rho * Q]$ and revising the units {and restating density in lbs/cu ft, with 1 cu ft = 7.481 gal} is:

ΔT (°F) = [H (BBTU/hr) * 1,000,000,000 BTU/BBTU] ÷ 62.429 (lb/cu ft) * Q (cu ft/sec) * 3600 (sec/hr)* 1 (BTU/ lb °F)

Thus an edge of mixing zone temperature increase can be calculated from:
Q/4 or Q*0.25 {allowing for a mixing zone containing 25% of the stream flow} (in cfs or cu ft/sec)
HR {as reported in the DMR} (in BBTU/hr or BTU * 10^9) (HR = heat rejection)
An edge of mixing zone river temperature can then be calculated: T_{emz} = ΔT + ambient river T {or intake T to use DMR data}

Example:
7Q10 = 23,385 CFS = /4 = Mixing = 6,846.5 CFS
HR = 5.5 x 10^9 BTU/hr = 5,500,000,000 BTU/hr

ΔT °F = 5,500,000,000 BTU ÷ [(62.429 lb/ft^3) * (6,846.5 ft^3/sec {river discharge}) * (3600 sec/hr) * (1BTU/lb °F)]
= 5,500,000,000 BTU ÷ 1,538,712,535
= 3.574416842 = ΔT = ~3.6 °F at the edge of the mixing zone.
The example shows the ΔT of the facility at low flow conditions. When the facility is reporting the maximum heat rejection, the facility changes the temperature of the discharge by about 3.6 °F. Unfortunately, the above equation does not ensure compliance with T_{emz}.

In April 2009, the department wrote and finalized a white paper describing how permit writers should determine compliance with thermal limitations when mixing considerations are present, as is the method used above demonstrates. Until the white paper was finalized, the department had been searching for an effective method to implement water quality standards for thermal discharges to streams afforded mixing in permits. This permit implements the calculations the facility must perform to derive permit compliance.

Determination of Schedule of Compliance:
The facility will have two years from date of issuance to meet the new water quality based temperature requirements. To comply with the new method of calculating thermal discharge, the facility has indicated they require time to develop, implement, and test new thermal gauges both in stream and in the plant, and new computer software which will allow them to manage the thermal discharge of the facility on a minute-by-minute basis. Until the new software is running, the facility has no way to continuously track temperature at the edge of the mixing zone, which in turn, cannot also track minutes of exceedances of the T_{dev}. The department has chosen to allow time for these upgrades to occur before final limitations are instituted, just as the department would allow a POTW time to upgrade the facility for a pollutant such as ammonia prior to new more restrictive limitations being enacted.

The previous permit special condition C.4.(a) enacted in April 2004 noted "water temperatures and temperature differentials specified in Missouri water quality standards shall be met." This special condition, while on the surface, required the permittee not violate WQS, the permittee was not provided with a basis to determine compliance with WQS. As indicated above, the basis for compliance was determined in 2009 when the department published a thermal compliance white paper.

TECHNOLOGY BASED EFFLUENT LIMITATION CONSIDERATIONS FOR THERMAL DISCHARGES:
Best Available Technology Economically Achievable (BAT or BTA) -- Sec. 304(b)(2) of the CWA 1.1.1.3

In general, BAT effluent limitations guidelines represent the best economically achievable performance of plants in the industrial subcategory or category. The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facility involved, the process(es) employed, potential process changes, and non-water quality environmental impacts, including energy requirements. The Agency retains considerable discretion in assigning the weight to be afforded these factors. Unlike BPT limitations, BAT limitations may be based on effluent reductions attainable through changes in a facility's processes and operations. As with BPT, where existing performance is uniformly inadequate, BAT may require a higher level of performance than is currently being achieved based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when such technologies are not common industry practice.

The department must consider six factors when setting case-by-case limitations pursuant to 40 CFR 125.3. These are found under BAT at 40 CFR 125.3(d)(3).

- The age of the equipment
- The process employed
- The engineering aspects of the application of various control techniques
- Process changes
- The cost of achieving such effluent reduction
- Non-water quality environmental impact (including energy requirements)

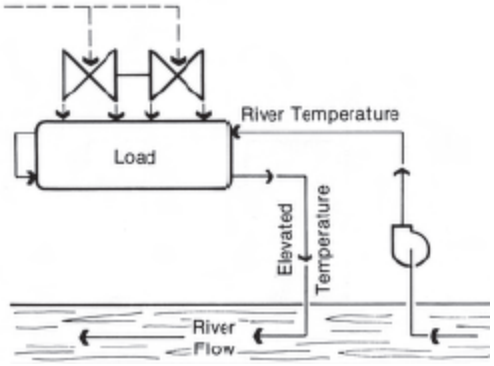
The information below was provided by the facility. The analysis was undertaken by the department to assess a case-by-case technology based effluent limitation ("TBEL") for thermal discharges from the Sioux Energy Center (SEC, or the "facility").

1. Age of Equipment

- The facility has two generating units with a net capability of 986 megawatts (MW). The first unit started operating in 1967 and the second in 1968. The typical annual (gross) generation ranges from four to six million megawatt hours (4,900,000 to 5,500,000 MWHR for 2013-2015).
- The facility was designed as a base load plant with once-through cooling. The original NPDES operating permit was issued on October 3, 1975. See *Part I Facility Information; Outfall #001; Permit Record of Thermal Limitations*.
- The facility's cooling water intake structure was constructed concurrently with the units and is located along the Mississippi River shoreline. The intake structure consists of two cells, one for each unit. Within each cell are 2 bays which each contain a 10-foot wide vertical conventional traveling screen for a total of four traveling screens for the facility. There is an eleven foot wide by 16.5 foot high opening to each bay. At the mouth of the opening are steel trash racks made of bars with 2.625 inch spacing.
- The traveling screens have 3/8 inch woven wire mesh and are operated based on either manual timer settings or differential pressure across the screens (which are affected by debris loading).
- Cooling water is passed through condensers and other heat exchangers and is discharged to the Mississippi River. The water from each of the two units is discharged through a ten foot diameter pipe leading to a single seal well, where the water flows over a weir into an approximately 2200 foot long discharge that empties into the River just upstream of Dresser Island.. A warming line recirculates a portion of the heated water from the seal well back to the intake to prevent ice buildup in the winter.
- The intake structure was originally designed to maximally withdraw 672 million gallons per day (MGD) of water. As noted in the 2008 renewal application, all four pumps were replaced (with completion in 2009) and the revised withdrawal rate is up to approximately 749 MGD. For a three year period ending in December 2015, the average Outfall #001 discharge flow was 637 MGD.

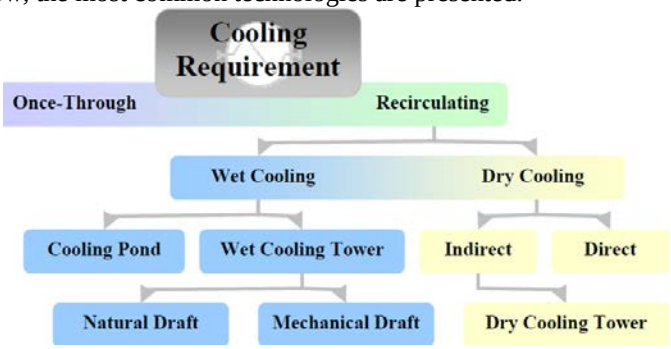
2. Process Employed

- The current process employed is once-through cooling. The cooling water intake structure is located at the end of a 1,600-foot long intake canal that extends south of the Mississippi River. It consists of two cells, one for each unit. Within each cell are 2 bays containing a 10 foot wide vertical conventional traveling screen for a total of four traveling screens for the entire intake. There is an 11 foot wide by 16.5 foot high opening to each bay. At the mouth, there are steel trash racks made of bars with 2.625 inch spacing.
- The heated water from each of the two units is discharged through a ten foot diameter pipe leading to a single seal well, where the water flows over a weir into an approximately 2200 foot long discharge channel that empties into the River just upstream of Dresser Island. A warming line recirculates a portion of the heated water from the seal well back to the intake to prevent ice buildup in the winter. Once through cooling provides the best power plant efficiency of the alternatives as the source water tends to be the lowest temperature heat sink available for most of the year. Below in figure 2[1] is a diagram of how once through cooling works.

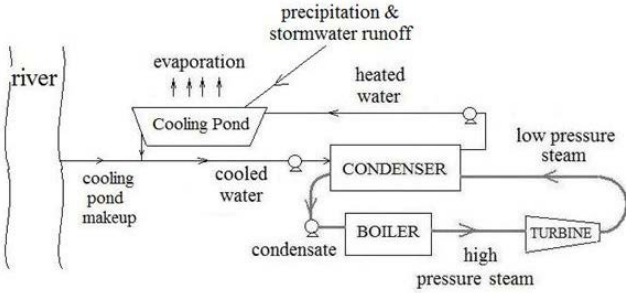


3. Engineering Aspects and Application Of Various Types Of Control Techniques

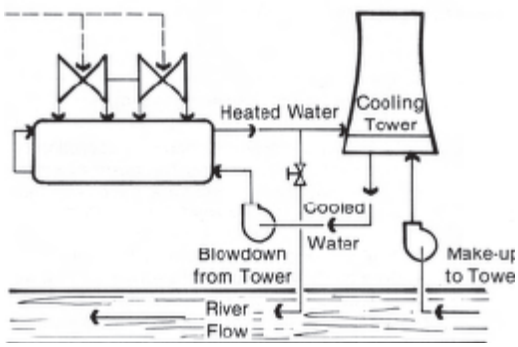
While the potentially available cooling technologies that may be employed at any given facility are generally well established, their suitability and successful application at individual facilities is strongly dependent on the site specific conditions associated with each facility. In figure 3 below, the most common technologies are presented.



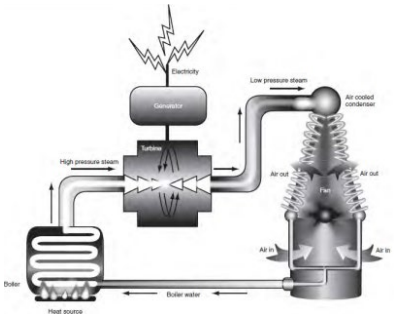
- Once-through cooling systems take water from nearby sources, such as the Mississippi River, circulate it through pipes to absorb heat from the steam in systems called condensers, and discharge the then warmer water to the local source. Once-through systems were initially the most common cooling technology because of their simplicity, efficiency, low cost, and the possibility of siting power plants in places with abundant supplies of cooling water. See figure 2 above for how a once-through cooling system operates.
- Cooling ponds typically consist of artificially constructed bodies of water-which may be created by damming a natural stream, utilizing an existing impounded body of water, or creating a new impoundment. The condenser water is fed into the cooling pond or lake, cooled through evaporation and then typically recycled to the condenser. While such ponds and lakes are established technologies at Missouri power plants, they have not been established for power plants located in the Missouri and Mississippi River floodplains. Figure 4 below is an example of how a cooling pond works.[2]



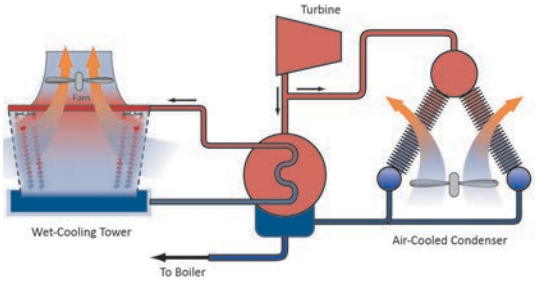
- The most common option available for replacing a once-through cooling system is a closed cycle cooling system (wet or dry).
- Wet closed cycle cooling systems are closed-loop systems designed to minimize the amount of water withdrawn from the river. In a wet closed cycle cooling system, condenser water still exchanges heat with water in a heat exchanger; however the cooling water is recycled between a cooling tower and a heat exchanger. In this system, the cooling water is cooled by evaporating a percentage of the water to the environment and requires make-up water to account for the consumed water. In the case of the Sioux Energy Center, the make-up water would come from the Mississippi River. Wet closed cycle cooling systems consume much more water than once-through cooling systems as the entire energy exchange is through evaporation of the water: a consumptive use;-however wet closed cycle cooling systems withdraw much less water than once through cooling systems. Wet closed cycle cooling systems can use natural draft or mechanical draft to accomplish cooling. Figure 5 below is a wet closed cycle cooling tower system.[3]



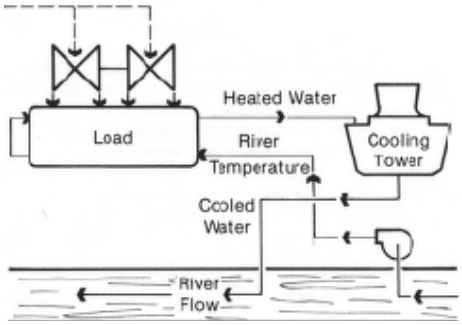
- Dry closed cycle cooling systems rely on air flow in cooling towers rather than water to cool the steam produced during electrical generation. Steam from the boiler is routed through a heat exchanger. Air is blown across the heat exchanger to condense the steam back into liquid, which is then returned to the boiler and is reused. Plants using dry cooling withdraw and consume a small amount of water to maintain and clean the boiler, including replacing boiler water lost through evaporation. Dry cooling has a higher capital cost than wet cooling, reduces the overall efficiency of a power plant, and does not operate effectively at high temperatures. Installation of dry cooling is more common on new plants. As a potential retrofit to an existing plant, this option presents difficulties. Existing plants originally designed for once-through cooling are equipped with older turbines with much more stringent limitations on exhaust pressure than those for modern turbines designed for use with dry cooling. Figure 6 below is a dry cooling system.[4]



- Hybrid cooling systems are a combination of wet and dry cooling systems. These systems combine two established cooling processes, uses the advantages of dry and wet cooling by reducing water consumption compared to wet cooling, and does not require an air cooled condenser as large as may otherwise be needed. Figure 7 below is a hybrid cooled system.[5]



- Mechanical Chillers operate with heat exchangers and pumps to control the temperature of the discharge. Mechanical chillers work best when the temperature reduction and volume is lower than that which is discharged from the Sioux Energy Center.
- Helper cooling systems transfer heat directly to the atmosphere and supplement an open-cycle cooling system before discharge to the receiving water. This could perhaps be accomplished, at least conceptually, via routing of the plant's heated effluent (before discharge) through a cooling tower or a cooling pond. Figure 8 below is a helper cooling tower system.[6]



4. Process Changes

The consideration of process changes includes changes at the existing facility that could be modified to improve the system. This includes changes from operations and maintenance to a complete retrofit of the entire system.

- Once-through cooling is the technology currently in use. Once-through systems are less expensive to build than closed cycle systems, which have a greater infrastructure requirement (e.g., construction of a cooling tower or cooling pond). Once-through systems consume less water than closed cycle cooling systems. Although once-through cooling systems withdraw a greater amount of water, essentially all of it is returned to the water source.
- Cooling ponds are an established technology in Missouri for plants located in watersheds with small streams that can be dammed to create a cooling pond, such as in Springfield or outside Montrose, MO. Such is not the case in the Mississippi River floodplain. The Mississippi River is controlled by the US Army Corps of Engineers and establishment of a dedicated cooling pond within the River would be incompatible with other uses including navigation and flood control. Other than the Mississippi and Missouri Rivers, there are no other streams located near the power plant large enough to support a cooling pond necessary to serve Sioux's water needs. Creation of a cooling pond would require retrofitting the existing plants piping, controls, and operations. Additional permitting would be required from the department's Water Resources Center and the US Corps of Engineers 401/404 program. Water requirements for pond cooling systems are typically higher than tower systems and are much more variable, as they can be operated as systems that resemble recirculating closed system and a once-through system which impacts the water withdrawal and consumption rates.
- Closed cycle cooling tower recirculating systems only withdraw enough water needed to maintain the required water level of the system, but they consume water through evaporation. To build a wet or hybrid cooling system, a water treatment plant would need to be constructed to clean the Mississippi River water to be used and recirculated through the plant. The retrofit installation of closed-cycle cooling at a plant originally built with once-through cooling is complex. It is not simply a matter of installing a cooling tower in the existing circulating water system for several reasons. Often the plan is to keep the existing condenser, circulating water flow rate, and as much of the existing circulating water pumps, lines, and intake/discharge structure as possible unchanged. The site-specific considerations are dependent on a number of variables, including:
    1. A suitable location with enough room for the tower must be found on or adjacent to the plant site. This may place the tower far from the turbine hall and require very long circulating water lines. The longer the distance, the higher consumption of energy required to replenish the towers with makeup water.
    2. The discharge head from the circulating water pump must be increased in order to get the water to the top of the cooling tower and to overcome any additional head loss in the new circulating water lines.
    3. This additional head may be obtained by replacing or modifying the existing pump to obtain higher discharge head. This would involve diverting the condenser discharge flow from its current route, installing a new line to the cooling tower and a new return line back to the existing intake. Additionally, new make-up and blowdown lines and pumps would need to be installed as described above for new installations.
    4. The existing inlet and discharge structures will have been designed for much higher flows than will be experienced with the closed-cycle system. This may lead to silting or fouling and will require either they be modified to restrict the flow area or be replaced with smaller, more suitable structures.
    5. With this approach, the pressure in the condenser water boxes and any remaining discharge lines from the existing condenser will be subject to much higher pressure. This may require reinforcement or replacement in order to avoid leakage or damage.
    6. Wet and hybrid cooling systems introduce additional chemicals to the system to prevent fouling and scaling of the system.
    7. While heated water discharges would decrease, additional heat would be released to the atmosphere.
- Mechanical chillers operate with heat exchangers and pumps to control the temperature of the discharge. Mechanical chillers work best when the temperature reduction and volume is lower than what is discharged from Sioux Energy Center. Corrosion protection chemicals would also be required. The installation of mechanical chillers would require energy to operate, still have the large withdrawal of water from the river and would transfer the heat from the water to the atmosphere. Additional concerns with clogging and flooding due the Mississippi River's operation and flow.

- Helper cooling systems supplement an open-cycle cooling system by removing a portion of the heat energy discharged in a plant's effluent and transferring it directly to the atmosphere. Ameren estimated the cost of constructing a helper cooling tower at Labadie and proportionally, would estimate the cost at Sioux to be approximately $93 million per unit. The construction of a helper cooling tower, pond, spray modules, or other technique will still have the impact to aquatic life on the intake structure with impingement and entrainment, it will still have water with high temperature being discharged, it will require retrofits to the existing system resulting in a loss of energy production and it will introduce additional chemicals to the process to prevent fouling and scaling.
- Under CWA§ 316(b) requirements, the facility is required to evaluate the installation of closed cycle cooling for reductions to the impingement and entrainment in the intake structure; however the installation of the closed cycle system would address the discharge of heated water back to the Mississippi River as well.

5. Non-Water Quality Environmental Impacts Including Energy Requirements

All cooling technologies have non-water quality environmental impacts, including impacts to energy requirements. Because impacts at the Sioux Energy Center would entail a retrofit, the non-water quality impacts would include changes to the existing system, which could result in energy production loss.

- Once-through cooling is the existing installed technology. Non-water quality impacts include the impact of the intake and the discharge on aquatic communities. Intake impacts are to be evaluated under CWA Section 316(b).
- Cooling pond construction would entail non-water quality and water quality impacts. Construction of a cooling pond would require retrofitting the existing facility, construction of a pond, which would require the removal of existing farmland and flood control structures.
- Closed-cycle cooling tower construction would require additional land acquisition which would remove farmland from use. Additionally, cooling tower construction would require retrofitting of the intake structure and plant operations. Other anticipated impacts include the necessity to build a water treatment plant to clean the water for usage. Building a water treatment plant similar to what is at Ameren Callaway would introduce additional waste streams and pollutants to be handled and potentially discharged. Cooling tower retrofits will require substantial engineering, design and construction, including replacement of condensers. Cooling tower installations would be anticipated to increase parasitic load requirements and decrease overall Sioux Energy Center efficiency. Closed cycle cooling towers may further require replacement of turbines and other equipment, plus changes in piping and handling methods of waste streams. A retrofitted cooling system of either the wet or dry type would have a deleterious effect on the plant's net heat rate and generating efficiency. If a wet cooling system, the power requirements will be higher than the current pumping power requirements for the once-through system. This power is used for the additional circulating pumps and for the cooling tower fans and represents power that must be generated but cannot be sold. Also, the plant will operate at a higher backpressure and therefore a higher heat rate with closed cycle cooling, which is more pronounced for a dry system than for a wet system. Closed cycle cooling would also require changes in outages of power from once every three years currently to a more frequent for cleaning and maintenance. Finally, closed cycle cooling would increase the heat released to the atmosphere and a potential increase in greenhouse gases.
- Mechanical chillers operate with heat exchangers and pumps to control the temperature of the discharge. Corrosion protection chemicals would be required and would entail energy to operate. Mechanical chillers would also include large river water withdrawals and the transfer the heat from processed water to the atmosphere. While mechanical chillers are sometimes used elsewhere in the Midwest, the usage at such a large power plant (such as the Labadie Energy Center) on a large river subject to Corps of Engineers jurisdiction, fluctuating river levels and flooding would limit the effectiveness of this technology.
- Helper cooling systems construction would have many of the similar non-water quality impacts as a full closed cycle cooling system, along with the impacts of once-through cooling.

6. Total Cost Of Application Of Technology In Relation To Reduction In Effluent

The total cost of the application of the technology needs to evaluate the costs of the benefits of the reduction in the effluent, the social benefits, the capital and construction costs, the costs in loss generation and electricity to sale, and the overall environmental impact. The overall environmental cost needs to include the cost of additional chemicals, impacts to waste streams being handled, and impacts to the air quality.

- Once through cooling is the installed technology at the facility.
- Cooling pond: Space available and the Mississippi River preclude this as a viable technology for the Sioux Energy Center.
- Cooling towers: While the installation of closed cycle cooling would reduce the discharge of heat load into the water, it would increase the consumption of water; it would have high capital costs and entail the addition of new chemicals, and a new water treatment plant. The costs of these factors must be included to determine the total cost of a complete plant cooling system. Mechanical Chillers: Mechanical chillers operate with heat exchangers and pumps to control the temperature of the discharge. Corrosion protection chemicals would also be required. The installation of mechanical chillers would require energy to operate, still have the large withdrawal of water from the river, would transfer the heat from the water to the atmosphere, additional concerns with clogging, and flooding due the Mississippi River's adjacency.
- Helper cooling systems: Ameren previously extrapolated the cost of constructing a helper cooling tower at Sioux of $93 million (based on estimates developed for Labadie). The construction of a helper cooling system would still impact aquatic life via the intake structure, discharge heated water, require retrofits to the existing system resulting in a loss of net energy production,

introduce additional chemicals to the process to prevent fouling and scaling, and put more heat into the atmosphere. At the Brayton Point Power Plant, which is 1500 MW plant (approximately fifty percent larger), the construction cost estimate from 2002 was $98.9 million, with an estimated annual maintenance costs are $300,000 per year. In addition, the Brayton Point estimated combined lost annual generation to be 152,148 MW-hr/year. This consists of 112,875 MW-hr/yr off additional auxiliary power consumption and 39,275 MW-hr/yr of steam turbine operating penalties.[7]

7. Reasonableness Of The Cost Of The Application Of Technology And The Removal Of Effluent

The cooling technologies are established technologies throughout the country; however the construction and establishment of the technology at the Sioux Energy Center requires a detailed engineering evaluation. The reasonableness of the application of the technology needs to account for the ability of the technology to be constructed and used on site and to produce a benefit of removing the parameter of concern (heat). The installation of the technology (or a mix thereof) must be reasonable, in that the solution is logical.

- Once-through cooling is the established and existing technology at the Sioux Energy Center. Once-through cooling has impacts on thermal discharge to the Mississippi River and impacts on impingement and entrainment at the intake. While once-through cooling withdraws high volumes of Mississippi River water, it returns nearly all of those withdrawals to the river.
- A cooling pond is not a reasonable alternative for the Sioux Energy Center as the location is not appropriate and the heat would still be discharged to the environment, just would be recirculated through the pond. Removal of additional farm land from productive use and changes in the flood controls in St. Charles County would not be a supported alternative.
- Closed cycle cooling towers are an established technology that may be feasible at the Sioux Energy Center. Siting conditions must be considered. The installation of closed cycle cooling may reduce the generating capacity of the facility by 4% or more. With closed cycle cooling, more water would be consumed in the process, a water treatment plant would need constructed to clean the water to the level for recirculating, chemicals would be required to prevent fouling and scaling in the towers. Closed cycle cooling may require replacement of turbines and other equipment, plus changes in piping and handling methods of waste streams. Closed cycle cooling would also require changes in outages of power from once every three years currently to a more frequent for cleaning and maintenance. Closed cycle cooling would further increase the heat released to the atmosphere and a potential increase in greenhouse gases.
- Mechanical chillers operate with heat exchangers and pumps to control the temperature of the discharge. Corrosion protection chemicals would also be required. The installation of mechanical chillers would require energy to operate, still have the large withdrawal of water from the river, would transfer the heat from the water to the atmosphere, addition of concerns with clogging and flooding due the Mississippi River's operation and flow. Concerns cited by the Carroll County, Maryland with using mechanical chillers include air pollution concerns, water quality such as usage of biocides, and noise pollution.
- Helper cooling systems would have the impacts of both closed cycle cooling system and the once through system. While it would reduce the impact of heat into the Mississippi River, it would still require the treatment at the water treatment plant, retrofitting of the system to handle at least partial flow through a cooling tower for recirculation. Additional chemicals to prevent fouling and scaling in the tower. Ameren estimates it would cost approximately $93 million to construct a single helper cooling tower at Sioux. At Brayton Point, there was a high energy penalty with the installation of a helper cooling tower with the loss of annual generation of 152,148 MW-hr/year.[8]
- As part of the renewal and the 316(b) requirements, changes to the intake structure are required and one option required for evaluation is the installation of closed cycle cooling.

8. Comparison Of Cost And Level Of Reduction

Once-through cooling is the existing technology in use. This is what Sioux Energy Center was constructed with and the cost is cost to continue operating and maintaining the system. The level of reduction is what the thermal studies of the 1970s set as the operating conditions is the level of reduction. Under the new 316(b) intake structure rule, the facility will face upgrades to reduce the number of aquatic larval and fish being impinged and entrained on the intake structure.

- Closed cycle cooling towers would reduce the discharge of heat load into the water, but it would increase the consumption of water, it would have high capital costs, addition of new chemicals, and a new water treatment plant. There are additional costs which must be included to determine the total cost of the wet cooling tower as part of a complete plant cooling system. Retrofitting a facility originally designed for once-through cooling to a recirculating cooling system will result in reduced power output from the additional equipment needing to be run, such as pumps and fans, and from the loss of efficiency because the cooling water is generally warmer coming back from a cooling tower than it is from the body of water used by a once-through cooling system. Accordingly, the energy penalty of retrofitting to a recirculating cooling system is the greatest when the power grid is strained the most, during periods of peak summer electric demand. The loss of efficiency and generation capacity means less electricity is available to meet demand or to serve as reliable reserve capacity.[9, 10, 11, 12]
- Mechanical Chillers: The City of Corvallis, Oregon estimated the cost to install mechanical chillers for temperature compliance for 11 MGD would be $35.1 million in 2008. Multiplying this cost to the 749 MGD of Sioux discharge, the cost would be $2.4 billion (749MGD/11MGD*$35.1M). For a 500 MW combined cycle greenfield plant, the cost estimate was $445 million in 2003, so the cost at Sioux at a minimum would be approximately $890 million, if it was a greenfield site plus inflation, retrofitting the existing system and cost of service increases over the last 12 years ($445M*2). The installation of mechanical chillers would require energy to operate, still have the large withdrawal of water from the river, would transfer the

heat from the water to the atmosphere, addition of concerns with clogging and flooding due the Mississippi River's operation and flow. Concerns cited by the Carroll County, Maryland with using mechanical chillers include air pollution concerns, water quality such as turbidity and usage of biocides, and noise pollution.[13, 14]

- Helper cooling systems operate in combination of once-through cooling and the closed cycle cooling to reduce the overall heat load to the river. Ameren estimated the cost of constructing a single helper cooling tower at Sioux of $93 million. The construction of a helper cooling tower will still have the impact to aquatic life on the intake structure with impingement and entrainment, it will still have water with elevated temperature being discharged, it will require retrofits to the existing system resulting in a loss of energy production, it will introduce additional chemicals to the process to prevent fouling and scaling, it will put more heat into the atmosphere. At the Brayton Point Power Plant, which is 1500 MW plant (approximately 50% larger than Sioux), the construction cost estimate from 2002 was $98.9 million, with an estimated annual maintenance costs are $300,000 per year. In addition, the Brayton Point estimated combined lost annual generation to be 152,148 MW-hr/year. This consists of 112,875 MW-hr/yr off additional auxiliary power consumption and 39,275 MW-hr/yr of steam turbine operating penalties.

9. Cost Of Achieving Effluent Reduction

- The costs associated with installation of closed cycle cooling to replace an existing once through cooling system are substantial. A comprehensive evaluation of such costs was completed by Maulbetsch Consulting in September 2010.15 That report developed "an estimate of the national cost of retrofitting with closed-cycle cooling systems all electric power plants which had been classified as "Phase II facilities" under Section 316(b) of the Clean Water Act." While the impetus for the Maulbetsch report was an evaluation of technologies which might achieve compliance with Section 316(b) of the Clean Water Act (i.e., requirements governing the intake side of the power plant cooling water process), many of the report findings are equally applicable to evaluation of technologies possibly achieving compliance with Section 316(a) (i.e., requirements governing the discharge side of the power plant cooling water process), and are of consequence to the derivation of a technology based effluent limitation in this instance. In its consideration of over 400 power plants (404 fossil plants and 40 nuclear plants), Maulbetsch found the following:

Plant Type	Capacity (MW)	Capital Cost (MM$)	Downtime Cost (MM$)	Total Capital + Downtime Cost (MM$)	Total Capital + Downtime Cost (MM$ per MW)
Nuclear	61,444	19,140	16,955	36,095	0.587
Fossil	265,592	46,020	14,316	60,336	0.227

- Applying the lesser of the above cost estimates to the facility reveals a capital plus downtime cost estimate in the range of $223,000,000 would be incurred due to the installation of a closed cycle cooling system. Of course, site specific conditions at Sioux may result in an actual cost greater than this. Maulbetsch further evaluated the net present value of the additional annual operating and penalty costs would be incurred by a once through cooling facility retrofitted to install closed cycle cooling, and found the following:

Plant Type	Annual Operating Power (MM$)	Annual Heat Rate Penalty (MM$)	Net Present Value Annual + Initial Costs (MM$)	Net Present Value (MM$ per MW)
Nuclear	220	359	40,162	0.654
Fossil	449	158	64,600	0.243

- Considering these annual costs in addition to the initial costs, results in a total net present value cost of $240,000,000.
- Ameren independently authorized completion of a preliminary assessment of the cost of installing closed loop cooling at its Labadie Energy Center. The assessment found installation of rectangular mechanical draft cooling towers would incur an estimated initial capital cost of approximately $397 M. Installation of natural draft cooling towers was estimated to cost $456M. By extrapolation to Sioux, these estimates would be $159 M and $182 M respectively. Note these costs represent initial costs only and do not include plume abatement (to eliminate icing potential and aesthetic issues) associated with mechanical draft towers. Consequently, they are comparable to the Maulbetsch cost estimates cited above.
- A cost estimate for installation of once through cooling has been prepared for the Merrimack Station Power Plant in Bow, New Hampshire by USEPA. A total present value after tax cash cost of $111,800,000 was determined. The facility includes two electric generating units with nameplate ratings of 350 MW and 120 MW for a total of 470 MW, (The document also cites the facility has "*an electrical output of approximately 478 megawatts*.") and thus a cost of approximately $240,000 per MW. The Sioux facility has a capacity of approximately 2 times the Merrimack Station, and thus the prorated cost applied to Sioux would be approximately $224,000,000. Note the good agreement with the Sioux cost estimates based on the Maulbetsch study.[16, 17]
- The above information suggests the cost to install closed cycle cooling at the facility would be in the range of a quarter of a billion dollars. It could certainly be more. For example, at the Millstone Power Station in Connecticut, the estimated capital cost to install natural draft cooling towers was estimated to be approximately two billion dollars plus additional annual operation and maintenance costs. The Millstone facility has a total capacity of 2113 MW which roughly twice (2.14 times) the capacity of the SEC.[18]

- The above cost estimates provide for complete replacement of the once through cooling system at the SEC. As discussed further above, one alternative to reduce the thermal load to the Mississippi River from the Sioux facility is to install "helper" cooling towers don't eliminate the heated discharge, but rather reduce its temperature before discharge. However, these costs are not insignificant either and approach those of complete replacement of once through cooling. As noted above, Ameren has estimated such a system would cost approximately $93,000,000 per unit at Sioux. Additional costs including lost power generation would have to be added to these estimates. Thus, significant expenditures would need to be incurred for possibly marginal benefit in terms of temperature reduction of the discharge.
- The cost to install mechanical chillers at the SEC would be even greater than those for the installation of closed loop cooling.

Conclusion:

- Technology limitations have not been implemented for this facility in the past.
- The SEC has been in operation for 49 years using a once-through cooling system. In evaluation of the other available technologies which are technically feasible to reduce thermal discharges to the Mississippi River, all such options were found to increase the chemicals in the discharge, release greater heat to the atmosphere, provide operational and maintenance issues, and entail significant costs.
- After applying factors listed above, and considering the technologies and unique circumstances discussed above, the department has determined, based its best professional judgment, a once-through cooling system is the best available technology at this time. Future analysis of impingement and entrainment will include requirements found under CWA §316(b) and may revisit or reverse the BAT judgment should an imbalanced indigenous population of aquatic life be observed at this site.
- The department has concluded that discharging thermal pollution over discharge of additional chemicals is preferred at this time.

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14. Brayton Point NPDES Factsheet Chapter 4: TBEL Determination. http://www.epa.gov/region1/npdes/braytonpoint/pdfs/BRAYTONchapter4.PDF
15. *Closed-Cycle Retrofitting Study: Capital and Performance Cost Estimates,* prepared by Maulbetsch Consulting for EPRI (Palo Alto, CA) et al., Final Report September 2010.
16. *New England Clean Water Act NPDES Permitting Determinations for the Thermal Discharge and Cooling Water Intake Structures at Merrimack Station in Bow, New Hampshire, NPDES Permit No. NH0001465.*
17. Attachment D to 2011 Fact Sheet for Draft NPDES permit, prepared by USEPA New England Region I, September 27, 2011.
18. *Comprehensive Evaluation of Cooling Water System Alternatives at Millstone Power Station (MPS) Final Report*, Project No. 19998242.10400, prepared by URS, August 2012.

CONVENTIONAL POLLUTANTS:
For the purposes of permit renewal, several conventional parameters were sampled. The facility reported biochemical oxygen demand at 4 mg/L. The facility reported chemical oxygen demand at 22 mg/L. The facility reported total organic carbon at 6.6 mg/L. The facility reported Oil and Grease at 2.2 mg/L. The facility reported total suspended solids at 178 mg/L. The permit writer has determined none of the above pollutants are of concern at this outfall. The Mississippi River is inherently turbid and while the once-through cooling water system condenses the water, the concentration of additional solids is negligible. The facility reported total residual chlorine was believed absent. However, the ELG identifies once-thorough cooling water as subject to BPT and BAT regulations for chlorine.

pH
6.5 to 9.0 SU. The Water Quality Standard at 10 CSR 20-7.031(5)(E) states water contaminants shall not cause pH to be outside the range of 6.5 to 9.0 standard pH units.

Chlorine, Free Available
The facility is limited per the ELG at 40 CFR 423.12 for best practicable control technology (BPT) of once through cooling water at 0.5 mg/L daily maximum, and 0.2 mg/L monthly average concentration. The facility is not afforded a schedule of compliance because the EPA has promulgated the ELG and these conditions are subject to all applicable facilities at all times. The facility has stated they infrequently use chlorine as a biocide. The department has considered and approved an "unscheduled" sampling regime.

Chlorine, Total Recoverable
The facility is limited per the ELG at 40 CFR 423.13 for best available technology (BAT) of once through cooling water at 0.2 mg/L daily maximum concentration. The facility is not afforded a schedule of compliance because the EPA has promulgated the ELG and these conditions are subject to all applicable facilities at all times. The facility has stated they infrequently use chlorine as a biocide. The department has considered and approved an "unscheduled" sampling regime.

METALS:
The facility reported any metals found in the once-through cooling water discharge are already present in the river. The permit writer has determined no additional testing of any metals is required at this outfall at this time.

NUTRIENTS:
The facility reported any nutrients found in the once-through cooling water discharge are already present in the river. The permit writer has determined no additional testing of nutrients at this outfall is required at this time.

OTHER:
The facility reported any bromide, Dioxin, fluoride, radioactivity, sulfate, sulfide, sulfite, or surfactants found in the once-through cooling water discharge are already present in the river. The permit writer has determined no additional testing of these parameters is needed at this outfall at this time.

WET Test, Acute
Previous permit limitations were pass/fail; however the department cannot perform RPA on narrative data. The permit writer has determined several biocides including chlorine may be used on the cooling tower therefore WET monitoring is required when the biocides are in use. *See Part VII Administrative Requirements, Public Notice Comments*.

For classified permanent streams, the Allowable Effluent Concentration (AEC)% is determined as follows:
Acute AEC% = $[DF_{cfs} \div (ZID_{7Q10} + DF_{cfs})] \times 100\% = \#\#\ \%$
Acute AEC% = $[1121\ CFS \div (585 + 1121\ CFS)] \times 100\% = 65.7\% \approx 66\%$

10 CSR 20-7.015((9)(L)4.A. states the dilution series must be proportional. Each dilution was determined by multiplying or dividing 0.8 from the AEC and then each consecutive value.
The calculated dilution series for this facility is: 83%, 66%, 53%, 42%, and 34%.

OUTFALLS #002 & #006: ASH PONDS

EFFLUENT LIMITATIONS TABLE:

PARAMETERS OUTFALLS #002 & #006	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*	*	SAME	ONCE/WEEK	ONCE/MONTH	24 HR. TOT
CONVENTIONAL								
CYANIDE-AMENABLE (CATC)	µg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
OIL & GREASE	mg/L	1, 3	15	10	20, 15	ONCE/MONTH	ONCE/MONTH	GRAB
PH ǂ	SU	1, 3	6.5 TO 9.0	6.5 to 9.0	6.0 TO 9.0	ONCE/WEEK	ONCE/MONTH	GRAB
TSS (ACTUAL)	mg/L	4	*	*	SAME	ONCE/WEEK	ONCE/MONTH	GRAB
TSS (NET)	mg/L	1	100	30	SAME	ONCE/WEEK	ONCE/MONTH	GRAB
METALS								
ALUMINUM, TOTAL RECOV.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
ARSENIC, TOTAL RECOVER.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
BORON, TOTAL RECOVER.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
CHROMIUM IV, DISSOLVED	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
IRON, TOTAL RECOVERABLE	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
MOLYBDENUM, TOTAL REC.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SELENIUM, TOTAL RECOVER.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
TITANIUM, TOTAL RECOVER.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NUTRIENTS								
AMMONIA AS N	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
KJELDAHL NITROGEN (TKN)	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NITRATE+ NITRITE AS N	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NITROGEN, TOTAL N (TN)	mg/L	1	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
PHOSPHORUS, TOTAL P (TP)	mg/L	1	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
OTHER								
CHLORIDE	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
FLUORIDE	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SULFATES	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SULFATES + CHLORIDES	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
WET TEST, CHRONIC	TUc	8	*	-	PASS/FAIL	ONCE/YEAR	ONCE/YEAR	GRAB

* - Monitoring requirement only
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
NEW - Parameter not established in previous state operating permit
I – interim limits
F – final limits

Basis for Limitations Codes:

5. State or Federal Regulation/Law (incl. ELG)
6. Water Quality Standard (includes RPA)
7. Water Quality Based Effluent Limits
8. Antidegradation Review/Policy
5. Water Quality Model
6. Best Professional Judgment
7. TMDL or Permit in lieu of TMDL
8. WET Test Policy
9. TBEL POC

TBEL POC TABLE:

PARAMETER	Units	Outfall #002	Outfall #006	Baseline	Baseline x 10	POC
FORM C OF APPLICATION FOR PERMIT RENEWAL: PART A						
Biochemical Oxygen Demand	mg/L	4	4	2	20	no
Chemical Oxygen Demand	mg/L	18	10	5	50	no
Total Organic Carbon	mg/L	6	1	1	10	no
Total Suspended Solids	mg/L	54	1	4	40	*
NUTRIENTS:						
Ammonia as N	**mg/L**	**0.5**	**5.6**	**0.05**	**0.5**	**YES**
Nitrate + Nitrite as N	**mg/L**	**2.0**	**25**	**0.05**	**0.5**	**YES**
Nitrogen, Total N	mg/L	2.2	0.07	none	none	n/a
Phosphorus, Total P	mg/L	<0.01	<0.01	0.01	0.1	no
FORM C OF APPLICATION FOR PERMIT RENEWAL: OTHER						
Bromide	mg/L	11	35	none	none	n/a
Chlorine, Total Residual	mg/L	0.08	0.06	none	none	n/a
Cyanide, Total	µg/L	<50	50	20	200	no
Fecal Coliform (Colony Forming Units/100 mL)	CFU	198	10	none	none	n/a
Fluoride	**mg/L**	**0.3**	**1.9**	**0.1**	**1**	**YES**
Oil and Grease	mg/L	2	2.8	5	50	*
Phenols, Total	µg/L	<5	<5	50	500	no
Sulfate as SO_4^{2-}	mg/L	54	640	none	none	n/a
Sulfide as S^{2-}	mg/L	1.5	1.5	1	10	no
Sulfite as SO_3^{2-}	mg/L	<2	<2	none	none	n/a
Surfactants	mg/L	0.04	0.01	none	none	n/a
METALS (AS TOTAL RECOVERABLE - UNLESS SPECIFIED):						
Aluminum	µg/L	2,800; 1120	400; 418	200	2,000	YES
Antimony	µg/L	<5; <1	<5; <1	20	200	no
Arsenic	µg/L	<5; 1.4	33; 17.1	10	100	no
Barium	µg/L	100; 115	480; 556	200	2,000	no
Beryllium	µg/L	<5; <1	<5; <1	5	50	no
Boron	**µg/L**	**700; 51**	**2,600; 1,890**	**100**	**1,000**	**YES**
Cadmium	µg/L	<5; <0.4	<5; <0.4	5	50	no
Chromium	µg/L	<5; 1.4	22; 14.1	10	100	no
Cobalt	µg/L	<5; 1	<5; 3	50	500	no
Copper	µg/L	5; 1	<5; <1	25	250	no
Iron	**µg/L**	**2,500; 923**	**80; 315**	**100**	**1,000**	**YES**
Lead	µg/L	5; 0.9	<5; 1	50	500	no
Magnesium	µg/L	13,600; 21,500	17,600	5,000	50,000	no
Manganese	µg/L	80; 50	10; 29	15	150	no
Mercury	µg/L	<0.2; <0.2	<0.2; <0.2	0.2	2	no
Molybdenum	**µg/L**	**40; 5**	**280; 154**	**10**	**100**	**YES**
Nickel	µg/L	12; <1	18; 9	40	400	no
Selenium	µg/L	5; 1.3	26; 20.8	5	50	no
Silver	µg/L	12; <0.4	30; <0.4	10	100	no
Thallium	µg/L	6; <1	15; <1	10	100	no
Tin	µg/L	<5; 5	<5; 9	30	300	no
Titanium	**µg/L**	**100; 70**	**7; 34**	**5**	**50**	**YES**
Zinc	µg/L	44; 19	24; 21	20	200	no

* = addressed by 40 CFR 423
< = reported below quantifiable analytical limits

TBEL DETERMINATION FOR POLLUTANTS OF CONCERN FROM THE ASH PONDS AT THE SIOUX ENERGY CENTER:
Following the EPA Permit Writers Manual, six parameters met the criteria for Pollutants of Concern (POCs): ammonia, nitrate/nitrite as nitrogen, fluoride, boron, molybdenum and titanium. These can be divided into two categories, nutrients, and inorganics/trace metals, as discussed below. It is important to note on September 30, 2015, the United States Environmental Protection Agency signed a final rule, revising the Steam Electric Effluent Guidelines (40 CFR Part 423). These regulations will result in substantial changes which, while not explicitly targeting nutrients or the inorganic/trace metal POCs identified for the Sioux Energy Center (SEC), will significantly reduce or eliminate discharges of these parameters.

NUTRIENTS
Discharges of nutrients including ammonia as nitrogen and nitrate/nitrite as nitrogen is an emerging issue for point source dischargers including those to major river systems implicated as contributors to the Gulf of Mexico Hypoxia problem. Additional monitoring, including DNR's Volunteer Early Nutrient Monitoring Program will better define these contributions and thus guide future regulatory development.

Elevated concentrations of these parameters were reported by Ameren in their 2008 NPDES permit renewal application; those processes included two significant sources of ammonia and its degradation byproducts (nitrate/nitrite residuals).

The first of these was the use of ammonium hydroxide in the regeneration of polisher demineralizers (used to purify water used in the plant's steam cycle). While this use is ongoing, Ameren is working to optimize the use of ammonium hydroxide and as part of replacement wastewater treatment systems (as described below) is further evaluating treatment technologies.

The second source was the use of ammonia and urea in exhaust gas treatment systems to reduce nitrous oxide (NOx) emissions. These chemicals were added to the exhaust gas and excess/carryover feeds resulted in residual concentrations in the fly ash sluiced to the ash pond (Outfall #006) for treatment. While these systems (and the feed of these chemicals into exhaust streams) have currently been suspended, they will likely resume, in order to meet NOx emission limits. However, as described below, replacement wastewater treatment systems will eliminate discharges of fly (and bottom) ash transport water, and thus eliminate the discharge of wastewaters containing these chemical associated with NOx controls.

Because these replacement wastewater systems are currently being designed and permitted, development of treatment technologies based on the historic effluent data would be inappropriate. The department has determined elimination of the wastestream is the BAT to eliminate the discharge of nutrients from the facility.

INORGANICS AND TRACE METALS
Analysis of ash indicates elevated concentrations of boron and molybdenum, and to a lesser extent, fluoride and titanium. All are likely associated with coal ash.

The newly revised federal Steam Electric Effluent Guidelines will require the SEC to eliminate the discharge of fly and bottom ash transport water, as soon as possible beginning November 1, 2018 but no later than December 31, 2023. Ameren is currently designing replacement wastewater treatment systems to manage the other (non-ash) wastestreams and has engaged DNR in discussions regarding construction and operating permit implications. The federal Coal Combustion Residual regulations (40 CFR Part 257) will also impact the SEC and likely result in closure of ash ponds within this same time frame.

As stated above, since these replacement wastewater systems are currently being designed and permitted, development of treatment technologies based on the historic effluent data would be inappropriate. Part of the engineering design includes assessment of internal wastestreams which will continue to be treated prior to discharge. These assessments and resulting data will be used to support permit applications to either construct and/or modify operating permits for these facilities. The department has determined elimination of the sluice water wastestream is the BAT to eliminate (or significantly reduce) the discharge of the listed inorganic constituents from the facility in accordance with the overall goal of the NPDES system.

CONCLUSION:
The facility will cease sluicing ash on or before May 1, 2021 thereby eliminating discharge of all of the above TBEL POCs.

DERIVATION AND DISCUSSION OF LIMITS FOR OUTFALLS #002 AND #006:

PHYSICAL:
The permittee reported color was believed absent at these outfalls. The permittee reported temperature associated with summer and winter discharges at these outfalls. The permit writer has determined temperature is not a pollutant of concern at these outfalls.

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. The facility will report the total flow in millions of gallons per day (MGD). Weekly sampling required; continued from previous permit.

CONVENTIONAL:
The facility reported 4 mg/L at outfall #002, and 4 mg/L at outfall #006 for 5-Day Biochemical Oxygen Demand (BOD_5). The permit writer has determined BOD_5 is not a contaminant of concern at these outfalls. The facility reported 18 mg/L at outfall #002, and 1 0 mg/L at outfall #006 for chemical oxygen demand (COD). The permit writer has determined COD is not a contaminant of concern at these outfalls. The facility reported 6 mg/L at outfall #002, and 1.3 mg/L at outfall #006 for total organic carbon (TOC). The permit writer has determined TOC is not a pollutant of concern at these outfalls. The facility reported 198 CFU/100mL at outfall #002, and 10 CFU/100mL at outfall #006 for fecal coliform. While fecal coliform and *E. coli* measure distinctively different organisms, the permit writer sees them as related. There are no water quality standards for fecal coliform, but there are for *E. coli*. See outfall #02A.

Chlorine, Total Residual (TRC)
The facility submitted data from December 13, 2007 through May 8, 2008 showing no detections of TRC from outfall #002. The permit writer has determined no reasonable potential for this parameter. Permit renewal testing showed 0.08 mg/L at outfall #002, and 0.06 mg/L at outfall #006; both significantly below the ML. Because outfall #006 is essentially similar for this parameter, the permit writer has determined no reasonable potential for both outfalls for TRC.

Cyanide, Amenable to Chlorination (CATC)
The permit renewal materials showed total cyanide at <50 µg/L at outfall #002, and at 50 µg/L at outfall #006. The permit writer has determined additional testing is required for CATC. Missouri's water quality standards are for CATC, not total cyanides therefore the cyanides present in the effluent may have been overestimated using the total cyanide testing method. Typically, effluent limits in permits are below the accepted minimum quantification level (ML). The department has determined the current acceptable ML for Cyanide Amenable to Chlorination (CATC) to be 10 µg/L when using SM 4500-CN^- G. Cyanides Amenable to Chlorination after Distillation in *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values equal to or greater than the minimum quantification level of 10 µg/L would be considered violations of the permit and values less than the minimum quantification level of 10 µg/L would be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of CATC in excess of the effluent limits. However, this permit establishes monitoring only, new requirement this permit, quarterly sampling and reporting.

Oil & Grease
Conventional pollutant, in accordance with 10 CSR 20-7.031 Table A: *Criteria for Designated Uses*; 10 mg/L monthly average (chronic standard). The daily maximum was calculated using the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001). Section 5.4.2 indicates the waste load allocation can be set to the chronic standard. When the chronic standard is multiplied by 1.5, the daily maximum can be calculated. Hence, 10 * 1.5 = 15 mg/L for the daily maximum. The ELG allows discharge of 20 mg/L daily maximum and 15 mg/L monthly average. However, these limits are not protective enough of the receiving lake therefore water quality limits will be used. Monthly sampling and reporting; continued from previous permit.

pH
Previous permit limits were 6.0 to 9.0, however, these limits are for treatment works treating domestic sewage for streams where mixing considerations are available. The previous limits have been assessed and determined they are not protective of water quality of Poeling Lake. The minimum value from outfall #002 reported in the last five years was 7.2, the maximum is 8.7. The minimum value from outfall #006 in the last five years was 6.6, and the maximum was 8.8 SU. The facility is able to meet the more restrictive permit limits therefore no schedule of compliance is afforded. Weekly sampling continued from previous permit.

Total Suspended Solids (TSS)

The effluent limit guidelines (ELG) for steam electric point source category for fly & bottom ash transport water BPT [40 CFR 423.12(b)(4)] is 100 mg/L daily maximum, and 30 mg/L monthly average. Facility will report total and net. Net limitations allowed; see *Part III Rationale and Derivation of Permit Limits; Intake Credits*. Weekly sampling and reporting; continued from previous permit.

METALS:

The facility tested for all of the metals on Missouri Forms C and D for permit renewal. The following table shows the best professional judgment method to determine which metals should be included in the permit using water quality standards as the guide (this differs from the TBEL POC analysis). Additionally, the facility retested for the parameters where more than one number is below. The permit writer asked the permittee to resample as the testing performed in 2008 when the permit renewal was due is outdated compared to current analytical procedures. The second number below was provided on March 4, 2016 and was used to make the final reasonable potential determination. An "X" means a sample was not collected.

WQBEL DETERMINATION:

METAL, TOTAL RECOVERABLE	OUTFALL #002 µG/L	USE	PRP OUTFALL #002 BEST PROFESSIONAL JUDGEMENT DECISION	OUTFALL #006 µG/L	USE	PRP OUTFALL #006 BEST PROFESSIONAL JUDGEMENT DECISION
Aluminum	**2800, 1120**	**AQL**	**YES**	**400, 418**	**AQL**	**YES**
Antimony	<5, <1	DW	no	<5, <1	DW	no
Arsenic	**<5, 1.4**	**AQL**	**no**	**33, 17.1**	**AQL**	**YES**
Barium	100, 93	DW	no	480, 556	DW	no
Beryllium	<5, <1	AQL	no	<5, <1	AQL	no
Boron	700, 51	IRR	no	2600, 1890	IRR	no*
Cadmium	<5, <0.4	AQL	no	<5, <0.4	AQL	no
Chromium	<5, 1.4	AQL	no	22	AQL	no
Chromium III	X, <10	AQL	no	X, <10	AQL	no
Chromium IV	**X, <5**	**AQL**	**no**	**X, 15**	**AQL**	**YES**
Cobalt	<5, <1	NWQS	no	<5, 3	NWQS	no
Copper	5, 1	AQL	no	<5, <1	AQL	no
Iron	**2500, 923**	**AQL**	**YES**	**80, 315**	**AQL**	**no**
Lead	5, 0.9	AQL	no	<5, 1	AQL	no
Magnesium	1360, 2150	NWQS	no	1760, 2740	NWQS	no
Molybdenum	40, 5	NWQS	no	280, 154	NWQS	no
Manganese	80, 50	NWQS	no	10, 29	NWQS	no
Mercury	<0.2, <0.2	AQL	no	<0.2, <0.2	AQL	no
Nickel	12, <1	AQL	no	18, 9	AQL	no
Selenium	**5, 1.3**	**AQL**	**no**	**26, 20.8**	**AQL**	**YES**
Silver	12, <0.4	AQL	no	30, <0.4	AQL	no
Thallium	6, <1	DW	no	15, <1	DW	no
Tin	<5, 5	NWQS	no	<5, 9	NWQS	no
Titanium	100, 70	NWQS	no	7, 34	NWQS	no
Zinc	44, 19	AQL	no	24, 21	AQL	no

<	Below detection limit (analytical method used showed no legitimate observation above the value reported)
*	See parameter discussion
AQL	Protection of Aquatic Life Water Quality Standard (also known as WWH)
DW:	Drinking Water Quality Standard; the Mississippi River is designated as a drinking water supply
IRR:	Irrigation Water Quality Standard; the newly classified "C" stream is designated as an irrigation water
NWQS:	No applicable Missouri Water Quality Standard (WQS) for the parameter
PRP:	Potential Reasonable Potential
Yes:	Additional sampling required to determine if RP exists
No:	Additional sampling not required. The permit writer has used best professional judgment to determine the values submitted for the purposes of permit renewal are reasonably below the Missouri water quality standards therefore have no RP to violate Missouri WQS.

The facility must use sufficiently sensitive methods as found in 40 CFR 136. No metals were addressed in any permit at either of the ash pond outfalls in the past. All requirements found below are new. All metals found below will be required to sample and report quarterly for each ash pond outfall.

Aluminum, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Arsenic, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Boron, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams; however, these protections are only afforded to parameters deemed toxic to aquatic life, watering animals, and humans. Boron has not been identified as a toxic parameter as only an irrigation use exists for surface waters; toxicity to terrestrial plants has not been included in the general criteria protection directive. However, this parameter was identified as a TBEL POC. Additional monitoring will determine if technology based limits are appropriate for this parameter.

Copper, Total Recoverable
The facility does not discharge chemical metal cleaning wastes to waters of the state therefore the BPT ELG 40 CFR 423.12(b)(5) does not apply. The facility does not have reasonable potential to cause an excursion above in-stream water-quality limitations. No monitoring required. See special condition #21.

Chromium, Hexavalent, Dissolved
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. The facility must use a sufficiently sensitive analytical method (5 µg/L was used for the renewal application resampling which is an appropriate level) to show the effluent's true concentration is below the water quality standard. Resampling on 1/27/2015 reported 15 µg/L dissolved hexavalent chromium. The acute WQS is 15 µg/L, and the chronic WQS is 10 µg/L. Monthly monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Iron, Total Recoverable
The facility does not discharge chemical metal cleaning wastes to waters of the state therefore the BPT ELG 40 CFR 423.12(b)(5) does not apply. However, the facility may have reasonable potential to cause an excursion above in-stream water-quality limitations and has also been identified as a TBEL POC.

Molybdenum, Total Recoverable
This parameter was identified as a TBEL POC.

Selenium, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Titanium, Total Recoverable
This parameter was identified as a TBEL POC.

NUTRIENTS:
The following nutrients will be evaluated quarterly by the permittee. All nutrients are new for this permit.

Ammonia as N
The facility reported 0.5 mg/L at outfall #002, and 5.6 mg/L at outfall #006 for ammonia as nitrogen. The TBEL evaluation has determined Ammonia as N is a pollutant of concern for the facility.

Kjeldahl Nitrogen, Total (TKN)
Added using the permit writer's best professional judgment. TKN is the sum of ammonia-nitrogen plus organically bound nitrogen but does not include nitrate-nitrogen or nitrite-nitrogen. The department is asking the facility to also provide this data.

Nitrate plus Nitrite as Nitrogen
The TBEL evaluation has determined nitrate plus nitrite as N is a pollutant of concern for the facility. The facility reported 2 mg/L at outfall #002, and 25 mg/L at outfall #006.

Nitrogen, Total N (TN)
The facility reported 2.2 mg/L at outfall #002 and 0.07 mg/L at outfall #006 of total nitrogen. Total Nitrogen (TN) is the sum of nitrate-nitrogen (NO_3-N), nitrite-nitrogen (NO_2-N), ammonia-nitrogen (NH_3-N) and organically bonded nitrogen. Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

Phosphorous, Total P (TN)
The facility indicated phosphorus was not present in either outfall. However, per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

OTHER:
The facility tested for sulfide, sulfite, and surfactants at these outfalls however, no water quality standards exist for these parameters therefore the permit writer has used best professional judgment to not include these parameters in the permit. The facility sampled for alpha radioactivity and both outfalls showed below detection limits. No RP. The facility sampled for total radium and radium 226, all samples were below detection limits; no RP. The facility reported a non-detect value at outfall #002, and 16.8 pCi/L at outfall #006 for beta radioactivity. The federal primary drinking water standards to which DNR regulations refer at 10 CSR 20-7.03(5)(I) are written in mrem/year. EPA 816-F-00-002 *Implementation Guidance for Radionuclides* describes how β concentration values must be converted to roentgen equivalent man (rem) per year (yr) to determine the cancer causing exposure rate which is how the drinking water standard is written. However, the facility did not supply each isotope of each element which was emitting β radiation therefore the calculation cannot be completed. However, if the heaviest beta-emitting element (^{40}K) was used to convert 100% of the analytical value into drinking water units, then 16.8 pCi/L * 730 L/y [= standard maximal exposure] * $1.88e^{-5}$ mrem/pCi [of ^{40}K] = 0.23 mrem/year, a value well below the standard of 4 mrem/yr; additional monitoring will not be required at this time.

Quarterly monitoring and reporting is required for all parameters below (except WET testing).

Chloride
The facility has indicated sulfates are present in the discharge; because Missouri water quality standards are written for the inclusion of chloride with sulfates, the facility must monitor for this parameter. New parameter this permit, monthly monitoring and reporting required.

Fluoride
The facility reported fluoride at 0.3 mg/L at outfall #002, and 1.9 mg/L at outfall #006. The TBEL POC analysis has identified this parameter is a POC therefore additional sampling is required. Currently, the discharge does not appear to have reasonable potential to cause or contribute to exceedances of in-stream water quality standards.

Sulfates
The facility reported 54 mg/L at outfall #002, and 640 mg/L at outfall #006. Current water quality standards indicate sulfates must be added to chlorides to determine compliance. The previous permit required monitoring sulfates quarterly; no limits. However, the previous permit writer did not implement the requirement correctly because the sulfate limit is tied to the addition of chlorides.

Sulfates Plus Chlorides
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state. The facility will measure sulfates and chlorides individually and report the sum total.

WET Test, Chronic
Yearly monitoring requirement only; monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards. Several new toxic parameters have been identified in these effluents therefore WET testing is required. There is no dilution of the receiving waterbody therefore a chronic test is more appropriate than the acute test. A chronic test will better characterize actual in-lake conditions because there is no mixing. Previous permit limits were pass/fail, however, the department has concluded pass/fail requirements cannot effectively measured reasonable potential. The previous permit required yearly testing in January, the permittee may test for WET at any month in this permit however yearly testing is still required, continued from previous permit and in accordance with the department's permit writer's manual.

The chronic allowable effluent concentration (AEC) for facilities discharging to unclassified, Class C, Class P (with default mixing considerations), or lakes [10 CSR 20-7.031(4)(A)4.B.(IV)(b)] is 100%.

The dilution series is standardized as 100%, 50%, 25%, 12.5%, & 6.25%.

The previous permit required only a 10% AEC. As the lake does not provide mixing, this was assuredly a typographical error and should have been 100%. The previous permit limitations also only required a single dilution test. The department's current WET testing policy indicates all WET tests performed shall be of multiple dilution series and thus the permit requirement is amended.

INTERNAL MONITORING POINT #02A: DOMESTIC WASTEWATER

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*	*	*, *	ONCE/QUARTER	ONCE/QUARTER	24 HR. TOT
CONVENTIONAL								
BOD_5	MG/L	1, 2	45	30	45, 30	ONCE/QUARTER	ONCE/QUARTER	GRAB
E. COLI	#/100 ML	1, 6	*	*	I - NEW	ONCE/QUARTER	ONCE/MONTH	GRAB
E. COLI	#/100 ML	1, 6	630	126	F - NEW	ONCE/QUARTER	ONCE/MONTH	GRAB
PH ǂ	SU	1, 2	6..0 TO 9.0	6.0 TO 9.0	6.0 TO 9.0	ONCE/QUARTER	ONCE/QUARTER	GRAB
TSS	MG/L	1, 2	45	30	45, 30	ONCE/QUARTER	ONCE/QUARTER	GRAB

* Monitoring requirement only
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.

Basis for Limitations Codes:

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

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

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. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Biochemical Oxygen Demand (BOD_5)

Effluent limitations from the previous state operating permit have been revised. Previous limitations: 45 mg/L weekly average; 30 mg/L monthly average. However, daily maximum and monthly average limitations required per 40 CFR 122.45(d); weekly and monthly averages not applicable as this discharge is not from a POTW [40 CFR 122.45(d)(2)]. Technology based limits from 10 CSR 20-7.015 applied as daily maximum 45 mg/L, monthly average 30 mg/L. Water quality limitations are not applicable at this outfall as this is an internal monitoring point.

Escherichia coli (E. coli)

The facility reported 198 CFU/100 mL at outfall #002, and 10 CFU/100 mL at outfall #006 for fecal coliform. While fecal coliform and *E. coli* measure distinctively different organisms, the permit writer sees them as related. There are no water quality standards for fecal coliform, but there are for *E. coli*. Additionally, there are no recreational uses for Poeling Lake, however, Poeling Lake discharges to backwater chutes of the Mississippi River having recreational uses. Because the discharge is within two miles [10 CSR 20-7.015(9)(B)1.D], the facility must sample for this parameter. By the nature of the discharge, reasonable potential exists. Per 10 CSR 20-7.015(9)(D)6.C. the facility must report daily maximums and monthly averages to the department during recreational season. The recreational season is defined as April 1 through October 31 per 10 CSR 20-7.031 Table A.

Averages are to be the geometric mean should the facility sample more than one time per month. The geometric mean is calculated by multiplying all of the data points and then taking the n^{th} root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 5, 6, and 10 (#/100 mL). Geometric mean = 5^{th} root of (1)(4)(5)(6)(10) = 5^{th} root of 1,200 = 4.1 #/100 mL.

The facility is currently not equipped to disinfect. The facility will have a two year schedule of compliance to meet water quality limitations for WBC-A which are 630 #/100 mL daily maximum per 10 CSR 20-7.015(9)(B)1.E. and 126 #/100 mL monthly average per 10 CSR 20-7.031 Table A.

pH

6.0 to 9.0 SU; continued from previous permit. Technology based limits at 10 CSR 20-7.015 are protective as this is an internal monitoring point. The facility will measure and report the minimum and maximum values; pH is not to be averaged. Water quality limitations are not applicable at this outfall for this parameter as this is an internal monitoring point.

Total Suspended Solids (TSS)

Effluent limitations from the previous state operating permit have been revised. Previous limitations: 45 mg/L weekly average; 30 mg/L monthly average. However, daily maximum and monthly average limitations required per 40 CFR 122.45(d); weekly and monthly averages not applicable as this discharge is not from a POTW [40 CFR 122.45(d)(2)]. Technology based limits from 10 CSR 20-7.015 applied as daily maximum 45 mg/L, monthly average 30 mg/L. Water quality limitations are not applicable at this outfall as this is an internal monitoring point.

OUTFALL #003 - EMERGENCY DISCHARGE SUMP

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*		SAME	ONCE/DAY/DISCHARGE	¤	24 HR. TOT
CONVENTIONAL								
OIL & GREASE	MG/L	1, 6	*		20, 15	ONCE/DAY/DISCHARGE	¤	GRAB
PH ǂ	SU	1, 6	*		6.0-9.0	ONCE/DAY/DISCHARGE	¤	GRAB
TSS	MG/L	1, 6	*		100, 30	ONCE/DAY/DISCHARGE	¤	GRAB
NUTRIENTS								
NITROGEN, TOTAL N (TN)	mg/L	1	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
PHOSPHORUS, TOT. P (TP)	mg/L	1	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
OTHER:								
CHLORIDES	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
SULFATES	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
CHLORIDE + SULFATE	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB

¤ - The facility must report the analytical findings no more than 30 days from the day of discharge.
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
New – new requirement

Basis for Limitations Codes:

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

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

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. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Oil & Grease
Sampling required when discharging.

pH
Sampling required when discharging.

Total Suspended Solids (TSS)
Sampling required when discharging.

NUTRIENTS:

Nitrogen, Total N (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

Phosphorous, Total P (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

OTHER:

Chloride
The facility must sample for chlorides when the emergency discharge structure is discharging.

Sulfate
The facility must sample for sulfate when the emergency discharge structure is discharging.

Chlorides Plus Sulfates
The facility must report sulfate plus chloride when the emergency discharge structure is discharging.

OUTFALL #007 - EMERGENCY DISCHARGE RECYCLE POND

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*		NEW	ONCE/DAY/DISCHARGE	¤	24 HR. TOT
CONVENTIONAL								
OIL & GREASE	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
pH ǂ	SU	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
TSS	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
FGD SCRUBBER WASTES:								
ARSENIC, TOTAL	µg/L	1	*	*	I - NEW	ONCE/DAY/DISCHARGE	¤	GRAB
ARSENIC, TOTAL	µg/L	1	11	8	F - NEW	ONCE/DAY/DISCHARGE	¤	GRAB
MERCURY, TOTAL	ng/L	1	*	*	I - NEW	ONCE/DAY/DISCHARGE	¤	GRAB
MERCURY, TOTAL	ng/L	1	788	356	F - NEW	ONCE/DAY/DISCHARGE	¤	GRAB
SELENIUM, TOTAL	µg/L	1	*	*	I - NEW	ONCE/DAY/DISCHARGE	¤	GRAB
SELENIUM, TOTAL	µg/L	1	23	12	F - NEW	ONCE/DAY/DISCHARGE	¤	GRAB
NITRATE/NITRITE AS N	mg/L	1	*	*	I - NEW	ONCE/DAY/DISCHARGE	¤	GRAB
NITRATE/NITRITE AS N	mg/L	1	17.0	4.4	F - NEW	ONCE/DAY/DISCHARGE	¤	GRAB
NUTRIENTS								
NITROGEN, TOTAL (TN)	mg/L	1	*			ONCE/DAY/DISCHARGE	¤	GRAB
PHOSPHORUS, TOT (TP)	mg/L	1	*			ONCE/DAY/DISCHARGE	¤	GRAB
OTHER								
CHLORIDES	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
SULFATES	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
CHLORIDE + SULFATE	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB

¤ - The facility must report the analytical findings no more than 30 days from the day of discharge.
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
New – new requirement
I = interim
F = final

Basis for Limitations Codes:

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

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

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. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Oil & Grease

Sampling required when discharging.

pH

Sampling required when discharging.

Total Suspended Solids (TSS)

Sampling required when discharging.

FGD SCRUBBER WASTES:

Arsenic, Total Recoverable
BAT requirements begin November 11, 2018: 11 µg/L daily maximum, 8 µg/L monthly average. Missouri water quality standards are 20 µg/L monthly average. The technology based limitations are more protective.

Mercury, Total Recoverable
BAT requirements begin November 11, 2018: 788 nanograms/L (ng/L) [0.788 µg/L] daily maximum, 356 ng/L [0.356 µg/L] monthly average. Missouri water quality standards are 2.4 µg/L daily maximum and 0.5 µg/L monthly average. The technology based limitations are more protective.

Selenium, Total Recoverable
BAT requirements begin November 11, 2018: 23 µg/L daily maximum, 12 µg/L monthly average.

Nitrate plus Nitrite as N
BAT requirements begin November 11, 2018: 17.0 mg/L daily maximum, 4.4 mg/L monthly average. There are no Missouri WQS for surface water for this parameter.

NUTRIENTS:

Nitrogen, Total N (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

Phosphorous, Total P (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

OTHER:

Chloride
The facility must sample for chlorides when the emergency discharge structure is discharging.

Sulfate
The facility must sample for sulfate when the emergency discharge structure is discharging.

Chlorides Plus Sulfates
The facility must report sulfate plus chloride when the emergency discharge structure is discharging.

Sampling and Reporting Requirements

Refer to each outfall's derivation and discussion of limits section to review individual sampling and reporting frequencies and sampling type.

ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:
The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. This final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online.

Per 40 CFR 127.15 and 127.24, permitted facilities may request a temporary waiver for up to 5 years or a permanent waiver from electronic reporting from the Department. To obtain an electronic reporting waiver, a permittee must first submit an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. A request must be made for each facility. If more than one facility is owned or operated by a single entity, then the entity must submit a separate request for each facility based on its specific circumstances. An approved waiver is non-transferable.

The Department must review and notify the facility within 120 calendar days of receipt if the waiver request has been approved or rejected [40 CFR 124.27(a)]. During the Department review period as well as after a waiver is granted, the facility must continue submitting a hard-copy of any reports required by their permit. The Department will enter data submitted in hard-copy from those facilities allowed to do so and electronically submit the data to the EPA on behalf of the facility.

✓ The permittee/facility is currently using the eDMR data reporting system. See special condition #C.24.

✓ Reporting for Thermal and pH Compliance: The facility will report their findings in the eDMR system. Daily measurements are reported in tabular format as an attachment. The facility will report the day with the highest reading in the "daily max" box for each: stream flow, stream temperature, discharge flow, and discharge temperature at end of mixing zone using the calculations provided in the permit.

PERMIT CONDITION (PARAMETER)	DISCHARGE NO.	MOCWIS PARAM. #	MOCWIS PARAMETER NAME	UNITS	LIMIT
Flow	001 T	50050	Flow, in conduit or thru treatment plant	Mgal/d (MGD)	*
Thermal Discharge	001 T	00015	Thermal discharge million btus per hr.	MBTU/hr	5.5
Effluent Flow (Qe) cfs	001 T	78886	Flow, Process water	ft^3/sec (CFS)	*
Effluent Temperature (Te) °F (monitoring location = end of pipe)	001 T	00011	Temperature, Water, deg. F	°F	*
Stream Flow (Qs) cfs (monitoring location = instream)	001 T	74069	Stream Flow – Estimated ≈	cfs	*
Stream Temperature (Ts) °F (monitoring location = instream)	001 T	52240	Temperature, background	°F	*
ΔT °F	001 T	03772	Temp. Diff between Up/Down stream	°F	5
Temz °F (monitoring location = downstream)	001 T	00011	Temperature, Water, deg. F	°F	varies monthly ϫ
Time of Deviation – Month Tcap may be exceeded 1% of the time (monthly monitoring)	001 T	82577	Month Excursion Time (Hours)	monthly total and year-to-date total (hours)	*
Tcap may be exceeded 1% of the time (yearly limit)	001 Y	82577	Month Excursion Time (Hours)	annual total (hours)	438 hours

≈ While the limit set parameter name says "estimated" the facility may <u>not</u> estimate stream flow and must use an appropriate gaging station to retrieve stream flow values.
ϫ The compliance point is listed as the Tdev value for each month as such is the value which shall not be exceeded.

SAMPLING FREQUENCY JUSTIFICATION:
Sampling and reporting frequency was generally retained from previous permit. Daily sampling of thermal discharge is required to coincide with other similar facilities. This facility is sampling for newly identified contaminants of concern at the ash ponds therefore monthly sampling is required to determine if the facility will be in compliance with the operating permit in accordance with Appendix U of Missouri's Water Pollution Control Permit Manual. Sampling frequency for stormwater-only outfalls is typically quarterly even though BMP inspection occurs monthly. The facility may sample more frequently if they need additional data to determine if their best management practices or technology is performing as expected. 40 CFR 122.45(d)(1) indicates all continuous discharges shall be permitted with daily maximum and monthly average limits.

WET Testing schedules and intervals are established in accordance with the department's Permit Writers Manual; Section 5.2 *Effluent Limits/ WET Testing for Compliance Bio-monitoring.*

<u>Chronic Whole Effluent Toxicity</u>
☒ -<u>No less than **Once/Year:**</u>
☒ -Industrial dischargers with toxic parameters in the discharge; which may alter production processes; or facilities which handle large quantities of toxic substances or substances which are toxic in large amounts shall conduct chronic WET test at a frequency of once per year.
Outfall #001: Once through cooling water - will be performed concurrently of biocide use.
Outfalls #002 and #006: Ash ponds - required yearly.

SAMPLING TYPE JUSTIFICATION:
Sampling type was generally continued from the previous permit. The sampling types are representative of the discharges, and are protective of water quality. Discharges with altering effluent should have composite sampling; discharges with uniform effluent can have grab samples. Grab samples are usually appropriate for stormwater. Parameters which must have grab sampling are: pH, ammonia, *E. coli*, total residual chlorine, free available chlorine, hexavalent chromium, dissolved oxygen, total phosphorus, and volatile organic samples. Composite sampling was changed to grab sampling at outfall #02A to match other sampling types throughout the rest of the permit.

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 all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. http://dnr.mo.gov/env/wpp/cpp/docs/watershed-based-management.pdf. 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, 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.

- ✓ *Because of the time required by the permit to conduct studies according to new CWA § 316(b) regulations, the permit will be issued for a full five year term.*

PUBLIC NOTICE:
The Department shall give public notice a draft permit has been prepared and its issuance is pending. http://dnr.mo.gov/env/wpp/permits/pn/index.html 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 first Public Notice period for this operating permit was from 9/2/2016 to 10/3/2016.

PUBLIC NOTICE COMMENTS:

Letter #1

Comment 1
DNR's BAT determination is unlawful. The fact sheet for the draft permit documents the elements that DNR considered as it conducted a TBEL analysis for thermal discharges at Sioux. DNR concluded in its best professional judgment a once through cooling system represents BAT. This is a surprising result given the explicit charge of the CWA to eliminate all polluting discharges as well as the clear instruction that the BAT standard should focus on the best performer in the industry.

DNR's TBEL determination superficially considers the relevant factors while quickly devolving into a misguided cost-benefit analysis contrasting once-through cooling with closed cycle cooling. While DNR is correct to consider the cost of compliance, there exists no legal charge to conduct a cost-benefit analysis. To the contrary, whereas the less protective best practicable control technology currently available (BPT) standard that was in place in the early years of the CWA required a consideration of cost in relation to effluent reduction benefits, the BAT standard simply lists cost among several other factors. Indeed, DNR's fact sheet identifies the proper relationship between cost and benefit as it pertains to various types of analyses. Specifically, the consideration of cost plays a lesser role in conducting BAT determinations than with other analyses. It is perplexing then that DNR proceeds to misapply the BAT requirements.

The fact sheet correctly identified closed-cycle cooling as the most common option available and an established technology that may be feasible for replacing the antiquated once-through cooling systems at Sioux. Aside from admitting that closed cycle cooling would reduce the discharge of heat load in the water –which is legally required solution to Sioux's thermal pollution problem – the remaining purported BAT analysis reads as a list of hurdles to closed-cycle cooling implementation. For instance, DNR states that closed-cycle cooling would increase the consumption of water; it would have a high capital costs and entail the addition of new chemicals, and a new water treatment plant. There is no discussion of the best performing technology applied at Sioux, would remedy the thermal pollution problem. There is no calculation of the extent to which thermal pollution would be reduced or eliminated from outfall #001 by application of alternative technologies. DNR's inappropriate and poorly executed cost analysis is mislabeled a BAT analysis. Regrettably, it is heavy on the purported cost of closed cycle cooling and bereft of its many benefits, it quantifies costs but fails to quantify pollution-reduction benefits, and it does not come close to complying with the CWA.

DNR must set permit limits for outfall #001 based on bona fide assessment of BAT. DNR must issue a revised draft NPDES permit subject to public notice and comment that describes and documents a legally sufficient BAT analysis to reduce thermal pollution from the antiquated once-through cooling system currently employed at Sioux.

Response 1
The permit writer determined the BAT at this time for the facility is once-through cooling. Nowhere in the regulations is a permit writer required to promote closed cycle cooling if it is not warranted at the site. When the facility has completed the required studies in accordance with CWA § 316(b) requirements, the permit writer may make a different conclusion if the facility has contributed to an imbalanced indigenous population of aquatic life.

Comment 2
DNR's four year schedule of compliance is unlawful. As a general rule, the CWA required that discharges comply immediately with all TBELs in furtherance of the statute's goal that all discharges of pollution ultimately be eliminated. EPA's CWA regulations therefore prohibit EPA from granting a discharger a schedule for coming into compliance where the statutory deadline has been passed; even where this is not the case, a compliance schedule cannot be issued when the water quality standards to be met are more than three years old. To obtain such a compliance schedule, the permittee must establish that such a schedule is necessary-that the standard could not otherwise be met- and even then, the permittee must achieve compliance as soon as possible.

DNR has a history of increasing thermal limits at Sioux's outfall #001. The original operating permit included a limit of 109 °F. In 1981, Ameren decided that it could operate Sioux better with a hear rejection limit of 4327.0 x 106 Btu/hr. DNR consented to this request and issued a permit in 1982 with a heat rejection limit of 4.33×10^9 Btu/hr. Two permit cycles followed with this same limit, until the limit was raised again in 1992 to 4.6×10^9 Btu/hr. In 1999, the thermal limit was elevated once more to 5.50×10^9 Btu/hr which remains the current metric.

DNR's fact sheet attempts to justify the schedule of compliance by stating that prior permit limits (and the interim limits in the draft) are stated in Btus/hr while the final permit limits are stated as temperature limits reflecting the applicable water quality standards. However, Sioux's existing permit already requires it to comply with the state's water quality standards. Thus, removing this requirement and replacing it with a four-year extension to come into compliance with water quality standards violates the anti-backsliding requirement of the CWA.

Ameren is a sophisticated utility. It knows what the water quality standards are, it knows how to meet them, and it should already be meeting them. Ameren's NPDES renewal application did not seek an extension and the fact sheet does not specify why the extension is necessary. Simply put, another four-year extension for Sioux to come into compliance with WQS is far too long.

DNR must eliminate the four-year extension for Sioux to meet the already applicable water quality standard.

Response 2
The department has reviewed additional information related to the thermal discharge at the facility and revised the SOC to allow for a two year SOC for thermal compliance. The previous permit's calculations consisted of measuring temperature on the intake condensers and measuring the temperature on the discharge condensers. This is a simple subtraction calculation to determine discharge BTUs.

In December 2016 following a meeting with the permit writer, the facility submitted a request to change the SOC a two year SOC citing that they believe it will take 24 months to design, permit, construct, and validate the instrumentation and procedures to comply with the limitation. This includes the amount of time required to install river and end of pipe monitoring gauges and software which will be used in real-time in the control room to determine compliance with WQS. Currently, the thermocouples installed at the facility measure temperatures which may not accurately represent the actual river temperature and the actual discharge temperature.

In reviewing the previous narrative permit condition which required compliance with the thermal water quality standard (WQS) it is apparent that the department was in error in placing such a condition related to WQS compliance in the permit. 40 CFR 122.44(d)(1)(iii) requires that in instances were reasonable potential (RP) to cause or contribute to an exceedance of a water quality standard exists, a numeric limitation must be included in the permit. The previous permit included a numeric BTU limitation to address the change in river temperature RP. The previous permit did not include a numeric limitation to address RP for the temperature cap. A narrative blanket expression of WQS compliance where RP exists is clearly in conflict of 40 CFR 122.44(d)(1)(iii). For this reason the narrative WQS compliance condition has been removed from the permit. Furthermore the draft permit requires compliance with a numeric temperature cap limitation given RP exists to exceed the temperature cap criteria beyond the allowable mixing zone.

Comment 3
The draft permit fails to eliminate the discharge of fly ash and bottom ash at outfalls #002 and #006.

The fact sheet for the draft permit states that: the newly revised federal Steam Electric Guidelines will require [Sioux] to eliminate the discharge of fly and bottom ash transport water as soon as possible beginning November 1, 2018 but no later than December 31, 2023. Ameren is currently designing wastewater treatment systems to manage the other (non-ash) wastestreams and has engaged DNR in discussions regarding construction and operating permit implications.

Although an accurate partial description of the revised ELGs as applied to Sioux, the fact sheet is unenforceable. The draft permit does not comply with the revised ELGs because they are not incorporated into the permit. The permit must be amended to explicitly incorporate the revised ELGs.

Outfalls #002 and #006 discharge ash transport wastewater. The revised ELG explicitly prohibits discharges of this transport water at Sioux. Although the fact sheet mentions discussions between DNR and Ameren regarding the elimination of fly and bottom ash transport water, the draft permit fails to incorporate both a deadline and a limit. To comply with the revised ELGs, DNR must endure that the final permit explicitly requires the elimination of bottom and fly ash transport water by November 1, 2018.

Response 3
The facility has determined May 1, 2021 or before would be the final sluice date. The date was approved by the department and has been incorporated as special condition #C.23 of the permit.

Comment 4
The draft permit failed to establish limits on FGD wastewater at Sioux. DNR must establish limits on FGD wastewater at outfall #007. Outfall #007 is designated as the emergency overflow from Sioux's no-discharge recycle pond, which includes FGD slurry. Pursuant to the revised ELGs, discharges of FGD wastewater from existing FGD systems are subject to limits for arsenic, mercury, selenium, and nitrogen. Accordingly, any discharges – including during an emergency – must be subject to these limits. Although the fact sheet recognizes that the revised ELGs impose limits on FGD wastewater effective November 1, 2018, the draft permit does not incorporate those limits. To comply with the revised ELGs, DNR must explicitly describe in the final permit the arsenic, mercury, selenium, and nitrogen limits applicable beginning November 1, 2018 at outfall #007.

Response 4
The purpose of the National Pollution Discharge Elimination System (NPDES) program is elimination of all sources of pollutants. By disallowing discharge of this outfall, the department has effectively controlled for the pollutants listed in the effluent limit guideline (ELG) more effectively than allowing discharge with limitations. Regardless, to comply with the spirit of the ELG, the limitations were added to the outfall even though no-discharge is more stringent than numeric effluent limitations.

Letter #2

Comment 1
The draft permit substantially changes the (final) monitoring parameters and methods to be used to assess compliance with Missouri's thermal water quality standards. It contains two provisions regarding the thermal effluent from the Center's once-through cooling water system. The first is the establishment of "interim Effluent Limitations" which continue the existing heat rejection limits for a period of up to four years. This time is provided in conjunction with a requirement that we implement changes necessary to achieve the "Final Effluent Limitations" and monitor compliance with Missouri's thermal water quality standards, applicable to Mississippi River Zone 1B per 10 CSR 20-7.031(5)(D).

The draft permit contains simple dilution formulas to be used to calculate the temperature and change in temperature at the edge of the mixing zone to assess compliance with the final limits. Facing similar criteria in prior draft permits for other Ameren Energy Centers, we raised concerns regarding our ability to maintain compliance (particularly during periods of high demand) when circumstances beyond the facility's control such as when ambient stream temperatures are very close to or exceed the monthly limits specific in the water quality standards.

At this time, we believe the Sioux Energy Center (SEC) will routinely and consistently achieve compliance using the formulas provided in the permit within the normal variability of ambient stream flows and temperatures. However, during extreme conditions our ability to operate could be impacted and in such circumstances Ameren reserves the right to seek a provisional variance from the Agency as provided by Missouri law. In addition, Ameren may seek DNR's approval of alternative measures of compliance including use of site specific thermal plume models, or other mechanisms as may be available. In addition, we may work with the Department to implement an alternative thermal discharge compliance equation, based on modeling that would more precisely calculate the change in temperature (ΔT) and temperature (T_{emz}) at the edge of the mixing zone. Ameren intends to utilize some or all of the time allowed under the interim limits, to develop appropriate monitoring methods and assess challenges posed by extreme ambient conditions as may occur during this period. The required annual report will provide the Department with details regarding compliance with the final outfall #001 limitations.

Response 1
The department does not dictate how the facility is to use the time within the schedule of compliance (SOC), however, the facility must meet the final effluent limitations when required or as soon as possible. The SOC was changed to a two year schedule as outlined in an email dated 12/9/2016.

Comment 2
Ameren believes the annual chronic WET test requirement for outfall #001 (cooling water) as listed on the tables and special condition #19 may not be necessary. Further, the required methods may not yield representative samples of the discharge during the planned molluskicide treatment of the intake bays. During the annual treatment, the intake bays are closed and isolated prior to adding molluskicide. The treatment is completed on a weekend as the plant has to be de-rated. Two air lances provide mixing within the bays. After approximately 8 hours, the intake bays are opened and pumped through the system at near 500,000 gpm. Outfall #001 samples collected following treatment are <0.05 ppm of the product (GE Spectrus CT 1300). Since the intake bay flow rates are extremely high and the molluskicide volumes and concentrations are relatively low, it would be unlikely to collect a representative sample (chronic WETs require multi day grabs) containing residual molluskicide present from outfall #001.

Response 2
The permit writer has considered the method by which molluskicides are used and has changed the type of test from chronic to single-grab acute.

Comment 3
Special condition 12 requires development and implementation of a stormwater pollution prevention plan and provides details regarding the scope and conditions. Under paragraph 13(c) it noted the plan must include a schedule for once per month inspections. We believe this is much more frequent than necessary and would create an administrative burden without commensurate benefits necessary to maintain appropriate controls. We note that SWPPP obligations for recently issued permit for Ameren's Callaway and Labadie Energy Centers, specify quarterly inspections instead. We ask the SEC permit be revised to be consistent with these and allow for a quarterly schedule.

Response 3
The department has determined monthly inspections are necessary for facilities discharging to waters of the state and the standard template language was changed accordingly. With a site as complex as this one, the permit writer has kept the frequency at monthly.

Additionally the following changes have been made to the permit draft since the public notice.

- It was determined the facility's outfall #02A is applicable to *E. coli* limitations because the nature of the discharge infers RP. The facility will have a 2-year SOC to install UV treatment as no treatment currently exists on site for bacteria. This change requires a second public notice.
- Outfall #001 permit table units were changed from mg/L to µg/L for free available chlorine
- Fact sheet permitted features table of flows was changed to add total flow correctly for outfall #006
- Low flow values were recalculated to include the Illinois River
- Weekly averages for domestic wastewater were commuted to daily maximums as only POTWs are afforded this concession.

The second Public Notice period for this operating permit was from 2/20/2017 through 3/20/2017.

One letter was received:

Comment 1
Essentially same as Comment 1 in Letter #2 for PN #1.

Response 1
The department has determined the standard equation is currently representative of this facility's discharge and the facility may submit for review, through permit modification, an alternate equation or modeling to revise the permit conditions.

Comment 2
Special condition #23 has the incorrect date for legacy wastewater.

Response 2
Special condition #23 was edited to reflect the correct legacy wastewater date of May 1, 2021.

Comment 3
The SOC compliance date for outfall #001 was listed as 4 years. Tables A-1, A-2, and fact sheet list the SOC for outfall #001 as 2 years.

Response 3
Typographical errors were corrected regarding the SOC timeframe (changed four to two) in section D of the permit. Public notice is not required as text in section A of the permit and the fact sheet clearly indicate it is a two year SOC.

Comment 4
The facility noted the last sentence of paragraph two on page three of outfall #007's discussion was removed as it was misleading and not entirely correct.

Response 4
The sentence was removed.

Comment 5
The facility noted the fact sheet's section entitled "Ash Impoundment Closures" was not labeled correctly and would be better suited in the ELG compliance section. Also, the dates supplied are tentative (except for the final sluice date).

Response 5
The section entitled "Ash Impoundment Closures" was moved to the ELG compliance section and labeled as tentative. Special condition #23 remains for the final sluice date.

Additionally the following changes have been made to the permit draft since the public notice.

- Outfall #007 fact sheet Effluent Limitations Table –total recoverable selenium; changed to reflect ELG values as WQ RP not established. Effluent limitation table A-8 for outfall #007 was correct.
- A section was added under "Part VI: Sampling and Reporting Requirements" to assist the permittee is entering the required information into eDMR.

None of these changes require an additional public notice.

DATE OF FACT SHEET: MARCH 21, 2017
COMPLETED BY:
PAM HACKLER, ENVIRONMENTAL SCIENTIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
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STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
AUGUST 1, 2014

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

Part I – General Conditions
Section A – Sampling, Monitoring, and Recording

1. **Sampling Requirements.**
   a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
   b. All samples shall be taken at the outfall(s) or Missouri Department of Natural Resources (Department) approved sampling location(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.

2. **Monitoring Requirements**.
   a. Records of monitoring information shall include:
      i. The date, exact place, and time of sampling or measurements;
      ii. The individual(s) who performed the sampling or measurements;
      iii. The date(s) analyses were performed;
      iv. The individual(s) who performed the analyses;
      v. The analytical techniques or methods used; and
      vi. The results of such analyses.
   b. If the permittee monitors any pollutant more frequently than required by the permit at the location specified in the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reported to the Department with the discharge monitoring report data (DMR) submitted to the Department pursuant to Section B, paragraph 7.

3. **Sample and Monitoring Calculations.** Calculations for all sample and monitoring results which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.

4. **Test Procedures**. The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure that the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is "sufficiently sensitive" when; 1) the method minimum level is at or below the level of the applicable water quality criterion for the pollutant or, 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility's discharge is high enough that the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015. These methods are also required for parameters that are listed as monitoring only, as the data collected may be used to determine if limitations need to be established. A permittee is responsible for working with their contractors to ensure that the analysis performed is sufficiently sensitive.

5. **Record Retention.** Except for records of monitoring information required by the permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

6. **Illegal Activities.**
   a. The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two (2) years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or both.
   b. The Missouri Clean Water Law provides that any person or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than six (6) months, or by both. Second and successive convictions for violation under this paragraph by any person shall be punished by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

Section B – Reporting Requirements

1. **Planned Changes.**
   a. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility when:
      i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
      ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42;
      iii. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
      iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.

2. **Non-compliance Reporting.**
   a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

b. The following shall be included as information which must be reported within 24 hours under this paragraph.
   i. Any unanticipated bypass which exceeds any effluent limitation in the permit.
   ii. Any upset which exceeds any effluent limitation in the permit.
   iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit required to be reported within 24 hours.

c. The Department may waive the written report on a case-by-case basis for reports under paragraph 2. b. of this section if the oral report has been received within 24 hours.

3. **Anticipated Noncompliance**. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The notice shall be submitted to the Department 60 days prior to such changes or activity.

4. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date. The report shall provide an explanation for the instance of noncompliance and a proposed schedule or anticipated date, for achieving compliance with the compliance schedule requirement.

5. **Other Noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs 2, 3, and 6 of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph 2. a. of this section.

6. **Other Information**. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

7. **Discharge Monitoring Reports.**
   a. Monitoring results shall be reported at the intervals specified in the permit.
   b. Monitoring results must be reported to the Department via the current method approved by the Department, unless the permittee has been granted a waiver from using the method. If the permittee has been granted a waiver, the permittee must use forms provided by the Department.
   c. Monitoring results shall be reported to the Department no later than the 28th day of the month following the end of the reporting period.

Section C – Bypass/Upset Requirements

1. **Definitions.**
   a. *Bypass*: the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending.
   b. *Severe Property Damage*: substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
   c. *Upset*: an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. **Bypass Requirements.**
   a. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. b. and 2. c. of this section.
   b. Notice.
      i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
      ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
   c. Prohibition of bypass.
      i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
         1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
         2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
         3. The permittee submitted notices as required under paragraph 2. b. of this section.
      ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.

3. **Upset Requirements.**
   a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
   b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
      i. An upset occurred and that the permittee can identify the cause(s) of the upset;
      ii. The permitted facility was at the time being properly operated; and
      iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
      iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
   c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

Section D – Administrative Requirements

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
   a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
   b. The Federal Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $25,000 per day for each violation. The Federal Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement

imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

c. Any person may be assessed an administrative penalty by the EPA Director for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

d. It is unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law, or any standard, rule or regulation promulgated by the commission. In the event the commission or the director determines that any provision of sections 644.006 to 644.141 of the Missouri Clean Water Law or standard, rules, limitations or regulations promulgated pursuant thereto, or permits issued by, or any final abatement order, other order, or determination made by the commission or the director, or any filing requirement pursuant to sections 644.006 to 644.141 of the Missouri Clean Water Law or any other provision which this state is required to enforce pursuant to any federal water pollution control act, is being, was, or is in imminent danger of being violated, the commission or director may cause to have instituted a civil action in any court of competent jurisdiction for the injunctive relief to prevent any such violation or further violation or for the assessment of a penalty not to exceed $10,000 per day for each day, or part thereof, the violation occurred and continues to occur, or both, as the court deems proper. Any person who willfully or negligently commits any violation in this paragraph shall, upon conviction, be punished by a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this paragraph by any person shall be punished by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

2. **Duty to Reapply.**
   a. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
   b. A permittee with a currently effective site-specific permit shall submit an application for renewal at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Department. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
   c. A permittees with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

5. **Proper Operation and Maintenance**. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

6. **Permit Actions.**
   a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
      i. Violations of any terms or conditions of this permit or the law;
      ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
      iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
      iv. Any reason set forth in the Law or Regulations.
   b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. **Permit Transfer.**
   a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
   b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
   c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.

8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

10. **Duty to Provide Information.** The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

11. **Inspection and Entry.** The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
    a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
    c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
    d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

12. **Closure of Treatment Facilities.**
    a. Persons who cease operation or plan to cease operation of waste, wastewater, and sludge handling and treatment facilities shall close the facilities in accordance with a closure plan approved by the Department.
    b. Operating Permits under 10 CSR 20-6.010 or under 10 CSR 20-6.015 are required until all waste, wastewater, and sludges have been disposed of in accordance with the closure plan approved by the Department and any disturbed areas have been properly stabilized. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed. Vegetative cover, if used, shall be at least 70% plant density over 100% of the disturbed area.

13. **Signatory Requirement.**
    a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
    b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
    c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.

14. **Severability.** The provisions of the permit are severable, and if any provision of the permit, or the application of any provision of the permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
August 1, 2019

PART III – BIOSOLIDS AND SLUDGE FROM DOMESTIC TREATMENT FACILITIES

SECTION A – GENERAL REQUIREMENTS

1. PART III Standard Conditions pertain to biosolids and sludge requirements under the Missouri Clean Water Law and regulations for domestic and municipal wastewater and also incorporates federal sludge disposal requirements under 40 CFR Part 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR Part 503 for domestic biosolids and sludge.
2. PART III Standard Conditions apply only to biosolids and sludge generated at domestic wastewater treatment facilities, including public owned treatment works (POTW) and privately owned facilities.
3. Biosolids and Sludge Use and Disposal Practices:
    a. The permittee is authorized to operate the biosolids and sludge generating, treatment, storage, use, and disposal facilities listed in the facility description of this permit.
    b. The permittee shall not exceed the design sludge/biosolids volume listed in the facility description and shall not use biosolids or sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
    c. For facilities operating under general operating permits that incorporate Standard Conditions PART III, the facility is authorized to operate the biosolids and sludge generating, treatment, storage, use and disposal facilities identified in the original operating permit application, subsequent renewal applications or subsequent written approval by the department.
4. Biosolids or Sludge Received from other Facilities:
    a. Permittees may accept domestic wastewater biosolids or sludge from other facilities as long as the permittee's design sludge capacity is not exceeded and the treatment facility performance is not impaired.
    b. The permittee shall obtain a signed statement from the biosolids or sludge generator or hauler that certifies the type and source of the sludge
5. Nothing in this permit precludes the initiation of legal action under local laws, except to the extent local laws are preempted by state law.
6. This permit does not preclude the enforcement of other applicable environmental regulations such as odor emissions under the Missouri Air Pollution Control Law and regulations.
7. This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable biosolids or sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act or under Chapter 644 RSMo.
8. In addition to Standard Conditions PART III, the Department may include biosolids and sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Exceptions to Standard Conditions PART III may be authorized on a case-by-case basis by the Department, as follows:
    a. The Department may modify a site-specific permit following permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR § 124.10, and 40 CFR § 501.15(a)(2)(ix)(E).
    b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR Part 503.

SECTION B – DEFINITIONS

1. Best Management Practices are practices to prevent or reduce the pollution of waters of the state and include agronomic loading rates (nitrogen based), soil conservation practices, spill prevention and maintenance procedures and other site restrictions.
2. Biosolids means organic fertilizer or soil amendment produced by the treatment of domestic wastewater sludge.
3. Biosolids land application facility is a facility where biosolids are spread onto the land at agronomic rates for production of food, feed or fiber. The facility includes any structures necessary to store the biosolids until soil, weather, and crop conditions are favorable for land application.
4. Class A biosolids means a material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR Part 503.
5. Class B biosolids means a material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with 40 CFR Part 503.
6. Domestic wastewater means wastewater originating from the sanitary conveniences of residences, commercial buildings, factories and institutions; or co-mingled sanitary and industrial wastewater processed by a (POTW) or a privately owned facility.
7. Feed crops are crops produced primarily for consumption by animals.
8. Fiber crops are crops such as flax and cotton.
9. Food crops are crops consumed by humans which include, but is not limted to, fruits, vegetables and tobacco.
10. Industrial wastewater means any wastewater, also known as process wastewater, not defined as domestic wastewater. Per 40 CFR Part 122.2, process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. Land application of industrial wastewater, residuals or sludge is not authorized by Standard Conditions PART III.
11. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological contact systems, and other similar facilities. It does not include wastewater treatment lagoons or constructed wetlands for wastewater treatment.
12. Plant Available Nitrogen (PAN) is nitrogen that will be available to plants during the growing seasons after biosolids application.
13. Public contact site is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.
14. Sludge is the solid, semisolid, or liquid residue removed during the treatment of wastewater. Sludge includes septage removed from septic tanks or equivalent facilities. Sludge does not include carbon coal byproducts (CCBs), sewage sludge incinerator ash, or grit/screenings generated during preliminary treatment of domestic sewage.
15. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen or concrete lined basin that receives sludge that has been removed from a wastewater treatment facility. It does not include a wastewater treatment lagoon or sludge treatment units that are not a part of a mechanical wastewater treatment facility.
16. Septage is the sludge pumped from residential septic tanks, cesspools, portable toilets, Type III marine sanitation devices, or similar treatment works such as sludge holding structures from residential wastewater treatment facilities with design populations of less than 150 people. Septage does not include grease removed from grease traps at a restaurant or material removed from septic tanks and other similar treatment works that have received industrial wastewater. The standard for biosolids from septage is different from other sludges. See Section H for more information.

SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES

1. Biosolids or sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and the requirements of Standard Conditions PART III or in accordance with Section A.3.c., above.
2. The permittee shall operate storage and treatment facilities, as defined by Section 644.016(23), RSMo, so that there is no biosolids or sludge discharged to waters of the state. Agricultural storm water discharges are exempt under the provisions of Section 644.059, RSMo.
3. Mechanical treatment plants shall have separate biosolids or sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove biosolids or sludge from these storage compartments on the required design schedule is a violation of this permit.

SECTION D – BIOSOLIDS OR SLUDGE DISPOSED AT OTHER TREATMENT FACILITY OR BY CONTRACT HAULER

1. Permittees that use contract haulers, under the authority of their operating permit, to dispose of biosolids or sludge, are responsible for compliance with all the terms of this permit. Contract haulers that assume the responsibility of the final disposal of biosolids or sludge, including biosolids land application, must obtain a Missouri State Operating Permit unless the hauler transports the biosolids or sludge to another permitted treatment facility.
2. Testing of biosolids or sludge, other than total solids content, is not required if biosolids or sludge are hauled to a permitted wastewater treatment facility, unless it is required by the accepting facility.

SECTION E – INCINERATION OF SLUDGE

1. Please be aware that sludge incineration facilities may be subject to the requirements of 40 CFR Part 503 Subpart E, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Permittee may be authorized under the facility description of this permit to store incineration ash in lagoons or ash ponds. This permit does not authorize the disposal of incineration ash. Incineration ash shall be disposed in accordance with 10 CSR 80; or, if the ash is determined to be hazardous, with 10 CSR 25.
3. In addition to normal sludge monitoring, incineration facilities shall report the following as part of the annual report, mass of sludge incinerated and mass of ash generated. Permittee shall also provide the name of the ash disposal facility and permit number if applicable.

SECTION F – SURFACE DISPOSAL SITES AND BIOSOLIDS AND SLUDGE LAGOONS

1. Please be aware that surface disposal sites of biosolids or sludge from wastewater treatment facilities may be subject to other laws including the requirements in 40 CFR Part 503 Subpart C, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Biosolids or sludge storage lagoons are temporary facilities and are not required to obtain a permit as a solid waste management facility under 10 CSR 80. In order to maintain biosolids or sludge storage lagoons as storage facilities, accumulated biosolids or sludge must be removed routinely, but not less than once every two years unless an alternate schedule is approved in the permit. The amount of biosolids or sludge removed will be dependent on biosolids or sludge generation and accumulation in the facility. Enough biosolids or sludge must be removed to maintain adequate storage capacity in the facility.
    a. In order to avoid damage to the lagoon seal during cleaning, the permittee may leave a layer of biosolids or sludge on the bottom of the lagoon, upon prior approval of the Department; or
    b. Permittee shall close the lagoon in accordance with Section I.

SECTION G – LAND APPLICATION OF BIOSOLIDS

1. The permittee shall not land apply biosolids unless land application is authorized in the facility description, the special conditions of the issued NPDES permit, or in accordance with Section A.3.c., above.
2. This permit only authorizes "Class A" or "Class B" biosolids derived from domestic wastewater to be land applied onto grass land, crop land, timber, or other similar agricultural or silviculture lands at rates suitable for beneficial use as organic fertilizer and soil conditioner.
3. Class A Biosolids Requirements: Biosolids shall meet Class A requirements for application to public contact sites, residential lawns, home gardens or sold and/or given away in a bag or other container.
4. Class B biosolids that are land applied to agricultural and public contact sites shall comply with the following restrictions:
    a. Food crops that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
    b. Food crops below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
    c. Food crops below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
    d. Animal grazing shall not be allowed for 30 days after application of biosolids.
    e. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
    f. Turf shall not be harvested for one year after application of biosolids if used for lawns or high public contact sites in close proximity to populated areas such as city parks or golf courses.
    g. After Class B biosolids have been land applied to public contact sites with high potential for public exposure, as defined in 40 CFR § 503.31, such as city parks or golf courses, access must be restricted for 12 months.
    h. After Class B biosolids have been land applied public contact sites with low potential for public exposure as defined in 40 CFR § 503.31, such as a rural land application or reclamation sites, access must be restricted for 30 days.

5. Pollutant limits
    a. Biosolids shall be monitored to determine the quality for regulated pollutants listed in Table 1, below. Limits for any pollutants not listed below may be established in the permit.
    b. The number of samples taken is directly related to the amount of biosolids or sludge produced by the facility (See Section J, below). Samples should be taken only during land application periods. When necessary, it is permissible to mix biosolids with lower concentrations of biosolids as well as other suitable Department approved material to achieve pollutant concentration below those identified in Table 1, below.
    c. Table 1 gives the ceiling concentration for biosolids. Biosolids which exceed the concentrations in Table 1 may not be land applied.

TABLE 1

Biosolids ceiling concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

d. Table 2 below gives the low metal concentration for biosolids. Because of its higher quality, biosolids with pollutant concentrations below those listed in Table 2 can safely be applied to agricultural land, forest, public contact sites, lawns, home gardens or be given away without further analysis. Biosolids containing metals in concentrations above the low metals concentrations but below the ceiling concentration limits may be land applied but shall not exceed the annual loading rates in Table 3 and the cumulative loading rates in Table 4. The permittee is required to track polluntant loading onto application sites for parameters that have exceeded the low metal concentration limits.

TABLE 2

Biosolids Low Metal Concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

e. Annual pollutant loading rate.

Table 3

Biosolids Annual Loading Rate	
Pollutant	Kg/ha (lbs./ac) per year
Arsenic	2.0 (1.79)
Cadmium	1.9 (1.70)
Copper	75 (66.94)
Lead	15 (13.39)
Mercury	0.85 (0.76)
Nickel	21 (18.74)
Selenium	5.0 (4.46)
Zinc	140 (124.96)

f. Cumulative pollutant loading rates.

Table 4

Biosolids Cumulative Pollutant Loading Rate	
Pollutant	Kg/ha (lbs./ac)
Arsenic	41 (37)
Cadmium	39 (35)
Copper	1500 (1339)
Lead	300 (268)
Mercury	17 (15)
Nickel	420 (375)
Selenium	100 (89)
Zinc	2800 (2499)

6. Best Management Practices. The permittee shall use the following best management practices during land application activities to prevent the discharge of biosolids to waters of the state.
   a. Biosolids shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under § 4 of the Endangered Species Act or its designated critical habitat.
   b. Apply biosolids only at the agronomic rate of nitrogen needed (see 5.c. of this section).
   c. The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop

nitrogen removal when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kgTN; or 2) When biosolids are land applied at an application rate greater than two dry tons per acre per year.

i. PAN can be determined as follows:

(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor[1]).

[1] Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volitalization factors and mineralization rates can be utilized on a case-by-case basis.

ii. Crop nutrient production/removal to be based on crop specific nitrogen needs and realistic yield goals. **NOTE:** There are a number of reference documents on the Missouri Department of Natural Resources website that are informative to implement best management practices in the proper management of biosolids, including crop specific nitrogen needs, realistic yields on a county by county basis and other supporting references.

iii. Biosolids that are applied at agronomic rates shall not cause the annual pollutant loading rates identified in Table 3 to be exceeded.

d. Buffer zones are as follows:

i. 300 feet of a water supply well, sinkhole, water supply reservoir or water supply intake in a stream;

ii. 300 feet of a losing stream, no discharge stream, stream stretches designated for whole body contact recreation, wild and scenic rivers, Ozark National Scenic Riverways or outstandingstate resource waters as listed in the Water Quality Standards, 10 CSR 20-7.031;

iii. 150 feet of dwellings or public use areas;

iv. 100 feet (35 feet if biosolids application is down-gradient or the buffer zone is entirely vegetated) of lake, pond, wetlands or gaining streams (perennial or intermittent);

v. 50 feet of a property line. Buffer distances from property lines may be waived with written permission from neighboring property owner.

vi. For the application of dry, cake or liquid biosolids that are subsurface injected, buffer zones identified in 5.d.i. through 5.d.iii above, may be reduced to 100 feet. The buffer zone may be reduced to 35 feet if the buffer zone is permanently vegetated. Subsurface injection does not include methods or technology reflective of combination surface/shallow soil incorporation.

e. Slope limitation for application sites are as follows:

i. For slopes less than or equal to 6 percent, no rate limitation;

ii. Applied to a slope 7 to 12 percent, the applicator may apply biosolids when soil conservation practices are used to meet the minimum erosion levels;

iii. Slopes > 12 percent, apply biosolids only when grass is vegetated and maintained with at least 80 percent ground cover at a rate of two dry tons per acre per year or less.

iv. Dry, cake or liquid biosolids that are subsurface injected, may be applied on slopes not to exceed 20 percent. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation.

f. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.

g. Biosolids may be land applied to sites with soil that are snow covered, frozen, or saturated with liquid when site restrictions or other controls are provided to prevent pollutants from being discharged to waters of the state during snowmelt or stormwater runoff. During inclement weather or unfavorable soil conditions use the following management practices:

i. A maximum field slope of 6% and a minimum 300 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be utilized for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of mthods or technology refletive of combination surface/shallow soil incorporation;

ii. A maximum field slope of 2% and 100 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be used for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not included the use of methods or technology refletive of combination surface/shallow soil incorporation;

iii. Other best management practices approved by the Department.

SECTION H – SEPTAGE

1. Haulers that land apply septage must obtain a state permit. An operating permit is not required for septage haulers who transport septage to another permitted treatment facility for disposal.
2. Do not apply more than 30,000 gallons of septage per acre per year or the volume otherwise stipulated in the operating permit.
3. Septic tanks are designed to retain sludge for one to three years which will allow for a larger reduction in pathogens and vectors, as compared to mechanical treatment facilities.
4. Septage must comply with Class B biosolids regarding pathogen and vector attraction reduction requirements before it may be applied to crops, pastures or timberland. To meet required pathogen and vector reduction requirements, mix 50 pounds of hydrated lime for every 1,000 gallons of septage and maintain a septage pH of at least 12 pH standard units for 30 minutes or more prior to application.
5. Lime is to be added to the pump truck and not directly to the septic tanks, as lime would harm the beneficial bacteria of the septic tank.
6. As residential septage contains relatively low levels of metals, the testing of metals in septage is not required.

SECTION I– CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical and lagoons) and sludge or biosolids storage and treatment facilities. It does not apply to land application sites.
2. Permittees of a domestic wastewater facility who plan to cease operation must obtain Department approval of a closure plan which addresses proper removal and disposal of all sludges and/or biosolids. Permittee must maintain this permit until the facility is closed in accordance with the approved closure plan per 10 CSR 20 – 6. 010 and 10 CSR 20 – 6.015.
3. Biosolids or sludge that are left in place during closure of a lagoon or earthen structure or ash pond shall not exceed the agricultural loading rates as follows:
    a. Biosolids and sludge shall meet the monitoring and land application limits for agricultural rates as referenced in Section G, above.
    b. If a wastewater treatment lagoon has been in operation for 15 years or more without sludge removal, the sludge in the lagoon qualifies as a Class B biosolids with respect to pathogens due to anaerobic digestion, and testing for fecal coliform is not required. For other lagoons, testing for fecal coliform is required to show compliance with Class B biosolids limitations. In order to reach Class B biosolids requirements, fecal coliform must be less than 2,000,000 colony forming units or 2,000,000 most probable number. All fecal samples must be presented as geometric mean per gram.
    c. The allowable nitrogen loading that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. For a grass cover crop, the allowable PAN is 300 pounds/acre. Alternative, site-specific application rates may be included in the closure plan for department consideration.
        i. PAN can be determined as follows:
        (Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor[1]).
        [1] Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volitalization factors and mineralization rates can be utilized on a case-by-case basis
4. Domestic wastewater treatment lagoons with a design treatment capacity less than or equal to 150 persons, are "similar treatment works" under the definition of septage. Therefore the sludge within the lagoons may be treated as septage during closure activities. See Section B, above. Under the septage category, residuals may be left in place as follows:
    a. Testing for metals or fecal coliform is not required.
    b. If the wastewater treatment lagoon has been in use for less than 15 years, mix lime with the sludge at a rate of 50 pounds of hydrated lime per 1000 gallons (134 cubic feet) of sludge.
    c. The amount of sludge that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. 100 dry tons/acre of sludge may be left in the basin without testing for nitrogen. If 100 dry tons/acre or more will be left in the lagoon, test for nitrogen and determine the PAN using the calculation above. Allowable PAN loading is 300 pounds/acre.
5. Biosolids or sludge left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, and unless otherwise approved, the lagoon berm shall be demolished, and the site shall be graded and contain ≥70% vegetative density over 100% of the site so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion. Alternative biosolids or sludge and soil mixing ratios may be included in the closure plan for department consideration.
6. Lagoon and earthen structure closure activities shall obtain a storm water permit for land disturbance activities that equal or exceed one acre in accordance with 10 CSR 20-6.200.
7. When closing a mechanical wastewater plant, all biosolids or sludge must be cleaned out and disposed of in accordance with the Department approved closure plan before the permit for the facility can be terminated.
    a. Land must be stabilized which includes any grading, alternate use or fate upon approval by the Department, remediation, or other work that exposes sediment to stormwater per 10 CSR 20-6.200. The site shall be graded and contain ≥70% vegetative density over 100% of the site, so as to avoid ponding of storm water and provide adequate

surface water drainage without creating erosion.

b. Hazardous Waste shall not be land applied or disposed during mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations pursuant to 10 CSR 25.

c. After demolition of the mechanical plant, the site must only contain clean fill defined in Section 260.200.1(6) RSMo as uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinderblocks, brick, minimal amounts of wood and metal, and inert solids as approved by rule or policy of the Department for fill, reclamation, or other beneficial use. Other solid wastes must be removed.

8. If biosolids or sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or I, a landfill permit or solid waste disposal permit must be obtained if the permittee chooses to seek authorization for on-site sludge disposal under the Missouri Solid Waste Management Law and regulations per 10 CSR 80, and the permittee must comply with the surface disposal requirements under 40 CFR Part 503, Subpart C.

SECTION J – MONITORING FREQUENCY

1. At a minimum, biosolids or sludge shall be tested for volume and percent total solids on a frequency that will accurately represent sludge quantities produced and disposed. Please see the table below.

TABLE 5

Biosolids or Sludge produced and disposed (Dry Tons per Year)	Monitoring Frequency (See Notes 1, and 2)		
	Metals, Pathogens and Vectors, Total Phosphorus, Total Potassium	Nitrogen TKN, Nitrogen PAN[1]	Priority Pollutants[2]
319 or less	1/year	1 per month	1/year
320 to 1650	4/year	1 per month	1/year
1651 to 16,500	6/year	1 per month	1/year
16,501+	12/year	1 per month	1/year

[1] Calculate plant available nitrogen (PAN) when either of the following occurs: 1) when biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.

[2] Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) are required only for permit holders that must have a pre-treatment program. Monitoring requirements may be modified and incorporated into the operating permit by the Department on a case-by-case basis.

Note 1: Total solids: A grab sample of sludge shall be tested one per day during land application periods for percent total solids. This data shall be used to calculate the dry tons of sludge applied per acre.
Note 2: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

2. Permittees that operate wastewater treatment lagoons, peak flow equalization basins, combined sewer overflow basins or biosolids or sludge lagoons that are cleaned out once a year or less, may choose to sample only when the biosolids or sludge is removed or the lagoon is closed. Test one composite sample for each 319 dry tons of biosolids or sludge removed from the lagoon during the reporting year or during lagoon closure. Composite sample must represent various areas at one-foot depth.
3. Additional testing may be required in the special conditions or other sections of the permit.
4. Biosolids and sludge monitoring shall be conducted in accordance with federal regulation 40 CFR § 503.8, Sampling and analysis.

SECTION K – RECORD KEEPING AND REPORTING REQUIREMENTS

1. The permittee shall maintain records on file at the facility for at least five years for the items listed in Standard Conditions PART III and any additional items in the Special Conditions section of this permit. This shall include dates when the biosolids or sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
2. Reporting period
   a. By February 19th of each year, applicable facilities shall submit an annual report for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and biosolids or sludge disposal facilities.
   b. Permittees with wastewater treatment lagoons shall submit the above annual report only when biosolids or sludge are removed from the lagoon during the report period or when the lagoon is closed.
3. Report Form. The annual report shall be prepared on report forms provided by the Department or equivalent forms approved by the Department.
4. Reports shall be submitted as follows:
   Major facilities, which are those serving 10,000 persons or more or with a design flow equal to or greater than 1 million gallons per day or that are required to have an approved pretreatment program, shall report to both the Department and EPA if the facility land applied, disposed of biosolids by surface disposal, or operated a sewage sludge incinerator. All other facilities shall maintain their biosolids or sludge records and keep them available to Department personnel upon request. State reports shall be submitted to the address listed as follows:

   DNR regional or other applicable office listed in the
   permit (see cover letter of permit)
   ATTN: Sludge Coordinator

Reports to EPA must be electronically submitted online via the Central Data Exchange at: https://cdx.epa.gov/ Additional information is available at: https://www.epa.gov/biosolids/compliance-and-annual-reporting-guidance-about-clean-water-act-laws

5. Annual report contents. The annual report shall include the following:
    a. Biosolids and sludge testing performed. If testing was conducted at a greater frequency than what is required by the permit, all test results must be included in the report.
    b. Biosolids or sludge quantity shall be reported as dry tons for the quantity produced and/or disposed.
    c. Gallons and % solids data used to calculate the dry ton amounts.
    d. Description of any unusual operating conditions.
    e. Final disposal method, dates, and location, and person responsible for hauling and disposal.
        i. This must include the name and address for the hauler and sludge facility. If hauled to a municipal wastewater treatment facility, sanitary landfill, or other approved treatment facility, give the name of that facility.
        ii. Include a description of the type of hauling equipment used and the capacity in tons, gallons, or cubic feet.
    f. Contract Hauler Activities:
    If using a contract hauler, provide a copy of a signed contract from the contractor. Permittee shall require the contractor to supply information required under this permit for which the contractor is responsible. The permittee shall submit a signed statement from the contractor that he has complied with the standards contained in this permit, unless the contract hauler has a separate biosolids or sludge use permit.
    g. Land Application Sites:
        i. Report the location of each application site, the annual and cumulative dry tons/acre for each site, and the landowners name and address. The location for each spreading site shall be given as a legal description for nearest ¼, ¼, Section, Township, Range, and county, or UTM coordinates. The facility shall report PAN when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.
        ii. If the "Low Metals" criteria are exceeded, report the annual and cumulative pollutant loading rates in pounds per acre for each applicable pollutant, and report the percent of cumulative pollutant loading which has been reached at each site.
        iii. Report the method used for compliance with pathogen and vector attraction requirements.
        iv. Report soil test results for pH and phosphorus. If no soil was tested during the year, report the last date when tested and the results.

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MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
Water Protection Program
FORM A – APPLICATION FOR NONDOMESTIC PERMIT UNDER MISSOURI CLEAN WATER LAW

FOR AGENCY USE ONLY	
CHECK NUMBER	1440781
DATE RECEIVED 10-2-17	FEE SUBMITTED #1250.00 JS.

Note ► PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM.

1. This application is for:

☐ An operating permit for a new or unpermitted facility:
Please indicate the original Construction Permit # _____

☐ An operating permit renewal:
Please indicate the permit # MO-_____ Expiration Date _____

☑ An operating permit modification:
Please indicate the permit # MO- 0000353 Modification Reason: new/modified outfalls & treatment

1.1 Is the appropriate fee included with the application? (See instructions for appropriate fee) ☑ YES ☐ NO

2. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE / FAX	
Ameren Missouri Sioux Energy Center		(314) 554-4581 /	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
8501 North State Route 94	West Alton	MO	63386

3. OWNER

NAME	EMAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE / FAX	
Union Electric Company d/b/a Ameren Missouri	msmallwood@ameren.com	(314) 554-4581 /	
ADDRESS (MAILING)	CITY	STATE	ZIP CODE
PO Box 66149, MC602	St. Louis	MO	63166-6149

3.1 Request review of draft permit prior to public notice? ■ YES ☐ NO

4. CONTINUING AUTHORITY

NAME	EMAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE / FAX	
Same as Owner		/	
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

5. OPERATOR

NAME	CERTIFICATE NUMBER	TELEPHONE NUMBER WITH AREA CODE / FAX	
Same as Owner		/	
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

6. FACILITY CONTACT

NAME	TITLE / E-MAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE / FAX
Matthew T. Wallace	Director, Sioux Energy Center /	(314) 992-6201 /

7. ADDITIONAL FACILITY INFORMATION

7.1 Legal Description of Outfalls. (Attach additional sheets if necessary.) see attached sheet

001 ____¼ ____¼ Sec ____ T ____ R ____ ____ County
UTM Coordinates Easting (X): _____ Northing (Y): _____
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

002 ____¼ ____¼ Sec ____ T ____ R ____ ____ County
UTM Coordinates Easting (X): _____ Northing (Y): _____

003 ____¼ ____¼ Sec ____ T ____ R ____ ____ County
UTM Coordinates Easting (X): _____ Northing (Y): _____

004 ____¼ ____¼ Sec ____ T ____ R ____ ____ County
UTM Coordinates Easting (X): _____ Northing (Y): _____

7.2 Primary Standard Industrial Classification (SIC) and Facility North American Industrial Classification System (NAICS) Codes.

001 – SIC 4911 and NAICS 221112 002 – SIC _____ and NAICS _____
003 – SIC _____ and NAICS _____ 004 – SIC _____ and NAICS _____

8. ADDITIONAL FORMS AND MAPS NECESSARY TO COMPLETE THIS APPLICATION
(Complete all forms that are applicable.)

A.	Is your facility a manufacturing, commercial, mining or silviculture waste treatment facility? If yes, complete Form C or 2F. (2F is the U.S. EPA's Application for Storm Water Discharges Associate with Industrial Activity.)	YES ☑	NO ☐
B.	Is application for storm water discharges only? If yes, complete Form C or 2F.	YES ☐	NO ☑
C.	Is your facility considered a "Primary Industry" under EPA guidelines: If yes, complete Forms C or 2F and D.	YES ☑	NO ☐
D.	Is wastewater land applied? If yes, complete Form I.	YES ☐	NO ☑
E.	Is sludge, biosolids, ash or residuals generated, treated, stored or land applied? If yes, complete Form R.	YES ☐	NO ☑
F.	If you are a Class IA CAFO, please disregard part D and E of this section. However, please attach any revision to your Nutrient Management Plan.		
F.	Attach a map showing all outfalls and the receiving stream at 1" = 2,000' scale.		

9. ELECTRONIC DISCHARGE MONITORING REPORT (eDMR) SUBMISSION SYSTEM

Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data. **One of the following must be checked in order for this application to be considered complete.** Please visit http://dnr.mo.gov/env/wpp/edmr.htm to access the Facility Participation Package.

☐ - You have completed and submitted with this permit application the required documentation to participate in the eDMR system.

☑ - You have previously submitted the required documentation to participate in the eDMR system and/or you are currently using the eDMR system.

☐ - You have submitted a written request for a waiver from electronic reporting. See instructions for further information regarding waivers.

10. DOWNSTREAM LANDOWNER(S) Attach additional sheets as necessary. See Instructions.
(PLEASE SHOW LOCATION ON MAP. SEE 8.D ABOVE).

NAME			
United States of America			
ADDRESS	**CITY**	**STATE**	**ZIP CODE**
1222 Spruce Street	St. Louis	MO	63103-2818

11. I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available to applicant under the Missouri Clean Water Law to the Missouri Clean Water Commission.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
Matthew T. Wallace - Director, Sioux Energy Center	(314) 992-2601
SIGNATURE	**DATE SIGNED**
Matthew T. Wallace	09/28/2017

MO 780-1479 (09-16)

BEFORE MAILING, PLEASE ENSURE ALL SECTIONS ARE COMPLETED AND ADDITIONAL FORMS, IF APPLICABLE, ARE INCLUDED.

Submittal of an incomplete application may result in the application being returned.

HAVE YOU INCLUDED:

- ☑ Appropriate Fees?
- ☑ Map at 1" = 2000' scale?
- ☑ Signature?
- ☑ Form C or 2F, if applicable?
- ☑ Form D, if applicable?
- ☐ Form I (Irrigation), if applicable?
- ☐ Form R (Sludge), if applicable?
- ☐ Revised Nutrient Management Plan, if applicable?

Sioux Power Plant, NPDES Permit MO-0000353

Form A, Section 7.0 Attachment

7. ADDITIONAL FACILITY INFORMATION

7.1 Legal Description of Outfalls

Note that 1/4 and Section are not applicable - see USG Survey 1838

Outfall	Township	Range	County	Easting (X)	Northing (Y)
001	48N	6E	St. Charles	734877	4311058
002	48N	6E	St. Charles	734273	4310597
003	48N	6E	St. Charles	734884	4310982
004	48N	6E	St. Charles	734711	4310878
005	48N	6E	St. Charles	734408	4310020
006	48N	6E	St. Charles	734716	4310212
007	48N	6E	St. Charles	734392	4309811
009	**48N**	**6E**	**St. Charles**	**734745**	**4310906**
09A	**48N**	**6E**	**St. Charles**	**735053**	**4310953**
010	**48N**	**6E**	**St. Charles**	**734606**	**4310668**

Note that above easting/northing locations are approximate.
Note that new/revised outfalls are in bold font.
Note that Outfall 008 is the intake structure, designated as a "permit feature".

7.2 Primary Standard Industrial Classification (SIC) and Facility North American Industrial Classification System (NAICS) Codes

Outfall	SIC	NAICS
001	4911	221112
002	4911	221112
003	4911	221112
004	4911	221112
005	4911	221112
006	4911	221112
007	4911	221112
008	4911	221112
009	4911	221112
09A	4911	221112
010	4911	221112

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Water Protection Program

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH

FORM C – APPLICATION FOR DISCHARGE PERMIT – MANUFACTURING, COMMERCIAL, MINING, SILVICULTURE OPERATIONS, PROCESS AND STORMWATER

FOR AGENCY USE ONLY	
CHECK NO.	
DATE RECEIVED	FEE SUBMITTED

NOTE: DO NOT ATTEMPT TO COMPLETE THIS FORM BEFORE READING THE ACCOMPANYING INSTRUCTIONS

1.00 NAME OF FACILITY

Ameren Missouri Sioux Energy Center

1.10 THIS FACILITY IS NOW IN OPERATION UNDER MISSOURI OPERATING PERMIT NUMBER

MO-0000353

1.20 THIS IS A NEW FACILITY AND WAS CONSTRUCTED UNDER MISSOURI CONSTRUCTION PERMIT NUMBER (COMPLETE ONLY IF THIS FACILITY DOES NOT HAVE AN OPERATING PERMIT).

NA

2.00 LIST THE STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES APPLICABLE TO YOUR FACILITY (FOUR DIGIT CODE)

A. FIRST 4911 B. SECOND _____

C. THIRD _____ D. FOURTH _____

2.10 FOR EACH OUTFALL GIVE THE LEGAL DESCRIPTION.

OUTFALL NUMBER (LIST) _____1/4 _____1/4 SEC_____ T_____ R_____ _____COUNTY

See attached list

2.20 FOR EACH OUTFALL LIST THE NAME OF THE RECEIVING WATER

OUTFALL NUMBER (LIST)	RECEIVING WATER
001, 003, 004, 009, 09A	Mississippi River
002, 005, 006	Mississippi River via Poeling Lake
007	Missouri River
008	NA - Permitted Feature

2.30 BRIEFLY DESCRIBE THE NATURE OF YOUR BUSINESS

Steam electric generating facility.

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent and treatment units labeled to correspond to the more detailed descriptions in item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, public sewers and outfalls. If a water balance cannot by determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of 1. All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water and storm water runoff. 2. The average flow contributed by each operation. 3. The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO.	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
(LIST)	A. OPERATION (LIST)	B. AVERAGE FLOW (INCLUDE UNITS) (MAXIMUM FLOW)	A. DESCRIPTION	B. LIST CODES FROM TABLE A
001	Non-contact cooling water	645 (724) MGD	Discharge	4-A
002	Bottom Ash Pond (Pond #1)	0.00 (15.8) MGD	Settling	1-U
			Discharge	4-A
003	Combined Drain Sump Overflo	0.00 (3.48) MGD	Discharge	4-A
004	Stormwater	Intermittent	Discharge	4-A
005	Stormwater	Intermittent	Discharge	4-A
006	Fly Ash Pond (Pond #2)	0.00 (10.8) MGD	Settling	1-U
			Neutralization	2-K
			Disccharge	4-A
007	Recycle Pond Emer Overflow	0.00 (1378) MGD	Settling	1-U
			Discharge	4-A
008	Intake "Permitted Feature"	NA	NA	NA
009	LVW Treatment Effluent	2.84 (8.17)	Coagulation	2-D
	- North Area Sump		Settling	1-U
	- South Area Sump		Neutralization	2-K
	- NCCM Wastewater		Discharge	4-A
	- Stormwater			
	- Bottom Ash Quench			
	- Sewage Treatment Plant			
09A	Sewage Treatment Plant	0.013 (0.039) MGD	Activated Sludge	3-A
			Settling	2-K
010	LVW Emer Overflow	0.00 (25.1) MGD	Setttling	2-K
			Discharge	4-A

2.40 CONTINUED

C. EXCEPT FOR STORM RUNOFF, LEAKS OR SPILLS, ARE ANY OF THE DISCHARGES DESCRIBED IN ITEMS A OR B INTERMITTENT OR SEASONAL?

☐ **YES** *(COMPLETE THE FOLLOWING TABLE)* ☑ **NO** *(GO TO SECTION 2.50)*

1. OUTFALL NUMBER *(list)*	2. OPERATION(S) CONTRIBUTING FLOW *(list)*	3. FREQUENCY		4. FLOW				C. DURATION *(in days)*
				A. FLOW RATE *(in mgd)*		B. TOTAL VOLUME (specify with units)		
		A. DAYS PER WEEK *(specify average)*	B. MONTHS PER YEAR *(specify average)*	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	4. LONG TERM DAILY	3. MAXIMUM AVERAGE	

2.50 MAXIMUM PRODUCTION

A. DOES AN EFFLUENT GUIDELINE LIMITATION PROMULGATED BY EPA UNDER SECTION 304 OF THE CLEAN WATER ACT APPLY TO YOUR FACILITY?

☑ **YES** *(COMPLETE B.)* ☐ **NO** *(GO TO SECTION 2.60)*

B. ARE THE LIMITATIONS IN THE APPLICABLE EFFLUENT GUIDELINES EXPRESSED IN TERMS OF PRODUCTION (OF OTHER MEASURE OF OPERATION)?

☐ **YES** *(COMPLETE c.)* ☑ **NO** *(GO TO SECTION 2.60)*

C. IF YOU ANSWERED "YES" TO B. LIST THE QUANTITY THAT REPRESENTS AN ACTUAL MEASUREMENT OF YOUR MAXIMUM LEVEL OF PRODUCTION, EXPRESSED IN THE TERMS AND UNITS USED IN THE APPLICABLE EFFLUENT GUIDELINE AND INDICATE THE AFFECTED OUTFALLS.

1. MAXIMUM QUANTITY			2. AFFECTED OUTFALLS *(list outfall numbers)*
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	

2.60 IMPROVEMENTS

A. ARE YOU NOW REQUIRED BY ANY FEDERAL, STATE OR LOCAL AUTHORITY TO MEET, ANY IMPLEMENTATION SCHEDULE FOR THE CONSTRUCTION, UPGRADING OR OPERATION OF WASTEWATER TREATMENT EQUIPMENT OR PRACTICES OR ANY OTHER ENVIRONMENTAL PROGRAMS THAT MAY AFFECT THE DISCHARGES DESCRIBED IN THIS APPLICATION? THIS INCLUDES, BUT IS NOT LIMITED TO, PERMIT CONDITIONS, ADMINISTRATIVE OR ENFORCEMENT ORDERS, ENFORCEMENT COMPLIANCE SCHEDULE LETTERS, STIPULATIONS, COURT ORDERS AND GRANT OR LOAN CONDITIONS.

☐ **YES** *(COMPLETE THE FOLLOWING TABLE)* ☑ **NO** *(GO TO 3.00)*

1. IDENTIFICATION OF CONDITION AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
				A. REQUIRED	B. PROJECTED

B. OPTIONAL: YOU MAY ATTACH ADDITIONAL SHEETS DESCRIBING ANY ADDITIONAL WATER POLLUTION CONTROL PROGRAMS *(OR OTHER ENVIRONMENTAL PROJECTS WHICH MAY AFFECT YOUR DISCHARGES)* YOU NOW HAVE UNDER WAY OR WHICH YOU PLAN. INDICATE WHETHER EACH PROGRAM IS NOW UNDER WAY OR PLANNED, AND INDICATE YOUR ACTUAL OR PLANNED SCHEDULES FOR CONSTRUCTION.

☑ **MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED.**

3.00 INTAKE AND EFFLUENT CHARACTERISTICS

A. & B. SEE INSTRUCTIONS BEFORE PROCEEDING – COMPLETE ONE TABLE FOR EACH OUTFALL – ANNOTATE THE OUTFALL NUMBER IN THE SPACE PROVIDED.
NOTE: TABLE 1 IS INCLUDED ON SEPARATE SHEETS NUMBERED FROM PAGE 6 TO PAGE 7.

C. USE THE SPACE BELOW TO LIST ANY OF THE POLLUTANTS LISTED IN PART B OF THE INSTRUCTIONS, WHICH YOU KNOW OR HAVE REASON TO BELIEVE IS DISCHARGED OR MAY BE DISCHARGED FROM ANY OUTFALL. FOR EVERY POLLUTANT YOU LIST, BRIEFLY DESCRIBE THE REASONS YOU BELIEVE IT TO BE PRESENT AND REPORT ANY ANALYTICAL DATA IN YOUR POSSESSION.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
Various metals including strontium, uranium, and vanadium may be present in coal ash in trace amounts. Asbestos is present in insulating material in the plant. Therefore incidental quantities may unavoidably reach the ash pond or low volume wastewater treatment system. However all asbestos removal and disposal activities are conducted in accordance with 40CFR61, Subpart M and OSHA Standard 20CFR1910.1001 and 1926.1101. The facility's intake water, the Mississippi River, may also contain pollutants listed in Table B. With respect to chemicals used in the facility laboratory, the discharge point would be Outfall 009. Any pollutants in the intake water would also be present in Outfall 001, Non-Contact Cooling Water.			

3.10 BIOLOGICAL TOXICITY TESTING DATA

DO YOU HAVE ANY KNOWLEDGE OR REASON TO BELIEVE THAT ANY BIOLOGICAL TEST FOR ACUTE OR CHRONIC TOXICITY HAS BEEN MADE ON ANY OF YOUR DISCHARGES OR ON RECEIVING WATER IN RELATION TO YOUR DISCHARGE WITHIN THE LAST THREE YEARS?

☑ YES (IDENTIFY THE TEST(S) AND DESCRIBE THEIR PURPOSES BELOW.) ☐ NO (GO TO 3.20)

The current NPDES permit requires Whole Effluent Toxicity (WET) testing for three outfalls (001-Non-Contact Cooling Water, 002-Bottom Ash Pond (Pond #!), and 006-Fly Ash Pond (Pond #2)). Toxicity was not indicated in the initial tests for these three outfalls conducted during 2017.

3.20 CONTRACT ANALYSIS INFORMATION

WERE ANY OF THE ANALYSES REPORTED PERFORMED BY A CONTRACT LABORATORY OR CONSULTING FIRM?

☑ **YES** *(LIST THE NAME, ADDRESS AND TELEPHONE NUMBER OF AND POLLUTANTS ANALYZED BY EACH SUCH LABORATORY OR FIRM BELOW.)* ☐ **NO** *(GO TO 3.30)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code and number)*	D. POLLUTANTS ANALYZED *(list)*
PDC Laboratories, Inc	3278 North Highway 67 Florissant MO 63033	314-432-0550	All to characterize Outfall 009 and 010. For the 2008 renewal application, GC/MS constituents.
Teledyne Brown Engineering	2508 Quality Lane Knoxville TN 37931	865-690-6819	For the 2008 renewal application: Gross Alpha, Gross Beta.

3.30 CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS APPLICATION AND ALL ATTACHMENTS AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
Matthew T. Wallace - Director, Sioux Energy Center	(314) 992-6201
SIGNATURE (SEE INSTRUCTIONS) Matthew T. Wallace	DATE SIGNED 9/20/2017

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheet *(Use the same format)* instead of completing these pages.
SEE INSTRUCTIONS

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

OUTFALL NO. 002

PART A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	4						est	mg/L		2		1
B. Chemical Oxygen Demand (COD)	18						est	mg/L		15		1
C. Total organic Carbon (TOC)	6						est	mg/L		5.4		1
D. Total Suspended Solids (TSS)	<30						est	mg/L		87		1
E. Ammonia *(as N)*	0.5						est	mg/L		0.02		1
F. Flow	VALUE 15.8 (max)		VALUE		VALUE		est	MGD		VALUE		
G. Temperature *(winter)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
H. Temperature *(summer)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
I. pH	MINIMUM 6.0	MAXIMUM 9.0	MINIMUM	MAXIMUM			est	STANDARD UNITS				

PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark column 2A for any pollutant, you must provide the results for at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS														
A. Bromide (24959-67-9)		X	11						est	mg/L		16		1
B. Chlorine, Total Residual		X	<0.1						est	mg/L		<0.1		1
C. Color		X												
D. Fecal Coliform	X		198						est	cfu/100mL		210		1
E. Fluoride (16984-48-8)	X		0.3						est	mg/L		0.2		1
F. Nitrate - Nitrate *(as N)*	X		2.0						est	mg/L		17		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

Outfall 002

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
G. Nitrogen, Total Organic *(as N)*	X		2.2						est	mg/L		0.4		1
H. Oil and Grease		X	2.0						est	mg/L		2.0		1
I. Phosphorus *(as P)*, Total (7723-14-0)	X		<0.01						est	mg/L		0.6		1
J. Sulfate *(as SO^4)* (14808-79-8)	X		54						est	mg/L		42		1
K. Sulfide *(as S)*		X												
L. Sulfite (as SO^3) (14265-45-3)		X												
M. Surfactants		X												
N. Aluminum, Total (7429-90-5)	X		2 8						est	mg/L		4.7		1
O. Barium, Total (7440-39-3)	X		0.1						est	mg/L		0.1		1
P. Boron, Total (7440-42-8)	X		0.7						est	mg/L		0.3		1
Q. Cobalt, Total (7440-48-4)		X	<0.005						est	mg/L		<0.005		1
R. Iron, Total (7439-89-6)	X		2.5						est	mg/L		4.4		1
S. Magnesium, Total (7439-95-4)	X		13.6						est	mg/L		15.2		1
T. Molybdenum, Total (7439-98-7)	X		0.04						est	mg/L		<0.005		1
U. Manganese, Total (7439-96-5)	X		0.08						est	mg/L		0.22		1
V. Tin, Total (7440-31-5)		X	<0.005						est	mg/L		<0.005		1
W. Titanium, Total (7440-32-6)	X		0.10						est	mg/L		0.11		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

Outfall 002

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS														
1M. Antimony, Total (7440-36-9)		X	<5						est	ug/L		<5		1
2M. Arsenic, Total (7440-38-2)		X	<5						est	ug/L		<5		1
3M. Beryllium, Total (7440-41-7)		X	<5						est	ug/L		<5		1
4M. Cadmium, Total (7440-43-9)		X	<5						est	ug/L		<5		1
5M. Chromium III (16065-83-1)		X	<5						est	ug/L		<5		1
6M. Chromium VI (18540-29-9)		X	<5						est	ug/L		<5		1
7M. Copper, Total (7440-50-8)	X		5						est	ug/L		11		1
8M. Lead, Total (7439-92-1)	X		5						est	ug/L		5		1
9M. Mercury, Total (7439-97-6)		X	<0.2						est	ug/L		<0.2		1
10M. Nickel, Total (7440-02-0)	X		12						est	ug/L		16		1
11M. Selenium, Total (7782-49-2)	X		5						est	ug/L		11		1
12M. Silver, Total (7440-22-4)		X	12						est	ug/L		<5		1
13M. Thallium, Total (7440-28-0)		X	6						est	ug/L		4		1
14M. Zinc, Total (7440-66-6)	X		44						est	ug/L		35		1
15M. Cyanide, Amenable to Chlorination		X	<10						est	ug/L		<10		1
16M. Phenols, Total		X	<10						est	ug/L		<10		1
RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheet *(Use the same format)* instead of completing these pages.
SEE INSTRUCTIONS

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

OUTFALL NO. 006

PART A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	4						est	mg/L		2		1
B. Chemical Oxygen Demand (COD)	10						est	mg/L		15		1
C. Total organic Carbon (TOC)	1.3						est	mg/L		5.4		1
D. Total Suspended Solids (TSS)	1						est	mg/L		87		1
E. Ammonia *(as N)*	5.6						est	mg/L		0.02		1
F. Flow	VALUE 10.8 (max)		VALUE		VALUE		est	MGD		VALUE		
G. Temperature *(winter)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
H. Temperature *(summer)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
I. pH	MINIMUM 6.0	MAXIMUM 9.0	MINIMUM	MAXIMUM			est	STANDARD UNITS				

PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark column 2A for any pollutant, you must provide the results for at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS														
A. Bromide (24959-67-9)	X		35						est	mg/L		16		1
B. Chlorine, Total Residual		X	<0.1						est	mg/L		<0.1		1
C. Color		X												
D. Fecal Coliform	X													
E. Flúoride (16984-48-8)	X		1.9						est	mg/L		0.2		1
F. Nitrate - Nitrate *(as N)*	X		25						est	mg/L		17		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

Outfall 006

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
G. Nitrogen, Total Organic *(as N)*	X		0.07						est	mg/L		0.43		1
H. Oil and Grease		X	<1						est	mg/L		2.3		1
I. Phosphorus *(as P)*, Total (7723-14-0)	X		<0.01						est	mg/L		0.6		1
J. Sulfate *(as SO^4)* (14808-79-8)	X		640						est	mg/L		42		1
K. Sulfide *(as S)*		X												
L. Sulfite (as SO^3) (14265-45-3)		X												
M. Surfactants		X												
N. Aluminum, Total (7429-90-5)	X		0.40						est	mg/L		4.7		1
O. Barium, Total (7440-39-3)	X		0.48						est	mg/L		0.13		1
P. Boron, Total (7440-42-8)	X		2.6						est	mg/L		0.3		1
Q. Cobalt, Total (7440-48-4)		X	<0.005						est	mg/L		<0.005		1
R. Iron, Total (7439-89-6)	X		0.08						est	mg/L		4.4		1
S. Magnesium, Total (7439-95-4)	X		17.6						est	mg/L		15.2		1
T. Molybdenum, Total (7439-98-7)	X		0.28						est	mg/L		<0.005		1
U. Manganese, Total (7439-96-5)	X		0.01						est	mg/L		0.22		1
V. Tin, Total (7440-31-5)		X	<0.005						est	mg/L		<0.005		1
W. Titanium, Total (7440-32-6)	X		0.007						est	mg/L		0.11		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

Outfall 006

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS														
1M. Antimony, Total (7440-36-9)		X	<5						est	ug/L		<5		1
2M. Arsenic, Total (7440-38-2)	X		33						est	ug/L		<5		1
3M. Beryllium, Total (7440-41-7)		X	<5						est	ug/L		<5		1
4M. Cadmium, Total (7440-43-9)		X	<5						est	ug/L		<5		1
5M. Chromium III (16065-83-1)	X		22						est	ug/L		8		1
6M. Chromium VI (18540-29-9)		X	<10						est	ug/L		<10		1
7M. Copper, Total (7440-50-8)		X	<5						est	ug/L		11		1
8M. Lead, Total (7439-92-1)		X	<5						est	ug/L		5		1
9M. Mercury, Total (7439-97-6)		X	<0.2						est	ug/L		<0.2		1
10M. Nickel, Total (7440-02-0)	X		18						est	ug/L		16		1
11M. Selenium, Total (7782-49-2)	X		26						est	ug/L		11		1
12M. Silver, Total (7440-22-4)		X	30						est	ug/L		<5		1
13M. Thallium, Total (7440-28-0)		X	15						est	ug/L		4		1
14M. Zinc, Total (7440-66-6)	X		24						est	ug/L		35		1
15M. Cyanide, Amenable to Chlorination		X	<10						est	ug/L		<10		1
16M. Phenols, Total		X	<10						est	ug/L		<10		1
RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheet *(Use the same format)* instead of completing these pages.
SEE INSTRUCTIONS

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

OUTFALL NO. 009

PART A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	4	94					est	mg/L	#/day	2		1
B. Chemical Oxygen Demand (COD)	18	428					est	mg/L	#/day	15		1
C. Total organic Carbon (TOC)	6.0	143					est	mg/L	#/day	5.4		1
D. Total Suspended Solids (TSS)	<30	<770					est	mg/L	#/day	87		1
E. Ammonia *(as N)*	0.6	14					est	mg/L	#/day	0.02		1
F. Flow	VALUE 2.86 (average)		VALUE 8.17 (max)		VALUE		est	MGD		VALUE		
G. Temperature *(winter)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
H. Temperature *(summer)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
I. pH	MINIMUM 6.0	MAXIMUM 9.0	MINIMUM	MAXIMUM			est	STANDARD UNITS				

PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark column 2A for any pollutant, you must provide the results for at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS														
A. Bromide (24959-67-9)		X	<1	<30					est	mg/L	#/day	16		1
B. Chlorine, Total Residual		X	<0.1	<3					est	mg/L	#/day	<0.1		1
C. Color		X												
D. Fecal Coliform	X									cfu/100mL		210		1
E. Fluoride (16984-48-8)	X		0.3	7					est	mg/L	#/day	0.2		1
F. Nitrate - Nitrate *(as N)*	X											17		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

Outfall 009

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
G. Nitrogen, Total Organic *(as N)*	X		2.2	52					est	mg/L	#/day	0.4		1
H. Oil and Grease		X	<1	<30					est	mg/L	#/day	2.3		1
I. Phosphorus *(as P)*, Total (7723-14-0)	X		<0.4	<10					est	mg/L	#/day	0.6		1
J. Sulfate *(as SO^4)* (14808-79-8)	X		52	1200					est	mg/L	#/day	42		1
K. Sulfide *(as S)*		X												
L. Sulfite (as SO^3) (14265-45-3)		X												
M. Surfactants		X												
N. Aluminum, Total (7429-90-5)	X		1.32	32					est	mg/L	#/day	4.7		1
O. Barium, Total (7440-39-3)		X	0.1	<2					est	mg/L	#/day	0.1		1
P. Boron, Total (7440-42-8)	X		0.1	2					est	mg/L	#/day	0.3		1
Q. Cobalt, Total (7440-48-4)		X	<0.005	<1					est	mg/L	#/day	<0.005		1
R. Iron, Total (7439-89-6)	X		1.24	30					est	mg/L	#/day	4.4		1
S. Magnesium, Total (7439-95-4)	X		19.8	470					est	mg/L	#/day	15.2		1
T. Molybdenum, Total (7439-98-7)		X	0.018	<1					est	mg/L	#/day	<0.005		1
U. Manganese, Total (7439-96-5)	X		0.1	2					est	mg/L	#/day	0.22		1
V. Tin, Total (7440-31-5)		X	0..031	<1					est	mg/L	#/day	<0.005		1
W. Titanium, Total (7440-32-6)		X	0.043	1					est	mg/L	#/day	0.11		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

Outfall 009

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS														
1M. Antimony, Total (7440-36-9)		X	0.4	<1					est	ug/L	#/day	<5		1
2M. Arsenic, Total (7440-38-2)		X	1.6	<1					est	ug/L	#/day	<5		1
3M. Beryllium, Total (7440-41-7)		X	0.3	<1					est	ug/L	#/day	<5		1
4M. Cadmium, Total (7440-43-9)		X	0.2	<1					est	ug/L	#/day	<5		1
5M. Chromium III (16065-83-1)		X	1.9	<1					est	ug/L	#/day	8		1
6M. Chromium VI (18540-29-9)		X	<5	<1					est	ug/L	#/day	<5		1
7M. Copper, Total (7440-50-8)		X	3.8	<1					est	ug/L	#/day	11		1
8M. Lead, Total (7439-92-1)		X	1.0	<1					est	ug/L	#/day	5		1
9M. Mercury, Total (7439-97-6)		X	<0.02	<1					est	ug/L	#/day	<0.2		1
10M. Nickel, Total (7440-02-0)		X	5.7	<1					est	ug/L	#/day	16		1
11M. Selenium, Total (7782-49-2)		X	1.9	<1					est	ug/L	#/day	11		1
12M. Silver, Total (7440-22-4)		X	0.04	<1					est	ug/L	#/day	<5		1
13M. Thallium, Total (7440-28-0)		X	0.1	<1					est	ug/L	#/day	4		1
14M. Zinc, Total (7440-66-6)	X		10	<1					est	ug/L	#/day	35		1
15M. Cyanide, Amenable to Chlorination		X	<10	<1					est	ug/L	#/day	<10		1
16M. Phenols, Total		X	<10	<1					est	ug/L	#/day	<10		1
RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheet *(Use the same format)* instead of completing these pages.
SEE INSTRUCTIONS

Note: This is a non-process outfall

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS

OUTFALL NO. 09A

PART A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	2						1	mg/L				
B. Chemical Oxygen Demand (COD)	17.5						1	mg/L				
C. Total organic Carbon (TOC)	4.6						1	mg/L				
D. Total Suspended Solids (TSS)	4.0						1	mg/L				
E. Ammonia *(as N)*	0.4						1	mg/L				
F. Flow	VALUE 0.013 (average)		VALUE 0.039 (design)		VALUE		1	MGD		VALUE		
G. Temperature *(winter)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
H. Temperature *(summer)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
I. pH	MINIMUM 6.0	MAXIMUM 9.0	MINIMUM	MAXIMUM			est	STANDARD UNITS				

PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark column 2A for any pollutant, you must provide the results for at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS														
A. Bromide (24959-67-9)	X		6.7						1	mg/L				
B. Chlorine, Total Residual		X												
C. Color		X												
D. Fecal Coliform	X		19,000						1	cfu/100mL				
E. Fluoride (16984-48-8)	X		0.6						1	mg/L				
F. Nitrate - Nitrate *(as N)*	X		17.2						1	mg/L				

Note: This is a non-process outfall

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
G. Nitrogen, Total Organic *(as N)*	X		0.08						1	mg/L				
H. Oil and Grease		X	2.2						1	mg/L				
I. Phosphorus *(as P)*, Total (7723-14-0)	X		2.8						1	mg/L				
J. Sulfate *(as SO^4)* (14808-79-8)	X		80						1	mg/L				
K. Sulfide *(as S)*		X												
L. Sulfite (as SO^3) (14265-45-3)		X												
M. Surfactants		x												
N. Aluminum, Total (7429-90-5)	X													
O. Barium, Total (7440-39-3)		X												
P. Boron, Total (7440-42-8)		X												
Q. Cobalt, Total (7440-48-4)		X												
R. Iron, Total (7439-89-6)	X		0.087						1	mg/L				
S. Magnesium, Total (7439-95-4)	X													
T. Molybdenum, Total (7439-98-7)		X												
U. Manganese, Total (7439-96-5)	X													
V. Tin, Total (7440-31-5)		X												
W. Titanium, Total (7440-32-6)		X												

Note: This is a non-process outfall

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS														
1M. Antimony, Total (7440-36-9)		X												
2M. Arsenic, Total (7440-38-2)		X												
3M. Beryllium, Total (7440-41-7)		X												
4M. Cadmium, Total (7440-43-9)		X												
5M. Chromium III (16065-83-1)	X													
6M. Chromium VI (18540-29-9)		X												
7M. Copper, Total (7440-50-8)	X													
8M. Lead, Total (7439-92-1)		X												
9M. Mercury, Total (7439-97-6)		X												
10M. Nickel, Total (7440-02-0)		X												
11M. Selenium, Total (7782-49-2)	X													
12M. Silver, Total (7440-22-4)		X												
13M. Thallium, Total (7440-28-0)		X												
14M. Zinc, Total (7440-66-6)	X													
15M. Cyanide, Amenable to Chlorination		X												
16M. Phenols, Total		X												
RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheet *(Use the same format)* instead of completing these pages.
SEE INSTRUCTIONS

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

OUTFALL NO. 010

PART A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	4						est	mg/L				
B. Chemical Oxygen Demand (COD)	15.1						est	mg/L				
C. Total organic Carbon (TOC)	4.3						est	mg/L				
D. Total Suspended Solids (TSS)												
E. Ammonia *(as N)*	2.3						est	mg/L				
F. Flow	VALUE 0.0 (average)		VALUE 25.1 (design)		VALUE		est	MGD		VALUE		
G. Temperature *(winter)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
H. Temperature *(summer)*	VALUE ambient		VALUE		VALUE		est	°C		VALUE		
I. pH	MINIMUM 6.0	MAXIMUM 9.0	MINIMUM	MAXIMUM			est	STANDARD UNITS				

PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark column 2A for any pollutant, you must provide the results for at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS														
A. Bromide (24959-67-9)		X	<1						est	mg/L				
B. Chlorine, Total Residual		X												
C. Color		X												
D. Fecal Coliform	X													
E. Fluoride (16984-48-8)	X		0.9						est	mg/L				
F. Nitrate - Nitrate *(as N)*	X													

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

Outfall 010

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
G. Nitrogen, Total Organic *(as N)*	X		1.4						est	mg/L				
H. Oil and Grease		X	<1						est	mg/L				
I. Phosphorus *(as P)*, Total (7723-14-0)	X		0.01						est	mg/L				
J. Sulfate *(as SO^4)* (14808-79-8)	X		255						est	mg/L				
K. Sulfide *(as S)*		X												
L. Sulfite (as SO^3) (14265-45-3)		X												
M. Surfactants		X												
N. Aluminum, Total (7429-90-5)	X		1.4						est	mg/L				
O. Barium, Total (7440-39-3)		X	0.3						est	mg/L				
P. Boron, Total (7440-42-8)	X		1.0						est	mg/L				
Q. Cobalt, Total (7440-48-4)		X												
R. Iron, Total (7439-89-6)	X		1.2						est	mg/L				
S. Magnesium, Total (7439-95-4)	X		19.3						est	mg/L				
T. Molybdenum, Total (7439-98-7)		X	0.09						est	mg/L				
U. Manganese, Total (7439-96-5)	X		0.1						est	mg/L				
V. Tin, Total (7440-31-5)		X	0.031						est	mg/L				
W. Titanium, Total (7440-32-6)	X		0.04						est	mg/L				

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

Outfall 010

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS														
1M. Antimony, Total (7440-36-9)		X	1						est	ug/L				
2M. Arsenic, Total (7440-38-2)		X	10						est	ug/L				
3M. Beryllium, Total (7440-41-7)		X	0.3						est	ug/L				
4M. Cadmium, Total (7440-43-9)		X	1.9						est	ug/L				
5M. Chromium III (16065-83-1)		X	<10						est	ug/L				
6M. Chromium VI (18540-29-9)		X	<10						est	ug/L				
7M. Copper, Total (7440-50-8)		X	2.5						est	ug/L				
8M. Lead, Total (7439-92-1)		X	2.1						est	ug/L				
9M. Mercury, Total (7439-97-6)		X	<0.2						est	ug/L				
10M. Nickel, Total (7440-02-0)		X	9						est	ug/L				
11M. Selenium, Total (7782-49-2)		X	10						est	ug/L				
12M. Silver, Total (7440-22-4)		X	9						est	ug/L				
13M. Thallium, Total (7440-28-0)		X	5						est	ug/L				
14M. Zinc, Total (7440-66-6)	X		28						est	ug/L				
15M. Cyanide, Amenable to Chlorination		X	<10						est	ug/L				
16M. Phenols, Total		X	<10						est	ug/L				
RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH

FORM D – APPLICATION FOR DISCHARGE PERMIT – PRIMARY INDUSTRIES

FOR AGENCY USE ONLY	
CHECK NO.	
DATE RECEIVED	FEE SUBMITTED

NOTE: DO NOT ATTEMPT TO COMPLETE THIS FORM BEFORE READING THE ACCOMPANYING INSTRUCTIONS

1.00 NAME OF FACILITY

Ameren Missouri Sioux Energy Center

1.10 THIS FACILITY IS NOW IN OPERATION UNDER MISSOURI OPERATING PERMIT NUMBER

MO - 0000353

This form is to be filled out in addition to forms A and C "Application for Discharge Permit" for the Industries listed below:

INDUSTRY CATEGORY

Adhesives and sealants
Aluminum forming
Auto and other laundries
Battery manufacturing
Coal mining
Coil coating
Copper forming
Electric and electronic compounds
Electroplating
Explosives manufacturing
Foundries
Gum and wood chemicals
Inorganic chemicals manufacturing
Iron and steel manufacturing
Leather tanning and finishing
Landfill
Mechanical products manufacturing
Nonferrous metals manufacturing
Ore mining
Organic chemicals manufacturing
Paint and ink formulation
Pesticides
Petroleum refining
Pharmaceutical preparations
Photographic equipment and supplies
Plastic and synthetic materials manufacturing
Plastic processing
Porcelain enameling
Printing and publishing
Pulp and paperboard mills
Rubber processing
Soap and detergent manufacturing
Steam electric power plants
Textile mills
Timber products processing

2.00 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

A. IS ANY POLLUTANT LISTED IN ITEM 1.30 A SUBSTANCE OR A COMPONENT OF A SUBSTANCE WHICH YOU DO OR EXPECT THAT YOU WILL OVER THE NEXT FIVE YEARS USE OR MANUFACTURE AS AN INTERMEDIATE OR FINAL PRODUCT OR BYPRODUCT?

☒ **YES** *(LIST ALL SUCH POLLUTANTS BELOW)* ☐ **NO** *(GO TO B)*

Various metals may be present in coal or coal ash.

With respect to chemicals used in the Plant laboratory and solvents used for equipment maintenance and/or lubrication, please see the 2008 renewal application ("Attachment D - Chemical Usage").

B. ARE YOUR OPERATIONS SUCH THAT YOUR RAW MATERIALS, PROCESSES OR PRODUCTS CAN REASONABLE BE EXPECTED TO VARY SO THAT YOUR DISCHARGES OF POLLUTANTS MAY DURING THE NEXT FIVE YEARS EXCEED TWO TIMES THE MAXIMUM VALUES REPORTED IN ITEM 1.30?

☒ **YES** *(COMPLETE C BELOW)* ☐ **NO** *(GO TO SECTION 3.00)*

C. IF YOU ANSWERED "YES" TO ITEM B, EXPLAIN BELOW AND DESCRIBE IN DETAIL THE SOURCES AND EXPECTED LEVELS OF SUCH POLLUTANTS THAT YOU ANTICIPATE WILL BE DISCHARGED FROM EACH OUTFALL OVER THE NEXT FIVE YEARS, TO THE BEST OF YOUR ABILIITY AT THIS TIME. CONTINUE ON ADDITIONAL SHEETS IF YOU NEED MORE SPACE.

Variations or changes in coal supply or usage may affect Outfall 009 (Low Volume Wastewater Treatment System Discharge) and/or Outfalls 002 & 006 (Bottom Ash Pond & Fly Ash Pond). A different fuel supply could result in variations in ash content, characteristics, or leachability which may result in changes of pollutants greater than a factor of two (2).

Wastewater streams can also be expected to exhibit variability, not as a result of varying raw material, processes, or products but rather as a result of varying influent water quality. Variability in intake water quality due to the effects of rainfall, runoff, and/or upstream pollutant discharges might cause discharge values on a gross basis to exceed two (2) times the maximum values reported in Item 1.30.

3.00 CONTRACT ANALYSIS INFORMATION

WERE ANY OF THE ANALYSES REPORTED IN 1.30 PERFORMED BY A CONTRACT LABORATORY OR CONSULTING FIRM?

☒ **YES** *(LIST THE NAME, ADDRESS, AND TELEPHONE NUMBER OF, AND ANALYZED BY, EACH SUCH LABORATORY OR FIRM BELOW)*

☐ **NO** *(GO TO SECTION 4.00)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code and number)*	D. POLLUTANTS ANALYZED *(list)*
PDC Laboratories Incorporated	3278 North Highway 67	(314) 432-0550	All Form D except Cyanide and
	Florissant MO 63033		Phenols.

4.00 CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	PHONE NUMBER (AREA CODE AND NUMBER)
Matthew T. Wallace - Director, Sioux Energy Center	(314) 992-2601
SIGNATURE	DATE SIGNED
	9/20/2017

APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES

TABLE II

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000353	002

1.30 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (*all seven pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TEST-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE (1) CONCENTRATION	A. MAXIMUM DAILY VALUE (2) MASS	B. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	B. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS	C. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	C. LONG TERM AVRG. VALUE (*if available*) (2) MASS	D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	A. LONG TERM AVRG. VALUE (2) MASS	B. NO OF ANALYSES
METALS, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-9)	✓		✓	<5						est	ug/L		<5		1
2M. Arsenic, Total (7440-38-2)	✓		✓	<5						est	ug/L		<5		1
3M. Beryllium, Total (7440-41-7)	✓		✓	<5						est	ug/L		<5		1
4M. Cadmium, Total (7440-43-9)	✓		✓	<5						est	ug/L		<5		1
5M. Chromium III (16065-83-1)	✓		✓	<5						est	ug/L		<5		1
6M. Chromium VI (18540-29-9)	✓		✓	<5						est	ug/L		<5		1
7M. Copper, Total (7440-50-8)	✓	✓		5						est	ug/l		11		1
8M. Lead, Total (7439-92-1)	✓	✓		5						est	ug/L		5		1
9M. Magnesium Total (7439-95-4)	✓	✓		13,600						est	ug/L		15,200		1
10M. Mercury, Total (7439-97-6)	✓		✓	<0.2						est	ug/L		<0.2		1
11M. Molybdenum Total (7439-98-7)	✓		✓	40						est	ug/l		<5		1
12M. Nickel, Total (7440-02-0)	✓	✓		12						est	ug/L		16		1
13M. Selenium, Total (7782-49-2)	✓	✓		5						est	ug/L		11		1
14M. Silver, Total (7440-22-4)	✓		✓	12						est	ug/L		<5		1
15M. Thallium, Total (7440-28-0)	✓		✓	6						est	ug/L		4		1
16M. Tin Total (7440-31-5)	✓		✓	<5						est	ug/L		<5		1
17M. Titanium Total (7440-32-6)	✓	✓		100						est	ug/L		110		1
18M. Zinc, Total (7440-66-6)	✓	✓		44						est	ug/L		35		1

NOTE: See attachments for data source information. Date provided represents anticipated post-construction effluent quality.

CONTINUED FROM PAGE 3

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X" A. TESTING REQUIRED	2. MARK "X" B. BELIEVED PRESENT	2. MARK "X" C. BELIEVED ABSENT	3. EFFLUENT A. MAXIMUM DAILY VALUE (1) CONCENTRATION	3. EFFLUENT A. MAXIMUM DAILY VALUE (2) MASS	3. EFFLUENT B. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	3. EFFLUENT B. MAXIMUM 30 DAY VALUE (if available) (2) MASS	3. EFFLUENT C. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	3. EFFLUENT C. LONG TERM AVRG. VALUE (if available) (2) MASS	D. NO. OF ANALYSES	4. UNITS A. CONCENTRATION	4. UNITS B. MASS	5. INTAKE (optional) A. LONG TERM AVRG. VALUE (1) CONCENTRATION	5. INTAKE (optional) A. LONG TERM AVRG. VALUE (2) MASS	5. INTAKE (optional) B. NO OF ANALYSES
19M. Cyanide, Amenable to Chlorination	☑	☐	☐	<10						est	ug/L		<10		1
20M. Phenols, Total	☑	☐	☐	<10						est	ug/L		<10		1
DIOXIN															
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☑	**DESCRIBE RESULTS**											
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☑	☐	☑	<25						1	ug/L		<25		1
2V. Acrylonitrile (107-13-1)	☑	☐	☑	<25						1	ug/L		<25		1
3V. Benzene (71-43-2)	☑	☐	☑	<5						1	ug/L		<5		1
4V. Bis (*Chloromethyl*) Ether (542-88-1)	☐	☐	☐	note 1											
5V. Bromoform (75-25-2)	☑	☐	☑	<5						1	ug/L		<5		1
6V. Carbon Tetrachloride (56-23-5)	☑	☐	☑	<5						1	ug/L		<5		1
7V. Chlorobenzene (108-90-7)	☑	☐	☑	<5						1	ug/L		<5		1
8V. Chlorodibromomethane (124-48-1)	☑	☐	☑	<5						1	ug/L		<5		1
9V. Chloroethane (75-00-3)	☑	☐	☑	<10						1	ug/L		<10		1
10V. 2-Chloroethylvinyl Ether (110-75-8)	☑	☐	☑	<5						1	ug/L		<5		1
11V. Chloroform (67-66-3)	☑	☐	☑	<5						1	ug/L		<5		1
12V. Dichlorobromomethane (75-27-4)	☑	☐	☑	<5						1	ug/L		<5		1
13V. Dichloro-difluoromethane (75-71-8)	☐	☐	☐	note 1											
14V. 1,1 – Dichloroethane (75-34-3)	☑	☐	☑	<5						1	ug/L		<5		1
15V. 1,2 – Dichloroethane (107-06-2)	☑	☐	☑	<5						1	ug/L		<5		1
16V. 1,1 – Dichloroethylene (75-35-4)	☑	☐	☑	<5						1	ug/L		<5		1
17V. 1,3 – Dichloropropane (78-87-5)	☑	☐	☑	<5						1	ug/L		<5		1
18V. 1,2 –Dichloropropylene (542-75-6) Note 2	☑	☐	☑	<5						1	ug/L		<5		1
19V. Ethylbenzene (100-41-4)	☑	☐	☑	<5						1	ug/L		<5		1
20V. Methyl Bromide (74-83-9)	☑	☐	☑	<10						1	ug/L		<10		1
21V. Methyl Chloride (74-87-3)	☑	☐	☑	<10						1	ug/L		<10		1

CONTINUE ON PAGE 4

Note 1: These parameters deleted per 40CFR122, Appendix D.

Note 2: This parameter is 1,3-dichloropropene per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Date provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000353	002

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING RE-QUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC.MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)	☑	☐	☑	<5						1	ug/L		<5		1
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	☑	☐	☑	<5						1	ug/L		<5		1
24V. Tetrachloroethylene (127-18-4)	☑	☐	☑	<5						1	ug/L		<5		1
25V. Toluene (108-88-3)	☑	☐	☑	<5						1	ug/L		<5		1
26V. 1,2 – Trans Dichloroethylene (156-60-5)	☑	☐	☑	<5						1	ug/L		<5		1
27V. 1,1,1 – Tri – chloroethane (71-55-6)	☑	☐	☑	<5						1	ug/L		<5		1
28V. 1,1,2 – Tri-chloroethane (79-00-5)	☑	☐	☑	<5						1	ug/L		<5		1
29V. Trichloro – ethylene (79-01-6)	☑	☐	☑	<5						1	ug/L		<5		1
30V. Trichloro – fluoromethane (75-69-4)	☐	☐	☐	note 1											
31V. Vinyl Chloride (75-01-4)	☑	☐	☑	<5						1	ug/L		<5		1
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2 – Chlorophenol (95-57-8)	☑	☐	☑	<10						1	ug/L		<10		1
2A. 2,4 – Dichloro – phenol (120-83-2)	☑	☐	☑	<10						1	ug/L		<10		1
3A. 2,4 – Dimethyl – phenol (105-67-9)	☑	☐	☑	<10						1	ug/L		<10		1
4A. 4,6 – Dinitro - O-Cresol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1
5A. 2,4 – Dinitro – phenol (51-28-5)	☑	☐	☑	<10						1	ug/L		<10		1
6A. 2-Nitrophenol (88-75-5)	☑	☐	☑	<10						1	ug/L		<10		1
7A. 4-Nitrophenol (100-02-7)	☑	☐	☑	<10						1	ug/L		<10		1
8A. P – Chloro – M Cresol (59-50-7)	☑	☐	☑	<10						1	ug/L		<10		1
9A. Pentachloro – phenol (87-86-5)	☑	☐	☑	<10						1	ug/L		<10		1
10A. Phenol (108-952)	☑	☐	☑	<10						1	ug/L		<10		1
11A. 2,4,6 – Trichloro-phenol (88-06-2)	☑	☐	☑	<10						1	ug/L		<10		1
12A. 2 - methyl – 4,6 dinitrophenol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1

Note 1: This parameter deleted per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Date provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
2B. Acenaphtylene (208-96-8)	☑	☐	☑	<10						1	ug/L		<10		1
3B. Anthracene (120-12-7)	☑	☐	☑	<10						1	ug/L		<10		1
4B. Benzidine (92-87-5)	☑	☐	☑	<10						1	ug/L		<10		1
5B. Benzo (a) Anthracene (56-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
6B. Benzo (a) Pyrene (50-32-8)	☑	☐	☑	<10						1	ug/L		<10		1
7B. 3,4 – Benzofluoranthene (205-99-2)	☑	☐	☑	<10						1	ug/L		<10		1
8B. Benzo (ghi) Perylene (191-24-2)	☑	☐	☑	<10						1	ug/L		<10		1
9B. Benzo (k) Fluoranthene (207-08-9)	☑	☐	☑	<10						1	ug/L		<10		1
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	☑	☐	☑	<10						1	ug/L		<10		1
11B. Bis (2-Chloroethyl) Ether (111-44-4)	☑	☐	☑	<10						1	ug/L		<10		1
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	☑	☐	☑	<10						1	ug/L		<10		1
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
15B. Butyl Benzyl Phthalate (85-68-7)	☑	☐	☑	<10						1	ug/L		<10		1
16B. 2-Chloronaphthalene (91-58-7)	☑	☐	☑	<10						1	ug/L		<10		1
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	☑	☐	☑	<10						1	ug/L		<10		1
18B. Chrysene (218-01-9)	☑	☐	☑	<10						1	ug/L		<10		1
19B. Dibenzo (a.h) Anthracene (53-70-3)	☑	☐	☑	<10						1	ug/L		<10		1
20B. 1,2 – Dichlorobenzene (95-50-1)	☑	☐	☑	<10						1	ug/L		<10		1
21B. 1,3 – Dichlorobenzene (541-73-1)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Date provided represents anticipated post-construction effluent quality.

CONTINUED FROM PAGE 5

NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	002

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
22B. 1, 4-Dichlorobenzene (106-46-7)	☑	☐	☑	<10						1	ug/L		<10		1
23B. 3, 3'-Dichlorobenzidine (91-94-1)	☑	☐	☑	<10						1	ug/L		<10		1
24B. Diethyl Phthalate (84-66-2)	☑	☐	☑	<10						1	ug/L		<10		1
25B. Dimethyl Phthalate (131-11-3)	☑	☐	☑	<10						1	ug/L		<10		1
26B. Di-N-butyl Phthalate (84-74-2)	☑	☐	☑	<10						1	ug/L		<10		1
27B. 2,4-Dinitrotoluene (121-14-2)	☑	☐	☑	<10						1	ug/L		<10		1
28B. 2,6-Dinitrotoluene (606-20-2)	☑	☐	☑	<10						1	ug/L		<10		1
29B. Di-N-Octyphthalate (117-84-0)	☑	☐	☑	<10						1	ug/L		<10		1
30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)	☑	☐	☑	<10						1	ug/L		<10		1
31B. Fluoranthene (206-44-0)	☑	☐	☑	<10						1	ug/L		<10		1
32B. Fluorene (86-73-7)	☑	☐	☑	<10						1	ug/L		<10		1
33B. Hexachlorobenzene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
34B. Hexachlorobutadiene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
35B. Hexachloro-cyclopentadiene (77-47-4)	☑	☐	☑	<10						1	ug/L		<10		1
36B. Hexachloroethane (67-72-1)	☑	☐	☑	<10						1	ug/L		<10		1
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	☑	☐	☑	<10						1	ug/L		<10		1
38B. Isophorone (78-59-1)	☑	☐	☑	<10						1	ug/L		<10		1
39B. Naphthalene (91-20-3)	☑	☐	☑	<10						1	ug/L		<10		1
40B. Nitrobenzene (98-95-3)	☑	☐	☑	<10						1	ug/L		<10		1
41B. N-Nitro-sodimethylamine (62-75-9)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Date provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TES-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
42B. N-Nitroso N-Propylamine (621-64-7)	☑	☐	☑	<10						1	ug/L		<10		1
43B. N-Nitro-sodiphenylamine (86-30-6)	☑	☐	☑	<10						1	ug/L		<10		1
44B. Phenanthrene (85-01-8)	☑	☐	☑	<10						1	ug/L		<10		1
45B. Pyrene (129-00-0)	☑	☐	☑	<10						1	ug/L		<10		1
46B. 1,2,4-Tri chlorobenzene (120-82-1)	☑	☐	☑	<10						1	ug/L		<10		1
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)	☐	☐	☑												
2P. α-BHC (319-84-6)	☐	☐	☑												
3P. β-BHC (319-84-6)	☐	☐	☑												
4P. γ-BHC (58-89-9)	☐	☐	☑												
5P. δ-BHC (319-86-8)	☐	☐	☑												
6P. Chlordane (57-74-9)	☐	☐	☑												
7P. 4,4'-DDT (50-29-3)	☐	☐	☑												
8P. 4,4'-DDE (72-55-9)	☐	☐	☑												
9P. 4,4'-DDD (72-54-8)	☐	☐	☑												
10P. Dieldrin (60-57-1)	☐	☐	☑												
11P. α-Endosulfan (115-29-7)	☐	☐	☑												
12P. β-Endosultan (115-29-7)	☐	☐	☑												
13P. Endosulfan Sulfate (1031-07-8)	☐	☐	☑												
14P. Endrin (72-20-8)	☐	☐	☑												
15P. Endrin Aldehyde (7421-93-4)	☐	☐	☑												
16P. Heptachlor (76-44-8)	☐	☐	☑												

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NOTE: See attachments for data source information. Date provided represents anticipated post-construction effluent quality.

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NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	002

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICISES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)	☐	☐	☑												
18P. PCB-1242 (53469-21-9)	☐	☐	☑												
19P. PBC-1254 (11097-69-1)	☐	☐	☑												
20P. PCB-1221 (11104-28-2)	☐	☐	☑												
21P. PCB-1232 (11141-16-5)	☐	☐	☑												
22P. PCB-1248 (12672-29-6)	☐	☐	☑												
23P. PCB-1260 (11096-82-5)	☐	☐	☑												
24P. PCB-1016 (12674-11-2)	☐	☐	☑												
25P. Toxaphene (8001-35-2)	☐	☐	☑												
J. RADIOACTIVITY															
(1) Alpha Total	☐	☐	☑												
(2) Beta Total	☐	☐	☑												
(3) Radium Total	☐	☐	☑												
(4) Radium 226 Total	☐	☐	☑												

NOTE: See attachments for data source information. Date provided represents anticipated post-construction effluent quality.

APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES

TABLE II

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000353	002

1.30 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (*all seven pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT						D. NO. OF ANALYSES	4. UNITS		5. INTAKE (*optional*)		
	A. TEST-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)			A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-9)	✓		✓	<5						est	ug/L		<5		1
2M. Arsenic, Total (7440-38-2)	✓		✓	<5						est	ug/L		<5		1
3M. Beryllium, Total (7440-41-7)	✓		✓	<5						est	ug/L		<5		1
4M. Cadmium, Total (7440-43-9)	✓		✓	<5						est	ug/L		<5		1
5M. Chromium III (16065-83-1)	✓		✓	<5						est	ug/L		<5		1
6M. Chromium VI (18540-29-9)	✓		✓	<5						est	ug/L		<5		1
7M. Copper, Total (7440-50-8)	✓	✓		5						est	ug/l		11		1
8M. Lead, Total (7439-92-1)	✓	✓		5						est	ug/L		5		1
9M. Magnesium Total (7439-95-4)	✓	✓		13,600						est	ug/L		15,200		1
10M. Mercury, Total (7439-97-6)	✓		✓	<0.2						est	ug/L		<0.2		1
11M. Molybdenum Total (7439-98-7)	✓		✓	40						est	ug/l		<5		1
12M. Nickel, Total (7440-02-0)	✓	✓		12						est	ug/L		16		1
13M. Selenium, Total (7782-49-2)	✓	✓		5						est	ug/L		11		1
14M. Silver, Total (7440-22-4)	✓		✓	12						est	ug/L		<5		1
15M. Thallium, Total (7440-28-0)	✓		✓	6						est	ug/L		4		1
16M. Tin Total (7440-31-5)	✓		✓	<5						est	ug/L		<5		1
17M. Titanium Total (7440-32-6)	✓	✓		100						est	ug/L		110		1
18M. Zinc, Total (7440-66-6)	✓	✓		44						est	ug/L		35		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM PAGE 3

19M. Cyanide, Amenable to Chlorination	☑	☐	☐	<10						est	ug/L		<10		1
20M. Phenols, Total	☑	☐	☐	<10						est	ug/L		<10		1
DIOXIN															
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☑	**DESCRIBE RESULTS**											

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☑	☐	☑	<25						1	ug/L		<25		1
2V. Acrylonitrile (107-13-1)	☑	☐	☑	<25						1	ug/L		<25		1
3V. Benzene (71-43-2)	☑	☐	☑	<5						1	ug/L		<5		1
4V. Bis (*Chloromethyl*) Ether (542-88-1)	☐	☐	☐	note 1											
5V. Bromoform (75-25-2)	☑	☐	☑	<5						1	ug/L		<5		1
6V. Carbon Tetrachloride (56-23-5)	☑	☐	☑	<5						1	ug/L		<5		1
7V. Chlorobenzene (108-90-7)	☑	☐	☑	<5						1	ug/L		<5		1
8V. Chlorodibromomethane (124-48-1)	☑	☐	☑	<5						1	ug/L		<5		1
9V. Chloroethane (75-00-3)	☑	☐	☑	<10						1	ug/L		<10		1
10V. 2-Chloroethylvinyl Ether (110-75-8)	☑	☐	☑	<5						1	ug/L		<5		1
11V. Chloroform (67-66-3)	☑	☐	☑	<5						1	ug/L		<5		1
12V. Dichlorobromomethane (75-27-4)	☑	☐	☑	<5						1	ug/L		<5		1
13V. Dichloro-difluoromethane (75-71-8)	☐	☐	☐	note 1											
14V. 1,1 – Dichloroethane (75-34-3)	☑	☐	☑	<5						1	ug/L		<5		1
15V. 1,2 – Dichloroethane (107-06-2)	☑	☐	☑	<5						1	ug/L		<5		1
16V. 1,1 – Dichloroethylene (75-35-4)	☑	☐	☑	<5						1	ug/L		<5		1
17V. 1,3 – Dichloropropane (78-87-5)	☑	☐	☑	<5						1	ug/L		<5		1
18V. 1,2 –Dichloropropylene (542-75-6) Note 2	☑	☐	☑	<5						1	ug/L		<5		1
19V. Ethylbenzene (100-41-4)	☑	☐	☑	<5						1	ug/L		<5		1
20V. Methyl Bromide (74-83-9)	☑	☐	☑	<10						1	ug/L		<10		1
21V. Methyl Chloride (74-87-3)	☑	☐	☑	<10						1	ug/L		<10		1

CONTINUE ON PAGE 4

Note 1: These parameters deleted per 40CFR122, Appendix D.

Note 2: This parameter is 1,3-dichloropropene per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	002

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING RE-QUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC.MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)	☑	☐	☑	<5						1	ug/L		<5		1
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	☑	☐	☑	<5						1	ug/L		<5		1
24V. Tetrachloroethylene (127-18-4)	☑	☐	☑	<5						1	ug/L		<5		1
25V. Toluene (108-88-3)	☑	☐	☑	<5						1	ug/L		<5		1
26V. 1,2 – Trans Dichloroethylene (156-60-5)	☑	☐	☑	<5						1	ug/L		<5		1
27V. 1,1,1 – Tri – chloroethane (71-55-6)	☑	☐	☑	<5						1	ug/L		<5		1
28V. 1,1,2 – Tri-chloroethane (79-00-5)	☑	☐	☑	<5						1	ug/L		<5		1
29V. Trichloro – ethylene (79-01-6)	☑	☐	☑	<5						1	ug/L		<5		1
30V. Trichloro – fluoromethane (75-69-4)	☐	☐	☐	note 1											
31V. Vinyl Chloride (75-01-4)	☑	☐	☑	<5						1	ug/L		<5		1
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2 – Chlorophenol (95-57-8)	☑	☐	☑	<10						1	ug/L		<10		1
2A. 2,4 – Dichloro – phenol (120-83-2)	☑	☐	☑	<10						1	ug/L		<10		1
3A. 2,4 – Dimethyl – phenol (105-67-9)	☑	☐	☑	<10						1	ug/L		<10		1
4A. 4,6 – Dinitro - O-Cresol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1
5A. 2,4 – Dinitro – phenol (51-28-5)	☑	☐	☑	<10						1	ug/L		<10		1
6A. 2-Nitrophenol (88-75-5)	☑	☐	☑	<10						1	ug/L		<10		1
7A. 4-Nitrophenol (100-02-7)	☑	☐	☑	<10						1	ug/L		<10		1
8A. P – Chloro – M Cresol (59-50-7)	☑	☐	☑	<10						1	ug/L		<10		1
9A. Pentachloro – phenol (87-86-5)	☑	☐	☑	<10						1	ug/L		<10		1
10A. Phenol (108-952)	☑	☐	☑	<10						1	ug/L		<10		1
11A. 2,4,6 – Trichloro-phenol (88-06-2)	☑	☐	☑	<10						1	ug/L		<10		1
12A. 2 - methyl – 4,6 dinitrophenol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1

Note 1: This parameter deleted per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
2B. Acenaphtylene (208-96-8)	☑	☐	☑	<10						1	ug/L		<10		1
3B. Anthracene (120-12-7)	☑	☐	☑	<10						1	ug/L		<10		1
4B. Benzidine (92-87-5)	☑	☐	☑	<10						1	ug/L		<10		1
5B. Benzo (a) Anthracene (56-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
6B. Benzo (a) Pyrene (50-32-8)	☑	☐	☑	<10						1	ug/L		<10		1
7B. 3,4 – Benzofluoranthene (205-99-2)	☑	☐	☑	<10						1	ug/L		<10		1
8B. Benzo (ghi) Perylene (191-24-2)	☑	☐	☑	<10						1	ug/L		<10		1
9B. Benzo (k) Fluoranthene (207-08-9)	☑	☐	☑	<10						1	ug/L		<10		1
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	☑	☐	☑	<10						1	ug/L		<10		1
11B. Bis (2-Chloroethyl) Ether (111-44-4)	☑	☐	☑	<10						1	ug/L		<10		1
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	☑	☐	☑	<10						1	ug/L		<10		1
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
15B. Butyl Benzyl Phthalate (85-68-7)	☑	☐	☑	<10						1	ug/L		<10		1
16B. 2-Chloronaphthalene (91-58-7)	☑	☐	☑	<10						1	ug/L		<10		1
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	☑	☐	☑	<10						1	ug/L		<10		1
18B. Chrysene (218-01-9)	☑	☐	☑	<10						1	ug/L		<10		1
19B. Dibenzo (a.h) Anthracene (53-70-3)	☑	☐	☑	<10						1	ug/L		<10		1
20B. 1,2 – Dichlorobenzene (95-50-1)	☑	☐	☑	<10						1	ug/L		<10		1
21B. 1,3 – Dichlorobenzene (541-73-1)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM PAGE 5

NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	002

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT						D. NO. OF ANALYSES	4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)			A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
22B. 1, 4-Dichlorobenzene (106-46-7)	☑	☐	☑	<10						1	ug/L		<10		1
23B. 3, 3'-Dichlorobenzidine (91-94-1)	☑	☐	☑	<10						1	ug/L		<10		1
24B. Diethyl Phthalate (84-66-2)	☑	☐	☑	<10						1	ug/L		<10		1
25B. Dimethyl Phthalate (131-11-3)	☑	☐	☑	<10						1	ug/L		<10		1
26B. Di-N-butyl Phthalate (84-74-2)	☑	☐	☑	<10						1	ug/L		<10		1
27B. 2,4-Dinitrotoluene (121-14-2)	☑	☐	☑	<10						1	ug/L		<10		1
28B. 2,6-Dinitrotoluene (606-20-2)	☑	☐	☑	<10						1	ug/L		<10		1
29B. Di-N-Octyphthalate (117-84-0)	☑	☐	☑	<10						1	ug/L		<10		1
30B. 1,2-Diphenylhydrazine *(as Azobenzene)* (122-66-7)	☑	☐	☑	<10						1	ug/L		<10		1
31B. Fluoranthene (206-44-0)	☑	☐	☑	<10						1	ug/L		<10		1
32B. Fluorene (86-73-7)	☑	☐	☑	<10						1	ug/L		<10		1
33B. Hexachlorobenzene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
34B. Hexachlorobutadiene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
35B. Hexachloro-cyclopentadiene (77-47-4)	☑	☐	☑	<10						1	ug/L		<10		1
36B. Hexachloroethane (67-72-1)	☑	☐	☑	<10						1	ug/L		<10		1
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	☑	☐	☑	<10						1	ug/L		<10		1
38B. Isophorone (78-59-1)	☑	☐	☑	<10						1	ug/L		<10		1
39B. Naphthalene (91-20-3)	☑	☐	☑	<10						1	ug/L		<10		1
40B. Nitrobenzene (98-95-3)	☑	☐	☑	<10						1	ug/L		<10		1
41B. N-Nitro-sodimethylamine (62-75-9)	☑	☐	☑	<10						1	ug/L		<10		1

CONTINUE ON PAGE 7

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TES-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
42B. N-Nitroso N-Propylamine (621-64-7)	☑	☐	☑	<10						1	ug/L		<10		1
43B. N-Nitro-sodiphenylamine (86-30-6)	☑	☐	☑	<10						1	ug/L		<10		1
44B. Phenanthrene (85-01-8)	☑	☐	☑	<10						1	ug/L		<10		1
45B. Pyrene (129-00-0)	☑	☐	☑	<10						1	ug/L		<10		1
46B. 1,2,4-Tri chlorobenzene (120-82-1)	☑	☐	☑	<10						1	ug/L		<10		1
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)	☐	☐	☑												
2P. α-BHC (319-84-6)	☐	☐	☑												
3P. β-BHC (319-84-6)	☐	☐	☑												
4P. γ-BHC (58-89-9)	☐	☐	☑												
5P. δ-BHC (319-86-8)	☐	☐	☑												
6P. Chlordane (57-74-9)	☐	☐	☑												
7P. 4,4'-DDT (50-29-3)	☐	☐	☑												
8P. 4,4'-DDE (72-55-9)	☐	☐	☑												
9P. 4,4'-DDD (72-54-8)	☐	☐	☑												
10P. Dieldrin (60-57-1)	☐	☐	☑												
11P. α-Endosulfan (115-29-7)	☐	☐	☑												
12P. β-Endosultan (115-29-7)	☐	☐	☑												
13P. Endosulfan Sulfate (1031-07-8)	☐	☐	☑												
14P. Endrin (72-20-8)	☐	☐	☑												
15P. Endrin Aldehyde (7421-93-4)	☐	☐	☑												
16P. Heptachlor (76-44-8)	☐	☐	☑												

CONTINUED ON PAGE 8

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM PAGE 7

NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	002

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICISES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)	☐	☐	☑												
18P. PCB-1242 (53469-21-9)	☐	☐	☑												
19P. PBC-1254 (11097-69-1)	☐	☐	☑												
20P. PCB-1221 (11104-28-2)	☐	☐	☑												
21P. PCB-1232 (11141-16-5)	☐	☐	☑												
22P. PCB-1248 (12672-29-6)	☐	☐	☑												
23P. PCB-1260 (11096-82-5)	☐	☐	☑												
24P. PCB-1016 (12674-11-2)	☐	☐	☑												
25P. Toxaphene (8001-35-2)	☐	☐	☑												
J. RADIOACTIVITY															
(1) Alpha Total	☐	☐	☑												
(2) Beta Total	☐	☐	☑												
(3) Radium Total	☐	☐	☑												
(4) Radium 226 Total	☐	☐	☑												

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES

TABLE II

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000353	006

1.30 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (*all seven pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TEST-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-9)	✓		✓	<5						est	ug/L		<5		1
2M. Arsenic, Total (7440-38-2)	✓	✓		33						est	ug/L		<5		1
3M. Beryllium, Total (7440-41-7)	✓		✓	<5						est	ug/L		<5		1
4M. Cadmium, Total (7440-43-9)	✓		✓	<5						est	ug/L		<5		1
5M. Chromium III (16065-83-1)	✓	✓		22						est	ug/l		8		1
6M. Chromium VI (18540-29-9)	✓		✓	<10						est	ug/L		<10		1
7M. Copper, Total (7440-50-8)	✓		✓	<5						est	ug/L		11		1
8M. Lead, Total (7439-92-1)	✓		✓	<5						est	ug/L		5		1
9M. Magnesium Total (7439-95-4)	✓	✓		17,600						est	ug/L		15,200		1
10M. Mercury, Total (7439-97-6)	✓		✓	<0.2						est	ug/L		<0.2		1
11M. Molybdenum Total (7439-98-7)	✓	✓		280						est	ug/L		<5		1
12M. Nickel, Total (7440-02-0)	✓	✓		18						est	ug/L		16		1
13M. Selenium, Total (7782-49-2)	✓	✓		26						est	ug/l		11		1
14M. Silver, Total (7440-22-4)	✓		✓	30						est	ug/L		<5		1
15M. Thallium, Total (7440-28-0)	✓		✓	15						est	ug/l		4		1
16M. Tin Total (7440-31-5)	✓		✓	<5						est	ug/L		<5		1
17M. Titanium Total (7440-32-6)	✓	✓		7						est	ug/L		110		1
18M. Zinc, Total (7440-66-6)	✓	✓		24						est	ug/L		35		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM PAGE 3

19M. Cyanide, Amenable to Chlorination	☑	☐	☐	<10						est	ug/L		<10		1
20M. Phenols, Total	☑	☐	☐	<10						est	ug/l		<10		1
DIOXIN															
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☐	**DESCRIBE RESULTS**											

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT						D. NO. OF ANALYSES	4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)			A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☑	☐	☑	<25						1	ug/L		<25		1
2V. Acrylonitrile (107-13-1)	☑	☐	☑	<25						1	ug/L		<25		1
3V. Benzene (71-43-2)	☑	☐	☑	<5						1	ug/L		<5		1
4V. Bis (*Chloromethyl*) Ether (542-88-1)	☐	☐	☐	note 1											
5V. Bromoform (75-25-2)	☑	☐	☑	<5						1	ug/L		<5		1
6V. Carbon Tetrachloride (56-23-5)	☑	☐	☑	<5						1	ug/L		<5		1
7V. Chlorobenzene (108-90-7)	☑	☐	☑	<5						1	ug/L		<5		1
8V. Chlorodibromomethane (124-48-1)	☑	☐	☑	<5						1	ug/L		<5		1
9V. Chloroethane (75-00-3)	☑	☐	☑	<10						1	ug/L		<10		1
10V. 2-Chloroethylvinyl Ether (110-75-8)	☑	☐	☑	<5						1	ug/L		<5		1
11V. Chloroform (67-66-3)	☑	☐	☑	<5						1	ug/L		<5		1
12V. Dichlorobromomethane (75-27-4)	☑	☐	☑	<5						1	ug/L		<5		1
13V. Dichloro-difluoromethane (75-71-8)	☐	☐	☐	note 1											
14V. 1,1 – Dichloroethane (75-34-3)	☑	☐	☑	<5						1	ug/L		<5		1
15V. 1,2 – Dichloroethane (107-06-2)	☑	☐	☑	<5						1	ug/L		<5		1
16V. 1,1 – Dichloroethylene (75-35-4)	☑	☐	☑	<5						1	ug/L		<5		1
17V. 1,3 – Dichloropropane (78-87-5)	☑	☐	☑	<5						1	ug/L		<5		1
18V. 1,2 –Dichloropropylene (542-75-6) Note 2	☑	☐	☑	<5						1	ug/L		<5		1
19V. Ethylbenzene (100-41-4)	☑	☐	☑	<5						1	ug/L		<5		1
20V. Methyl Bromide (74-83-9)	☑	☐	☑	<10						1	ug/L		<10		1
21V. Methyl Chloride (74-87-3)	☑	☐	☑	<10						1	ug/L		<10		1

CONTINUE ON PAGE 4

Note 1: These parameters deleted per 40CFR122, Appendix D.

Note 2: This parameter is 1,3-dichloropropene per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	006

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC.MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)	☑	☐	☑	<5						1	ug/L		<5		1
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	☑	☐	☑	<5						1	ug/L		<5		1
24V. Tetrachloroethylene (127-18-4)	☑	☐	☑	<5						1	ug/L		<5		1
25V. Toluene (108-88-3)	☑	☐	☑	<5						1	ug/L		<5		1
26V. 1,2 – Trans Dichloroethylene (156-60-5)	☑	☐	☑	<5						1	ug/L		<5		1
27V. 1,1,1 – Tri – chloroethane (71-55-6)	☑	☐	☑	<5						1	ug/L		<5		1
28V. 1,1,2 – Tri-chloroethane (79-00-5)	☑	☐	☑	<5						1	ug/L		<5		1
29V. Trichloro – ethylene (79-01-6)	☑	☐	☑	<5						1	ug/L		<5		1
30V. Trichloro – fluoromethane (75-69-4)	☐	☐	☐	note 1											
31V. Vinyl Chloride (75-01-4)	☑	☐	☑	<5						1	ug/L		<5		1
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2 – Chlorophenol (95-57-8)	☑	☐	☑	<10						1	ug/L		<10		1
2A. 2,4 – Dichloro – phenol (120-83-2)	☑	☐	☑	<10						1	ug/L		<10		1
3A. 2,4 – Dimethyl – phenol (105-67-9)	☑	☐	☑	<10						1	ug/L		<10		1
4A. 4,6 – Dinitro - O-Cresol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1
5A. 2,4 – Dinitro – phenol (51-28-5)	☑	☐	☑	<10						1	ug/L		<10		1
6A. 2-Nitrophenol (88-75-5)	☑	☐	☑	<10						1	ug/L		<10		1
7A. 4-Nitrophenol (100-02-7)	☑	☐	☑	<10						1	ug/L		<10		1
8A. P – Chloro – M Cresol (59-50-7)	☑	☐	☑	<10						1	ug/L		<10		1
9A. Pentachloro – phenol (87-86-5)	☑	☐	☑	<10						1	ug/L		<10		1
10A. Phenol (108-952)	☑	☐	☑	<10						1	ug/L		<10		1
11A. 2,4,6 – Trichloro-phenol (88-06-2)	☑	☐	☑	<10						1	ug/L		<10		1
12A. 2 - methyl – 4,6 dinitrophenol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1

Note 1: This parameter deleted per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
2B. Acenaphtylene (208-96-8)	☑	☐	☑	<10						1	ug/L		<10		1
3B. Anthracene (120-12-7)	☑	☐	☑	<10						1	ug/L		<10		1
4B. Benzidine (92-87-5)	☑	☐	☑	<10						1	ug/L		<10		1
5B. Benzo (a) Anthracene (56-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
6B. Benzo (a) Pyrene (50-32-8)	☑	☐	☑	<10						1	ug/L		<10		1
7B. 3,4 – Benzofluoranthene (205-99-2)	☑	☐	☑	<10						1	ug/L		<10		1
8B. Benzo (ghi) Perylene (191-24-2)	☑	☐	☑	<10						1	ug/L		<10		1
9B. Benzo (k) Fluoranthene (207-08-9)	☑	☐	☑	<10						1	ug/L		<10		1
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	☑	☐	☑	<10						1	ug/L		<10		1
11B. Bis (2-Chloroethyl) Ether (111-44-4)	☑	☐	☑	<10						1	ug/L		<10		1
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	☑	☐	☑	<10						1	ug/L		<10		1
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
15B. Butyl Benzyl Phthalate (85-68-7)	☑	☐	☑	<10						1	ug/L		<10		1
16B. 2-Chloronaphthalene (91-58-7)	☑	☐	☑	<10						1	ug/L		<10		1
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	☑	☐	☑	<10						1	ug/L		<10		1
18B. Chrysene (218-01-9)	☑	☐	☑	<10						1	ug/L		<10		1
19B. Dibenzo (a.h) Anthracene (53-70-3)	☑	☐	☑	<10						1	ug/L		<10		1
20B. 1,2 – Dichlorobenzene (95-50-1)	☑	☐	☑	<10						1	ug/L		<10		1
21B. 1,3 – Dichlorobenzene (541-73-1)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM PAGE 5

NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	006

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
22B. 1, 4-Dichlorobenzene (106-46-7)	☑	☐	☑	<10						1	ug/L		<10		1
23B. 3, 3'-Dichlorobenzidine (91-94-1)	☑	☐	☑	<10						1	ug/L		<10		1
24B. Diethyl Phthalate (84-66-2)	☑	☐	☑	<10						1	ug/L		<10		1
25B. Dimethyl Phthalate (131-11-3)	☑	☐	☑	<10						1	ug/L		<10		1
26B. Di-N-butyl Phthalate (84-74-2)	☑	☐	☑	<10						1	ug/L		<10		1
27B. 2,4-Dinitrotoluene (121-14-2)	☑	☐	☑	<10						1	ug/L		<10		1
28B. 2,6-Dinitrotoluene (606-20-2)	☑	☐	☑	<10						1	ug/L		<10		1
29B. Di-N-Octyphthalate (117-84-0)	☑	☐	☑	<10						1	ug/L		<10		1
30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)	☑	☐	☑	<10						1	ug/L		<10		1
31B. Fluoranthene (206-44-0)	☑	☐	☑	<10						1	ug/L		<10		1
32B. Fluorene (86-73-7)	☑	☐	☑	<10						1	ug/L		<10		1
33B. Hexachlorobenzene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
34B. Hexachlorobutadiene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
35B. Hexachloro-cyclopentadiene (77-47-4)	☑	☐	☑	<10						1	ug/L		<10		1
36B. Hexachloroethane (67-72-1)	☑	☐	☑	<10						1	ug/L		<10		1
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	☑	☐	☑	<10						1	ug/L		<10		1
38B. Isophorone (78-59-1)	☑	☐	☑	<10						1	ug/L		<10		1
39B. Naphthalene (91-20-3)	☑	☐	☑	<10						1	ug/L		<10		1
40B. Nitrobenzene (98-95-3)	☑	☐	☑	<10						1	ug/L		<10		1
41B. N-Nitro-sodimethylamine (62-75-9)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TES-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
42B. N-Nitroso N-Propylamine (621-64-7)	☑	☐	☑	<10						1	ug/L		<10		1
43B. N-Nitro-sodiphenylamine (86-30-6)	☑	☐	☑	<10						1	ug/L		<10		1
44B. Phenanthrene (85-01-8)	☑	☐	☑	<10						1	ug/L		<10		1
45B. Pyrene (129-00-0)	☑	☐	☑	<10						1	ug/L		<10		1
46B. 1,2,4-Tri chlorobenzene (120-82-1)	☑	☐	☑	<10						1	ug/L		<10		1
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)	☐	☐	☑												
2P. α-BHC (319-84-6)	☐	☐	☑												
3P. β-BHC (319-84-6)	☐	☐	☑												
4P. γ-BHC (58-89-9)	☐	☐	☑												
5P. δ-BHC (319-86-8)	☐	☐	☑												
6P. Chlordane (57-74-9)	☐	☐	☑												
7P. 4,4'-DDT (50-29-3)	☐	☐	☑												
8P. 4,4'-DDE (72-55-9)	☐	☐	☑												
9P. 4,4'-DDD (72-54-8)	☐	☐	☑												
10P. Dieldrin (60-57-1)	☐	☐	☑												
11P. α-Endosulfan (115-29-7)	☐	☐	☑												
12P. β-Endosultan (115-29-7)	☐	☐	☑												
13P. Endosulfan Sulfate (1031-07-8)	☐	☐	☑												
14P. Endrin (72-20-8)	☐	☐	☑												
15P. Endrin Aldehyde (7421-93-4)	☐	☐	☑												
16P. Heptachlor (76-44-8)	☐	☐	☑												

CONTINUED ON PAGE 8

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

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NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	006

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICISES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)	☐	☐	☑												
18P. PCB-1242 (53469-21-9)	☐	☐	☑												
19P. PBC-1254 (11097-69-1)	☐	☐	☑												
20P. PCB-1221 (11104-28-2)	☐	☐	☑												
21P. PCB-1232 (11141-16-5)	☐	☐	☑												
22P. PCB-1248 (12672-29-6)	☐	☐	☑												
23P. PCB-1260 (11096-82-5)	☐	☐	☑												
24P. PCB-1016 (12674-11-2)	☐	☐	☑												
25P. Toxaphene (8001-35-2)	☐	☐	☑												
J. RADIOACTIVITY															
(1) Alpha Total	☐	☐	☑												
(2) Beta Total	☐	☐	☑												
(3) Radium Total	☐	☐	☑												
(4) Radium 226 Total	☐	☐	☑												

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES

TABLE II

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000353	009

1.30 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (*all seven pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TEST-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-9)	✓		✓	0.4						est	ug/L		<5		1
2M. Arsenic, Total (7440-38-2)	✓		✓	1.6						est	ug/L		<5		1
3M. Beryllium, Total (7440-41-7)	✓		✓	0.3						est	ug/L		<5		1
4M. Cadmium, Total (7440-43-9)	✓		✓	0.2						est	ug/L		<5		1
5M. Chromium III (16065-83-1)	✓		✓	1.9						est	ug/L		8		1
6M. Chromium VI (18540-29-9)	✓		✓	<5						est	ug/L		<5		1
7M. Copper, Total (7440-50-8)	✓		✓	3.8						est	ug/L		11		1
8M. Lead, Total (7439-92-1)	✓		✓	1.0						est	ug/L		5		1
9M. Magnesium Total (7439-95-4)	✓	✓		19,800						est	ug/L		15,200		1
10M. Mercury, Total (7439-97-6)	✓		✓	<0.02						est	ug/L		<0.2		1
11M. Molybdenum Total (7439-98-7)	✓		✓	18						est	ug/l		<5		1
12M. Nickel, Total (7440-02-0)	✓		✓	5.7						est	ug/l		16		1
13M. Selenium, Total (7782-49-2)	✓		✓	1.9						est	ug/L		11		1
14M. Silver, Total (7440-22-4)	✓		✓	0.04						est	ug/L		<5		1
15M. Thallium, Total (7440-28-0)	✓		✓	0.1						est	ug/L		4		1
16M. Tin Total (7440-31-5)	✓		✓	31						est	ug/L		<5		1
17M. Titanium Total (7440-32-6)	✓		✓	43						est	ug/L		110		1
18M. Zinc, Total (7440-66-6)	✓	✓		10						est	ug/L		35		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM PAGE 3

19M. Cyanide, Amenable to Chlorination	☑	☐	☑	<10						est	ug/L		<10		1
20M. Phenols, Total	☑	☐	☑	<10						est	ug/L		<10		1
DIOXIN															
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☐	**DESCRIBE RESULTS**											

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT						D. NO. OF ANALYSES	4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)			A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☑	☐	☑	<25						1	ug/L		<25		1
2V. Acrylonitrile (107-13-1)	☑	☐	☑	<25						1	ug/L		<25		1
3V. Benzene (71-43-2)	☑	☐	☑	<5						1	ug/L		<5		1
4V. Bis (*Chloromethyl*) Ether (542-88-1)	☐	☐	☐	note 1											
5V. Bromoform (75-25-2)	☑	☐	☑	<5						1	ug/L		<5		1
6V. Carbon Tetrachloride (56-23-5)	☑	☐	☑	<5						1	ug/L		<5		1
7V. Chlorobenzene (108-90-7)	☑	☐	☑	<5						1	ug/L		<5		1
8V. Chlorodibromomethane (124-48-1)	☑	☐	☑	<5						1	ug/L		<5		1
9V. Chloroethane (75-00-3)	☑	☐	☑	<10						1	ug/L		<10		1
10V. 2-Chloroethylvinyl Ether (110-75-8)	☑	☐	☑	<5						1	ug/L		<5		1
11V. Chloroform (67-66-3)	☑	☐	☑	<5						1	ug/L		<5		1
12V. Dichlorobromomethane (75-27-4)	☑	☐	☑	<5						1	ug/L		<5		1
13V. Dichloro-difluoromethane (75-71-8)	☐	☐	☐	note 1											
14V. 1,1 – Dichloroethane (75-34-3)	☑	☐	☑	<5						1	ug/L		<5		1
15V. 1,2 – Dichloroethane (107-06-2)	☑	☐	☑	<5						1	ug/L		<5		1
16V. 1,1 – Dichloroethylene (75-35-4)	☑	☐	☑	<5						1	ug/L		<5		1
17V. 1,3 – Dichloropropane (78-87-5)	☑	☐	☑	<5						1	ug/L		<5		1
18V. 1,2 –Dichloropropylene (542-75-6) Note 2	☑	☐	☑	<5						1	ug/L		<5		1
19V. Ethylbenzene (100-41-4)	☑	☐	☑	<5						1	ug/L		<5		1
20V. Methyl Bromide (74-83-9)	☑	☐	☑	<10						1	ug/L		<10		1
21V. Methyl Chloride (74-87-3)	☑	☐	☑	<10						1	ug/L		<10		1

Note 1: These parameters deleted per 40CFR122, Appendix D.

Note 2: This parameter is 1,3-dichloropropene per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

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NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	009

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT						D. NO. OF ANALYSES	4. UNITS		5. INTAKE (optional)		
	A. TESTING RE-QUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)			A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC.MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)	☑	☐	☑	<5						1	ug/L		<5		1
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	☑	☐	☑	<5						1	ug/L		<5		1
24V. Tetrachloroethylene (127-18-4)	☑	☐	☑	<5						1	ug/L		<5		1
25V. Toluene (108-88-3)	☑	☐	☑	<5						1	ug/L		<5		1
26V. 1,2 – Trans Dichloroethylene (156-60-5)	☑	☐	☑	<5						1	ug/L		<5		1
27V. 1,1,1 – Tri – chloroethane (71-55-6)	☑	☐	☑	<5						1	ug/L		<5		1
28V. 1,1,2 – Tri-chloroethane (79-00-5)	☑	☐	☑	<5						1	ug/L		<5		1
29V. Trichloro – ethylene (79-01-6)	☑	☐	☑	<5						1	ug/L		<5		1
30V. Trichloro – fluoromethane (75-69-4)	☐	☐	☐	note 1											
31V. Vinyl Chloride (75-01-4)	☑	☐	☑	<5						1	ug/L		<5		1
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2 – Chlorophenol (95-57-8)	☑	☐	☑	<10						1	ug/L		<10		1
2A. 2,4 – Dichloro – phenol (120-83-2)	☑	☐	☑	<10						1	ug/L		<10		1
3A. 2,4 – Dimethyl – phenol (105-67-9)	☑	☐	☑	<10						1	ug/L		<10		1
4A. 4,6 – Dinitro - O-Cresol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1
5A. 2,4 – Dinitro – phenol (51-28-5)	☑	☐	☑	<10						1	ug/L		<10		1
6A. 2-Nitrophenol (88-75-5)	☑	☐	☑	<10						1	ug/L		<10		1
7A. 4-Nitrophenol (100-02-7)	☑	☐	☑	<10						1	ug/L		<10		1
8A. P – Chloro – M Cresol (59-50-7)	☑	☐	☑	<10						1	ug/L		<10		1
9A. Pentachloro – phenol (87-86-5)	☑	☐	☑	<10						1	ug/L		<10		1
10A. Phenol (108-952)	☑	☐	☑	<10						1	ug/L		<10		1
11A. 2,4,6 – Trichloro-phenol (88-06-2)	☑	☐	☑	<10						1	ug/L		<10		1
12A. 2 - methyl – 4,6 dinitrophenol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1

Note 1: This parameter deleted per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
2B. Acenaphtylene (208-96-8)	☑	☐	☑	<10						1	ug/L		<10		1
3B. Anthracene (120-12-7)	☑	☐	☑	<10						1	ug/L		<10		1
4B. Benzidine (92-87-5)	☑	☐	☑	<10						1	ug/L		<10		1
5B. Benzo (a) Anthracene (56-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
6B. Benzo (a) Pyrene (50-32-8)	☑	☐	☑	<10						1	ug/L		<10		1
7B. 3,4 – Benzofluoranthene (205-99-2)	☑	☐	☑	<10						1	ug/L		<10		1
8B. Benzo (ghi) Perylene (191-24-2)	☑	☐	☑	<10						1	ug/L		<10		1
9B. Benzo (k) Fluoranthene (207-08-9)	☑	☐	☑	<10						1	ug/L		<10		1
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	☑	☐	☑	<10						1	ug/L		<10		1
11B. Bis (2-Chloroethyl) Ether (111-44-4)	☑	☐	☑	<10						1	ug/L		<10		1
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	☑	☐	☑	<10						1	ug/L		<10		1
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
15B. Butyl Benzyl Phthalate (85-68-7)	☑	☐	☑	<10						1	ug/L		<10		1
16B. 2-Chloronaphthalene (91-58-7)	☑	☐	☑	<10						1	ug/L		<10		1
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	☑	☐	☑	<10						1	ug/L		<10		1
18B. Chrysene (218-01-9)	☑	☐	☑	<10						1	ug/L		<10		1
19B. Dibenzo (a.h) Anthracene (53-70-3)	☑	☐	☑	<10						1	ug/L		<10		1
20B. 1,2 – Dichlorobenzene (95-50-1)	☑	☐	☑	<10						1	ug/L		<10		1
21B. 1,3 – Dichlorobenzene (541-73-1)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

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NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	009

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
22B. 1, 4-Dichlorobenzene (106-46-7)	☑	☐	☑	<10						1	ug/L		<10		1
23B. 3, 3'-Dichlorobenzidine (91-94-1)	☑	☐	☑	<10						1	ug/L		<10		1
24B. Diethyl Phthalate (84-66-2)	☑	☐	☑	<10						1	ug/L		<10		1
25B. Dimethyl Phthalate (131-11-3)	☑	☐	☑	<10						1	ug/L		<10		1
26B. Di-N-butyl Phthalate (84-74-2)	☑	☐	☑	<10						1	ug/L		<10		1
27B. 2,4-Dinitrotoluene (121-14-2)	☑	☐	☑	<10						1	ug/L		<10		1
28B. 2,6-Dinitrotoluene (606-20-2)	☑	☐	☑	<10						1	ug/L		<10		1
29B. Di-N-Octyphthalate (117-84-0)	☑	☐	☑	<10						1	ug/L		<10		1
30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)	☑	☐	☑	<10						1	ug/L		<10		1
31B. Fluoranthene (206-44-0)	☑	☐	☑	<10						1	ug/L		<10		1
32B. Fluorene (86-73-7)	☑	☐	☑	<10						1	ug/L		<10		1
33B. Hexachlorobenzene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
34B. Hexachlorobutadiene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
35B. Hexachloro-cyclopentadiene (77-47-4)	☑	☐	☑	<10						1	ug/L		<10		1
36B. Hexachloroethane (67-72-1)	☑	☐	☑	<10						1	ug/L		<10		1
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	☑	☐	☑	<10						1	ug/L		<10		1
38B. Isophorone (78-59-1)	☑	☐	☑	<10						1	ug/L		<10		1
39B. Naphthalene (91-20-3)	☑	☐	☑	<10						1	ug/L		<10		1
40B. Nitrobenzene (98-95-3)	☑	☐	☑	<10						1	ug/L		<10		1
41B. N-Nitro-sodimethylamine (62-75-9)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TES-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
42B. N-Nitroso N-Propylamine (621-64-7)	☑	☐	☑	<10						1	ug/L		<10		1
43B. N-Nitro-sodiphenylamine (86-30-6)	☑	☐	☑	<10						1	ug/L		<10		1
44B. Phenanthrene (85-01-8)	☑	☐	☑	<10						1	ug/L		<10		1
45B. Pyrene (129-00-0)	☑	☐	☑	<10						1	ug/L		<10		1
46B. 1,2,4-Tri chlorobenzene (120-82-1)	☑	☐	☑	<10						1	ug/L		<10		1
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)	☐	☐	☑												
2P. α-BHC (319-84-6)	☐	☐	☑												
3P. β-BHC (319-84-6)	☐	☐	☑												
4P. γ-BHC (58-89-9)	☐	☐	☑												
5P. δ-BHC (319-86-8)	☐	☐	☑												
6P. Chlordane (57-74-9)	☐	☐	☑												
7P. 4,4'-DDT (50-29-3)	☐	☐	☑												
8P. 4,4'-DDE (72-55-9)	☐	☐	☑												
9P. 4,4'-DDD (72-54-8)	☐	☐	☑												
10P. Dieldrin (60-57-1)	☐	☐	☑												
11P. α-Endosulfan (115-29-7)	☐	☐	☑												
12P. β-Endosultan (115-29-7)	☐	☐	☑												
13P. Endosulfan Sulfate (1031-07-8)	☐	☐	☑												
14P. Endrin (72-20-8)	☐	☐	☑												
15P. Endrin Aldehyde (7421-93-4)	☐	☐	☑												
16P. Heptachlor (76-44-8)	☐	☐	☑												

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

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NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	009

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICISES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)	☐	☐	☑												
18P. PCB-1242 (53469-21-9)	☐	☐	☑												
19P. PBC-1254 (11097-69-1)	☐	☐	☑												
20P. PCB-1221 (11104-28-2)	☐	☐	☑												
21P. PCB-1232 (11141-16-5)	☐	☐	☑												
22P. PCB-1248 (12672-29-6)	☐	☐	☑												
23P. PCB-1260 (11096-82-5)	☐	☐	☑												
24P. PCB-1016 (12674-11-2)	☐	☐	☑												
25P. Toxaphene (8001-35-2)	☐	☐	☑												
J. RADIOACTIVITY															
(1) Alpha Total	☐	☐	☑												
(2) Beta Total	☐	☐	☑												
(3) Radium Total	☐	☐	☑												
(4) Radium 226 Total	☐	☐	☑												

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES

TABLE II

NPDES # *(IF ASSIGNED)*	OUTFALL NUMBER
MO-0000353	010

1.30 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (*all seven pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. TEST-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE (1) CONCENTRATION	A. MAXIMUM DAILY VALUE (2) MASS	B. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	B. MAXIMUM 30 DAY VALUE *(if available)* (2) MASS	C. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	C. LONG TERM AVRG. VALUE *(if available)* (2) MASS	D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	A. LONG TERM AVRG. VALUE (2) MASS	B. NO OF ANALYSES
METALS, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-9)	✓		✓	1						est	ug/L		<5		1
2M. Arsenic, Total (7440-38-2)	✓		✓	10						est	ug/L		<5		1
3M. Beryllium, Total (7440-41-7)	✓		✓	0.3						est	ug/L		<5		1
4M. Cadmium, Total (7440-43-9)	✓		✓	1.9						est	ug/L		<5		1
5M. Chromium III (16065-83-1)	✓		✓	<10						est	ug/L		8		1
6M. Chromium VI (18540-29-9)	✓		✓	<10						est	ug/L		<5		1
7M. Copper, Total (7440-50-8)	✓		✓	2.5						est	ug/L		11		1
8M. Lead, Total (7439-92-1)	✓		✓	2.1						est	ug/L		5		1
9M. Magnesium Total (7439-95-4)	✓	✓		19,300						est	ug/L		15,200		1
10M. Mercury, Total (7439-97-6)	✓		✓	<0.2						est	ug/L		<0.2		1
11M. Molybdenum Total (7439-98-7)	✓		✓	92						est	ug/L		<5		1
12M. Nickel, Total (7440-02-0)	✓		✓	9						est	ug/L		16		1
13M. Selenium, Total (7782-49-2)	✓		✓	10						est	ug/L		11		1
14M. Silver, Total (7440-22-4)	✓		✓	9						est	ug/L		<5		1
15M. Thallium, Total (7440-28-0)	✓		✓	5						est	ug/L		4		1
16M. Tin Total (7440-31-5)	✓		✓	31						est	ug/L		<5		1
17M. Titanium Total (7440-32-6)	✓	✓		43						est	ug/L		110		1
18M. Zinc, Total (7440-66-6)	✓	✓		28						est	ug/L		35		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

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19M. Cyanide, Amenable to Chlorination	☑	☐	☑	<10						est	ug/L		<10		1
20M. Phenols, Total	☑	☐	☑	<10						est	ug/L		<10		1
DIOXIN																
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☐	**DESCRIBE RESULTS**												

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT						D. NO. OF ANALYSES	4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)			A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☑		☑	<25						1	ug/L		<25		1
2V. Acrylonitrile (107-13-1)	☑		☑	<25						1	ug/L		<25		1
3V. Benzene (71-43-2)	☑		☑	<5						1	ug/L		<5		1
4V. Bis (*Chloromethyl*) Ether (542-88-1)	☐		☐	note 1											
5V. Bromoform (75-25-2)	☑		☑	<5						1	ug/L		<5		1
6V. Carbon Tetrachloride (56-23-5)	☑		☑	<5						1	ug/L		<5		1
7V. Chlorobenzene (108-90-7)	☑		☑	<5						1	ug/L		<5		1
8V. Chlorodibromomethane (124-48-1)	☑		☑	<5						1	ug/L		<5		1
9V. Chloroethane (75-00-3)	☑		☑	<10						1	ug/L		<10		1
10V. 2-Chloroethylvinyl Ether (110-75-8)	☑		☑	<5						1	ug/L		<5		1
11V. Chloroform (67-66-3)	☑		☑	<5						1	ug/L		<5		1
12V. Dichlorobromomethane (75-27-4)	☑		☑	<5						1	ug/L		<5		1
13V. Dichloro-difluoromethane (75-71-8)	☐		☐	note 1											
14V. 1,1 – Dichloroethane (75-34-3)	☑		☑	<5						1	ug/L		<5		1
15V. 1,2 – Dichloroethane (107-06-2)	☑		☑	<5						1	ug/L		<5		1
16V. 1,1 – Dichloroethylene (75-35-4)	☑		☑	<5						1	ug/L		<5		1
17V. 1,3 – Dichloropropane (78-87-5)	☑		☑	<5						1	ug/L		<5		1
18V. 1,2 –Dichloropropylene (542-75-6) Note 2	☑		☑	<5						1	ug/L		<5		1
19V. Ethylbenzene (100-41-4)	☑		☑	<5						1	ug/L		<5		1
20V. Methyl Bromide (74-83-9)	☑		☑	<10						1	ug/L		<10		1
21V. Methyl Chloride (74-87-3)	☑		☑	<10						1	ug/L		<10		1

Note 1: These parameters deleted per 40CFR122, Appendix D.

Note 2: This parameter is 1,3-dichloropropene per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

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NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	010

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING RE-QUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC.MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)	☑	☐	☑	<5						1	ug/L		<5		1
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	☑	☐	☑	<5						1	ug/L		<5		1
24V. Tetrachloroethylene (127-18-4)	☑	☐	☑	<5						1	ug/L		<5		1
25V. Toluene (108-88-3)	☑	☐	☑	<5						1	ug/L		<5		1
26V. 1,2 – Trans Dichloroethylene (156-60-5)	☑	☐	☑	<5						1	ug/L		<5		1
27V. 1,1,1 – Tri – chloroethane (71-55-6)	☑	☐	☑	<5						1	ug/L		<5		1
28V. 1,1,2 – Tri-chloroethane (79-00-5)	☑	☐	☑	<5						1	ug/L		<5		1
29V. Trichloro – ethylene (79-01-6)	☑	☐	☑	<5						1	ug/L		<5		1
30V. Trichloro – fluoromethane (75-69-4)	☐	☐	☐	note 1											
31V. Vinyl Chloride (75-01-4)	☑	☐	☑	<5						1	ug/L		<5		1
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2 – Chlorophenol (95-57-8)	☑	☐	☑	<10						1	ug/L		<10		1
2A. 2,4 – Dichloro – phenol (120-83-2)	☑	☐	☑	<10						1	ug/L		<10		1
3A. 2,4 – Dimethyl – phenol (105-67-9)	☑	☐	☑	<10						1	ug/L		<10		1
4A. 4,6 – Dinitro - O-Cresol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1
5A. 2,4 – Dinitro – phenol (51-28-5)	☑	☐	☑	<10						1	ug/L		<10		1
6A. 2-Nitrophenol (88-75-5)	☑	☐	☑	<10						1	ug/L		<10		1
7A. 4-Nitrophenol (100-02-7)	☑	☐	☑	<10						1	ug/L		<10		1
8A. P – Chloro – M Cresol (59-50-7)	☑	☐	☑	<10						1	ug/L		<10		1
9A. Pentachloro – phenol (87-86-5)	☑	☐	☑	<10						1	ug/L		<10		1
10A. Phenol (108-952)	☑	☐	☑	<10						1	ug/L		<10		1
11A. 2,4,6 – Trichloro-phenol (88-06-2)	☑	☐	☑	<10						1	ug/L		<10		1
12A. 2 - methyl – 4,6 dinitrophenol (534-52-1)	☑	☐	☑	<10						1	ug/L		<10		1

Note 1: This parameter deleted per 40CFR122, Appendix D.

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
2B. Acenaphtylene (208-96-8)	☑	☐	☑	<10						1	ug/L		<10		1
3B. Anthracene (120-12-7)	☑	☐	☑	<10						1	ug/L		<10		1
4B. Benzidine (92-87-5)	☑	☐	☑	<10						1	ug/L		<10		1
5B. Benzo (a) Anthracene (56-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
6B. Benzo (a) Pyrene (50-32-8)	☑	☐	☑	<10						1	ug/L		<10		1
7B. 3,4 – Benzofluoranthene (205-99-2)	☑	☐	☑	<10						1	ug/L		<10		1
8B. Benzo (ghi) Perylene (191-24-2)	☑	☐	☑	<10						1	ug/L		<10		1
9B. Benzo (k) Fluoranthene (207-08-9)	☑	☐	☑	<10						1	ug/L		<10		1
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	☑	☐	☑	<10						1	ug/L		<10		1
11B. Bis (2-Chloroethyl) Ether (111-44-4)	☑	☐	☑	<10						1	ug/L		<10		1
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	☑	☐	☑	<10						1	ug/L		<10		1
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	☑	☐	☑	<10						1	ug/L		<10		1
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	☑	☐	☑	<10						1	ug/L		<10		1
15B. Butyl Benzyl Phthalate (85-68-7)	☑	☐	☑	<10						1	ug/L		<10		1
16B. 2-Chloronaphthalene (91-58-7)	☑	☐	☑	<10						1	ug/L		<10		1
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	☑	☐	☑	<10						1	ug/L		<10		1
18B. Chrysene (218-01-9)	☑	☐	☑	<10						1	ug/L		<10		1
19B. Dibenzo (a.h) Anthracene (53-70-3)	☑	☐	☑	<10						1	ug/L		<10		1
20B. 1,2 – Dichlorobenzene (95-50-1)	☑	☐	☑	<10						1	ug/L		<10		1
21B. 1,3 – Dichlorobenzene (541-73-1)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

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NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000353	010

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
22B. 1, 4-Dichlorobenzene (106-46-7)	☑	☐	☑	<10						1	ug/L		<10		1
23B. 3, 3'-Dichlorobenzidine (91-94-1)	☑	☐	☑	<10						1	ug/L		<10		1
24B. Diethyl Phthalate (84-66-2)	☑	☐	☑	<10						1	ug/L		<10		1
25B. Dimethyl Phthalate (131-11-3)	☑	☐	☑	<10						1	ug/L		<10		1
26B. Di-N-butyl Phthalate (84-74-2)	☑	☐	☑	<10						1	ug/L		<10		1
27B. 2,4-Dinitrotoluene (121-14-2)	☑	☐	☑	<10						1	ug/L		<10		1
28B. 2,6-Dinitrotoluene (606-20-2)	☑	☐	☑	<10						1	ug/L		<10		1
29B. Di-N-Octyphthalate (117-84-0)	☑	☐	☑	<10						1	ug/L		<10		1
30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)	☑	☐	☑	<10						1	ug/L		<10		1
31B. Fluoranthene (206-44-0)	☑	☐	☑	<10						1	ug/L		<10		1
32B. Fluorene (86-73-7)	☑	☐	☑	<10						1	ug/L		<10		1
33B. Hexachlorobenzene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
34B. Hexachlorobutadiene (87-68-3)	☑	☐	☑	<10						1	ug/L		<10		1
35B. Hexachloro-cyclopentadiene (77-47-4)	☑	☐	☑	<10						1	ug/L		<10		1
36B. Hexachloroethane (67-72-1)	☑	☐	☑	<10						1	ug/L		<10		1
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	☑	☐	☑	<10						1	ug/L		<10		1
38B. Isophorone (78-59-1)	☑	☐	☑	<10						1	ug/L		<10		1
39B. Naphthalene (91-20-3)	☑	☐	☑	<10						1	ug/L		<10		1
40B. Nitrobenzene (98-95-3)	☑	☐	☑	<10						1	ug/L		<10		1
41B. N-Nitro-sodimethylamine (62-75-9)	☑	☐	☑	<10						1	ug/L		<10		1

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TES-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
42B. N-Nitroso N-Propylamine (621-64-7)	☑	☐	☑	<10						1	ug/L		<10		1
43B. N-Nitro-sodiphenylamine (86-30-6)	☑	☐	☑	<10						1	ug/L		<10		1
44B. Phenanthrene (85-01-8)	☑	☐	☑	<10						1	ug/L		<10		1
45B. Pyrene (129-00-0)	☑	☐	☑	<10						1	ug/L		<10		1
46B. 1,2,4-Tri chlorobenzene (120-82-1)	☑	☐	☑	<10						1	ug/L		<10		1
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)	☐	☐	☑												
2P. α-BHC (319-84-6)	☐	☐	☑												
3P. β-BHC (319-84-6)	☐	☐	☑												
4P. γ-BHC (58-89-9)	☐	☐	☑												
5P. δ-BHC (319-86-8)	☐	☐	☑												
6P. Chlordane (57-74-9)	☐	☐	☑												
7P. 4,4'-DDT (50-29-3)	☐	☐	☑												
8P. 4,4'-DDE (72-55-9)	☐	☐	☑												
9P. 4,4'-DDD (72-54-8)	☐	☐	☑												
10P. Dieldrin (60-57-1)	☐	☐	☑												
11P. α-Endosulfan (115-29-7)	☐	☐	☑												
12P. β-Endosultan (115-29-7)	☐	☐	☑												
13P. Endosulfan Sulfate (1031-07-8)	☐	☐	☑												
14P. Endrin (72-20-8)	☐	☐	☑												
15P. Endrin Aldehyde (7421-93-4)	☐	☐	☑												
16P. Heptachlor (76-44-8)	☐	☐	☑												

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NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.

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NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0000353	010

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICISES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)	☐	☐	☑												
18P. PCB-1242 (53469-21-9)	☐	☐	☑												
19P. PBC-1254 (11097-69-1)	☐	☐	☑												
20P. PCB-1221 (11104-28-2)	☐	☐	☑												
21P. PCB-1232 (11141-16-5)	☐	☐	☑												
22P. PCB-1248 (12672-29-6)	☐	☐	☑												
23P. PCB-1260 (11096-82-5)	☐	☐	☑												
24P. PCB-1016 (12674-11-2)	☐	☐	☑												
25P. Toxaphene (8001-35-2)	☐	☐	☑												
J. RADIOACTIVITY															
(1) Alpha Total	☐	☐	☑												
(2) Beta Total	☐	☐	☑												
(3) Radium Total	☐	☐	☑												
(4) Radium 226 Total	☐	☐	☑												

NOTE: See attachments for data source information. Data provided represents anticipated post-construction effluent quality.