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-0001716
Owner:	BASF Corporation
Address:	P.O. Box 13528, Research Triangle Park, NC 27709-3528
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	BASF Corporation – Hannibal Plant
Facility Address:	3150 Highway JJ, Palmyra, MO 63461-2611
Legal Description:	See following page(s)
UTM Coordinates:	See following page(s)
Receiving Stream:	See following page(s)
First Classified Stream and ID:	See following page(s)
USGS Basin & Sub-watershed No.:	See following page(s)

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

FACILITY DESCRIPTION

Agricultural chemical manufacturing; SIC# 2879; NAICS# 525320

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.

March 1, 2019
Effective Date

March 1, 2021
Modification Date

Edward B. Galbraith, Director, Division of Environmental Quality

September 30, 2023
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (CONTINUED)

BASF manufactures agricultural pesticides. All BASF pesticide manufacturing process wastewater is collected through a series of feed tankage and pumping systems. These systems are currently being used to manage the liquid wastes sent to incineration for treatment prior to discharge.

OUTFALL #001: SIC# 2879; NAICS# 325320
Pesticide manufacturing wastewater subject to Pesticide Manufacturing Categorical Standards and stormwater: incinerated (BAT for category). Also discharges domestic wastewater (aeration, clarification, heating via Pick heater), sulfuric acid recovery (SAR) unit, cooling tower make-up water, and laundry wastewater: not incinerated. All effluents are mixed and sampled at Sump #11 prior to discharge. The effluent is passed through a diffuser after sampling but prior to discharge to the Mississippi River.

Legal Description:	NE ¼, SW ¼, Sec. 11, T58N, R5W, Marion County
UTM:	X = 634447, Y = 4410628
Receiving Stream:	Mississippi River
First Classified Stream and ID:	Mississippi River (P) (WBID# 3699)
USGS Basin & Sub-watershed No.:	07110004-0304
Average Flow:	1.15 MGD
Design Flow:	2.5 MGD

OUTFALL #002: SIC# 2879; NAICS# 325320
Discharge from West Utilities Plant: boilers #6 and #7 blowdown, DI water regeneration, lime softening blowdown; scrubbing systems effluent, raw water treatment reject, boiler feedwater demineralization ion exchange regeneration blowdown, stormwater from secondary containment, cooling tower #6 blowdown. pH is neutralized prior to discharge.

Legal Description:	NE ¼, SE ¼, Sec. 10, T58N, R5W, Marion County
UTM:	X = 633982, Y = 4410950
Receiving Stream:	Mississippi River
First Classified Stream and ID:	Mississippi River (P) (WBID# 3699)
USGS Basin & Sub-watershed No.:	07110004-0304
Average Flow:	0.5 MGD
Design Flow:	1.0 MGD

OUTFALL #003: Removed from this renewal. Previously an internal outfall receiving domestic wastewater and discharges from Hannibal Biotech Plant (currently out of service). The Hannibal Biotech plant is not authorized to discharge as 40 CFR 439 requirements were removed.

Domestic wastewater: The basins associated with outfall #003 continue to be used as a conveyance to and provide minimal treatment (settling and biodegradation) for the site's sanitary wastewater. The sanitary wastewater is disinfected by applying 140 ºF steam prior to discharge at outfall #001. Domestic wastewater is discharged through outfall #001 to the Mississippi River. No sampling requirements.

Legal Description:	SE ¼, SW ¼, Sec. 10, T58N, R5W, Marion County
UTM:	X = 633982, Y = 4410950

OUTFALL #004: SIC# 2879; NAICS# 325320
Stormwater and trace steam condensate (low volume, possibly entrained during precipitation event) and fire protection test water is allowed for discharge. Dry weather discharge of steam condensate is prohibited. Wyeth Holdings (MO-0135763), and agricultural stormwater also discharges to the Barrow Pit. Settling, retention, and controlled discharge.

Legal Description:	SE ¼, SW ¼, Sec. 10, T58N, R5W, Marion County
UTM:	X = 633982, Y = 4410950
Receiving Stream:	Mississippi River
First Classified Stream and ID:	Mississippi River (P) (WBID# 3699)
USGS Basin & Sub-watershed No.:	07110004-0304
Average Flow:	unknown
Design Flow:	n/a

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001
incinerator wastewater

TABLE A-1
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 **March 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	*		*	once/week	24 hr. total
ELG PARAMETERS						
Biochemical Oxygen Demand$_5$ (BOD_5)	mg/L	*		*	once/month	composite ¥
Biochemical Oxygen Demand$_5$ (BOD_5)	lbs/day	13,643.0		2,983.6	once/month	composite ¥
Chemical Oxygen Demand (COD)	mg/L	*		*	once/month	composite ¥
Chemical Oxygen Demand (COD)	lbs/day	23,985.6		16,601.6	once/month	composite ¥
Organic Pesticides - Total	mg/L	*		*	once/month	composite ¥
Organic Pesticides - Total	lbs/day	18.3		1.8	once/month	composite ¥
Total Suspended Solids (TSS)	mg/L	*		*	once/month	composite ¥
Total Suspended Solids (TSS)	lbs/day	11,259.4		3,350.3	once/month	composite ¥
CONVENTIONAL PARAMETERS						
E. coli €	#/100 ml	630		126	once/month	grab
pH Ω	SU	6.0 to 9.5		6.0 to 9.5	continuous	continuous
pH – single excursion	minutes	60		-	continuous	calculation
pH – monthly total	minutes	-		446	continuous	calculation
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE APRIL 28, 2019. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
NUTRIENTS						
Ammonia as N	mg/L	*		*	once/quarter ◊	composite ¥
Nitrogen, Total (TN)	mg/L	*		*	once/quarter ◊	composite ¥
Phosphorus, Total (TP)	mg/L	*		*	once/quarter ◊	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2019. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
ELG PARAMETERS						
Thimet and Counter (phorate/terbufos)	mg/L	*		*	twice/year φ	composite ¥
Thimet and Counter (phorate/terbufos)	lbs/day	0.90		0.23	twice/year φ	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED TWICE PER YEAR; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
OTHER						
Whole Effluent Toxicity, Acute see special condition #1	TU_a	30.9			once/year	composite ¥
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.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #002
air pollution control and water treatment wastewater

TABLE A-2
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. In accordance with 10 CSR 20-7.031, the final effluent limitations outlined in Table A-3 must be achieved as soon as possible but no later than **March 1, 2022**. These interim effluent limitations are effective beginning **March 1, 2019** and remain in effect through **February 28, 2021** or as soon as possible. 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	*		*	once/month	24 hr. total
CONVENTIONAL						
Chemical Oxygen Demand	mg/L	*		*	once/month	composite ¥
Chemical Oxygen Demand	lbs/day	*		*	once/month	composite ¥
pH Ω	SU	6.5 to 9.0		6.5 to 9.0	once/month	grab
Total Suspended Solids	mg/L	*		*	once/month	composite ¥
Total Suspended Solids	lbs/day	*		*	once/month	composite ¥
METALS						
Aluminum, Total Recoverable	µg/L	*		*	once/month	composite ¥
Aluminum, Total Recoverable	lbs/day	*		*	once/month	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE APRIL 28, 2019. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
NUTRIENTS						
Nitrogen, Total (TN)	mg/L	*		*	once/quarter ◊	composite ¥
Phosphorus, Total (TP)	mg/L	*		*	once/quarter ◊	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2019. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
OTHER						
Whole Effluent Toxicity, Acute see special condition #2	TU_a	*			once/year	composite ¥
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.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #002
air pollution control and water treatment wastewater

TABLE A-3
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 **March 1, 2021** 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/month	24 hr. total
CONVENTIONAL						
Chemical Oxygen Demand	mg/L	*		*	once/month	composite ¥
Chemical Oxygen Demand	lbs/day	*		*	once/month	composite ¥
pH Ω	SU	6.5 to 9.0		6.5 to 9.0	once/month	grab
Total Suspended Solids	mg/L	*		*	once/month	composite ¥
Total Suspended Solids	lbs/day	*		*	once/month	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE APRIL 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
NUTRIENTS						
Nitrogen, Total (TN)	mg/L	*		*	once/quarter ◊	composite ¥
Phosphorus, Total (TP)	mg/L	*		*	once/quarter ◊	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
OTHER						
Whole Effluent Toxicity, Acute see special condition #2	TU_a	*			once/year	composite ¥
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.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #004 *Stormwater*	**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 **March 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 LIMITATIONS		BENCH-MARKS	MONITORING REQUIREMENTS	
		DAILY MAXIMUM	MONTHLY AVERAGE		MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		-	once/quarter ◊	24 Hr Est.
CONVENTIONAL						
Chemical Oxygen Demand	mg/L	**		120	once/quarter ◊	grab
Oil & Grease	mg/L	**		10	once/quarter ◊	grab
pH Ω	SU	*		-	once/quarter ◊	grab
Total Suspended Solids	mg/L	**		100	once/quarter ◊	grab
NUTRIENTS						
Ammonia as N	mg/L	*		-	once/quarter ◊	grab

MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2019.
THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only

** Monitoring requirement with associated benchmark

Ω The facility will report the minimum and maximum values. pH is not to be averaged.

¥ The facility may collect either a time-proportional or a flow-proportional composite sample but must be collected over a singular 24 hour period.

€ Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean.

◊ Quarterly sampling

QUARTER	MONTHS	ALL OTHER PARAMETERS	REPORT IS DUE
First	January, February, March	Sample at least once during any month of the 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	January 28th

φ Twice yearly sampling schedule:

MINIMUM BI-ANNUAL SAMPLING REQUIREMENTS			
	MONTHS	APPLICABLE PARAMETERS	REPORT IS DUE
First Half of Year	January, February, March, April, May, June	Sample at least once during any month of the half year	July 28th
Second Half of Year	July, August, September, October, November, December	Sample at least once during any month of the half year	January 28th

B. SCHEDULE OF COMPLIANCE

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

The 2021 modification removed the SOC for aluminum due to diffuser installation and recalculation of the MZ and ZID. See statement of basis.

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I and Part III standard conditions dated August 1, 2014 and March 1, 2015, respectively, and hereby incorporated as though fully set forth herein.

D. SPECIAL CONDITIONS

1. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows for 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) The Allowable Effluent Concentration (AEC) for this outfall is 3.24%
   (e) The dilution series is: 0.8%, 1.6%, 3.24%, 6.5%, and 13%
   (f) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
   (g) 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.
   (h) Accelerated Testing Trigger: If the regularly scheduled acute WET test exceeds the TU_a limit, the permittee shall conduct accelerated follow-up WET testing as prescribed in the following conditions. Results of the follow-up accelerated WET testing shall be reported in TU_a. This permit requires the following additional toxicity testing if any one test result exceeds a TU_a limit.
      (1) A multiple dilution test shall be performed for both test species within 60 calendar days of becoming aware the regularly scheduled WET test exceeded a TU_a limit, and once every two weeks thereafter until one of the following conditions are met:
         i. Three consecutive multiple-dilution tests are below the TU_a limit. No further tests need to be performed until next regularly scheduled test period.
         ii. A total of three multiple-dilution tests exceed the TU_a limit.
      (2) Follow-up tests do not negate an initial test result.
      (3) The permittee shall submit a summary of all accelerated WET test results for the test series along with complete copies of the laboratory reports as received from the laboratory within 14 calendar days of the availability of the third test exceeding a TU_a limit.
   (i) TIE/TRE Trigger: The following shall apply upon the exceedance of the TU_a limit in three accelerated follow-up WET tests. The permittee should contact the Department within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. If the permittee does not contact the Department upon the third follow up test exceeding a TU_a limit, a toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall submit a plan for conducting a TIE or TRE within 60 calendar days of the date of the automatic trigger or the Department's direction to perform either a TIE or TRE. The plan shall be based on EPA Methods and include a schedule for completion. This plan must be approved by the Department before the TIE or TRE is begun.

D. SPECIAL CONDITIONS (CONTINUED)

2. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows for outfall #002:
   (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) The Allowable Effluent Concentration (AEC) for this facility is 1.37%
   (e) The dilution series is: 0.3% 0.7% 1.37% 2.7% 5.5%
   (f) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
   (g) 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.

3. 40 CFR 122.41(e) 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.

4. This facility is required to submit a closure plan of the lagoon per 10 CSR 20-6.010(12) if the facility is no longer using the lagoon associated with outfall #003.

5. The facility shall, for the application for permit renewal:
   (a) Submit no less than four samples from outfall #001 for each of the following parameters: alkalinity, aluminum (total recoverable) bromide, chloride, chloride plus sulfate, fluoride, hardness, orthophosphate, phosphorus, sulfate, and total dissolved solids.
   (b) And submit no less than four samples from outfall #002 for each of the following parameters: chloride, chloride plus sulfate, fluoride, sulfate, and total dissolved solids.
   (c) The facility must submit at least one sample from outfall #004 for all parameters in outfalls #001 and #002 in this permit, in accordance with 10 CSR 20-6.200(2)(C)1.E(I), (II), and (III). Additional constituents in 10 CSR 20-6.200(2)(C)1.E.(III) which must be sampled for in all stormwater discharges are: oil and grease, pH, biochemical oxygen demand (BOD_5), chemical oxygen demand (COD), total suspended solids, conductivity, total phosphorus, total Kjeldahl nitrogen (TKN), and nitrate plus nitrite as total N.

D. SPECIAL CONDITIONS (CONTINUED)

6. Electronic Discharge Monitoring Report (eDMR) Submission System
   (a) Discharge Monitoring Reporting Requirements. The permittee must electronically submit compliance monitoring data via the eDMR system. In regards to Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit.
   (b) Programmatic Reporting Requirements. The following reports (if required by this permit) must be electronically submitted as an attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:
      (1) Schedule of Compliance Progress Reports;
      (2) Any additional report required by the permit excluding bypass reporting.
      After such a system has been made available by the Department, required data shall be directly input into the system by the next report due date.
   (c) Other actions. The following shall be submitted electronically after the system has been made available by the Department:
      (1) General Permit Applications/Notices of Intent to discharge (NOIs);
      (2) Notices of Termination (NOTs);
      (3) No Exposure Certifications (NOEs);
      (4) Low Erosivity Waivers and Other Waivers from Stormwater Controls (LEWs); and
      (5) Bypass reporting.
   (d) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx.
   (e) 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. 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. 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.

7. The facility's SIC code(s) or description is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2) hence shall implement a Stormwater Pollution Prevention Plan (SWPPP) which must be prepared and implemented within 90 days of 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 years or as site conditions change. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in: *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002) published by the EPA in 2015 https://www.epa.gov/sites/production/files/2015-11/documents/swppp_guide_industrial_2015.pdf The purpose of the SWPPP and the Best Management Practices (BMPs) listed herein is the prevention of pollution of waters of the state. A deficiency of a BMP means it was not effective preventing pollution [10 CSR 20-2.010(56)] of waters of the state. Corrective action means the facility took steps to eliminate the deficiency.
   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.
   (b) A schedule for at least 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 proposed 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. Electronic versions of the documents are acceptable.
   (c) A provision for designating an individual to be responsible for environmental matters.
   (d) A provision for providing training to all personnel involved in housekeeping, material handling (including but not limited to loading and unloading), storage, and staging of all operational, maintenance, storage, and cleaning areas. Proof of training shall be submitted upon request by the Department.

D. SPECIAL CONDITIONS (CONTINUED)

8. 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 that 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. Any spills should be noted in the SWPPP.
   (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
   (f) Ensure adequate provisions are provided to prevent and to protect embankments from erosion.

9. This permit stipulates pollutant benchmarks applicable to your discharge. The benchmarks do not constitute direct numeric effluent limitations; therefore, a benchmark exceedance alone is not a permit violation. Benchmark monitoring and visual inspections shall be used to determine the overall effectiveness of the SWPPP and to assist you in knowing when additional corrective action may be necessary to protect water quality. If a sample exceeds a benchmark concentration you must review your SWPPP and your BMPs to determine what improvements or additional controls are needed to reduce the pollutant in your stormwater discharge(s).

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

10. To protect the general criteria found at 10 CSR 20-7.031(4), before releasing water accumulated in secondary containment areas containing petroleum products, the stormwater 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 Department and EPA personnel.

11. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the CWA section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued to 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 contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or controls any pollutant not limited in the permit.

12. All outfalls and permitted features must be clearly marked in the field.

D. SPECIAL CONDITIONS (CONTINUED)

13. 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).

14. Report as no-discharge when a discharge does not occur during the report period. It is a violation of this permit to report no-discharge when a discharge has occurred.

15. 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 report the "non-detect" 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 calculating monthly averages, one-half of the minimum detection limit (MDL) should be used instead of a zero. Where all data are below the MDL, the "<MDL" shall be reported as indicated in item (C).

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

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MODIFICATION STATEMENT OF BASIS
FOR
MO-0001716
BASF HANNIBAL

This Statement of Basis (Statement) gives pertinent information regarding modification(s) to the above listed operating permit. A Statement is not an enforceable part of a Missouri State Operating Permit. Changes found here supersede previous fact sheet determinations. The permit was revised as appropriate to reflect changes enumerated in this modification.

PART I. FACILITY INFORMATION

The facility's basic information has not changed; see original fact sheet.

PART II. MODIFICATION RATIONALE

This operating permit is hereby modified to reflect a change in the schedule of compliance for aluminum at outfall #002. The permittee applied to the Army Corps of Engineers to obtain a permit to perform work and install a diffuser for outfall #002. The diffuser approval was delayed by the Corps, and given other delays, like the COVID-19 pandemic, the work schedule has been changed. The final effluent limitations previously due March 1, 2021, have been extended to March 1, 2022. Minor formatting fixes but no other changes were made at this time.

After the public notice ending January 4, 2021, the antidegradation review was to be implemented in the permit. However, because the July 2019 antidegradation was not public noticed independently at that time, a second public notice of this modification, which includes the antidegradation is completed presently. Included after this statement of basis is the results for the CORMIX modeling and the July 2019 antidegradation.

Changes implemented in this modification are:

- 2019 antidegradation review supports the change of design flow of outfall #001 from 1.5 MGD to 2.5 MGD (3.75 cfs)
- Aluminum at outfall #002
- Average flow of outfall #002 was changed from 0.2 to 0.5 MGD.
- The AEC for WET at outfall #002 was changed to 1.37% from 9.1% based on the newly installed diffuser
- The WET dilution series at outfall #002 was changed to: 0.3%, 0.7%, 1.37%, 2.7%, and 5.5% instead of: 2.275%, 4.55%, 9.1%, 18.2%, and 36.4% based on the newly installed diffuser

OUTFALL #002:
CORMIX1 MODEL MIXING CONSIDERATIONS TABLE: MISSISSIPPI RIVER (OUTFALL #002)

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
not evaluated	0.41 % effluent (11939.84 cfs)	not evaluated	not evaluated	1.37 % effluent (11824.75 cfs)	not evaluated

The 7Q10 = 11989 cfs

Aluminum, Total Recoverable
Using the above MZ and ZID values, the following limits were recalculated for aluminum.
Acute AQL: 750 µg/L
Acute WLA: Ce = ((1.547 cfsDF + 11824 cfsZID) * 750 – (11824 cfsZID * 0 background)) / 1.547 cfsDF = 5732652.206
LTAa: WLAa * LTAa multiplier = 5732652.206 * 0.554 = 3178597.766 [CV: 0.274, 99th %ile]
Daily Maximum: MDL = LTA * MDL multiplier = 3178597.766 * 1.804 = 5732652.2 µg/L [CV: 0.274, 99th %ile]
Monthly Average: AML = LTA * AML multiplier = 3178597.766 * 1.24 = 3941267 µg/L [CV: 0.274, 95th %ile, n=4]
Limits implemented in the SOC for aluminum were 8,250 µg/L daily maximum, and 4,112 µg/L monthly average. Utilizing the past data and the new mixing considerations, there is no longer RP for aluminum and the SOC is removed. Additionally, aluminum monitoring is removed.

Table A-3 in the permit was modified to remove aluminum and implement the final date of the date of this modification issuance.

PART III. ADMINISTRATIVE REQUIREMENTS

On the basis of preliminary staff review, and utilizing current applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue this permit subject to specified effluent limitations, schedules, and special conditions. The changes contained herein require a public notice comment period per 10 CSR 20-6.020. 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.

- ✓ The first Public Notice period for this operating permit was from 11/20/2020 to 12/21/2020. A public notice period was required for this change because the schedule was extended greater than 120 days.
- ✓ An antidegradation review was completed in July 2019, however was not public noticed at that time. This mod permit was redrafted with the antideg incorporated, and needed to be re-public noticed. The second PN started January 22, 2021 and ended February 22, 2021.

DATE OF FACT SHEET: FEBRUARY 23, 2021
COMPLETED BY:
PAM HACKLER, ENVIRONMENTAL SCIENTIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - INDUSTRIAL UNIT
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Hannibal Plant
Outfall 002 Diffuser Dilution Analysis

Prepared for

BASF Corporation

Hannibal, Missouri

by

Lial Tischler, Ph.D., Texas P.E. No. 32768
Tischler/Kocurek
Round Rock, Texas

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March 2019

Executive Summary

This report describes an evaluation of the dilution that can be achieved by a new high-rate diffuser for Hannibal Plant Outfall 002 that discharges to the Mississippi River. This diffuser will have a single port that discharges at a minimum depth below the water surface of 13.4 feet (4.07 metres). The discharge velocity at the port will be 3.09 metres/second at an average flow rate of 0.5 million gallons per day.

Tischler/Kocurek prepared the evaluation, at the request of BASF Corporation. The evaluation was performed to satisfy the analyses and documentation requested by the Missouri Department of Natural Resources in e-mail and telephone communications with BASF and its consultant when the Outfall 001 diffuser dilution was evaluated (2007). The initial dilution that is achieved with the single port diffuser was simulated using the mixing zone model CORMIX1, which was developed by the U.S. Environmental Protection Agency (EPA) and is described in an EPA report. CORMIX1 models a single port diffuser as a buoyant jet in a stratified or unstratified ambient surface water.

The CORMIX1 modeling analysis demonstrates that the high-rate diffuser achieves effluent dilution at the edge of the zone of initial dilution (ZID) of less than 10 percent effluent under the full range of normal operating conditions. The critical site-specific ZID dilution was determined to be 1.37% effluent and occurs at the maximum monthly average (design) effluent flow and maximum effluent temperature. The corresponding critical dilution at the edge of the mixing zone is 0.41% effluent.

Outfall 002 Diffuser Dilution Analysis
BASF Corporation
Hannibal Plant
Introduction

At the request of the BASF Corporation (BASF) Tischler/Kocurek (T/K) has completed the analysis of a submerged diffuser for effluent discharged from the BASF Hannibal Plant's Outfall 002. Outfall 002 currently discharges to the Mississippi River (Upper Mississippi River at Mile 320 of Pool 22) through a submerged pipe exiting near the river bank. This discharge is regulated by NPDES Permit No. MO-0001716, which was issued by the Missouri Department of Natural Resources (DNR). BASF will modify this discharge to install a single port on a new submerged pipe that will result in a minimum effluent discharge velocity of greater than 10 feet/second (3.09 metres/second, m/s) at the average effluent flow rate.

Outfall 002 discharges utility water including boiler blowdown, deionized water regeneration wastewater, lime softening blowdown, wet scrubbing systems effluent, raw water treatment reject, boiler feedwater demineralization ion exchange regeneration blowdown, cooling tower blowdown, and storm water from secondary containment in the utilities area. Analysis of Outfall 002 samples for the NPDES permit renewal and amendment showed an aluminum concentration of 14 mg/L. This concentration was determined by DNR to result in a reasonable potential (RP) to exceed the acute aquatic life water quality standard for aluminum of 0.75 mg/L when the DNR standard dilution (10% effluent) is used in the RP calculation.

The water quality standards regulation provides for site-specific dilution allowances when an effluent diffuser is used (10 CSR 20 - 7.031(4)(A)4.B.(III)(b)). Therefore, the Hannibal Plant has designed a single-port diffuser for Outfall 002 to achieve an effluent concentration within the zone of initial dilution (ZID) of less than 10% effluent.

This mixing evaluation was conducted to determine the dilution achieved by the proposed single-port discharge to the river. The evaluation addresses a critical combination of effluent characteristics and critical low flow in the Mississippi River to provide an estimate of the minimum dilution that is achieved at the edge of the ZID.

Diffuser location
The diffuser will be located on the west bank of the river at approximately reach mile 319.8 of Pool 22. The port will be located at a distance of 20 meters (m) from the west shoreline at the flat pool elevation of 140.21 m (459.9 feet).1 (1 The flat pool elevation is the lowest water level in the pool at low flow. This was verified in a discussion with Jim Steinman at the Rock Island office of the COE.)

The location of the diffuser is shown on the aerial photograph in Appendix A. This photograph is the most recent U.S. Army Corp of Engineers (COE) survey of this section of the navigation channel, which was conducted on June 20, 2006.

The design width of the navigation channel at this location is 121.92 m (400 feet).2 (2 This is the maintained minimum width of the navigation channel, which is only a fraction of the total river width. The total width of the west channel of the river at this location is 580 m, as measured from the 2006 COE survey map (Appendix A of the original report).

Diffuser Configuration
Different combinations of port diameter and discharge depths were evaluated to develop the conceptual design of the Outfall 002 diffuser. The parameters specified in the conceptual design that is described in this report are as follows:
• Port diameter = 0.095 m (4 inches).
• Port depth below water surface = 4.07 m (13.35 feet).
• Total water depth at port = 4.57 m (15 ft - estimated from Appendix A COE map).
• Distance of port from nearest bank = 20 m.
• Vertical discharge angle = 0° (i.e., discharge is parallel to bottom).
• Horizontal discharge angle = 90° (i.e., discharge is perpendicular to direction of river flow).
Figure 1 is a schematic of the diffuser installation.

Effluent characteristics
The effluent characteristics that were used to develop this outfall design are based on current operating data for this discharge. The modeled maximum monthly average discharge rate is 1.0 million gallons per day (MGD) (0.044 m3/s). The maximum monthly average flow is specified by the DNR for calculating the critical dilution. Wastewater is pumped through the outfall intermittently based on level control in a pump sump. The average daily discharge rate is approximately 0.5 MGD during normal operating conditions, which is the flow rating for one of the pumps at the lift station. The effluent dilution achieved at this flow rate is also presented in this report.

Effluent temperatures are not monitored at Outfall 002. Because of the characteristics of the sources of wastewater and the retention time in the system sumps, it is assumed that maximum summer temperatures will be near ambient. In the winter, the sources and collection system will retain heat and the wastewater is expected to be warmer than ambient air temperatures.

Therefore, the modeling assumes a summer maximum discharge temperature of 100 °F (37.8 °C) and a winter temperature of 60 °F (15.6 °C). The effluent total dissolved solids (TDS) concentration was analyzed in four samples collected on March 19-22, 2019. The minimum TDS concentration was 680 mg/L, the maximum was 1,560 mg/L and the average concentration was 1,185 mg/L. Therefore, the effluent is “fresh” water and the CORMIX internal algorithm for calculating effluent density was used with the specified effluent temperature range to characterize the density of the effluent for the diffuser modeling. Note that in all cases simulated the effluent is warmer than the river and will be buoyant, i.e., rise toward the water surface after discharge.

The density characteristics of the effluent used in the diffuser evaluation are shown in Table 1.

Table 1
Effluent Characteristics

Density Condition	Temperature (°C)	Density (g/m³)
Summer	37.8	993.03
Winter	15.6	999.01

The conditions shown in Table 1 represent the extremes of the expected ranges for effluent density during representative operating conditions. These extreme conditions in effluent density will be conservative in terms of predicting the minimum achievable dilution with the high-rate diffuser.

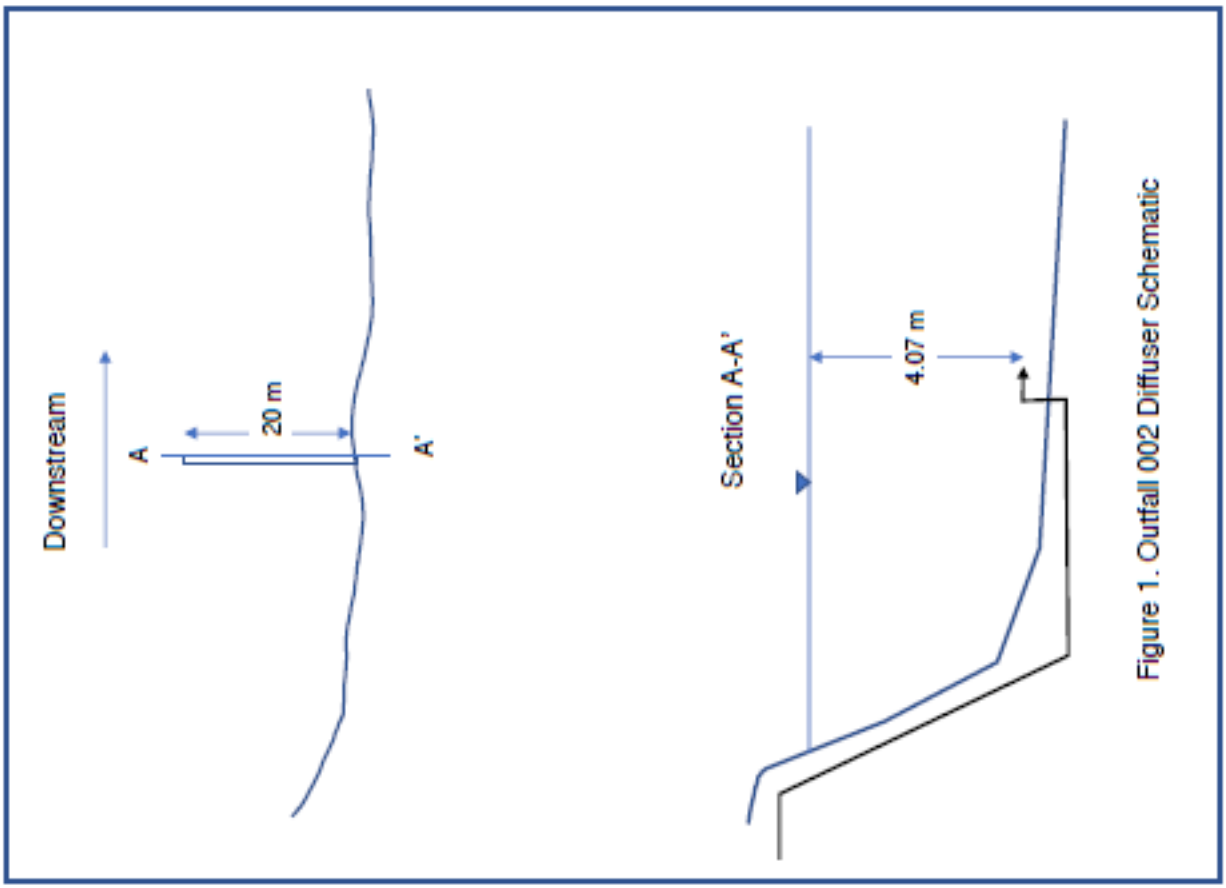


Figure 1. Outfall 002 Diffuser Schematic

Dilution Analysis
The initial dilution that is achieved with the single port diffuser was simulated using the mixing zone model CORMIX1, which was developed by the U.S. Environmental Protection Agency (EPA) and is described in an EPA report. CORMIX1 models a single port diffuser as a jet. The CORMIX1 model simulates the mixing of a buoyant plume in a receiving water that may be considered density stratified or unstratified. The model also simulates the effects of ambient currents on mixing. The output from CORMIX1 is the centerline dilution factor and the plume dimensions as a function of distance from the discharge port. Note that the highest concentration is at the plume centerline and decreases to background concentrations at the edges of the plume. The model simulates both near-field and far-field mixing.

For this diffuser analysis, four conditions were evaluated: (1) at the maximum effluent temperature and maximum monthly average (design) effluent flow; (2) at the maximum effluent temperature and average daily flow; (3) at an average winter temperature and maximum monthly average flow; and (4) at the winter effluent temperature and average daily flow.

Ambient Conditions
The CORMIX1 model was used to calculate the achievable mixing at the critical receiving water conditions at the discharge location. The receiving water data required by CORMIX1 were taken from multiple sources: (1) the NPDES permit; (2) Map No. 78, U.S. Army Corps of Engineers, Upper Mississippi Valley; (3) COE Survey Pool 22 - Reach River Miles 319.0-320.5; and (4) the DNR water quality standards.

The required input data for ambient river conditions in CORMIX1 are: the river width at the discharge; the average river depth, the depth at the point of discharge (which may differ from the average depth by up to ± 30 percent), the river flow rate, and the river temperature (if the density is to be calculated by the model).

The river bifurcates into two channels at Goose Island. The western channel, which contains the navigation channel, is the wider and deeper section of the river and was the section modeled for this dilution evaluation. The width of the western channel at the point of discharge is 580 m (measured on Google Earth).

As shown on the survey map (Appendix A), the depth of the river near the western bank of the channel is substantially greater than the depths near the eastern bank. The diffuser port will discharge in a deep area in the channel cross-section (~20 m from the west bank). The Missouri water quality standards specify that the mixing zone for a stream with a 7Q10 that is greater than 20 cubic feet/second

(cfs) is one-fourth of the width of the stream, cross sectional area, or flow (10 CSR 20 - 7.031(4)(A)4.B.(III)(a)). The 7Q10 flow at the discharge site is 461.9 m3/s (16,310 cfs).3 (3 Fact Sheet, NPDES Permit) One-fourth of the 7Q10 flow is 115.47 m3/s.

At the discharge location the width of the channel is 580 m.4 (4 This is the width of the west channel of the river, which receives the BASF discharge. It is assumed that the east channel should not be used to determine the one-fourth river width specified in the water quality standards, because the effluent discharge cannot affect flows in that section of the river.) One fourth of the channel width is 145 m. The average depth of the surveyed section of the channel for a width of 145 m, as measured from the west bank, is 4.86 m, which meets the CORMIX1 criterion for the ratio of the average depth to the water depth at the diffuser port. Therefore, the river section that is modeled with CORMIX1 is 145 m wide and has an average depth of 4.86 m. The water depth at the diffuser port is 4.57 m and the port outlet is 4.07 m below the water surface.5 (5 All of these values are at the 7Q10 low flow, i.e., the flat pool as defined by the COE.) As can be seen from reviewing the model output, modeling only this fraction of the width of the river channel has no effect on the calculated dilution, because the plume does not extend to the eastern boundary of the simulated channel section within the regulatory mixing zone. There are no measurements of the proportion of the 7Q10 flow that flows through the 145 m section of the channel being modeled (one-fourth of the west channel width). A fraction of the river flow passes on the eastern side of Goose Island, and some portion of the flow will also be in the eastern side of the west channel (the shallow areas not included in the COE survey).

The percent of the river cross-sectional area that is represented by the 145-m segment on the west side of the west channel was estimated from the COE survey aerial photograph. The depth of the eastern channel (east of Goose Island) was estimated as 2 m. The average depth in the west channel was estimated by dividing the channel into three cross-sections: (1) the 145-m section; (2) a 145-m wide section with a measured average depth of 1.88 m; and (3) a 290-m wide section of the west channel east of the surveyed section which has an estimated average depth of 1.5 m.6 (6 The total width of the west channel at the discharge point is 580 m. One-quarter of this width is 145 m and the 290 m width represents the portion of the 580 m cross-section with measured depths. This section's average depth is based on the measured depths at the eastern edge of the COE survey line.) The average depths assumed for these two areas outside of the west channel segment that is modeled are intended to be greater than the true average depths in order to assure that the percentage of flow through the modeled segment is underestimated.

Based on this method of calculation of river cross-sections, and assuming that the flow volume in each section is proportional to the respective cross-sectional area of the river channel, 49.9% of the 7Q10 flow will be through the 145-m wide section modeled with CORMIX1. It was assumed for the modeling that the upstream (ambient flow) through the 145 m cross-section that is being modeled is 115.47 m3/s, which is one-fourth of the 7Q10 flow, in order to be consistent with the DNR mixing zone criteria. This flow assumption underestimates the actual flow and velocity in the modeled section, based on the cross-sectional areas calculated and estimated from the survey data. This underestimation will result in the calculated dilution values being lower (more conservative) than what should be expected under actual low-flow conditions.

The summer ambient water temperature was assumed to be 31.1 °C, which is the maximum allowable temperature in the Missouri water quality standards for this river segment. The river water density calculated by CORMIX1 is 995.3 kg/m3 in the summer (based on the water quality standard) and 999.97 kg/m3 in the winter at a measured temperature of 4.3 °C (USGS Station 07020850). Two model parameters affect only far-field dilution, which is not important to this modeling. Mannings n was selected as 0.030 based Table 12.2.1 in Maidment (1994)7. (7 Maidment, D.R., editor (1994) *Handbook of Hydrology*, McGraw-Hill, Inc., New York.) This value of Mannings n represents the roughness of a clean and straight natural stream with a sandy bottom, which describes the channel at the discharge location. The wind speed used in the model is 2 m/s, which is a default value commonly used in CORMIX1. Because wind speed only has an effect on dilution in the far field of the mixing zone, the assumption of the default wind speed has no effect on the acute mixing zone dilution estimates.

Modeling Results
The CORMIX models predict the plume centerline dilution factor at the edge of the hydrodynamic mixing zone (near field region), which is the point at which buoyancy and momentum-induced mixing ceases. Additional mixing of the diluted effluent with the receiving water outside of the near field region occurs due to wind and ambient current. This dilution is termed far field dilution and is not considered by the DNR in the establishment of permit limits for toxic pollutants and whole effluent toxicity.

Mixing Zone Definition
The water quality standards specify that the mixing zone for a stream with a 7Q10 that is greater than 20 cfs (0.567 m3/s) is one-fourth of the width of the stream, cross-sectional area, or flow (10 CSR 20-7.031(4)(A)4.B.(III)(a)). Based on the width of the west channel at the point of discharge, the mixing zone length (and width) is 145 m. The ZID length is one-tenth of the mixing zone width (10 CSR 20 - 7.031(4)(A)4.B.(III)(b)), so it is 14.5 m from the discharge port. It is assumed that the 14.5 m applies in all directions from the port (i.e., cross-stream and downstream).

Diffuser Dilution Calculations
Two combinations of effluent density and flow were examined to determine the critical ambient and effluent conditions in terms of critical initial dilution. The maximum 30-day average flow of 1.0 MGD (0.044 m3/s) was used for all modeling, as specified by DNR. A long-term monthly average flow of 0.5 MGD (0.022 m3/s) was also simulated for comparison.

Two effluent densities (maximum summer temperature and winter temperature) were simulated to determine the effect of effluent density on mixing at both flow rates. Table 2 presents the results of the CORMIX1 simulations. Copies of the four CORMIX1 simulations shown in the table are provided in Appendix B (CORMIX session reports and prediction reports). [not included here]

Table 2
Critical Effluent Dilution

Effluent Density	Ambient Density	Effluent Flow (MGD)	ZID Percent Effluent	MZ Percent Effluent
993.03	995.3	1.0	1.34	0.41
993.03	995.3	0.5	1.66	0.19
999.97	999.1	1.0	1.37	0.33
999.97	999.1	0.5	1.74	0.17

As shown in Table 2, the lowest dilution at the ZID (1.74% effluent) occurs at the winter temperature, average flow case. The DNR critical ZID dilution at the design flow is 1.37% effluent. In both maximum (design) flow cases, the dilution at the ZID is substantially greater than the default 10% value used in the regulation. The three EPA toxic dilution zone (TDZ) criteria are achieved in all cases. The minimum dilution at the edge of the mixing zone (0.41 percent effluent) occurs at the summer temperature, design flow condition. Because the Outfall 002 discharge is 570 m upstream of the Outfall 001 discharge and the mixing zone for Outfall 002 is 145 m long, the mixing zones do not overlap.

Conclusions
The CORMIX1 modeling analysis demonstrates that the proposed high-rate diffuser achieves effluent dilutions at the ZID of less than 10 percent effluent under the full range of normal operating conditions. The critical site-specific ZID dilution of 1.37% at the design flow of 1.0 MGD should be used in the NPDES permit as the dilution basis for calculation of reasonable potential for aluminum. The critical dilution at the edge of the mixing zone is 0.41% effluent.

Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to
the Mississippi River
by
BASF-Hannibal Plant

July 2019

1. Facility Information

Facility Type: INDUSTRIAL – Pesticides and Agricultural Chemicals – SIC #2879, NAICS #325320

Facility Description: The BASF Hannibal Plant is located at 3150 Highway JJ, Palmyra, Missouri, adjacent to the Mississippi River. The facility produces agricultural chemicals. The BASF Hannibal Plant is approximately nine miles north of Hannibal, Missouri on the Mississippi River. BASF can be divided into five sub-facilities; pyrrole, IMI1, IMI2, SAR plant, and PROWL. Each area has associated products. One product at a time can be produced at each plant, but some of the plants are capable of producing multiple products. The BASF Corporation facility operates seven days a week and 24 hours a day, with an average one month of maintenance down time for each plant per year.

Process water for the BASF facility is drawn from several on-site wells, and is treated at the west utilities facility. Treatment of the well water consists of iron and calcium carbonate removal using a Gyrazur cold-lime softener followed by a clarifier. Wastewater from the process water treatment plant flows to a settling basin with pH neutralization and is discharged at outfall #002. The sand in the Gyrazur unit acts as a "seed" for the collection of calcium carbonate. Most of the treatment sludge consists of the accumulation of calcium carbonate and ferric hydroxide on sand particles, resulting in the formation of irregularly shaped spheres with a diameter of 1/16 to one (1) inch. The west utilities plant also generates electricity from combustion of natural gas for plant usage.

BASF facility has secondary containment around all tanks, pumps and valves, and process areas. Stormwater runoff collected in these containment systems is tested for active ingredients, Chemical Oxygen Demand (COD), and Biochemical Oxygen Demand (BOD). If contamination is detected, or if no testing is conducted, the water is removed by vacuum truck and incinerated along with aqueous process wastes. If no contamination is detected, the water is pumped to the Mississippi River through outfall #001. Separate containment is provided for pumps and valves in the plant. Stormwater collected in these systems is not analyzed, but is instead sent directly to the incinerators.

The Antidegradation request is for the increase in flow through Outfall #001 to 2.5 MGD and to incorporate the results of the Cormix study on Outfall #002 with the installation of the diffuser (see Appendix B).

County:	Marion	UTM Coordinates:	X= 633982 / Y= 4410950
12- Digit HUC:	07110004-0304	Legal Description:	NE ¼, SE ¼, Section 10, T58N, R5W
EDU*:	Central Plains/ Cuivre/ Salt	Ecoregion:	Central Plains

* - Ecological Drainage Unit

2. Water Quality Information

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (Department) developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review which documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, and revised July 13, 2016, a facility is required to use *Missouri's Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1. Water Quality History: The section of the Mississippi River that the facility discharges to is not listed as impaired. There is a Total Maximum Daily Load (TMDL) for the Mississippi River for Chlordane and Polychlorinated biphenyls, or PCBs in fish tissue. The facility's discharge is not expected to contain these pollutants.

Outfall	Design Flow (cfs)	Treatment Level	Receiving Waterbody	Distance to Classified Segment
001	3.75	Advanced (Incineration and Biological)	Mississippi River	0.0 mi
002	1.55	Advanced (pH Neutralization)	Mississippi River	0.0 mi

3. Receiving Waterbody Information

Waterbody Name	Class	WBID	Low-Flow Values (cfs)§				Designated Uses**
			1Q10	7Q10	30Q10	60Q10	
Mississippi River	(P)	3699	10901	11989	14247	15722	AQL, DWS, IND, IRR, LWW, SCR, WBC(A), HHP ,General Criteria

** Irrigation (IRR), Livestock & Wildlife Protection (LWP), Protection of Warm Water Aquatic Life (AQL), Human Health Protection (HHP), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation – Category A (WBC-A), Whole Body Contact Recreation – Category B (WBC-B), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

§ Low flow values were obtained from USGS Gaging Station #05420500 near Clinton Iowa; data were obtained from 1/1/1930 and were calculated using a departmentally developed spreadsheet

Receiving Water Body Segment #1: Mississippi River

Upper end segment* UTM coordinates: X= 634201 / Y= 4411169

Lower end segment* UTM coordinates: X= 634275 / Y= 4411091

* Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.

4. General Comments

The applicant elected to determine that discharge of the pollutant of concern (POC) is insignificant in the receiving stream using existing water quality. This analysis was conducted to fulfill the requirements of the AIP. Information that was provided by the applicant including a letter detailing the proposed discharge from Minh Hoac, Senior Environmental Specialist with BASF Corporation, and summary forms used to develop this review document can be found in Appendix C, Antidegradation Review Summary Attachments.

A Geohydrological Evaluation was not submitted for this facility upgrade. The stream is gaining for discharge purposes (Appendix A: Map).

Dissolved oxygen modeling analysis was not submitted for review. Staff believes that the discharge will not impact water quality standards for dissolved oxygen.

A Missouri Department of Conservation Natural Heritage Review Report was obtained by the department in the 2016 modification and Antidegradation Review; MDC found no record of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the defined Project Area.

5. Antidegradation Review Information

The following is a review of BASF Corporation's proposed increase in flow from Outfall #001 and the installation of a diffuser on Outfall #002. BASF Corporation submitted their Antidegradation Request in May 2019 with the supporting information including the Cormix modeling for review by the Department's Watershed Protection Section.

5.1. Tier Determination

Below is a list of pollutants of concern (POC) reasonably expected to be impacted by the increase in flow through Outfall #001 and the installation of the diffuser in Outfall #002. POCs are defined as those pollutants "proposed for discharge that affects beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge." (AIP, Page 7). The facility has more POCs that are listed as part of the operating permit and in the Antidegradation Review, see sections 9.1 and 9.2. Tier 2 was determined for all POCs.

Table 1. Pollutants of Concern and Tier Determination

Pollutants of Concern	Tier*	Degradation	Comment
Aluminum, Total Recoverable	2	Insignificant	
Total Kjeldahl Nitrogen (TKN)	2	**	Monitoring per 10 CSR 20-7.015(9)(D)8
Nitrite + Nitrate	2	**	Monitoring per 10 CSR 20-7.015(9)(D)8
Ammonia as N	2	**	Monitoring per 10 CSR 20-7.015(9)(D)8
Phosphorus, Total P (TP)	2	***	Monitoring per 10 CSR 20-7.015(9)(D)8

* Tier assumed. Tier determination not possible:

** No in-stream standards for these parameters.

*** Standards for these parameters are ranges

The following Antidegradation Review Summary attachments in Appendix D were used by the applicant:

For pollutants of concern, the attachments are:
☒ Attachment A, Tier 2 with significant degradation.
☐ Attachment B, Tier 2 with minimal degradation.
☐ Attachment D, Tier 1 Review. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment

5.2. Existing Water Quality
Existing water quality data was submitted. All POCs were considered to be Tier 2 based on the submitted tier analysis.

5.3. No Discharge Evaluation
According to 10 CSR 20-6.010 (4)(D), reports for the purpose of constructing a wastewater treatment facility shall consider the feasibility of constructing and operating a no discharge facility. Because Missouri's antidegradation implementation procedures specify that if the proposed activity results in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. Part of that analysis as shown below is the non-degrading or no discharge evaluation. See Section 5.4.1 discussion for the regionalization alternative.

No Discharge is not an alternative for this facility based on the proposed discharge amounts, 3.5 MGD and the different production lines the facility produces throughout the year.

5.3.1 Losing Stream Alterative Discharge Location
Under 10 CSR 20-7.015(4) (A), *discharges to losing stream shall be permitted only after other alternatives including land application, discharge to gaining stream and connection to a regional facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons*.
The Discharge does not discharge to a losing stream segment or will not discharge with 2 miles of a losing stream segment.

5.3.2 Social and Economic Importance Evaluation
Missouri's antidegradation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required.

5.4. Demonstration of Necessity and Social and Economic Importance
Missouri's antidegradation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required.

5.4.1. Regionalization Alterative
Within Section II B 1. of the AIP, discussion of the potential for discharge to a regional wastewater collection system is mentioned. As an industrial facility remotely located 6.0 miles from Palmyra and
9 miles from Hannibal, respectively, and with the proposed flow from BASF, there is no regionalization alternative available.

6. General Assumptions of the Water Quality and Antidegradation Review

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.
9. If the proposed treatment technology is not covered in 10 CSR 20-8 Design Guides, the treatment process may be considered a new technology. As a new technology, the permittee will need to work with the review engineer to ensure equipment is sized properly. The operating permit may contain additional requirements to evaluate the effectiveness of the technology once the facility is in operation. This Antidegradation Review is based on the information provided by the facility and is not a comprehensive review of the proposed treatment technology. If the review engineer determines the proposed technology will not consistently meet proposed effluent limits, the permittee will be required to revise their Antidegradation Report.

7. Mixing Considerations

Mixing Zone (MZ): The mixing zones for Outfall #001 and Outfall #002 do not overlap.

CORMIX Model Mixing Considerations Table: Mississippi River (Outfall #001)

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
not evaluated	0.69 % effluent	not evaluated	not evaluated	3.24 % effluent	not evaluated

Mixing study completed for diffuser by BASF, submitted to the Department and accepted in 2007 to enlarge ZID.

CORMIX Model Mixing Considerations Table: Mississippi River (Outfall #002)

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
not evaluated	0.41 % effluent	not evaluated	not evaluated	1.37 % effluent	not evaluated

Mixing study completed for diffuser by BASF, submitted to the Department and accepted in June 2019 to enlarge ZID.

8. Receiving Water Monitoring Requirements

No receiving water monitoring requirements recommended at this time.

9. Derivation and Discussion of Limits

Wasteload allocations and limits were calculated using two methods:

Water quality-based – Using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)}$$

(EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration
C_s = upstream concentration
Q_s = upstream flow
C_e = effluent concentration
Q_e = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality-based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

9.1. Outfall #001

As all effluent limits in Outfall #001 are based on the production values from the Effluent Limit Guidelines, while there is an increase in design flow, there is no increase in the production at the facility. The only change to Outfall #001 parameters is the speciation of nitrogen due to the change in 10 CSR 20-7.015(9)(D)8 in February 2019.

Table 3. Effluent Limits Outfall 001

PARAMETERS	Unit	Daily Max	Monthly Avg	Minimum Sampling Frequency	Minimum Reporting Frequency	Sample Type
Physical						
Flow	MGD	*	*	once/month	once/month	24 Hr. Tot
ELG Parameters						
Biochemical Oxygen Demand – 5	mg/L	*	*	once/month	once/month	composite
Biochemical Oxygen Demand – 5	lbs/day	13,643.0	2,983.6	once/month	once/month	composite
Chemical Oxygen Demand (COD)	mg/L	*	*	once/month	once/month	composite

PARAMETERS	Unit	Daily Max	Monthly Avg	Minimum Sampling Frequency	Minimum Reporting Frequency	Sample Type
Chemical Oxygen Demand (COD)	lbs/day	23,985.6	16,601.6	once/month	once/month	composite
Organic Pesticides –Total	mg/L	*	*	once/month	once/month	composite
Organic Pesticides –Total	lbs/day	18.3	1.8	once/month	once/month	composite
Total Suspended Solids (TSS)	mg/L	*	*	once/month	once/month	composite
Total Suspended Solids (TSS)	lbs/day	11,259.4	3,350.3	once/month	once/month	composite
Thimet/Counter(Phorate/Terbufos)	mg/L	*	*	twice/year	twice/year	composite
Thimet/Counter(Phorate/Terbufos)	lbs/day	0.90	0.23	twice/year	twice/year	composite
Conventional Parameters						
E. coli (mpn/100mL)	ϵ	630	126	once/month	once/month	grab
pH Ω	SU	6.0 to 9.5	6.0 to 9.5	continuous	once/month	continuous
pH – single excursion	minutes	60	-	continuous	once/month	continuous
pH – monthly total	minutes	-	446	continuous	once/month	continuous
Nutrients						
Total Kjeldahl Nitrogen (TKN)	mg/L	*	*	once/month	once/month	composite
Nitrite + Nitrate	mg/L	*	*	once/month	once/month	composite
Ammonia as N	mg/L	*	*	once/month	once/month	composite
Phosphorus, Total P (TP)	mg/L	*	*	once/month	once/month	composite
Other						
WET Test - Acute	TUa	30.9	-	once/year	once/year	composite

Total Phosphorus and Total Nitrogen (Speciated). Monthly effluent monitoring for Ammonia, Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate are required per 10 CSR 20-7.015(9)(D)8 as the facility has a design discharge greater than or equal to 1.0 MGD.

9.2. Outfall #002
Outfall #002 previously had water quality based effluent limits and with the installation of the diffuser, the mixing zones for the water quality based parameters has changed.

Table 4. Effluent Limits Outfall #002

PARAMETERS	Unit	Daily Max	Monthly Avg	Minimum Sampling Frequency	Minimum Reporting Frequency	Sample Type
Physical						
Flow	MGD	*	*	once/month	once/month	24 Hr. Tot
Conventional						
Chemical Oxygen Demand (COD)	mg/L	*	*	once/month	once/month	composite
Chemical Oxygen Demand (COD)	lbs/day	*	*	once/month	once/month	composite
pH Ω	SU	6.5 to 9.0	6.5 to 9.0	once/month	once/month	grab
Total Suspended Solids (TSS)	mg/L	*	*	once/month	once/month	composite
Total Suspended Solids (TSS)	lbs/day	*	*	once/month	once/month	composite
Metals						
Aluminum, TR	µg/L	*	*	once/quarter	quarterly	composite
Aluminum, TR	lbs/day	*	*	once/quarter	quarterly	composite
Nutrients						
Total Kjeldahl Nitrogen (TKN)	mg/L	*	*	once/month	once/month	composite
Nitrite + Nitrate	mg/L	*	*	once/month	once/month	composite
Ammonia as N	mg/L	*	*	once/month	once/month	composite
Phosphorus, Total P (TP)	mg/L	*	*	once/month	once/month	composite
Other						
WET Test - Acute	TUa	*	-	annually	once/year	composite

COD, TSS, & Aluminum, Total Recoverable. Monitoring only.

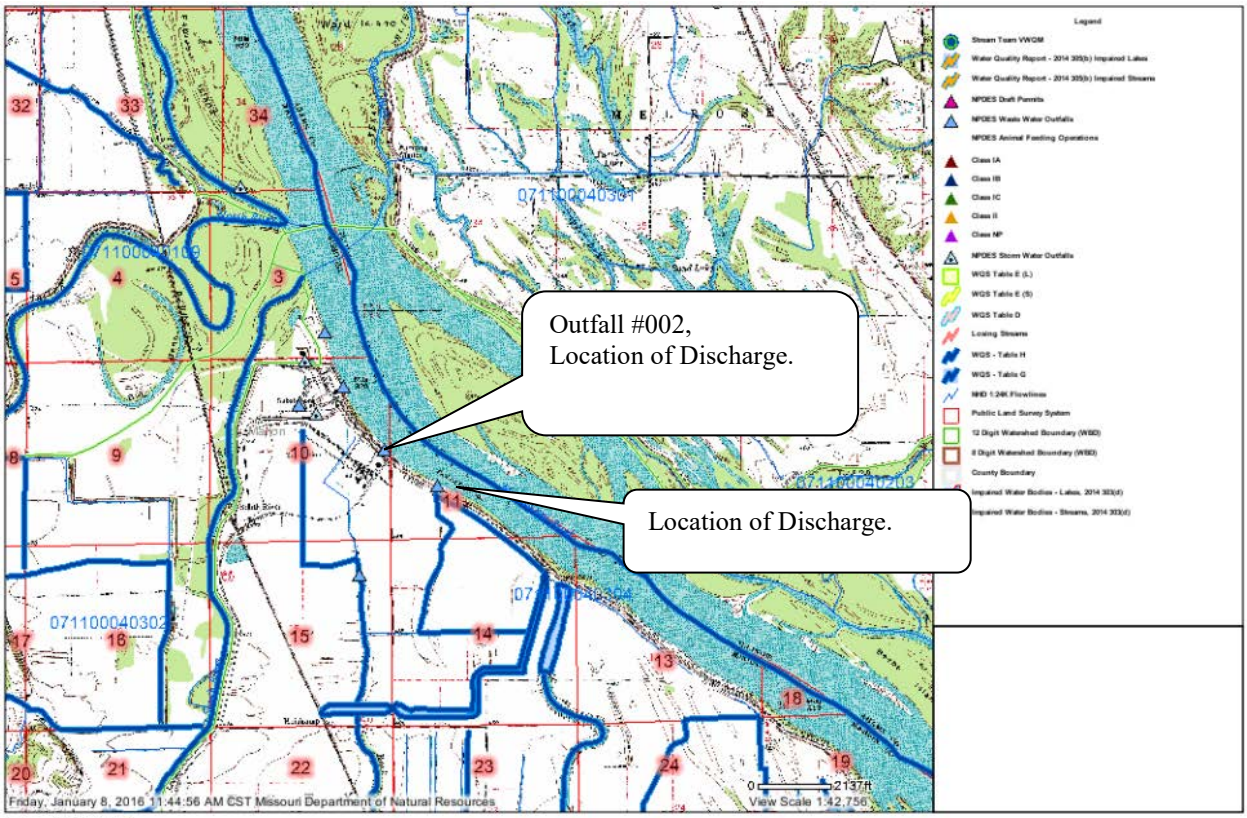
Total Phosphorus and Total Nitrogen (Speciated). Monthly effluent monitoring for Ammonia, Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate are required per 10 CSR 20-7.015(9)(D)8 as the facility has a design discharge greater than or equal to 1.0 MGD.

10. Antidegradation Review Preliminary Determination

The proposed expanded and modified facility discharge, BASF-Hannibal Plant will result in insignificant degradation of the segment identified in the Mississippi River. Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. The Department has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

Reviewer: Leasue Meyers, EI
Date: 07/03/19
Unit Chief: John Rustige, P.E.

Appendix A: Map of Discharge Location



Missouri Department of Natural Resources

Disclaimer: Although this map has been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.

Appendix B: Outfall #002 Cormix Results

From: Crawshaw, James <James.Crawshaw@dnr.mo.gov>
Sent: Wednesday, June 19, 2019 9:16 AM
To: Hackler, Pam <pam.hackler@dnr.mo.gov>; Meyers, Lease <lease.meyers@dnr.mo.gov>
Cc: Kruse, Michael <michael.kruse@dnr.mo.gov>
Subject: BASF outfall 002 Mixing Zone Review

Good morning Pam and Lease, I have completed my review of the BASF mixing zone study for outfall 002,

The BASF Corporation – Hannibal plant (permit number MO-0001716) recently submitted a mixing zone study report along with model results evaluating the dilution expected to be achieved by a new high-rate diffuser for Hannibal Plant Outfall 002 that discharges to the Mississippi River. The study found that the critical site-specific zone of initial dilution (ZID) would be 1.37 % effluent and the critical dilution at the edge of the mixing zone would be 0.41% effluent once the diffuser has been installed as designed. The facility is asking that the reasonable potential calculation for aluminum be updated using these values once the diffuser is installed.

I have reviewed the BASF mixing zone study for outfall 002 and replicated the CORMIX modeling. My modeling results support the values found in the BASF study, and indicate that the modeling assumptions are adequately conservative to capture the expected critical conditions for the Mississippi River at Hannibal. The model incorporates conservative assumptions for ambient river flow, ambient river velocity, and effluent density. My modeling results support the use of a critical dilution of 1.37% effluent at the edge of the ZID and 0.41% effluent at the edge of the mixing zone if the diffuser is installed as designed. If needed, my model outputs can be found at E:\Planning_TMDL-Modeling_Unit\Modeling Reviews & Requests\Mixing Zone Studies\BASF\Modeling. Let me know if you have any questions or need anything else.

Also, let me know if I should contact Minh Hoac and provide my review; we generally prefer to have the permit writer relay information to the facility regarding any final determinations, but I can contact him directly if needed.

Thanks,

James Crawshaw
TMDL/Modeling Unit
Watershed Protection Section
Missouri Department of Natural Resources
Phone: 573-751-2034
james.crawshaw@dnr.mo.gov

Appendix C: Antidegradation Review Summary Attachments

Receipt ID# 10058747
$250.00
7-6-17

RECEIVED
JUL 05 2017
Water Protection Program

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

WATER QUALITY REVIEW ASSISTANCE/ANTIDEGRADATION REVIEW REQUEST

PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS

TYPE OF PROJECT ☐ Grant ☐ SRF Loan ☑ All Other Projects

REQUESTER	TELEPHONE NUMBER WITH AREA CODE
BASF Hannibal Site	(573) 769-8796
PERMITTEE / FACILITY NAME: BASF Hannibal Site	MSOP NUMBER (IF APPLICABLE)
COUNTY: Marion	SIC / NAICS CODE: 2879/325320

REASON FOR REQUEST

☐ New Discharge (See Instruction #9) ☑ Upgrade (No expansion) (See AIP) ☐ Expansion ☐ QAPP or Study Review

DESCRIPTION OF PROPOSED ACTIVITY:

The site will manufacture a new product, 750-F (Revysol), using existing process equipment and the new product will replace production of certain existing products, so wastewater discharge volumes will not increase. Effluent COD will increase at Outfalls 001 and 002 but will remain at less than 28% of the existing permit limits for COD in Outfall 001. No other regulated pollutants will increase.

FACILITY INFORMATION

METHOD OF BACTERIA COMPLIANCE

☐ Chlorine Disinfection ☐ Ultraviolet Disinfection ☐ Ozone ☑ Not Applicable All wastewater is incinerated

WATER QUALITY ISSUES*

None

*Water quality issues include: effluent limit compliance issues, notices of violation, water body beneficial uses not attained or supported, etc.

OUTFALL	LOCATION (UTM OR LAT/LONG OR LEGAL DESCRIPTION)	MAPPED[1] (CHECK)	RECEIVING WATER BODY[2]
001	Section 11, 58N, 5W	✓	Mississippi River
002	Section 11, 58N, 5W		Mississippi River

[1] Please attach topographic map (See: www.dnr.mo.gov/internetmapviewer/) with outfall locations clearly marked. For additional outfalls, attach a separate form.

[2] Please see general instructions for discharges to streams.

OUTFALL	NEW DESIGN FLOW ** (MGD)	TREATMENT TYPE	EFFLUENT TYPES*
001	No increase	Biological treatment (003 only) followed by incineration and neutralization	Industrial wastewater, sanitary wastewater
002	No increase	Chemical oxidation, neutralization	Industrial wastewater

* Describe predominating character of effluent. Example: Domestic Wastewater, Municipal Wastewater, Industrial Wastewater, Storm water, Mining Leachate, etc.

** If expansion, indicate new design flow.

See General Instructions. Additional information may be needed to complete your request. Your request may be returned if items are missing. The water quality review assistance is a process to determine effluent limits for new facilities or existing facilities seeking to increase loading into the receiving stream.

SIGNATUR: [signature] DATE: 06/23/2017

PRINT NAME: Peter Waddington, Site Director

EMAIL ADDRESS: peter.waddington@basf.com

PHONE NUMBER: (573) 769-8500

Applicant supplied (check all that apply):

- ☐ Attachment A – Significant Degradation
- ☐ Attachment B – Minimal Degradation
- ☐ Attachment C – Temporary degradation
- ☐ Attachment D – Tier 1 Review
- ☒ No Degradation Evaluation
- ☐ Heritage Review Determination. See Instruction #8.
- ☐ Geohydrologic Evaluation. See Instruction #9.
- ☐ Tier Analysis for minimal degradation (see Page 3, Tier 2 Reviews).
- ☐ Quality Assurance Project Plan.
- ☐ Time of travel study (see Instruction #3) or model (see Instruction #2).

Submit request to:

Missouri Department of Natural Resources,
Water Protection Program,
ATTN: WPCB Engineering Section
P.O. Box 176
Jefferson City, MO 65102-0176
Phone: 573-751-1300
Fax: 573-522-9920

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0001716
BASF – HANNIBAL PLANT

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)(A)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.

Part I. FACILITY INFORMATION

Facility Type:	Industrial - Major, Categorical
Facility SIC Code(s):	2879 Pesticides and Agricultural Chemicals, Not Elsewhere Classified
Facility NAICS Code:	325320 Pesticide and Other Agricultural Chemical Manufacturing
Application Date:	11/03/2017
Modification Dates:	9/22/2015, 11/01/2016, 03/13/2017, 02/01/2018
Expiration Date:	09/30/2018
Last Inspection:	04/07/2016 - in compliance

FACILITY DESCRIPTION:
Agricultural chemical manufacturing facility. The BASF Hannibal Plant is approximately nine miles north of Hannibal, Missouri on the Mississippi River. BASF can be divided into five sub-facilities; pyrrole, IMI1, IMI2, SAR plant, and PROWL. Each area has associated products. The Pyrrole plant was brought into production in March of 2001. One product at a time can be produced at each plant, but some of the plants are capable of producing multiple products. The BASF Corporation facility operates seven days a week and 24 hours a day, with an average one month of maintenance down time for each plant per year. This permit includes the tankage for managing wastewater, the incinerators, the water treatment plant and the effluent system that discharges the incinerated wastewater streams.

BASF manufactures the following Pesticide Active Ingredients (PAIs): Arsenal (imazapyr), Assert (imazamethabenz-methyl), Cadre, Chlorfenapyr, Counter, Kixor, PROWL, Pursuit, Raptor, Revysol (revysol/ F-750), and Thimet (phorate). Total volume manufactured daily: 312,697 lbs/day. BASF formulates the following products: Basagran 5L, Basagran Forte, Pendi D110, Prowl 3.3, Prowl H2O, Prowl Tech. BASF packages the following products: Extreme, Raptor 1AS, Varisto, Viper.

The chemical manufacturing processes generate three process waste streams. These include fumes, organic, and aqueous wastes (wastewaters). All three waste streams are handled by four RCRA Part B permitted on-site incinerators. The site includes tankage for managing wastewater from the production facilities. Wastewater is accumulated in tanks prior to incineration and the tanks provide surge protection between the production facilities and the incinerators. If one of the incinerators is shut down for any reason, the industrial process wastewater which feeds that unit will either be accumulated in tanks, or switched to feed another on-line incinerator. Fumes are switched to another incinerator or to other air pollution control devices. Each incinerator is equipped with a quench system, where process water is used to cool the gasses, and a stack scrubber, which also uses process water.

Incinerators at the site must achieve emissions controls; these take the form of air scrubbers to meet 40 CFR 63.1200 *et seq* (Subpart EEE) for hazardous waste combustors. In 2009, a spike of hexavalent chromium was added to the C incinerator to demonstrate comprehensive performance. After that time, hexavalent chromium discharges were elevated, likely due to the high concentration of salts in the waste feed. Since then, testing has shown a decrease in hexavalent chromium in the incinerator wastewater. This renewal addresses the issues caused by incineration of inorganic wastes, specifically the concentration of metals and solids in the incinerator

wastewater. Chlorides and salts are not removed from wastewater in the incineration process which contributes to excesses of solids. Additional information regarding solids monitoring and limitations are provided in Part III and IV of the fact sheet.
Other wastewater is generated from the cooling towers, venturi scrubbers, and boilers; this is discharged at outfall #002. Inorganic pollutants contribute to particulate emissions therefore must be quench or scrubbed from the air which contribute to pollutants in air emissions control discharges.

Process water for the BASF facility is drawn from several on-site wells, and is treated at the west utilities facility. Treatment of the well water consists of iron and calcium carbonate removal using a Gyrazur cold-lime softener followed by a clarifier. Wastewater from the process water treatment plant flows to a settling basin with pH neutralization and is discharged at outfall #002. The sand in the Gyrazur unit acts as a "seed" for the collection of calcium carbonate. Most of the treatment sludge consists of the accumulation of calcium carbonate and ferric hydroxide on sand particles, resulting in the formation of irregularly shaped spheres with a diameter of $^{1}/_{16}$ to one (1) inch. The west utilities plant also generates electricity from combustion of natural gas for plant usage.

BASF facility has secondary containment around all tanks, pumps and valves, and process areas. Stormwater runoff collected in these containment systems is tested for active ingredients, Chemical Oxygen Demand (COD), and Biochemical Oxygen Demand (BOD). If contamination is detected, or if no testing is conducted, the water is removed by vacuum truck and incinerated along with aqueous process wastes. If no contamination is detected, the water is pumped to the Mississippi River through outfall #001. Separate containment is provided for pumps and valves in the plant. Stormwater collected in these systems is not analyzed, but is instead sent directly to the incinerators.

Water supply for human consumption and domestic use is supplied by Marion County Public Water Supply District #1.

PERMITTED FEATURES TABLE:

OUTFALL	AVERAGE FLOW	DESIGN FLOW	TREATMENT LEVEL	EFFLUENT TYPE
#001	1.4 MGD	1.5 MGD	incineration	process wastewater from the manufacture, formulation, and packaging of pesticides, domestic wastewater
#002	0.2 MGD	1.0 MGD	neutralization	scrubber, plant well system: boiler #6 and #7 blowdown, distilled water regeneration, lime softening blowdown, Nitric Acid tank fume scrubber, and acid unloading
#004	unknown	unknown	settling	stormwater; entrained steam condensate, fire protection test water

FACILITY PERFORMANCE HISTORY & COMMENTS:
The electronic discharge monitoring reports were reviewed for the last five years. There were no exceedances noted. The facility updated the application to provide for the removal of outfall #003 from the site. Outfall #003 was an internal monitoring point which is no longer used or required as the categorical industry is no longer present. The permittee reported exceedances of the design flow 27 months in the last five years.

The permit writer reviewed documentation pertaining to the facility including a site visit by the Northeast Regional Office on 6/27/2018; lab samples collected by the department on 2/19/2015, 3/2/2016, and 6/12/2018; and spills which were reported to the department on 9/27/2016, 10/09/2017, 10/12/2017, and 1/13/2018. NPDES permits do not regulate spills but water quality was evaluated regardless. A site inspection was completed on 4/7/2016. The permit writer did not note any concerns which were not already addressed via return-to-compliance letters, permit modifications, site corrective actions, or otherwise.

The on-site laboratory conducts analyses for most parameters listed in the permit for reporting purposes, and various other parameters for manufacturing operational control. The facility uses liquid and/or gas chromatography for testing samples for product. The facility uses EPA approved methods or Standard Methods for conventional pollutants. The facility sends samples for Whole Effluent Toxicity tests to off-site laboratories for analysis.

The facility shuttered and removed the coal-fired power plant north of the property which historically supplied electricity to the plant, and was permitted under MO-0099236. The facility clean-closed the coal pile area and retention pond in 2016. The operating permit for that site was terminated in early 2017.

During the preview comment period beginning in August 2018, the permittee noted the following: "The permit writer changed the sampling frequency of many parameters from minimum monthly sampling to weekly sampling as the data showed the facility had been testing all of them more frequently than monthly." The permittee requested these parameters be established back to the monthly sampling requirements, and the permit writer obliged. The permit writer noted in the response; regardless of permit stipulations, standard conditions Part I, attached to the permit, Part 1, Section A, #2.b. requires the permittee report all data to the department taken for the month for any parameters established in the permit. The permittee must upload the parameter-specific daily data in an

attachment each month more than one sample is taken. The permit writer could not find the DMRs with the daily data attached therefore the permittee was out of compliance with the established standard condition requirement during the last permit term.

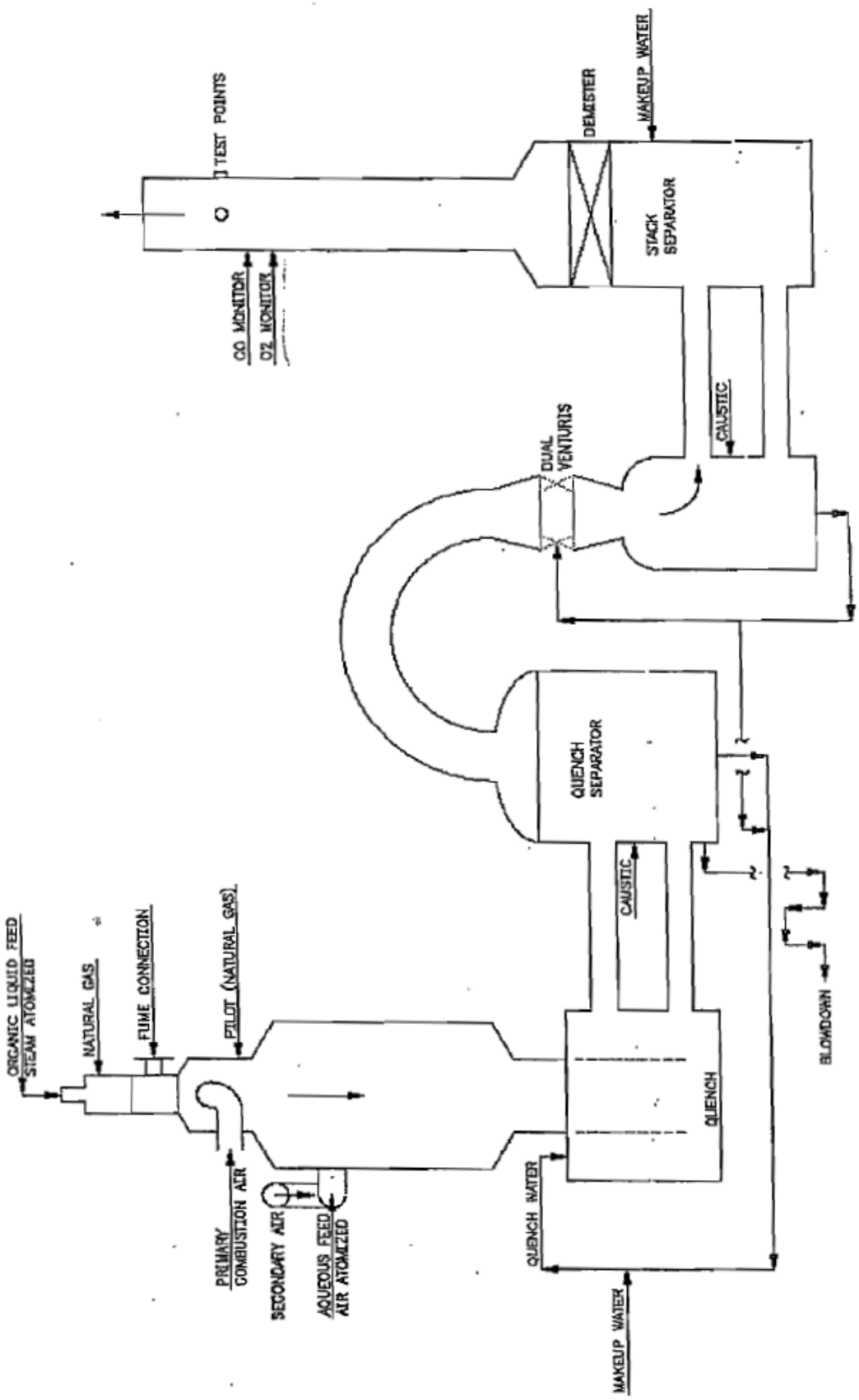
FACILITY MAP:

The waters listed as WBID #3960 are newly classified waters of the state which were removed by the Watershed Protection Section at the request of the permittee.

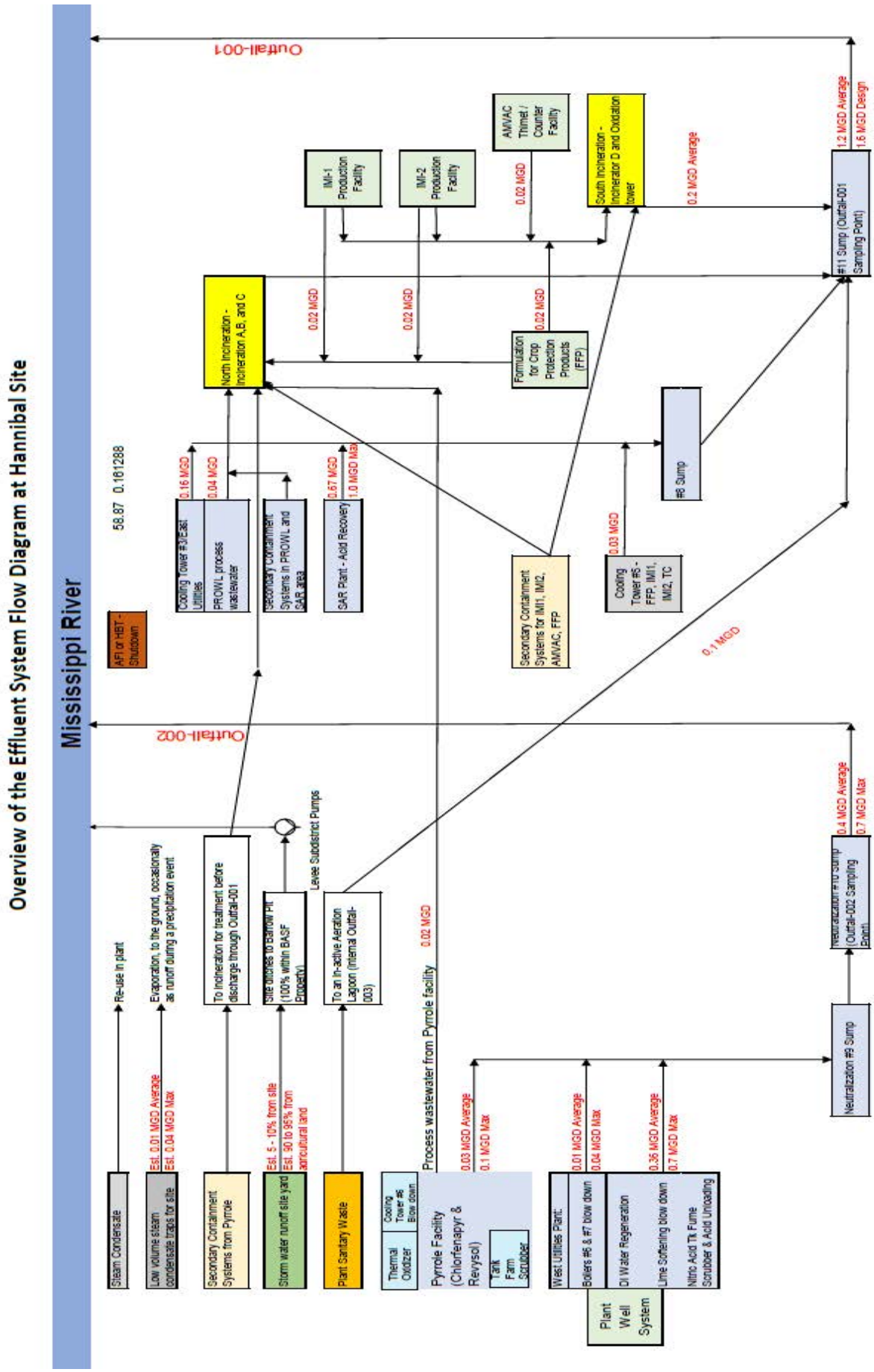
In October 2018, the Watershed Protection Section informed the permittee and the Operating Permits Section regarding the removal of the WBID #3960 waters. The facility has therefore requested outfall #004 be implemented in this permit. See Part III: SWPPP and SAMPLING FOR PERMIT RENEWAL.

In November of 2018, the facility submitted an updated Form A to indicate the correct Continuing Authority.

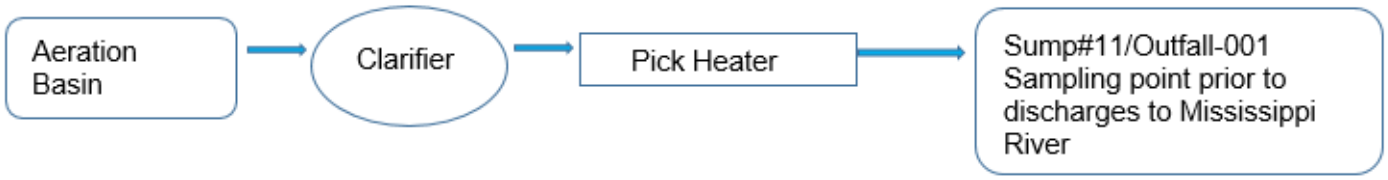
INCINERATOR DIAGRAM:



WATER BALANCE DIAGRAM:



DOMESTIC WASTEWATER DIAGRAM:



Part II. RECEIVING WATERBODY INFORMATION

RECEIVING WATERBODY'S WATER QUALITY:
The receiving waterbody has concurrent water quality data available. Please visit the USGS website for available information on the Mississippi River.

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 not addressed by normal water pollution control programs. http://dnr.mo.gov/env/wpp/waterquality/303d/303d.htm
✓ Not applicable; this facility does not discharge to an impaired segment of a 303(d) listed stream.

TOTAL MAXIMUM DAILY LOAD (TMDL):
A TMDL is a calculation of the maximum amount of a given pollutant that a water body 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 or TMDL may be developed. The TMDL shall include the WLA calculation. http://dnr.mo.gov/env/wpp/tmdl/
✓ Not applicable; this facility is not associated with a TMDL.

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 WATERBODY TABLE:

OUTFALL	WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	DISTANCE TO SEGMENT	12-DIGIT HUC
#001, #002, & #004	Mississippi River	P	3699	DWS, HHP, IND, IRR, LWW, SCR, WBC-A, WWH (AQL), GEN	0.0 mi	Bay Island – Mississippi River 07110004-0304

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	LOW-FLOW VALUES (CFS)				
		GAGING STATION	1Q10	7Q10	30Q10	60Q10
#001 & #002	Mississippi River	Clinton IA	10901	11989	14247	15722

Low flow values were obtained from USGS Gaging Station #05420500 near Clinton Iowa; data were obtained from 1/1/1930 and were calculated using a departmentally developed spreadsheet (available upon request).

CORMIX1 MODEL MIXING CONSIDERATIONS TABLE: MISSISSIPPI RIVER (OUTFALL #001)

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
not evaluated	0.69 % effluent	not evaluated	not evaluated	3.24 % effluent	not evaluated

Mixing study completed for diffuser by BASF, submitted to the Department and accepted in 2007 to enlarge ZID.

STANDARD MIXING CONSIDERATIONS TABLE: MISSISSIPPI RIVER (OUTFALL #002)

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
5900	6166	6633	23.3	23.3	23.3

ZID cannot be more than 10 times the facility design flow.
Design Flow (DF) = 1.5 MGD = 2.325 cfs, therefore the ZID was modified to reflect 10 x the design flow (DF).

RECEIVING STREAM MONITORING REQUIREMENTS:
None required at this time.

Part III. RATIONALE AND DERIVATION OF EFFLUENT LIMITATIONS & PERMIT CONDITIONS

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

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

ANTIBACKSLIDING:
Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(l)] require a reissued permit to be as stringent as the previous permit with some exceptions. Backsliding (a less stringent permit limitation) is only allowed under certain conditions.

✓ Limitations in this operating permit for the reissuance 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 justify the application of a less stringent effluent limitation.

- The previous permit's special condition stated: "Land Application of industrial sludge/biosolids: a. Shall be conducted in accordance with the biosolids management plan submitted to the Department; b. There shall be no application during frozen, snow covered or saturated soil conditions; c. Detailed records of land application practices shall be kept on site for a minimum of five (5) years and made available to the Department upon request." This special condition is no longer applicable to the facility therefore was removed.
- Internal monitoring point outfall #003 was removed from this renewal. The permittee has indicated the effluent receives further treatment after the outfall therefore internal outfall limitations are not required.

✓ Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) which would have justified the application of a less stringent effluent limitation.

- Five years of DMR data were available to the permit writer.
  - This permit renewal removes the chronic WET testing sampling requirement at outfall #001. The facility has acute WET testing limitations in this permit which are more protective than the chronic testing requirement as the diffuser mixing study has determined a very large mixing zone for the facility while the zone of initial dilution is smaller. Any toxicity from the permittee's discharge would likely be acute.
  - The limitation for Total Organic Pesticide Chemicals was increased for the daily maximum but decreased for the monthly average. This is because the previous permit's calculations were arbitrary; this permit uses actual values of production, formulation, and packaging for this parameter.
- Per a memorandum issued by the EPA entitled *Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies* (4/19/1996), the Department has found the permittee eligible for reduced monitoring frequency. A decreased sampling frequency is warranted for nitrate as N on outfall #002; the facility has shown low variability for this parameter and is discharging this parameter in low quantities. The permittee has shown through sampling Terbufos and Counter these pollutants exhibit very low variability and low concentration of discharge and are also monitored for in total organic pesticide chemicals; the monitoring frequency was reduced form monthly to twice annually.

✓ The Department determined technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).

- The previous permit contained a specific set of prohibitions related to general criteria found in 10 CSR 20-7.031(4); however, there was no determination as to whether the discharges have reasonable potential to cause or contribute to excursion of those general water quality standards in the previous permit. Federal regulations 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. Rather than conducting the appropriate RP determination and establishing numeric effluent limitations for specific pollutant parameters, the previous permit simply placed the prohibitions in the permit. These conditions were removed from the permit. Appropriate reasonable potential determinations were conducted for each general criterion listed in 10 CSR 20-7.031(4) and effluent limitations were placed in the permit for those general criteria where it was determined the discharge had reasonable potential to cause or contribute to excursions of the general criteria. Specific effluent limitations were not included for those general criteria where it was determined that the discharges will not cause or contribute to excursions of general criteria. Removal of the prohibitions does not reduce the protections of the permit or allow for impairment of the receiving stream. The permit maintains sufficient effluent limitations, monitoring requirements and best management practices to protect water quality.
- The previous permit special condition stated: "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."
  The permit writer has determined this special condition was outside the scope of NPDES permitting and was removed.

ANTIDEGRADATION REVIEW:

For process water discharge with new, altered, or expanding discharges, the Department is to document, by means of antidegradation review, if the use of a water body's available assimilative capacity is justified. In accordance with Missouri's water quality regulations for antidegradation [10 CSR 20-7.031(3)], degradation may be justified by documenting the socio-economic importance of a discharge after determining the necessity of the discharge. Facilities must submit the antidegradation review request to the Department prior to establishing, altering, or expanding discharges. See http://dnr.mo.gov/env/wpp/permits/antideg-implementation.htm

✓ Not applicable; the facility has not submitted information proposing expanded or altered process water discharge for this renewal; no further degradation proposed therefore no further review necessary. Antidegradation reviews were completed in 2015 for a liquid scrubber to capture NOx emissions, and in 2018 for increased flows and the addition of hexavalent chromium as a parameter of concern.

For stormwater discharges with new, altered, or expanding discharges, the stormwater BMP chosen for the facility, through the antidegradation analysis performed by the facility, must be implemented and maintained at the facility. Failure to implement and maintain the chosen BMP alternative is a permit violation; see SWPPP.

✓ Applicable; the facility must review and maintain stormwater BMPs as appropriate.

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 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 limitations of the permit.

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 only outfalls will generally 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 inspections of the stormwater BMPs occur monthly, facilities with no compliance issues are usually expected to sample stormwater quarterly.

Numeric benchmark values are based on water quality standards or other stormwater permits including guidance forming the basis of Environmental Protection Agency's (EPA's) *Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity* (MSGP). 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.

✓ Applicable; this facility has stormwater-only outfalls.

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 facility has an associated Effluent Limit Guideline (ELG) which is applicable to the wastewater discharges at this facility. The following table shows the limits in the ELG at 40 CFR 455 Subpart A. the provisions of this subpart are applicable to discharges resulting from the manufacture of organic pesticide active ingredients and organo-tin pesticide active ingredients.

✓ This facility manufactures 312,697 lbs per day of PAIs; 40 CFR 455.22 and 455.23 are applicable. The previous permit used both sections for permit compliance applying the most stringent limit as is required by law.

✓ The facility uses incineration to control the discharge of pollutants from the facility. The permit writer has determined this is the best available control technology to control volatile pollutants therefore 40 CFR 455.24 (BAT) also applies, therefore the conditions of 455.21(d) is applied to outfall #001. Best Available Technology Economically Achievable is defined at CWA section 304(b)(2). In general, BAT represents the best available economically achievable performance of plants in the industrial subcategory or category.

✓ As the facility does not use biological treatment for the treatment process, neither Table 4 nor Table 5 were applied.

✓ 40 CFR 444 was evaluated for applicability, however, this facility is not a *commercial* incinerator therefore §444 does not apply.

✓ Should water-quality derived effluent limits be more protective of the receiving water's quality, the WQS will be used as the limiting factor.

OUTFALL #001

PARAMETER FROM §455 SUBPART A	DAILY MAXIMUM	MONTHLY AVERAGE
Biochemical Oxygen Demand (BOD)	7.400 lbs/1000 lbs of organic pesticide chemicals allowed	1.6000 lbs/1000 lbs of organic pesticide chemicals allowed
Chemical Oxygen Demand (COD)	13.000 lbs/1000 lbs of organic pesticide chemicals allowed	9.0000 lbs/1000 lbs of organic pesticide chemicals allowed
Total Organic Pesticide Chemicals (TOPs)	0.010 lbs/1000 lbs of organic pesticide chemicals allowed	0.0018 lbs/1000 lbs of organic pesticide chemicals allowed
Total Suspended Solids (TSS)	6.100 lbs/1000 lbs of organic pesticide chemicals allowed	1.8000 lbs/1000 lbs of organic pesticide chemicals allowed

GENERAL CRITERIA CONSIDERATIONS:
In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into permits for pollutants which have been determined to cause, have the reasonable potential to cause, or to contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. The rule further states pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above a narrative criterion within an applicable State water quality standard, the permit shall contain a numeric effluent limitation to protect that narrative criterion. The previous permit included the narrative criteria as specific prohibitions placed upon the discharge. These prohibitions were included in the permit absent any discussion of the discharge's reasonable potential to cause or contribute to an excursion of the criterion. In order to comply with this regulation, the permit writer has completed a reasonable potential determination on whether the discharge has reasonable potential to cause, or contribute to an excursion of the general criteria listed in 10 CSR 20-7.031(4). These specific requirements are listed below followed by derivation and discussion (the lettering matches that of the rule itself, under 10 CSR 20-7.031(4)). In instances where reasonable potential exists, the permit includes numeric limitations to address the reasonable potential. In instances where reasonable potential does not exist the permit includes monitoring of the discharges potential to impact the receiving stream's narrative criteria. Finally, all of the previous permit narrative criteria prohibitions have been removed from the permit given they are addressed by numeric limits where reasonable potential exists. It should also be noted that Section 644.076.1, RSMo as well as Section D – Administrative Requirements of Standard Conditions Part I of this permit state that it shall be unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri that is 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.

(A) 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.
- For all outfalls, there is no RP for putrescent bottom deposits preventing full maintenance of beneficial uses because nothing disclosed by the permittee at renewal for these outfalls indicates putrescent wastewater would be discharged from the facility.
- For all outfalls, there is no RP for unsightly or harmful bottom deposits preventing full maintenance of beneficial uses because nothing disclosed by the permittee at renewal for these outfalls indicates unsightly or harmful bottom deposits will be discharged.

(B) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses.
- For all outfalls, there is no RP for oil in sufficient amounts to be unsightly preventing full maintenance of beneficial uses because nothing disclosed by the permittee at renewal or during prior sampling for DMR requirements for these outfalls indicates oil will be present in sufficient amounts to impair beneficial uses.
- For all outfalls, there is no RP for scum and floating debris in sufficient amounts to be unsightly preventing full maintenance of beneficial uses because nothing disclosed by the permittee at renewal for these outfalls indicates scum and floating debris will be present in sufficient amounts to impair beneficial uses

(C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
- For all outfalls, there is no RP for unsightly color or turbidity in sufficient amounts preventing full maintenance of beneficial uses because nothing disclosed by the permittee at renewal for these outfalls indicates unsightly color or turbidity will be present in sufficient amounts to impair beneficial uses.
- For all outfalls, there is no RP for offensive odor in sufficient amounts preventing full maintenance of beneficial uses because nothing disclosed by the permittee at renewal for these outfalls indicates offensive odor will be present in sufficient amounts to impair beneficial uses.

(D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life.
- This facility has numeric effluent limitations for WET testing; the permit writer has considered the synergistic effects of the pollutants as discharged by this facility and has determined WET testing to protect for this special condition.

(E) There shall be no significant human health hazard from incidental contact with the water.
- It is the permit writer's opinion this criterion is the same as (D).

(F) There shall be no acute toxicity to livestock or wildlife watering.
- It is the permit writer's opinion this criterion is the same as (D).

(G) Waters shall be free from physical, chemical, or hydrologic changes that would impair the natural biological community.
- For all outfalls, there is no RP for physical, chemical or hydrologic changes that would impair the natural biological community because nothing disclosed by the permittee at renewal for these outfalls indicates physical changes that would impair the natural biological community.

(H) 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.
- There are no solid waste disposal activities or any operation that has reasonable potential to cause or contribute to the materials listed above being discharged through any outfall.

GROUNDWATER MONITORING:
Groundwater is a water of the state according to 10 CSR 20-7.015(1)11, and is subject to regulations at 10 CSR 20-7.015(7) and 10 CSR 20-7.031(6) and must be protected accordingly.

✓ This facility is not required to monitor groundwater for the water protection program.

MAJOR WATER USER:
Any surface or groundwater user with a water source and the equipment necessary to withdraw or divert 100,000 gallons (or 70 gallons per minute) or more per day combined from all sources from any stream, river, lake, well, spring, or other water source is considered a major water user in Missouri. All major water users are required by law to register water use annually (Missouri Revised Statues Chapter 256.400 Geology, Water Resources and Geodetic Survey Section). https://dnr.mo.gov/pubs/pub2337.htm

✓ Applicable; this facility is a major water user and is registered with the state. The facility used 881,141,219 gallons total in 2017; when divided by 365 days, that is about 2.4 MGD. The water used is alluvial groundwater. The facility does not have any surface water intakes.

REASONABLE POTENTIAL:
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 causing or have the reasonable potential to cause (or contribute to) an in-stream excursion above narrative or numeric water quality standards. If the permit writer determines any given 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 [40 CFR Part 122.44(d)(1)(iii)].

✓ Applicable; an RPA was conducted on appropriate parameters and was conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version including calculations of this RPA is available upon request. See Wasteload Allocations (WLA) for Limits in this section.

OUTFALL #001 AT 30Q10 MIXING OR ABOVE

PARAMETER	ACUTE WQS	CHRONIC WQS	LISTING	DAILY MAX LIMIT	MONTHLY AVERAGE LIMIT	CHRONIC RIVER CONCENTRATION	RP
Chloride Plus Sulfate	◊	n/a	AQL	44899 mg/L	n/a	0.00	no
Fluoride	n/a	4 mg/L	IRR/LWP	229428 mg/L	n/a	0.00	no
Pyrene	n/a	960	DWS	5506292.73 µg/L	2744652.82 µg/L	0.00	no
Total Organic Pesticides	n/a	11596.6 µg/L	HHF	106776025.96 µg/L	33154724.55 µg/L	0.00	no

◊ 20% above background at 60Q10 mixing

The facility submitted a CORMIX1 model to allow a greater mixing area for the 7Q10 parameters. The following metals RPA was based on the values from the model. The spreadsheet was modified under each parameter believed present to include the ratio of the effluent (Cell L21 = *0.0069 for the mixing zone and Cell L/22 = *0.0324 for the ZID) at the edges of the respective mixing areas. A copy of the spreadsheet with the alterations is available upon request.

Outfall #001

PARAMETER	DAILY MAXIMUM	MONTHLY AVERAGE	CMC	RWC ACUTE	CCC	RWC CHRONIC	N	MAX/MIN	CV	MF	RP
Aluminum	8250.00	4112.27	750.0	62.18	NA	NA	1	1600/1600	0.6	13.19	no
Antimony	16689.99	8319.25	NA	0.51	4300.0	0.00	1	13/13	0.6	13.19	no
Arsenic	476713.14	237621.23	NA	NA	150.0	0.00	1	29/29	0.6	13.19	no
Chromium VI	176.00	56.30	16.0	5.75	11.0	0.01	67	653/1	2.2	2.99	no
Copper	239.71	119.48	21.8	1.40	13.9	0.00	1	36/36	0.6	13.19	no
Iron	3178087.63	1584141.56	NA	NA	1000.0	141.44	1	20740/20740	0.6	13.19	no
Nickel	7685.87	3831.08	698.7	8.16	77.6	0.01	1	210/210	0.6	13.19	no
Selenium	15890.44	7920.71	NA	NA	5.0	0.18	1	27/27	0.6	13.19	no
Zinc	1966.74	980.34	178.8	13.21	177.3	0.02	1	340/340	0.6	13.19	no

Outfall #002

PARAMETER	DAILY MAXIMUM	MONTHLY AVERAGE	CMC	RWC ACUTE	CCC	RWC CHRONIC	N	MAX/MIN	CV	MF	RP
Aluminum	8250.00	4112.27	750	16792.7	NA	NA	1	14000/14000	0.6	13.19	yes
Chromium VI	176.00	87.73	16.0	10.73	11.0	0.06	3	21/13.3	0.6	5.62	no
Iron	3178087.6	1584141.5	NA	NA	1000.0	150.04	1	22000/22000	0.6	13.19	no

Units are (µg/L) unless otherwise noted.
All metals are total recoverable except for hexavalent chromium which is dissolved.
n/a Not Applicable
n number of samples; if the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent.

CV	Coefficient of Variation (CV) is calculated by dividing the Standard Deviation of the sample set by the mean of the same sample set.
CCC	continuous chronic concentration
CMC	continuous maximum concentration
RWC	Receiving Water Concentration: concentration of a toxicant or the parameter in the receiving water after mixing (if applicable)
MF	Multiplying Factor; 99% confidence level and 99% probability basis
RP	Reasonable Potential: an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).

- ✓ Permit writers use the Department's permit writer's manual (http://dnr.mo.gov/env/wpp/permits/manual/permit-manual.htm), the EPA's permit writer's manual (https://www.epa.gov/npdes/npdes-permit-writers-manual), program policies, and best professional judgment. For each parameter in each permit, the permit writer carefully considers all applicable information regarding: technology based effluent limitations, effluent limitation guidelines, water quality standards, stream flows and uses, and all applicable site specific information and data gathered by the permittee through discharge monitoring reports and renewal (or new) application sampling. Best professional judgment is based on the experience of the permit writer, cohorts in the Department and resources at the EPA, research, and maintaining continuity of permits if necessary. For stormwater permits, the permit writer is required per 10 CSR 6.200(6)(B)2 to consider: A. application and other information supplied by the permittee; B. effluent guidelines; C. best professional judgment of the permit writer; D. water quality; and E. BMPs. Part V provides specific decisions related to this permit.

SAMPLING FOR PERMIT RENEWAL:
This permit establishes renewal sampling for certain parameters present in the wastewater and stormwater discharges from the facility. Please see special condition #5. Conditions (a) and (b) specify the pollutants which must have 4 or more samples submitted with the application for permit renewal.

Condition (c) indicates the facility must sample all stormwater discharges for permit renewal in accordance with 10 CSR 20-6.200(2)(C)1.E(I), (II), and (III). This section of the rule indicates the facility must sample for all parameters included in this NPDES permit for renewal sampling for outfall #004 stormwater discharge. As the facility has determined using the Barrow Pit for industrial stormwater discharges to be the preferred stormwater management method, the facility thereby accepts all responsibility for the stormwater in accordance with 40 CFR 122.26(b)(14). The minimal requirement is a singular sample, but multiple samples are recommended. Because the facility has decided to use the Barrow pit as a stormwater treatment device, the facility has accepted all liability for the stormwater discharges from the barrow Pit, including agricultural constituents. The facility must inquire which pesticides, herbicides, and other agricultural chemicals the farm has applied and test for those parameters for renewal. Additionally, because this facility manufactures agricultural chemicals, the facility may not dismiss detections as a result of agricultural practices.

As the permittee has requested outfall #004 be used as an industrial stormwater outfall, it is now considered a wholly industrial outfall. Previous disclosures regarding the 90-95% agricultural runoff do not negate the industrial stormwater component of the discharge. The facility has stated repeatedly the use of the Barrow Pit is the desired treatment device for stormwater discharges from the facility. While agricultural discharges are exempted for permitting in 40 CFR 122.3(e), the facility has decided to assume responsibility for the discharge at outfall #004 by requesting outfall #004 after the Barrow Pit be placed into the permit. These actions and requests thereby make the discharge industrial. 40 CFR 122.26(b)(14) states in part: Storm water discharge associated with industrial activity means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under this part 122. For the categories of industries identified in this section, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas.

Sampling requirements promulgated in 10 CSR 20-6.200 (2)(C)1.E.(I) require the permittee sample stormwater for all the parameters limited by an ELG in the permit; where part (II) indicates the facility must sample for any pollutant listed in the operating permit. Part (III) indicates oil and grease, pH, biochemical oxygen demand (BOD5), chemical oxygen demand (COD), total suspended solids, conductivity, total phosphorus, total Kjeldahl nitrogen (TKN), and nitrate plus nitrate as N must also be sampled for permit renewal.

Special Condition #5 are requirements for all industrial stormwater discharges and cannot be negotiated away as they are found in regulation. Similar requirements are also promulgated in 40 CFR 122.26(c)(1)(i)(E)(2), of which this facility are also subject.

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 total recoverable aluminum at outfall #002. Time is required for the permittee to determine how to comply with the new water quality limits.

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

- ✓ This facility also has a Spill Prevention Control and Countermeasures (SPCC) plan in accordance with 40 CFR 112 which is not regulated under this permit.

SLUDGE – DOMESTIC BIOSOLIDS AND INDUSTRIAL SLUDGE:
Biosolids are solid materials resulting from domestic wastewater treatment; sewage sludge is solid, semi-solid, 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 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: (WQ422 through WQ449) http://extension.missouri.edu/main/DisplayCategory.aspx?C=74. Industrial sludge is solid, semi-solid, 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.

- ✓ Permittee is not authorized to land apply sludge or biosolids. Both biosolids and industrial sludge are currently stored in the lagoon. The permittee must submit a sludge management plan for approval detailing removal and disposal plans when sludge is to be removed from lagoons. Formerly labeled as outfall #003, the lagoon no longer provides effective treatment of domestic wastewater but remains in use for minimal treatment. The permittee has not submitted a closure plan to the department at this time. 10 CSR 20-6.010(12) requires the facility submit a closure plan; a special condition was added to the permit to compel the appropriate closure if the facility determines they no longer need to use the lagoon.

STORMWATER PERMITTING:
A standard mass-balance equation cannot be calculated for stormwater from this facility because the stormwater flow and flow in the receiving stream cannot be determined for conditions on any given day. The amount of stormwater discharged from the facility will vary based on previous rainfall, soil saturation, humidity, detention time, BMPs, surface permeability, etc. Flow in the receiving stream will vary based on climatic conditions, size of watershed, amount of surfaces with reduced permeability (houses, parking lots, and the like) in the watershed, hydrogeology, topography, etc. Decreased permeability increases the flash of the stream.

It is likely sufficient rainfall to cause a discharge for four continuous days from a facility will also cause some significant amount of flow in the receiving stream. Chronic WQSs are based on a four-day exposure (except ammonia, which is based on a thirty day exposure). In the event a discharge does occur from this facility for four continuous days, some amount of flow will occur in the receiving stream. This flow will dilute stormwater discharges from a facility. For these reasons, most industrial stormwater facilities have limited potential to cause a violation of chronic water quality standards in the receiving stream.

Sufficient rainfall to cause a discharge for one hour or more from a facility would not necessarily cause significant flow in a receiving stream. Acute WQSs are based on a one hour of exposure, and must be protected at all times in unclassified streams, and within mixing zones of class P streams [10 CSR 20-7.031(4) and (5)(4)4.B.]. Therefore, industrial stormwater facilities with toxic contaminants do have the potential to cause a violation of acute WQSs if those toxic contaminants occur in sufficient amounts.

It is due to the items stated above staff are unable to perform statistical Reasonable Potential Analysis (RPA). However, staff will use their best professional judgment in determining if a facility has a potential to violate Missouri's Water Quality Standards.

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*, (EPA 833-B-09-002) published by the EPA in 2015 https://www.epa.gov/sites/production/files/2015-11/documents/swppp_guide_industrial_2015.pdf, 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. Additional information can be found in *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006; September 1992).

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)]. 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 within 90 days of the effective date. The facility has disclosed the Barrow Pit area was historically artificially constructed by the permittee. This area was newly classified as a water of the state in 2013. In October 2018, the Watershed Protection Section removed the Barrow Pit from the presumed designated uses.
- ✓ This permit establishes a SWPPP for the facility where one was not established before. Prior to this permit, the facility used an area called the Barrow Pit to temper and control stormwater. The facility has indicated up to 95% of the water discharged from the Barrow Pit is agricultural therefore the data collected by sampling the Barrow Pit outfall would not be representative of the facility's stormwater discharges. The permit writer believes sampling from the Barrow Pit is not representative of the industrial

activity. The permit writer has noted the sampling locations must be representative of the activity in accordance with 40 CFR 122.41(j) and 40 CFR 122.48(b). Furthermore, use of the Barrow Pit as a BMP is likely not the best available management practice accessible to the facility. The permit writer, during pre-public notice negotiations, was also trying to limit the scope of the water monitoring to the active facility footprint, and not bring additional areas into the purview of the permit. However, since the facility has repeatedly insisted to use the Barrow Pit outfall (rather than sampling wastewater coming from the facility area), then the facility will be assuming responsibility of all waters discharged from the pit, including the 90-95% agricultural water which will accumulate. Outfall #004 was established in accordance with the permittee's wishes.

✓ Currently, this facility uses a stormwater containment system where gate valves are employed to contain any spills should they occur. In a site visit on 6/27/2018, the Northeast Regional Office representatives noticed fish swimming in pools just downstream of the gate valves indicating no immediate issue with the stormwater being discharged from the site.

VARIANCE:

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 permit is not drafted under premise 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 discharge into the receiving stream without endangering water quality. Two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs) are reviewed. If one limit does not provide adequate protection for the receiving waters, then the other must be used.

✓ Applicable; wasteload allocations were calculated where relevant using water quality criteria or water quality model results and by applying the dilution equation below:

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$ (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 designated as daily maximum limits (MDL) 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 designated as monthly average limits (AML) 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 MDL and 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; 3/1991.
- 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 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.

✓ Applicable; the permittee submitted a CORMIX1 model for mixing of toxic effluent at outfall #001 and was approved in 2007. The permit writer has applied the mixing allowances to applicable water-quality based discharges at outfall #001.

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.

Part IV. Effluent Limits Determination

Effluent limitations derived and established for this permit are based on current operations of the facility. Effluent means both process water and stormwater. Any flow through the outfall is considered a discharge and must be sampled and reported as provided below. 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.

Outfall #001 – Main Facility Outfall

Effluent Limitations Table:

PARAMETERS	Unit	Daily Max	Monthly Avg	previous permit requirement	Minimum Sampling Frequency	Minimum Reporting Frequency	Sample Type
Physical							
Flow	MGD	*	*	monitoring	once/month	once/month	24 Hr. Tot
ELG Parameters							
Biochemical Oxygen Demand – 5	mg/L	*	*	monitoring	once/month	once/month	composite
Biochemical Oxygen Demand – 5	lbs/day	13,643.0	2,983.6	15,740; 3,403	once/month	once/month	composite
Chemical Oxygen Demand (COD)	mg/L	*	*	monitoring	once/month	once/month	composite
Chemical Oxygen Demand (COD)	lbs/day	23,985.6	16,601.6	27,651; 19,143	once/month	once/month	composite
Organic Pesticides –Total	mg/L	*	*	monitoring	once/month	once/month	composite
Organic Pesticides –Total	lbs/day	18.3	1.8	13.54, 4.03	once/month	once/month	composite
Total Suspended Solids (TSS)	mg/L	*	*	monitoring	once/month	once/month	composite
Total Suspended Solids (TSS)	lbs/day	11,259.4	3,350.3	12,97; 3,829	once/month	once/month	composite
Thimet/Counter (Phorate/Terbufos)	mg/L	*	*	new	twice/year	twice/year	composite
Thimet/Counter (Phorate/Terbufos)	lbs/day	0.90	0.23	1.63, 0.55	twice/year	twice/year	composite
Conventional Parameters							
E. coli (mpn/100mL)	€	630	126	same	once/month	once/month	grab
pH Ω	SU	6.0 to 9.5	6.0 to 9.5	same	continuous	once/month	continuous
pH – single excursion	minutes	60	-	same	continuous	once/month	continuous
pH – monthly total	minutes	-	446	same	continuous	once/month	continuous
Nutrients							
Nitrogen, Total N (TN)	mg/L	*	*	same	quarterly	quarterly	composite
Phosphorus, Total P (TP)	mg/L	*	*	same	quarterly	quarterly	composite
Other							
WET Test - Acute	TUa	30.9	-	% survival	once/year	once/year	composite

*	Monitoring and reporting requirement only
Ω	Report the minimum and maximum pH values; pH is not to be averaged.
€	# of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.
new	Parameter not established in previous state operating permit.
Monitoring	Monitoring and reporting requirement
TR	Total Recoverable

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). From the data collected, it is apparent the facility is collecting samples for this parameter more often than monthly. The facility is required by Standard Conditions I.A.2.b. to report all data to the

Department which is collected for compliance purposes. The facility shall sample for this parameter at least monthlly and report monthly.

Temperature

The Department considered thermal discharge a pollutant of concern for this facility as is required by the CWA. This facility is in Zone 1A of the Mississippi River. Data from 2004 through 2006 indicate discharge temperatures of 140 to 169 degrees Fahrenheit. The permittee has a diffuser installed; however, the thermal regulations are not based on 7Q10, but are based on the discharge volume, discharge temperature, stream discharge, and stream temperature on the day of the discharge. The facility submitted the raw temperature data to the Department on 5/18/2018. The permit writer evaluated the data, with the historical temperature and flow data of the river on an ad-hoc basis; not all points were evaluated but six days of the data were evaluated. The evaluation determined the permittee will not cause thermal pollution to waters of the state as the flows discharged from the facility are well below the flow of the river. Similar to the CORMIX1 model, the permit writer found the discharge only increases the temperature of the river by about 0.1 degree at the end of the mixing zone; the overall temperature of the river is not affected; monitoring not required.

ELG REQUIREMENTS:

The limitations calculated in this subsection are based on the decisions set in Part III: EFFLUENT LIMITATION GUIDELINES.
Permit limit = (guideline limit)*(lbs/day manufactured)/1000. Previous permit calculations used 4,254 pounds production in the calculations. This value goes back to the 2007 permit where they disclosed the facility was "producing" 4,254,000 pounds per day. However, the ELG limits the allowances to the organic pesticide chemicals which were manufactured on-site; the difference being the definition for manufactured. The facility formulates (blending or mixing of chemicals) and manufactures (creates a new chemical via a chemical reaction) pesticides. "Production" is different than "manufactured" and the ELG is clear that allowances are only for the lbs/day which are "manufactured" on site.

The values calculated for this permit renewal allow for additional sources of pollutants. In an email dated 9/17/2018, the facility supplied new data and were incorporated below. The calculations include the ELG allowance, an allowance for formulation, an allowance for packaging, an allowance for domestic wastewater, and an allowance for stormwater which is also incinerated. There are no water quality limitations for these parameters. From the data collected, it is apparent the facility is collecting samples for these parameters more often than monthly. The facility must sample at least one time each month for these parameters; any additional samples must be reported to the department according to standard conditions Part I, Section A.2.b.

The following data were supplied:
Pesticide Active Ingredients Manufactured: 312,697 lbs/day
Formulations: (at IMI-1) 148,193 lbs/day and (at Basagran) 381,323 lbs/day; total is 529,516 lbs/day
Packaging (at FFP): 911,716 lbs/day
Stormwater: Max 0.04 MGD (lbs/day = x/8.34 * 0.04) = 2.998 lbs/day
Domestic wastewater was calculated based on the allowances in 10 CSR 20-7.015(2)(A)1. and BPJ
A spreadsheet with the calculations is available upon request.

Biochemical Oxygen Demand (BOD_5)

Manufacturing	Daily Maximum =	7.4	lbs	*	312697	/	1000	=	2314.0	lbs/day
Manufacturing	Monthly Average =	1.6	lbs	*	312697	/	1000	=	500.3	lbs/day
Formulation	Daily Maximum =	7.4	lbs	*	529516	/	1000	=	3918.4	lbs/day
Formulation	Monthly Average =	1.6	lbs	*	529516	/	1000	=	847.2	lbs/day
Packaging	Daily Maximum =	7.4	lbs	*	991283	/	1000	=	7335.5	lbs/day
Packaging	Monthly Average =	1.6	lbs	*	991283	/	1000	=	1586.1	lbs/day
Stormwater	Daily Maximum =	7.4	lbs	*	2.997	/	1000	=	0.0222	lbs/day
Stormwater	Monthly Average =	1.6	lbs	*	2.997	/	1000	=	0.0048	lbs/day
Domestic WW	Daily Maximum =	45	mg/L	*	0.2	*	8.34	=	75.06	lbs/day
Domestic WW	Monthly Average =	30	mg/L	*	0.2	*	8.34	=	50.04	lbs/day
	Total Daily Max:								**13,643.0**	**lbs/day**
	Total Monthly Average:								**2,983.6**	**lbs/day**

Previous permit was monthly monitoring only for concentration based evaluation, and 15,740 lbs/day daily maximum and 3,403 lbs/day monthly average. The facility reported 2 to 169 mg/L and 2 to 1,921 lbs/day daily maximum; and 1 to 440 mg/L and 2 to 915 lbs/day monthly average for this parameter.

Chemical Oxygen Demand (COD)

Manufacturing	Daily Maximum =	13	lbs	*	312697	/	1000	=	4065.1	lbs/day
Manufacturing	Monthly Average =	9	lbs	*	312697	/	1000	=	2814.3	lbs/day
Formulation	Daily Maximum =	13	lbs	*	529516	/	1000	=	6883.7	lbs/day
Formulation	Monthly Average =	9	lbs	*	529516	/	1000	=	4765.6	lbs/day

Packaging	Daily Maximum =	13	lbs	*	991283	/	1000	=	12886.7	lbs/day
Packaging	Monthly Average =	9	lbs	*	991283	/	1000	=	8921.5	lbs/day
Stormwater	Daily Maximum =	13	lbs	*	2.998	/	1000	=	0.0390	lbs/day
Stormwater	Monthly Average =	9	lbs	*	2.998	/	1000	=	0.0270	lbs/day
Domestic WW	Daily Maximum =	90	mg/L	*	0.2	*	8.34	=	150.12	lbs/day
Domestic WW	Monthly Average =	60	mg/L	*	0.2	*	8.34	=	100.08	lbs/day
	Total Daily Max:								**23,985.6**	**lbs/day**
	Total Monthly Average:								**16,601.6**	**lbs/day**

Previous permit was monitoring only for concentration based evaluation (continued), and 27,651 lbs/day daily maximum and 19,143 lbs/day monthly average. The facility reported between 61 to 7,867 mg/L and 519 to 13,334 lbs/day maximum and 42 to 2,092 mg/L and 166 to 12,424 lbs/day average for this parameter. Domestic wastewater component allowance was doubled for COD as the COD of wastewater is generally double that of BOD.

An antidegradation review was completed for this parameter October 2017 and implemented in to the permit modification on February 1, 2018. The limits for this parameter cannot not be raised for any reason under the antidegradation analysis per 10 CSR 20-7.031(3)(D). The antideg indicated the change in production line increased COD in outfall #001 and #002, COD was evaluated as a parameter of concern. As current technology limits are more protective than the antideg values, the current production-based limits must be applied; the values used for the antideg were not the current manufacturing, formulating, or packaging values.

Total Organic Pesticide Chemicals

Manufacturing	Daily Maximum =	0.01	lbs	*	312697	/	1000	=	3.1	lbs/day
Manufacturing	Monthly Average =	0.001	lbs	*	312697	/	1000	=	0.3	lbs/day
Formulation	Daily Maximum =	0.01	lbs	*	529516	/	1000	=	5.3	lbs/day
Formulation	Monthly Average =	0.001	lbs	*	529516	/	1000	=	0.5	lbs/day
Packaging	Daily Maximum =	0.01	lbs	*	991283	/	1000	=	9.9	lbs/day
Packaging	Monthly Average =	0.001	lbs	*	991283	/	1000	=	1.0	lbs/day
Stormwater	Daily Maximum =	0.01	lbs	*	2.998	/	1000	=	3.0E-05	lbs/day
Stormwater	Monthly Average =	0.001	lbs	*	2.998	/	1000	=	3.0E-06	lbs/day
	Total Daily Max:								**18.3**	**lbs/day**
	Total Monthly Average:								**1.8**	**lbs/day**

The previous permit limitations were 13.54 lbs/day daily maximum and 4.03 lbs/day monthly average and monitoring for concentration (continued) in the wastewater. The calculation for the previous permit was performed using an arbitrary ratio, was not explained fully, and therefore is not continued. Water quality limitations would be less restrictive than technology therefore are not applied. The facility reported between 0.001 and 10.16 lbs/day for this parameter in the last five years, however since April 2014 the facility has reported 0.007 lbs/day; the facility is able to meet the new technology limitations 100% of the time.

Total Suspended Solids (TSS)

Manufacturing	Daily Maximum =	6.1	lbs	*	312697	/	1000	=	1907.5	lbs/day
Manufacturing	Monthly Average =	1.8	lbs	*	312697	/	1000	=	562.9	lbs/day
Formulation	Daily Maximum =	6.1	lbs	*	529516	/	1000	=	3230.0	lbs/day
Formulation	Monthly Average =	1.8	lbs	*	529516	/	1000	=	953.1	lbs/day
Packaging	Daily Maximum =	6.1	lbs	*	991283	/	1000	=	6046.8	lbs/day
Packaging	Monthly Average =	1.8	lbs	*	991283	/	1000	=	1784.3	lbs/day
Stormwater	Daily Maximum =	6.1	lbs	*	2.998	/	1000	=	0.0183	lbs/day
Stormwater	Monthly Average =	1.8	lbs	*	2.998	/	1000	=	0.0054	lbs/day
Domestic WW	Daily Maximum =	45	mg/L	*	0.2	*	8.34	=	75.06	lbs/day
Domestic WW	Monthly Average =	30	mg/L	*	0.2	*	8.34	=	50.04	lbs/day
	Total Daily Max:								**11,259.4**	**lbs/day**
	Total Monthly Average:								**3,350.3**	**lbs/day**

Previous permit was monitoring only for concentration based evaluation (continued), and 12,975 lbs/day daily maximum and 3,829 lbs/day monthly average. The facility reported 31 to 649 mg/L and 139 to 7,393 lbs/day daily maximum; and 10 to 262 mg/L and 104 to 915 lbs/day monthly average.

Thimet/Counter (phorate/terbufos)

Manufacturing	Daily Maximum =	0.000492	lbs	*	312697	/	1000	=	0.1538	lbs/day
Manufacturing	Monthly Average =	0.000126	lbs	*	312697	/	1000	=	0.0394	lbs/day
Formulation	Daily Maximum =	0.000492	lbs	*	529516	/	1000	=	0.2605	lbs/day
Formulation	Monthly Average =	0.000126	lbs	*	529516	/	1000	=	0.0667	lbs/day

Packaging	Daily Maximum =	0.000492	lbs	*	991283	/	1000	=	0.4877	lbs/day
Packaging	Monthly Average =	0.000126	lbs	*	991283	/	1000	=	0.1249	lbs/day
	Total Daily Max:								**0.90**	**lbs/day**
	Total Monthly Average:								**0.23**	**lbs/day**

Table 2 to Part 455 per 40 CFR 455.20(d) - Organic Pesticide Active Ingredient Effluent Limitations Best Available Technology Economically Achievable (BAT) and Pretreatment Standards for Existing Sources (PSES); terbufos daily maximum shall not exceed 4.92 $x10^{-4}$ lbs/1000 lbs product; monthly average shall not exceed 1.26 $x10^{-4}$ lbs/1000 product. The facility reported 0.001 to 1 lbs/day maximum and 0.001 to 0.01 lbs/day average.

The previous permit implemented 1.63 lbs/day daily maximum and 0.55 lbs/day monthly average limits for the combination of these two pesticides as was continued from the previous permit. The permit from 2000 was reviewed and this permit included these limitations but did not provide a fact sheet with an explanation or derivation of the limits. The permit writer has noted each permit since has simply continued the previous permit limitations. The permit writer has determined these decisions do conform to the antibacksliding regulations but also legal authority for inclusion of limits must be explained by the permitting authority; a statement for simply "continuing" limitations is typically not sufficient. The facility manufactures these two pesticides on one line at the facility. They've reported between 0.001 and 1 pound per day for this parameter. The permit writer has determined these pollutants are accounted for during the analysis of total organic pollutants which are also controlled in this permit via effluent guide limitations. However, 455.20(d) requires monitoring of Thimet and Counter. The permittee's incinerators have shown to effectively remove these pollutants; monthly sampling reduced to twice annual sampling.

CONVENTIONAL:

Escherichia coli (E. coli)
Domestic wastewater is discharged from this outfall. Daily maximum limit of 630 colony forming units per 100 mL [10 CSR 20-7.015(9)(B)1.E.] and a monthly geometric mean limit of 126 bacteria per 100 mL [10 CSR 20-7.031 Table A1] during the recreational season from April 1 through October 31 only [10 CSR 20-7.031(5)(C)], to protect Whole Body Contact (A) [10 CSR 20-7.031(C)2.A.(I)] designated use of the receiving stream.

An effluent limit for both daily maximum and monthly geometric mean is required by 40 CFR 122.45(d). 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. Geometric Mean = 5^{th} root of (1)(4)(5)(6)(10) = 5^{th} root of 1,200 = 4.1 #/100 mL.

pH
6.0 to 9.5 SU per 10 CSR 20-7.015(9)(I)1 and per 40 CFR §401.17 for technology based limits; allowances of excursions where the pH may deviate from the limitations are also allowed. The total time deviation is allowed at 7 hours 26 minutes (446 minutes) in any calendar month, and any single excursion is prohibited when greater than 60 minutes. The permittee reported between 2.25 and 15.33 SU for this parameter; annual total excursions were: 2016 had 102 minutes; 2017 had 53 minutes; and 2018 has had none thus far. Previous permit allowed for a maximum pH of 9.5 SU per best professional judgment. The permit writer has reviewed the CORMIX1 mixing study and determined the effluent will not exceed 9.0 SU at the edge of the mixing zone as required by 10 CSR 20-7.015(9)(I).

Total Dissolved Solids (TDS)
Previous permit was monitoring only, discontinued. There are no water quality standards for this parameter.

METALS:

Chromium, Hexavalent (Cr-6), Dissolved
Previous permit required monthly sampling for this parameter. Monitoring discontinued, no RP.

NUTRIENTS:

Nitrogen, Total N (TN)
Quarterly monitoring required per 10 CSR 20-7.015(9)(D)7.

Phosphorous, Total P (TP)
Quarterly monitoring required per 10 CSR 20-7.015(9)(D)7.

OTHER:

Whole Effluent Toxicity (WET) Test, Acute

Monitoring is required to determine if reasonable potential exists for the discharge to cause toxicity within the receiving stream. A WET test is a quantifiable method to determine discharges from the facility cause toxicity to aquatic life by itself, in combination with, or through synergistic responses, when mixed with receiving stream water.

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 the provisions in 10 CSR 20-6 and the Water Quality Standards in 10 CSR 20-7 are being met. Under 10 CSR 20-6.010(8)(A)4, the Department may require other terms and conditions it deems necessary to assure compliance with the CWA and related regulations of the Missouri Clean Water Commission. The following Missouri Clean Water Laws (MCWL) apply: §644.051.3. requires the Department to set permit conditions complying 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); and §644.051.5. is the basic authority to require testing conditions.

Previous permit limitations were pass/fail, however, the units are being converted to toxic units (TUa) at this time; the endpoint of percent survival remains unchanged. The facility has a CORMIX1 mixing study which revealed the allowable effluent concentration for toxicity was 3.24%, this LC_{50} has been retained from the previous permit. The dilution series was 0.8%, 1.6%, 3.24%, 6.5%, and 13%, continued from the previous permit as was appropriately established based on 10 CSR 20-7.015(9)(L)4.A. Based on the above information, the Acute Toxic Unit (TUa) limit is $100/LC_{50} = 100/3.24 = 30.9$ TUa, which translates to the same limit as the pass/fail requirement. See the TSD (EPA /505/2-90-001) Section 1.3.1. As these are the same requirements as the previous permit, no schedule of compliance is afforded.

Whole Effluent Toxicity (WET) Test, Chronic

Previous permit required monitoring for this parameter once per permit cycle. The permit writer has reviewed the data from a singular chronic test collected and performed in May 2017 and determined it is not necessary to continue monitoring for chronic toxicity. This facility monitors for acute toxicity and has a site specific mixing model determining the levels of effluent toxicity within the receiving stream.

OUTFALL #002 – AIR POLLUTION CONTROL SYSTEMS WASTEWATER

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL							
FLOW	MGD	*	*	MONITORING	ONCE/WEEK	ONCE/MONTH	24 HR. TOT
CONVENTIONAL							
CHEMICAL OXYGEN DEMAND (COD)	mg/L	*	*	MONITORING	ONCE/WEEK	ONCE/MONTH	COMPOSITE
CHEMICAL OXYGEN DEMAND (COD)	lbs/day	*	*	MONITORING	ONCE/WEEK	ONCE/MONTH	COMPOSITE
PH Ω	SU	6.5 TO 9.0	6.5 to 9.0	SAME	ONCE/WEEK	ONCE/MONTH	GRAB
TOTAL SUSPENDED SOLIDS (TSS)	mg/L	*	*	MONITORING	ONCE/WEEK	ONCE/MONTH	COMPOSITE
TOTAL SUSPENDED SOLIDS (TSS)	lbs/day	*	*	MONITORING	ONCE/WEEK	ONCE/MONTH	COMPOSITE
METALS							
ALUMINUM, TR	µg/L	*	*	NEW/INTERIM	ONCE/WEEK	ONCE/MONTH	COMPOSITE
ALUMINUM, TR	µg/L	8,250	4,112	NEW/FINAL	ONCE/WEEK	ONCE/MONTH	COMPOSITE
ALUMINUM, TR	lbs/day	*	*	NEW	ONCE/WEEK	ONCE/MONTH	COMPOSITE
NUTRIENTS							
NITROGEN, TOTAL N (TN)	mg/L	*	*	MONITORING	QUARTERLY	QUARTERLY	COMPOSITE
PHOSPHORUS, TOTAL P (TP)	mg/L	*	*	MONITORING	QUARTERLY	QUARTERLY	COMPOSITE
OTHER							
WET TEST - ACUTE	TUa	*	-	NEW	ANNUALLY	ONCE/YEAR	COMPOSITE

*	Monitoring requirement only
Ω	Report the minimum and maximum pH values; pH is not to be averaged
NEW	Parameter not established in previous state operating permit
TR	Total Recoverable
Interim	interim limit
Final	final limit after schedule of compliance

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). From the data collected, it is apparent the facility is collecting samples for this parameter more often than monthly. The facility is required by Standard Conditions I.A.2.b. to report all data to the Department which is collected for compliance purposes. The facility shall sample for this parameter at least monthly and report monthly.

CONVENTIONAL:

Chemical Oxygen Demand (COD)

Previous permit was monitoring only for both concentration and pounds. The facility reported between 51 to 316 mg/L and 204 to 1,242 lbs/day for the daily maximum and 51 to 58 mg/L and 140 to 210 lbs/day for the monthly average. Only five months of data were available for this parameter therefore monitoring is continued until the next permit cycle. From the data collected, it is apparent the facility is collecting samples for this parameter more often than monthly. The facility is required by Standard Conditions I.A.2.b. to report all data to the Department which is collected for compliance purposes. From the data collected, it is apparent the facility is collecting samples for this parameter more often than monthly. The facility is required by Standard Conditions I.A.2.b. to report all data to the Department which is collected for compliance purposes. The facility shall sample for this parameter at least monthly and report monthly.

pH
6.5 to 9.0 SU – instantaneous grab sample. Water quality limits [10 CSR 20-7.031(5)(E)] are applicable to this outfall. Continued from previous permit; from the data collected, it is apparent the facility is collecting samples for this parameter more often than monthly. The facility is required by Standard Conditions I.A.2.b. to report all data to the Department which is collected for compliance purposes. The facility shall sample for this parameter at least monthly and report monthly. The facility reported from 6 to 9.5 SU for this parameter.

Total Dissolved Solids (TDS)
Monitoring removed.

Total Suspended Solids (TSS)
Previous permit was monitoring only for pounds per day. The facility reported between 7940 to 19,439 lbs/day for the daily maximum and 5294 to 11,587 lbs/day for the monthly average. The maximum amount of solids per day, calculated using the design flow of 1.5 MGD is 19439/(8.34*1.5) = 1547 mg/L. Only five months of data were available for this parameter therefore monitoring is continued until the next permit cycle. The facility will also additionally report in mg/L. From the data collected, it is apparent the facility is collecting samples for this parameter more often than monthly. The facility is required by Standard Conditions I.A.2.b. to report all data to the Department which is collected for compliance purposes. The facility shall sample for this parameter at least monthly and report monthly.

METALS:
Effluent limitations for total recoverable metals were developed using methods and procedures outlined in the *Technical Support Document For Water Quality-based Toxic Controls* (EPA/505/2-90-001) and *The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007). Propagation of fish, shellfish, and wildlife apply designated as "Aquatic Life Protection" in 10 CSR 20-7.031 Tables A1 and A2. Additional use criterion (HHP, DWS, GRW, IRR, or LWW) may also be used as applicable to determine the most protective effluent limit for the stream class and uses. The hardness value used for hardness-dependent metals calculations was based on the ecoregion's 50th percentile.

Aluminum, Total Recoverable
Daily maximum 8,250 µg/L; monthly average 4,112 µg/L; the facility will also report lbs/day. The permittee submitted data showing the discharge contained 14,000 µg/L and 94.94 lbs/day of aluminum daily maximum and 12,500 µg/L 26.25 lbs/day four-sample average. This parameter shows RP using RPA therefore a limit is required. Additionally, the permit writer has determined RP using RPD. In July 2015, the department granted a change-chemical approval of NALCO 8158 for use at the facility which contains aluminum. NALCO 8158 is a water clarification aid used in the on-site water treatment plant which treats raw well water. In the letter from the facility, they explained the proper and appropriate use of this chemical would result in a 1% increase of aluminum in the discharge and most of the aluminum would be retained in the sludge. At that time, the department approved the use of the new chemical based on engineering calculations. Data provided by the permittee at the time indicated only 0.39 lbs/day (at 30 mg/L used) up to 1.29 lbs/day (at 100 mg/L used) of aluminum would be added to the effluent by use of the Nalco coagulant. At the time of approval, the department believed the concentration of aluminum discharges to the Mississippi River would be insignificant.

However, from the sampling for renewal results, it appears aluminum is either not being retained in the sludge or the Nalco product is not being used appropriately to moderate discharge of aluminum, or, since outfall #002 discharges cooling tower blowdown, boiler blowdown, and boiler feedwater demineralization ion exchange blowdown; any of these wastewaters may be concentrating aluminum found in the raw water. Monthly monitoring is required; the facility cannot currently meet the new water quality based limitations therefore will have a schedule of compliance to determine operational controls or other remedies to reduce aluminum in the discharge.

Acute AQL WQS: 750 µg/L
Chronic AQL WQS: none
Acute WLA: $C_e = ((1.55\ cfs_{DF} + 15.5\ cfs_{ZID}) * 750\ \mu g/L) \div 1.55 cfs_{DF}$ $C_e = 8250.000\ \mu g/L$
LTA_a: 8250.000 (0.321) = 2648.937 [CV = 0.6, 99th Percentile]
Use most protective number of LTA_a or LTA_c.
MDL: 2648.937 (3.11) = **8,250 µg/L** [CV = 0.6, 99th Percentile]
AML: 2648.937 (1.55) = **4,112 µg/L** [CV = 0.6, 95th Percentile, n = 4]

Chromium, Hexavalent, Dissolved
Monitoring removed, no RP.

NUTRIENTS:

Nitrate as N
This parameter was added at the antidegradation dated February 2016 with monitoring only; monitoring removed.

Nitrogen, Total N (TN)
Quarterly monitoring required per 10 CSR 20-7.015(9)(D)7.

Phosphorous, Total P (TP)
Quarterly monitoring required per 10 CSR 20-7.015(9)(D)7.

OTHER:

Whole Effluent Toxicity (WET) Test, Acute
Monitoring is required to determine if reasonable potential exists for the discharge to cause toxicity within the receiving stream. A WET test is a quantifiable method to determine discharges from the facility cause toxicity to aquatic life by itself, in combination with, or through synergistic responses, when mixed with receiving stream water.

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 the provisions in 10 CSR 20-6 and the Water Quality Standards in 10 CSR 20-7 are being met. Under 10 CSR 20-6.010(8)(A)4, the Department may require other terms and conditions it deems necessary to assure compliance with the CWA and related regulations of the Missouri Clean Water Commission. The following Missouri Clean Water Laws (MCWL) apply: §644.051.3. requires the Department to set permit conditions complying 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); and §644.051.5. is the basic authority to require testing conditions. WET tests are required by all facilities meeting the following criteria:

- ✓ Facility is a designated a Major

For classified permanent streams with other than default mixing considerations, the Allowable Effluent Concentration (AEC)% is determined as follows: $AEC_a\% = [1.55\ cfs_{DF} \div (15.5\ cfs_{ZID7Q10} + 1.55\ cfs_{DF})] * 100\% = 9.1\ \%$

10 CSR 20-7.015((9)(L)4.A. states the dilution series must be proportional. Each dilution was determined by multiplying or dividing 2 from the AEC and then each consecutive value. The dilution series is: 2.275%, 4.55% 9.1%, 18.2%, and 36.4%

Annual testing is the minimum testing frequency; monitoring requirements promulgated in 40 CFR 122.44(i)(2) states "requirements to report monitoring results shall be established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge, but in no case less than once per year."

OUTFALL #004 – STORMWATER

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAXIMUM LIMIT	BENCH-MARK	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL							
FLOW	MGD	*	-	NEW	ONCE/QUARTER	QUARTERLY	24 HR. ESTIMATE
CONVENTIONAL							
COD	mg/L	**	120	NEW	ONCE/QUARTER	QUARTERLY	GRAB
OIL & GREASE	mg/L	**	10	NEW	ONCE/QUARTER	QUARTERLY	GRAB
pH Ω	SU	*	-	NEW	ONCE/QUARTER	QUARTERLY	GRAB
TSS	mg/L	**	100	NEW	ONCE/QUARTER	QUARTERLY	GRAB
NUTRIENTS							
AMMONIA AS N	mg/L	*	-	NEW	ONCE/QUARTER	QUARTERLY	GRAB

* Monitoring and reporting requirement only
** Monitoring with associated benchmark
Ω Report the minimum and maximum pH values; pH is not to be averaged
NEW Parameter not established in previous state operating permit

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:

Chemical Oxygen Demand (COD)
Monitoring with 120 mg/L daily maximum benchmark is included using the permit writer's best professional judgment. There is no numeric water quality standard for COD; however, increased oxygen demand may impact instream water quality. COD is a pollutant of concern for the industry category. COD is also a valuable indicator parameter. COD monitoring allows the permittee to identify increases in COD may indicate materials/chemicals coming into contact with stormwater causing an increase in oxygen demand. Increases in COD may indicate a need for maintenance or improvement of BMPs. The benchmark value falls within the range of values implemented in other permits having similar industrial activities and is achievable through proper BMP controls.

Oil & Grease
Monitoring with a daily maximum benchmark of 10 mg/L. Oil and grease is considered a conventional pollutant and is found at this facility. Oil and grease is a comprehensive test which measures for gasoline, diesel, crude oil, creosote, kerosene, heating oils, heavy fuel oils, lubricating oils, waxes, and some asphalt and pitch. The test can also detect some volatile organics such as benzene, toluene, ethylbenzene, or toluene, but these constituents are often lost during testing due to their boiling points. It is recommended to perform separate testing for these constituents if they are a known pollutant of concern at the site, i.e. aquatic life toxicity or human health is a concern. Results do not allow for separation of specific pollutants within the test, they are reported, totaled, as "oil and grease". Per 10 CSR 20-7.031 Table A1: *Criteria for Designated Uses*; 10 mg/L is the standard for protection of aquatic life. This standard will also be used to protect the general criteria found at 10 CSR 20: 7.031 (4). 10 mg/L is the level at which sheen is expected to form on receiving waters. Oils and greases of different densities will possibly form sheen or unsightly bottom deposits at levels which vary from 10 mg/L. To protect the general criteria, it is the responsibility of the permittee to visually observe the discharge and receiving waters for sheen or bottom deposits. The benchmark is achievable through proper operational and maintenance of BMPs and falls within the range of values implemented in other permits having similar industrial activities.

pH
Monitoring only.

Total Suspended Solids (TSS)
Monitoring with a daily maximum benchmark of 100 mg/L. There is no numeric water quality standard for TSS; however, sediment discharges can negatively impact aquatic life habitat. TSS is also a valuable indicator parameter. TSS monitoring allows the permittee to identify increases in TSS indicating uncontrolled materials leaving the site. Increased suspended solids in runoff can lead to decreased available oxygen for aquatic life and an increase of surface water temperatures in a receiving stream. Suspended solids can also be carriers of toxins, which can adsorb to the suspended particles; therefore, total suspended solids are a valuable indicator parameter for other pollution. The Barrow Pit provides settling therefore this benchmark is achievable through proper placement, operation, and maintenance of BMPs, and falls within the range of values implemented in other permits having similar industrial activities.

NUTRIENTS:

Ammonia as N
Ammonia is present on site and part of the manufacturing process. Monitoring required to determine the quantity of ammonia in the stormwater.

Part V. 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. Additionally, see Standard Conditions Part I attached at the end of this permit and fully incorporated within.

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.

SAMPLING FREQUENCY JUSTIFICATION:
Sampling and reporting frequency was generally retained from previous permit. 40 CFR 122.45(d)(1) indicates all continuous discharges shall be permitted with daily maximum and monthly average limits. Sampling frequency for stormwater-only outfalls is typically quarterly even though BMP inspection occurs monthly. The facility may sample more frequently if additional data is required to determine if best management operations and technology are performing as expected.

SAMPLING TYPE JUSTIFICATION:
Sampling type was 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, dissolved oxygen, total phosphorus, and volatile organic samples.

SUFFICIENTLY SENSITIVE ANALYTICAL METHODS:
Please review Standard Conditions Part 1, section A, number 4. The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 and/or 40 CFR 136 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 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 quantifies the pollutant below the level of

the applicable water quality criterion 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 and or 40 CFR 136. These methods are also required for parameters listed as monitoring only, as the data collected may be used to determine if numeric limitations need to be established. A permittee is responsible for working with their contractors to ensure the analysis performed is sufficiently sensitive. 40 CFR 136 lists the approved methods accepted by the Department. Table A at 10 CSR 20-7.031 shows water quality standards.

Part VI. Administrative Requirements

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

Permit Synchronization:
The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together 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, that data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit.
✓ *This permit will maintain synchronization by expiring the end of the 3rd quarter, 2023.*

Public Notice:
The Department shall give public notice that 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 Public Notice period for this operating permit was from 12/28/2019 to 1/28/2019; no comments were received.

Date of Fact Sheet: February 6, 2019

Completed By:
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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
March 1, 2015

PART III – SLUDGE AND BIOSOLIDS FROM DOMESTIC AND INDUSTRIAL WASTEWATER TREATMENT FACILITIES

SECTION A – GENERAL REQUIREMENTS

1. This permit pertains to sludge requirements under the Missouri Clean Water Law and regulation for domestic wastewater and industrial process wastewater. This permit also incorporates applicable federal sludge disposal requirements under 40 CFR 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR 503 for domestic wastewater. EPA has reviewed and accepted these standard sludge conditions. EPA may choose to issue a separate sludge addendum to this permit or a separate federal sludge permit at their discretion to further address the federal requirements.
2. These PART III Standard Conditions apply only to sludge and biosolids generated at domestic wastewater treatment facilities, including public owned treatment works (POTW), privately owned facilities and sludge or biosolids generated at industrial facilities.
3. Sludge and Biosolids Use and Disposal Practices:
    a. The permittee is authorized to operate the sludge and biosolids treatment, storage, use, and disposal facilities listed in the facility description of this permit.
    b. The permittee shall not exceed the design sludge volume listed in the facility description and shall not use sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
    c. The permittee is authorized to operate the storage, treatment or generating sites listed in the Facility Description section of this permit.
4. Sludge Received from other Facilities:
    a. Permittees may accept domestic wastewater sludge from other facilities including septic tank pumpings from residential sources as long as the design sludge volume is not exceeded and the treatment facility performance is not impaired.
    b. The permittee shall obtain a signed statement from the sludge generator or hauler that certifies the type and source of the sludge
5. These permit requirements do not supersede nor remove liability for compliance with county and other local ordinances.
6. These permit requirements do not supersede nor remove liability for compliance with other 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 sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Actor under Chapter 644 RSMo.
8. In addition to STANDARD CONDITIONS, the Department may include sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Alternate Limits in the Site Specific Permit.
   Where deemed appropriate, the Department may require an individual site specific permit in order to authorize alternate limitations:
    a. A site specific permit must be obtained for each operating location, including application sites.
    b. To request a site specific permit, an individual permit application, permit fee, and supporting documents shall be submitted for each operating location. This shall include a detailed sludge/biosolids management plan or engineering report.
10. Exceptions to these Standard Conditions may be authorized on a case-by-case basis by the Department, as follows:
    a. The Department will prepare a permit modification and follow permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR 124.10, and 40 CFR 501.15(a)(2)(ix)(E). This includes notification of the owner of the property located adjacent to each land application site, where appropriate.
    b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR 503.

SECTION B – DEFINITIONS

1. Best Management Practices include agronomic loading rates, soil conservation practices 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 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 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 (PFRP) in accordance with 40 CFR 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. Industrial wastewater means any wastewater, also known as process water, not defined as domestic wastewater. Per 40 CFR Part 122, process water 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.
8. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including septic tanks, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological discs, and other similar facilities. It does not include wastewater treatment lagoons and constructed wetlands for wastewater treatment.
9. Operating location as defined in 10 CSR 20-2.010 is all contiguous lands owned, operated or controlled by one (1) person or by two (2) or more persons jointly or as tenants in common.
10. Plant Available Nitrogen (PAN) is the nitrogen that will be available to plants during the growing seasons after biosolids application.
11. 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.
12. 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)
13. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen 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.
14. Septage is the material pumped from residential septic tanks and similar treatment works (with a design population of less than 150 people). The standard for biosolids from septage is different from other sludges.

SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES

1. Sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and sludge conditions of this permit.
2. The permittee shall operate the facility so that there is no sludge discharged to waters of the state.
3. Mechanical treatment plants shall have separate sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove sludge from these storage compartments on the required design schedule is a violation of this permit.

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

1. This section applies to permittees that haul sludge to another treatment facility for disposal or use contract haulers to remove and dispose of sludge.
2. Permittees that use contract haulers are responsible for compliance with all the terms of this permit including final disposal, unless the hauler has a separate permit for sludge or biosolids disposal issued by the Department; or the hauler transports the sludge to another permitted treatment facility.
3. Haulers who land apply septage must obtain a state permit.
4. Testing of sludge, other than total solids content, is not required if sludge is hauled to a municipal wastewater treatment facility or other permitted wastewater treatment facility, unless it is required by the accepting facility.

SECTION E – INCINERATION OF SLUDGE

1. Sludge incineration facilities shall comply with the requirements of 40 CFR 503 Subpart E; air pollution control regulations under 10 CSR 10; and solid waste management regulations under 10 CSR 80.
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, quantity of sludge incinerated, quantity of ash generated, quantity of ash stored, and ash used or disposal method, quantity, and location. Permittee shall also provide the name of the disposal facility and the applicable permit number.

SECTION F – SURFACE DISPOSAL SITES AND SLUDGE LAGOONS

1. Surface disposal sites of domestic facilities shall comply with the requirements in 40 CFR 503 Subpart C; air pollution control regulations under 10 CSR 10; and solid waste management regulations under 10 CSR 80.
2. 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 sludge storage lagoons as storage facilities, accumulated 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 sludge removed will be dependent on sludge generation and accumulation in the facility. Enough 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 sludge on the bottom of the lagoon, upon prior approval of the Department; or
    b. Permittee shall close the lagoon in accordance with Section H.

SECTION G – LAND APPLICATION

1. The permittee shall not land apply sludge or biosolids unless land application is authorized in the facility description or the special conditions of the issued NPDES permit.
2. Land application sites within a 20 miles radius of the wastewater treatment facility are authorized under this permit when biosolids are applied for beneficial use in accordance with these standard conditions unless otherwise specified in a site specific permit. If the permittee's land application site is greater than a 20 mile radius of the wastewater treatment facility, approval must be granted from the Department.
3. Land application shall not adversely affect a threatened or endangered species or its designated critical habitat.
4. Biosolids shall not be applied unless authorized in this permit or exempted under 10 CSR 20, Chapter 6.
    a. This permit does not authorize the land application of domestic sludge except for when sludge meets the definition of biosolids.
    b. This permit authorizes "Class A or B" biosolids derived from domestic wastewater and/or process water sludge 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.
5. Public Contact Sites:

    Permittees who wish to apply Class A biosolids to public contact sites must obtain approval from the Department after two years of proper operation with acceptable testing documentation that shows the biosolids meet Class A criteria. A shorter length of testing will be allowed with prior approval from the Department. Authorization for land applications must be provided in the special conditions section of this permit or in a separate site specific permit.
    a. After Class B biosolids have been land applied, public access must be restricted for 12 months.
    b. Class B biosolids are only land applied to root crops, home gardens or vegetable crops whose edible parts will not be for human consumption.
6. Agricultural and Silvicultural Sites:

    Septage – Based on Water Quality guide 422 (WQ422) published by the University of Missouri
    a. Haulers that land apply septage must obtain a state permit
    b. Do not apply more than 30,000 gallons of septage per acre per year.
    c. Septage 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 other mechanical type treatment facilities.
    d. To meet Class B sludge requirements, maintain septage at 12 pH for at least thirty (30) minutes before land application. 50 pounds of hydrated lime shall be added to each 1,000 gallons of septage in order to meet pathogen and vector stabilization for septage biosolids applied to crops, pastures or timberland.
    e. 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.

Biosolids - Based on Water Quality guide 423, 424, and 425 (WQ423, WQ424, WQ425) published by the University of Missouri;

a. Biosolids shall be monitored to determine the quality for regulated pollutants
b. The number of samples taken is directly related to the amount of sludge produced by the facility (See Section I of these Standard Conditions). Report as dry weight unless otherwise specified in the site specific permit. 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 reach the maximum concentration of pollutants allowed.
c. Table 1 gives the maximum concentration allowable to protect water quality standards

TABLE 1

Biosolids ceiling concentration [1]	
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

[1] Land application is not allowed if the sludge concentration exceeds the maximum limits for any of these pollutants

d. The low metal concentration biosolids has reduced requirements because of its higher quality and can safely be applied for 100 years or longer at typical agronomic loading rates. (See Table 2)

TABLE 2

Biosolids Low Metal Concentration [1]	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	36
Zinc	2,800

[1] You may apply low metal biosolids without tracking cumulative metal limits, provided the cumulative application of biosolids does not exceed 500 dry tons per acre.

e. Each pollutant in Table 3 has an annual and a total cumulative loading limit, based on the allowable pounds per acre for various soil categories.

TABLE 3

Pollutant	CEC 15+		CEC 5 to 15		CEC 0 to 5	
	Annual	Total [1]	Annual	Total [1]	Annual	Total [1]
Arsenic	1.8	36.0	1.8	36.0	1.8	36.0
Cadmium	1.7	35.0	0.9	9.0	0.4	4.5
Copper	66.0	1,335.0	25.0	250.0	12.0	125.0
Lead	13.0	267.0	13.0	267.0	13.0	133.0
Mercury	0.7	15.0	0.7	15.0	0.7	15.0
Nickel	19.0	347.0	19.0	250.0	12.0	125.0
Selenium	4.5	89.0	4.5	44.0	1.6	16.0
Zinc	124.0	2,492.0	50.0	500.0	25.0	250.0

[1] Total cumulative loading limits for soils with equal or greater than 6.0 pH (salt based test) or 6.5 pH (water based test)

TABLE 4 - Guidelines for land application of other trace substances [1]

Cumulative Loading	
Pollutant	Pounds per acre
Aluminum	4,000[2]
Beryllium	100
Cobalt	50
Fluoride	800
Manganese	500
Silver	200
Tin	1,000
Dioxin	(10 ppt in soil)[3]
Other	[4]

[1] Design of land treatment systems for Industrial Waste, 1979. Michael Ray Overcash, North Carolina State University and Land Treatment of Municipal Wastewater, EPA 1981.)

[2] This applies for a soil with a pH between 6.0 and 7.0 (salt based test) or a pH between 6.5 to 7.5 (water based test). Case-by-case review is required for higher pH soils.

[3] Total Dioxin Toxicity Equivalents (TEQ) in soils, based on a risk assessment under 40 CFR 744, May 1998.

[4] Case by case review. Concentrations in sludge should not exceed the 95th percentile of the National Sewage Sludge Survey, EPA, January 2009.

Best Management Practices – Based on Water Quality guide 426 (WQ426) published by the University of Missouri

a. Use best management practices when applying biosolids.
b. Biosolids cannot discharge from the land application site
c. Biosolid application is subject to the Missouri Department of Agriculture State Milk Board concerning grazing restrictions of lactating dairy cattle.
d. Biosolid application must be in accordance with section 4 of the Endangered Species Act.
e. Do not apply more than the agronomic rate of nitrogen needed.
f. The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop removal 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.
    i. PAN can be determined as follows and is in accordance with WQ426
    (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.
g. Buffer zones are as follows:
    i. 300 feet of a water supply well, sinkhole, lake, pond, 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 outstanding state resource waters as listed in the Water Quality Standards, 10 CSR 20-7.031;
    iii. 150 feet if dwellings;
    iv. 100 feet of wetlands or permanent flowing streams;
    v. 50 feet of a property line or other waters of the state, including intermittent flowing streams.
h. Slope limitation for application sites are as follows;
    i. A slope 0 to 6 percent has 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.
i. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.
j. Do not apply biosolids to sites with soil that is snow covered, frozen or saturated with liquid without prior approval by the Department.
k. Biosolids / sludge applicators must keep detailed records up to five years.

SECTION H – CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical, industrial, and lagoons) and sludge or biosolids storage and treatment facilities and incineration ash ponds. 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 residues, including sludge, biosolids. Mechanical plants, sludge lagoons, ash ponds and other storage structures must obtain approval of a closure plan from the Department. 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. Residuals 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. Residuals shall meet the monitoring and land application limits for agricultural rates as referenced in Section H of these standard conditions.
    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.
        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.
4. When closing a domestic wastewater treatment lagoon with a design treatment capacity equal or less than 150 persons, the residuals are considered “septage” under the similar treatment works definition. See Section B of these standard conditions. 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. Residuals left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, 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.
6. Lagoons and/or earthen structure and/or ash pond 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 and/or industrial process wastewater plant; all 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. Per 10 CSR 20-6.015(4)(B)6, Hazardous Waste shall not be land applied or disposed during industrial and mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations under 10 CSR 25.
    c. After demolition of the mechanical plant / industrial plant, the site must only contain clean fill defined in RSMo 260.200 (5) 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 or other beneficial use. Other solid wastes must be removed.
8. If sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or H, 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 503, Subpart C.

SECTION I – MONITORING FREQUENCY

1. At a minimum, sludge or biosolids 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

Design Sludge Production (dry tons per year)	Monitoring Frequency (See Notes 1, 2, and 3)			
	Metals, Pathogens and Vectors	Nitrogen TKN [1]	Nitrogen PAN [2]	Priority Pollutants and TCLP [3]
0 to 100	1 per year	1 per year	1 per month	1 per year
101 to 200	biannual	biannual	1 per month	1 per year
201 to 1,000	quarterly	quarterly	1 per month	1 per year
1,001 to 10,000	1 per month	1 per month	1 per week	--[4]
10,001 +	1 per week	1 per week	1 per day	--[4]

[1] Test total Kjeldahl nitrogen, if biosolids application is 2 dry tons per acre per year or less.

[2] 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.

[3] Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) and toxicity characteristic leaching procedure (40 CFR 261.24) is required only for permit holders that must have a pre-treatment program.

[4] One sample for each 1,000 dry tons of sludge.

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: Total Phosphorus: Total phosphorus and total potassium shall be tested at the same monitoring frequency as metals.
Note 3: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

2. If you own a wastewater treatment lagoon or sludge lagoon that is cleaned out once a year or less, you may choose to sample only when the sludge is removed or the lagoon is closed. Test one composite sample for each 100 dry tons of sludge or biosolids removed from the lagoon during the year within the lagoon at closing. 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. Permittees receiving industrial wastewater may be required to conduct additional testing upon request from the Department.
4. At this time, the Department recommends monitoring requirements shall be performed in accordance with, "POTW Sludge Sampling and Analysis Guidance Document," United States Environmental Protection Agency, August 1989, and the subsequent revisions.

SECTION J – 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 these standard conditions and any additional items in the Special Conditions section of this permit. This shall include dates when the sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
2. Reporting period
    a. By January 28th of each year, an annual report shall be submitted for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and sludge or biosolids disposal facilities.
    b. Permittees with wastewater treatment lagoons shall submit the above annual report only when sludge or biosolids are removed from the lagoon during the report period or when the lagoon is closed.
3. Report Forms. The annual report shall be submitted on report forms provided by the Department or equivalent forms approved by the Department.
4. Reports shall be submitted as follows:

Major facilities (those serving 10,000 persons or 1 million gallons per day) shall report to both the Department and EPA. Other facilities need to report only to the Department. Reports shall be submitted to the addresses listed as follows:

DNR regional office listed in your permit
(see cover letter of permit)
ATTN: Sludge Coordinator

EPA Region VII
Water Compliance Branch (WACM)
Sludge Coordinator
11201 Renner Blvd.
Lenexa, KS 66219

5. Annual report contents. The annual report shall include the following:
    a. Sludge and biosolids testing performed. Include a copy or summary of all test results, even if not required by the permit.
    b. Sludge or biosolids quantity shall be reported as dry tons for quantity generated by the wastewater treatment facility, the quantity stored on site at the end of the year, and the quantity used 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, 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 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 sludge or biosolids 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, CEC, and phosphorus. If none was tested during the year, report the last date when tested and results.

BASF

We create chemistry

August 13, 2020

Ms. Pam Hackler
Environmental Scientist
Missouri Department of Natural Resources
Water Protection Program
1101 Riverside Drive
Jefferson City, MO 65102

Re: NPDES Permit MO-0001716 – Permit Modification Application for Outfall 002

Dear Ms. Hackler:

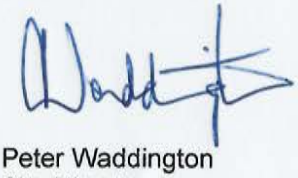
The purpose of this permit modification is to request an extension for the Schedule of Compliance with the final effluent limitations for total recoverable aluminum at Outfall-002. BASF requests an extension of one year, from March 1, 2021 to March 1, 2022.

Enclosed with this letter is the Form A for the permit modification for Outfall-002. Several factors have contributed to the request for the extension, including:

1. The delay in getting permission (~ 11 months) from the Army Corps of Engineers, believed to be due largely to COVID-19 impacts. The delay prevented BASF from installing the diffuser needed to come into compliance during optimal warm weather conditions and low river stages as originally planned.
2. Installation of the diffuser requires working from a barge in the Mississippi River. Historic data shows potential that the river will be frozen middle of December 2020 to middle of February 2021, making such an installation during this time frame impossible.
3. Even if river conditions allow for barge use, Lock and Dam 25 will be closed from beginning of January 2021 to end of February 2021 according to a Massman (contractor) resource. This will prevent the barge and installation equipment needed for installation from reaching the site from St. Louis.
4. Potential of high river levels at various times of the year that preclude safe construction work from the barge, requiring additional flexibility in the installation schedule.
5. A general shortage of resources related to COVID-19 that have impeded project execution.

BASF plans to pay the application filing fee payment of $1250 via credit card or over the phone to Missouri Department of Natural Resources (MDNR). If you have any questions or need any additional information to support this request, please do not hesitate to contact Minh Hoac (573-769-8839).

Sincerely,
BASF Corporation



Peter Waddington
Site Director

Enclosure
cc: Irene Crawford, Director, MDNR NERO

BASF Corporation
Hannibal Site
3150 Highway JJ
Palmyra, MO 63461
Tel: (573) 769-8500

rec'd 08/13/20 AP 35351

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

FOR AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED
JET PAY CONFIRMATION NUMBER	

PLEASE READ ALL THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM.
SUBMITTAL OF AN INCOMPLETE APPLICATION MAY RESULT IN THE APPLICATION BEING RETURNED.

IF YOUR FACILITY IS ELIGIBLE FOR A NO EXPOSURE EXEMPTION:
Fill out the No Exposure Certification Form (Mo 780-2828): https://dnr.mo.gov/forms/780-2828-f.pdf

1. REASON FOR APPLICATION:

- ☐ a. This facility is now in operation under Missouri State Operating Permit (permit) MO – _____, is submitting an application for renewal, and there is no proposed increase in design wastewater flow. Annual fees will be paid when invoiced and there is no additional permit fee required for renewal.
- ☐ b. This facility is now in operation under permit MO – _____, is submitting an application for renewal, and there is a proposed increase in design wastewater flow. Antidegradation Review may be required. Annual fees will be paid when invoiced and there is no additional permit fee required for renewal.
- ☐ c. This is a facility submitting an application for a new permit (for a new facility). Antidegradation Review may be required. New permit fee is required.
- ☑ d. This facility is now in operation under Missouri State Operating Permit (permit) MO – 1716 and is requesting a modification to the permit. Antidegradation Review may be required. Modification fee is required.

2. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
BASF Hannibal Site		573-769-8839	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
3150 Highway JJ	Palmyra	MO	63334

3. OWNER

NAME		TELEPHONE NUMBER WITH AREA CODE	
BASF Corporation (same as 2)			
EMAIL ADDRESS			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

4. CONTINUING AUTHORITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
BASF Corporation (same as 2)			
EMAIL ADDRESS			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

5. OPERATOR CERTIFICATION

NAME	CERTIFICATE NUMBER	TELEPHONE NUMBER WITH AREA CODE	
BASF Corporation (same as 2)			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE NUMBER WITH AREA CODE
Minh Hoac	EHS Specialist, Sr.	573-769-8839
E-MAIL ADDRESS		

7. DOWNSTREAM LANDOWNER(S) Attach additional sheets as necessary.

NAME			
Klocke, Randall and Janet (note: discharges are to Mississippi River)			
ADDRESS	CITY	STATE	ZIP CODE
161 County Road 127	Ewing	MO	63440

8. ADDITIONAL FACILITY INFORMATION

8.1 Legal Description of Outfalls. (Attach additional sheets if necessary.)
For Universal Transverse Mercator (UTM), use Zone 15 North referenced to North American Datum 1983 (NAD83)

001 ____¼ ____¼ Sec 11 T 58N R 5W Marion ____ County
UTM Coordinates Easting (X): _____ Northing (Y): _____

002 ____¼ ____¼ Sec 11 T 58N R 5W Marion ____ 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): _____

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

Primary SIC 2879 and NAICS 325320 SIC ____ and NAICS ____

SIC ____ and NAICS ____ SIC ____ and NAICS ____

9. ADDITIONAL FORMS AND MAPS NECESSARY TO COMPLETE THIS APPLICATION

A. Is this permit for a manufacturing, commercial, mining, solid/hazardous waste, or silviculture facility? YES ☑ NO ☐
If yes, complete Form C.

B. Is the facility considered a "Primary Industry" under EPA guidelines (40 CFR Part 122, Appendix A) : YES ☑ NO ☐
If yes, complete Forms C and D.

C. Is wastewater land applied? YES ☐ NO ☑
If yes, complete Form I.

D. Are sludge, biosolids, ash, or residuals generated, treated, stored, or land applied? YES ☐ NO ☑
If yes, complete Form R.

E. Have you received or applied for any permit or construction approval under the CWA or any other environmental regulatory authority? YES ☐ NO ☑
If yes, please include a list of all permits or approvals for this facility.

F. Do you use cooling water in your operations at this facility? YES ☑ NO ☐
If yes, please indicate the source of the water: Wells

G. Attach a map showing all outfalls and the receiving stream at 1" = 2,000' scale.

10. 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.

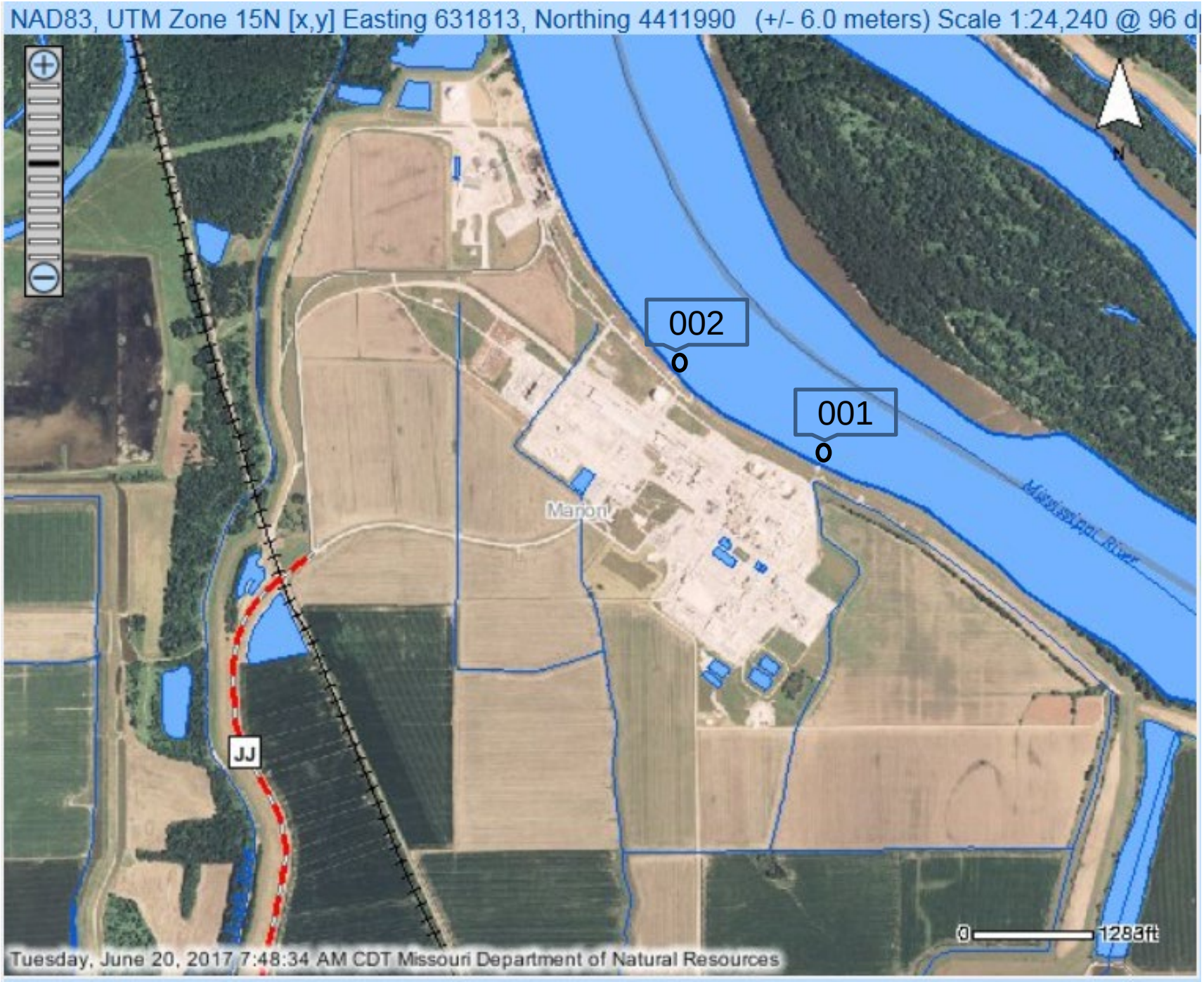
11. FEES

Permit fees may be paid by attaching a check, or online by credit card or eCheck through the JetPay system. Use the URL provided to access JetPay and make an online payment: https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/

12. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
Peter Waddington - Site Director	573-769-8500
SIGNATURE 	DATE SIGNED 08/13/2020


NAD83, UTM Zone 15N [x,y] Easting 631813, Northing 4411990 (+/- 6.0 meters) Scale 1:24,240 @ 96 d
002
001
Marion
JJ
N
0
1283ft
Tuesday, June 20, 2017 7:48:34 AM CDT Missouri Department of Natural Resources